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The Priority Structure of Corporate Liabilities

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ABSTRACT

Most discussions of corporate capital structure effectively assume that all debt is the same. Yet debt differs by maturity, covenant restrictions, conversion rights, call provisions, and priority. Here, we examine priority structure across a sample of 4995 COMPUSTAT industrial firms from 1981 to 1991. We analyze the variation in the use of capital leases, secured debt, ordinary debt, subordinated debt, and preferred stock both as a fraction of the firm's market value and as a fraction of total fixed claims. Our evidence provides consistent support for contracting cost hypotheses, mixed support for tax hypotheses, and little support for the signaling hypothesis.

A CENTRAL ISSUE IN corporate finance is the explanation of corporate leverage choices. While much of the extant analysis proceeds as if firms issue only common stock and a homogeneous class of debt, firms in fact issue a rich array of fixed claims that vary in several important dimensions. For example, they vary by maturity, covenant restrictions, conversion rights, call provisions, and priority. In this article we focus on variation in the priority structure of fixed claims.

There is little available evidence on corporate priority structure. Thus, we believe that an important aspect of this article is simply to document the use of claims of different priorities for a large sample of industrial firms. Using data from COMPUSTAT, we examine five priority classes: capitalized leases, secured debt, ordinary debt, subordinated debt, and preferred stock. We report both aggregate measures of priority structure as well as the distribution of the use of each of these instruments. We also offer basic tests of hypotheses explaining variation in priority structure. Our primary focus in these tests is to provide a better understanding of the relative importance of contracting cost, information asymmetry, and tax hypotheses in explaining variation in the use of claims of different priorities.

I. Characteristics of Corporate Liabilities

As Table I illustrates, the corporate claims on which we focus differ in other dimensions in addition to priority. In this section, we describe some of the

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Table I

Characteristics of Corporate Liabilities

Types of Corporate Liabilities	Capitalized Leases	Secured Debt	Ordinary Debt	Subordinated Debt	Preferred Stock	Common Stock
Priority of claim	Highest ←					→ Lowest
Can default trigger bankruptcy?	Yes				No	
Control rights	Right to restrict use of leased assest only	Right to limit activities specified in covenants			Right to limit activities and conditional voting rights[a]	Voting rights[b]
Corporate tax shields: Cash flows	Lease and interest payments are deductible				Dividend payments are not deductible	
Depreciation	Depends on the structure of the contract[c]	Assets financed with debt or equity can be depreciated				
Flotation costs	Flotation costs in lease payment	Flotation costs amortized over the life of the issue			Flotation costs are not deductible	
Tax liability for claimholders: Individuals	Lease and interest payments are ordinary income				Dividends are ordinary income	
Corporations					70% of dividends excluded from taxable income	

[a] Preferred stockholders can limit activities that are specified in the covenants, such as dividend payments to common stockholders, if preferred dividends have not been paid. Voting rights of preferred shares generally are conditional on corporate events such as the omission of preferred dividends or a change in control.

[b] Common stockholders elect the board of directors, who appoint top management. Common stockholders also vote on corporate activities as specified in the charter such as merger proposals.

[c] Typically the lessor depreciates the asset (and the lessee does not). However, leases can be structured so that the lessee depreciates the asset.

basic differences among these claims to provide a more complete framework for interpreting the hypotheses and tests that follow.

A. Rights in Bankruptcy

Bankruptcy is a legal proceeding for the court-supervised administration of a firm in financial distress. Default on promises made in lease or debt contracts generally give the claimholders the right to force the firm into bankruptcy. Under Chapter 7, the firm is liquidated—its assets are sold and the proceeds are distributed to the firm's claimants according to their priority. However, most large public corporations file under Chapter 11, which allows reorganization of the firm's outstanding contracts. An acceptable reorganization plan must be approved by each class of the firm's creditors.

Of the claims that we examine, capital leases generally have the highest priority in bankruptcy. Default on a promised lease payment typically gives the lessor the right to repossess the leased asset. If the lessee files for bankruptcy and argues that the asset is essential to the ongoing operation of the firm, the court can restrain the lessor from repossessing the leased asset. However, if the lessee affirms the lease contract, the court requires that the lessee continue to make the specified lease payments to the lessor throughout the bankruptcy process. (In contrast, debtholders typically are not paid until the bankruptcy process is resolved.)

Debt contracts contain provisions that specify the priority of the claim in bankruptcy. Secured debt gives the debtholders title to pledged assets until the bonds are paid in full. In liquidation, secured debtholders have first claim on the pledged assets. If the value of the pledged assets is less than the amount owed, secured debtholders have a claim on the firm's other assets for the shortfall. Subordinated debt generally specifies that with the occurrence of a stipulated event (such as bankruptcy or default on payments to senior debt), its claimholders are paid only after senior debtholders are paid in full.[1] Thus, subordinated debtholders agree to stand at the back of the line of debtholders.

Common and preferred stockholders do not have the right to force a firm into bankruptcy and, in bankruptcy, their claims have lower priority than that of debtholders. Preferred stock has higher priority in bankruptcy than common stock.

B. Control Rights

Lease contracts generally restrict corporate decisions only with respect to the leased asset. For example, the lease contract might specify required maintenance activities or limit subleasing of the asset, but the contract

[1] This is the most common form of subordination (sometimes referred to as "inchoate" subordination). For more detail as well as a discussion of the less common types of subordination, see American Bar Foundation (1971).

normally would not include provisions restricting the firm's financing or payout policies. (Internal Revenue Service rules prohibit such provisions in contracts that qualify for lease tax treatment.)

Debt contracts typically contain covenants that restrict the firm's investment, payout, and financing policies. The covenants can be either affirmative covenants (for example, requiring the firm to maintain specific working capital balances) or negative covenants (for example, prohibiting the firm from issuing additional debt unless a specified financial ratio is maintained). But debt contracts normally do not give lenders the right to initiate policy. Such rights would be expensive under the U.S. bankruptcy code. If a debt issue were to give lenders such control rights and the firm were to default on other payments, the firm's other creditors could sue the lender, claiming the lender received an unfair preference, and have the effective priority of that lender's debt reduced. Preferred stock issues also can include covenants limiting corporate policy choices. For example, preferred stock generally prohibits dividend payments to common stockholders unless preferred dividends have been paid. However, such preferred-stock covenants are typically less extensive than those in debt contracts. Preferred stock also can convey certain voting rights. However, preferred voting rights generally are conditioned on specific corporate events such as an omission of a preferred dividend or a merger.

Common stockholders have voting rights as specified in the corporate charter. They typically elect the board of directors who appoint corporate management. They also vote on certain corporate activities like mergers and corporate charter amendments.

C. Taxes

The various fixed claims examined in this article have materially different tax consequences for the parties to the contracts. Lease and interest payments are tax deductible expenses for the firm; under U.S. tax law, dividend payments are not. Assets financed with either debt or stock can be depreciated. There is greater flexibility in allocating depreciation tax shields in a lease; leases can be structured so that either the lessor or the lessee receives the depreciation expense. In lease contracts, origination expenses are generally reflected in the schedule of lease payments and thereby deductible. Debt flotation costs are amortized over the life of the issue and are also deductible. Flotation costs are not tax-reducing expenses in a common or preferred stock issue—they are a direct charge to the capital account.

For lessors and bondholder, the lease and interest payments are ordinary income. The tax consequences of dividends for stockholders differ between individuals and corporations. If the stockholder is an individual, it is ordinary income; if the stockholder is a corporation, 70 percent of the dividend is excluded in the calculation of taxable income.

II. Data

Our sample consists of all firms on the COMPUSTAT expanded annual industrial and full-coverage files and the COMPUSTAT research annual industrial file from 1981 through 1992. To focus on industrial firms, we restrict our sample to SIC codes from 2000 to 5999. We also require that the firm have sufficient data to determine the book value of capitalized leases, secured debt, ordinary notes and debentures, subordinated debt, and preferred stock.

Table II provides summary statistics on the priority structure of the fixed claims for the pooled time series and cross-section of firms on COMPUSTAT over this period (36,845 firm-year observations). We report the book value of the claims in each priority class as a percentage of total assets in Panel A and as a percentage of total fixed claims (capitalized leases, debt, plus preferred stock) in Panel B. Panel B indicates that the bulk of these fixed claims are spread between secured debt (36 percent) and ordinary debt (34 percent). Sixty-five percent of the firms issue some ordinary debt, while 9 percent issue only ordinary debt. Similarly, 63 percent of the firms have some secured debt in their capital structures, and 11 percent have only secured debt. The remaining claims are observed less frequently—capitalized leases comprise an average of 14 percent of total long-term fixed claims; subordinated debt, 11 percent; and preferred stock, 5 percent. Moreover, 50 percent of the firms have no capitalized leases on their balance sheets, 73 percent have no subordinated debt, and 79 percent have no preferred stock.

Table II also reports measures of the dispersion of the priority of claims within a given firm. On average, firms issue claims in 2.4 of these five priority classes. Twenty-six percent of the firms issue claims in a single priority class, while only 3 percent of the firms issue claims of all five classes. Finally, we calculate a Herfindahl index as a summary measure of dispersion.[2] The average value of the Herfindahl index in our sample is 0.75 (the median value is 0.78). As noted above, 26 percent of the firms have only one class of fixed claims outstanding yielding a Herfindahl index of 1.0.

III. The Determinants of Priority Structure

We estimate our regressions employing two deflators for the dependent variables—in Table III we express the value of claims in each priority class as a percentage of total firm value and in Table IV, as a percentage of total fixed claims. The regressions in Tables III and IV are pooled time-series and cross-sectional censored (Tobit) regressions. We estimate censored regres-

[2] To calculate the Herfindahl index, we square the fraction of long-term liabilities in each priority class and then sum the squares. If the firm has only a single class of fixed claims outstanding, the Herfindahl index takes its maximum value of 1.0; if the firm has exactly one-fifth of its fixed claims in each of the five priority classes, the Herfindahl index takes its minimum value of 0.2.

Table II

Summary statistics for the distribution of fixed claims by priority class. Sample: All firms on COMPUSTAT between 1981 and 1992 with Standard Industrial Classification (SIC) codes from 2000 to 5999 (36,845 firm-year observations).

	Mean	Standard Deviation	Percent at Minimum	25th Percentile	Median	75th Percentile	Percent at Maximum
Panel A: Priority Class as a Percentage of Total Firm Value							
Capitalized leases	2	5	50	0	0	2	0
Secured debt	10	15	33	0	3	14	0
Ordinary debt	8	12	34	0	2	13	0
Subordinated debt	4	11	73	0	0	1	0
Preferred stock	2	8	81	0	0	0	0
Total fixed claims	26	22	0	9	21	36	2[a]
Panel B: Priority Class as a Percentage of Total Fixed Claims (Capitalized Leases, Debt, Plus Preferred Stock)							
Capitalized leases	14	27	50	0	0	11	5
Secured debt	36	39	37	0	18	76	11
Ordinary debt	34	39	35	0	11	73	9
Subordinated debt	11	24	73	0	0	2	1
Preferred stock	5	18	79	0	0	0	2
Number of priority classes	2.39	1.08	26	1	2	3	3
Herfindahl index	0.75	0.23	0	0.53	0.78	1	26

[a] All observations where the ratio total fixed claims to total assets ≥ 1.00 (cases where the book value of equity ≤ 0).

Table III

Censored (Tobit) regressions of the value of claims in each priority class as a fraction of total firm value on the firms' market-to-book ratio, a regulation dummy variable, the log of firm value, the firms' abnormal earnings, and a dummy variable for tax-loss carryforwards. Sample: all firms on COMPUSTAT between 1981 and 1991 with Standard Industrial Classification (SIC) codes between 2000 and 5999. Statistical significance is indicated by the *p*-values (in parentheses); economic impact is indicated by the predicted change in the dependent variable from a movement from the tenth to the ninetieth percentile in the independent variable as a percentage of the mean of the dependent variable (in brackets).

	Dependent Variable				
Independent Variable	(1) Capitalized Leases	(2) Secured Debt	(3) Ordinary Debt	(4) Subordinated Debt	(5) Preferred Stock
Intercept	−0.93 (0.001)	14.74 (0.001)	−3.06 (0.001)	−27.15 (0.001)	−28.28 (0.001)
Market-to-book ratio	−0.17 (0.001) [−25.5]	−1.33 (0.001) [−46.9]	−1.77 (0.001) [−139.0]	−1.79 (0.001) [−76.8]	0.37 (0.011) [79.3]
Regulation dummy	−6.32 (0.001) [−258.0]	7.35 (0.001) [86.5]	5.36 (0.001) [141.1]	2.71 (0.217) [35.2]	8.82 (0.001) [415.0]
Abnormal earnings	0.16 (0.241) [2.6]	0.65 (0.019) [2.5]	0.12 (0.535) [1.0]	0.45 (0.370) [1.9]	1.31 (0.006) [30.9]
Tax-loss carryforward	0.70 (0.001) [35.0]	2.91 (0.001) [34.2]	−0.60 (0.001) [−15.8]	8.34 (0.001) [108.3]	6.85 (0.001) [344.6]
Log of firm value	−0.03 (0.215) [−9.6]	−2.10 (0.001) [−158.9]	2.52 (0.001) [313.2]	2.17 (0.001) [181.2]	1.61 (0.001) [469.6]
R^2	0.01[a]	0.06[a]	0.15[a]	0.01[a]	0.03[a]
Number of observations	24571	24571	24571	24571	24571

[a] R^2 from ordinary least squares regression.

sions because the dependent variable is restricted to the range zero to one, and there are a significant number of observations that take the values zero and one. In these regressions, each firm year is treated as an independent observation.[3]

For capitalized leases, subordinated debt, and preferred stock, the fraction of total variation in the dependent variable explained by the regressions reported in Tables III and IV is quite low; the R^2s from ordinary-least-squares

[3] We realize that the *p*-values in these regressions may be understated. In section *D* we report alternate regression specifications to check the robustness of these results.

Table IV

Censored (Tobit) regression of the value claims in each priority class as a fraction of total fixed claims (capitalized leases, debt, plus preferred stock) on the firms' market-to-book ratio, a regulation dummy variable, the log of firm value, the firms' abnormal earnings, and a dummy variable for tax-loss carryforwards. Sample: All firms on COMPUSTAT between 1981 and 1991 with Standard Industrial Classification (SIC) codes between 2000 and 5999. Statistical significance is indicated by the *p*-values (in parenthesis); economic impact is indicated by the predicted change in the dependent variable from a movement from the tenth to the ninetieth percentile in the independent variable as a percentage of the mean of the dependent variable (in brackets).

	Dependent Variable				
Independent Variable	(1) Capitalized Leases	(2) Secured Debt	(3) Ordinary Claims	(4) Subordinated Debt	(5) Preferred Stock
Intercept	−1.83 (0.087)	79.08 (0.001)	−9.41 (0.001)	−70.19 (0.001)	−73.75 (0.001)
Market-to-book ratio	3.43 (0.001) [71.0]	−1.41 (0.001) [−12.0]	−4.98 (0.001) [−42.2]	−5.16 (0.001) [−135.8]	0.10 (0.807) [7.7]
Regulation dummy	−41.93 (0.001) [−244.6]	18.21 (0.001) [51.7]	0.18 (0.958) [0.5]	4.77 (0.424) [41.8]	21.57 (0.001) [376.5]
Abnormal earnings	−0.50 (0.553) [−1.1]	0.16 (0.866) [0.2]	−0.95 (0.210) [−0.9]	−0.41 (0.765) [−1.2]	2.96 (0.004) [25.0]
Tax-loss carryforward	2.89 (0.001) [19.9]	−3.40 (0.001) [−9.7]	−8.67 (0.001) [−24.5]	19.97 (0.001) [175.2]	17.97 (0.001) [330.4]
Log of firm value	−1.93 (0.001) [−85.6]	−11.36 (0.001) [−203.8]	10.95 (0.001) [198.9]	5.73 (0.001) [261.6]	4.23 (0.001) [448.7]
R^2	0.03[a]	0.13[a]	0.22[a]	0.01[a]	0.02[a]
Number of observations	24571	24571	24571	24571	24571

[a] R^2 from ordinary least squares regression.

regressions range from 0.01 to 0.03. This suggests that the motivation for issuing claims in these priority classes is more idiosyncratic (such as the use of preferred stock in financing a merger). The regressions for ordinary debt and secured debt have more explanatory power with ordinary least squares (OLS) R^2s that range from 0.06 to 0.22.

To derive a better understanding of the impact of the independent variables, we report two measures of significance in Tables III and IV. Statistical significance is measured by the *p*-value (in parentheses). The economic impact is measured by the predicted change in the dependent variable from changing the independent variable from the tenth to the ninetieth percentile expressed as a percentage of the mean of the dependent variable (in brackets).

A. Contracting-Cost Hypotheses

A.1. The Investment Opportunity Set

With risky fixed claims in the firm's capital structure, conflicts can arise between stockholders and bondholders over the firm's real investment decisions. For example, if most of the benefits from a profitable investment opportunity were to accrue to the bondholders, then stockholders might decide that it is not in their interests to invest in this project. Myers (1977) labels this the underinvestment problem. Similarly, it is sometimes possible to transfer wealth from bondholders to stockholders by exchanging higher-risk for lower-risk assets. This is known as the asset-substitution problem.

Myers argues that the underinvestment problems arising from the conflict between bondholders and stockholders can be reduced by reducing the amount of debt in the firm's capital structure, by including restrictive covenants in the indenture agreements, or by shortening the maturity of the debt. These incentive problems also can be reduced if the firm preserves the right to finance new investments with high priority claims, such as secured debt or leases (Stulz and Johnson (1985)). Financing new investment projects with senior claims limits wealth transfers from stockholders to existing bondholders and thus reduces the incentives to underinvest. Including security provisions in the debt also limits the firm's ability to engage in asset substitution (Smith and Warner (1979)). This suggests that a firm with more growth options in its investment opportunity set—and thus for whom these incentive problems are more severe—should have a greater portion of its long-term liabilities in senior claims such as capitalized leases or secured debt.

Smith and Watts (1992) and Gaver and Gaver (1993) examine the association between measures of the firm's investment opportunity set and the firm's financing, compensation, and dividend policies. These studies employ the ratio of the market value of the firm's assets to their book value as a proxy for growth options in the firm's investment opportunity set. Since a firm's balance sheet normally does not include intangible assets like growth options, then the more growth options in its investment opportunity set, the higher will be the firm's market-to-book ratio. Consistent with incentive-contracting hypotheses, Smith and Watts (1992) find that this ratio is significantly associated with the firm's observed policy choices. Thus, following the procedure in Barclay and Smith (1995), we use the market-to-book ratio to proxy for the firm's investment opportunity set.[4]

[4] We estimate the market value of the firm's assets as the book value of assets minus the book value of equity plus the market value of equity. The market-to-book ratio is then calculated as the estimated market value of assets divided by the book value of assets. The estimated market-to-book ratio has several extreme observations. For example, 98 percent of the ratios are between 0.57 and 9.58. The range for this variable, however, is 0.19 to 260.30. To prevent extreme observations from having an undue influence on the regression results, we discard observations if the market-to-book ratio is greater than ten. Discarding these observations reduces the statistical significance of this variable in the regressions, but increases the size of the coefficient.

The regressions in Table III indicate that firms with more growth options in their investment opportunity sets (as proxied by high market-to-book ratios) issue significantly fewer fixed claims in the forms of lease and debt obligations, but more preferred stock—the p-values are all less than 0.001, except for preferred stock (which is 0.011). This is consistent with previous results indicating that firms with more growth options tend to have less debt overall in their capital structures. The economic impact appears material; changing the market-to-book ratio from the tenth to the ninetieth percentile lowers leasing by 25.5 percent, lowers ordinary debt by 139.0 percent, and increases preferred stock by 79.3 percent.

By examining the evidence in Table IV (where we scale by total fixed claims), we obtain a richer understanding of the relative use of the different priority claims. Table IV indicates that firms with more growth opportunities use capitalized leases more intensively but issue a smaller fraction of debt in each priority class (the effect of growth options on use of preferred stock is not significant). The economic impact ranges from 7.7 to 135.8 percent.

A.2. Regulation

Although courts have ruled that investors in regulated utilities are entitled to a normal return on their investment, regulators face political incentives to transfer wealth from investors to customers. Investors will pay higher prices for the firms' claims if they are structured so that the opportunities for such wealth transfers are more effectively restricted (Smith (1986)). By issuing more debt and preferred stock, inadequate rate awards translate into larger percentage reductions in the value of common shares, thereby more effectively constraining regulators' actions.

To estimate the effects of regulation, we construct a dummy variable that is set equal to one for firms in regulated industries and zero otherwise.[5] Tables III and IV suggest several effects of regulation on the priority of the firm's fixed claims. As a fraction of either total firm value or total fixed claims, regulated firms use significantly fewer capitalized leases but significantly more secured debt and preferred stock than unregulated firms. The economic impact also appears material, ranging from 51.7 percent (for secured debt to fixed claims) to 415.0 percent (for preferred stock to firm value). Regulated firms use significantly more ordinary debt as a fraction of firm value than unregulated firms (the economic impact is 141.0 percent); however, as a fraction of total fixed claims, there is no significant difference in its use.

B. Information Asymmetry Hypotheses

Signaling models generally imply that undervalued firms will issue claims with high priority since they are the least undervalued, and overvalued firms will issue claims with low priority since they are the most overvalued (see Harris and Raviv (1991)). Yet, in the signaling literature, little attention has

[5] Regulated industries include telecommunications (4812 and 4813) through 1982, and gas and electric utilities (4900 to 4939).

been given to defining quality in a way that is empirically observable. However, the signaling models all assume that managers have better (or more timely) information about firm value than investors. To measure quality empirically, we use the firm's abnormal future earnings.[6] We assume that high-quality (under-valued) firms have positive future abnormal earnings and low-quality (over-valued) firms have negative future abnormal earnings.

Using the firm's future abnormal earnings as a proxy for firm quality, we find little support for this hypotheses. In Table III, the significant positive coefficient for secured debt as a fraction of firm value is consistent with the information-asymmetry hypothesis; but the economic impact is only 2.5 percent. Moreover, the significant positive coefficients in both Tables III and IV on the preferred-stock variable are opposite from the sign predicted by the signaling models. Therefore, while signaling models may help explain the choice of security at issuance, our evidence suggests that they have little power in explaining the variation in priority structure across firms.

C. Taxes

The tax system encourages firms facing higher effective marginal tax rates to issue more debt that bears interest and that is fully deductible from taxable income (DeAngelo and Masulis (1980)). The interest payments on risky debt include a default premium that is tax deductible as paid. Thus, the tax system encourages firms facing higher effective marginal tax rates to issue the lowest priority (and thus most risky) debt claims (Scholes and Wolfson (1992)). Finally, noninterest tax shields like tax-loss carryforwards encourage leasing because leasing provides the firm with additional flexibility to allocate tax shields to the party that values them more highly (Smith and Wakeman (1985)).

As a proxy for the firm's marginal tax rate, we include a dummy variable that is equal to one if the firm has any tax-loss carryforwards, and zero otherwise. We assume that firms with tax-loss carryforwards have low effective marginal tax rates.

The evidence in Tables III and IV indicates that firms with more tax-loss carryforwards have significantly more capitalized leases, subordinated debt, and preferred stock but less ordinary debt. Here, the economic impact ranges from 9.7 to 344.6 percent. More leasing is consistent with the tax hypothesis; leasing allows transfer of depreciation tax shields to lessors with high marginal tax rates who would place a higher value on these shields. Consis-

[6] Assuming that earnings follow a random walk, we define abnormal earnings in year $t + 1$ as earnings per share in year $t + 1$ (excluding extraordinary items and discontinued operations and adjusted for any changes in shares outstanding) minus earnings per share in year t, divided by the share price in year t. This variable has several extreme observations. For example, 98 percent of the abnormal earnings are between -1.43 and 2.11, while the range for this variable is $-92{,}773$ to 1306. We discard observations if the absolute value of the abnormal earnings variable is greater than five. Discarding these observations has a material effect on the estimated coefficient for the abnormal earnings variable. This coefficient is not significantly different from zero in any regression in which these extreme observations are included. Discarding these observations, however, has little effect on the other variables in the regression.

tent with the Scholes and Wolfson (1992) tax arguments, firms with higher tax-loss carryforwards issue more preferred stock. But this tax hypothesis predicts more secured debt and less subordinated debt—the opposite of what we find.

C.1. Alternate Tax Variables

A potential explanation for the limited support for the tax hypothesis is that tax-loss carryforwards proxy for poor operating performance and financial distress, rather than the firm's tax circumstances. To check the robustness of our results, we employ other tax proxies. Using data from COMPUSTAT, we include the firms' average tax rate, and the firms' use of investment tax credits. Moreover, because there were material changes in the tax code implemented in 1986 and 1987, we include dummy variables for 1986 and 1987 to 1992. In Table V, we report the results of regressions estimated including all the tax variables. (If we reestimate the regressions including the tax variables individually, in all but four of the 45 cases, the sign and the statistical significance of the coefficients are unaffected. Thus, multicollinearity among the various tax variables does not appear to cause serious problems in these regressions.)

Our evidence offers support for several tax-based hypotheses. Consistent with the hypothesis that firms with lower effective tax rates issue more preferred stock, the average-tax-rate coefficient is negative. Consistent with the DeAngelo and Masulis hypothesis that firms with more noninterest tax shields face a comparative disadvantage in issuing debt, the tax-loss-carryforward and investment-tax-credit coefficients are both positive in the preferred stock regression. Our evidence is consistent with the hypothesis that firms with higher tax rates engage in less leasing; the average-tax-rate coefficient is negative and the tax-loss-carryforward coefficient is positive in the leasing regression. Finally, consistent with the Smith and Wakeman argument that limitations on the use of investment tax credits (ITCs) can induce firms to lease assets, the ITC coefficient in the leasing regression is negative.

The tax revision of 1986 changed the tax code in at least two important ways. First, it eliminated the investment tax credit for new investment. Second, it instituted the alternate minimum tax. These changes would create offsetting incentives with respect to leasing. The alternate minimum tax would encourage more leasing to shift tax shields to parties who value them more highly, while elimination of the ITC removes a tax-based motive for leasing. The significant negative coefficient on the 1987 to 1992 dummy variable suggests that the ITC effect is larger.

Other aspects of our evidence appear inconsistent with particular tax-based hypotheses. Scholes and Wolfson (1992) argue that because interest is a deductible corporate expense, firms facing higher tax rates have incentives to issue lower priority debt claims to increase the value of the tax shield. This prediction implies that the average-tax-rate coefficient should increase as one moves across the secured-debt, ordinary-debt, and subordinated-debt regressions. Yet, the average-tax-rate coefficient is positive in the secured-debt

Table V

Censored (Tobit) regression of the value of claims in each priority class as a fraction of total fixed claims (capitalized leases, debt, plus preferred stock) on the films' market-to-book ratio, a regulation dummy variable, the log of firm value, the firms' abnormal earnings, and a various proxies for the firms' tax status. Sample: all firms on COMPUSTAT between 1981 and 1991 with Standard Industrial Classification (SIC) codes between 2000 and 5999 (p-values in parentheses).

	Dependent Variable				
Independent Variable	(1) Capitalized Leases	(2) Secured Debt	(3) Ordinary Debt	(4) Subordinated Debt	(5) Preferred Stock
Intercept	1.29 (0.259)	78.08 (0.001)	−7.69 (0.001)	−68.95 (0.001)	−72.51 (0.001)
Market-to-book ratio	3.38 (0.001)	−1.42 (0.001)	−4.86 (0.001)	−5.02 (0.001)	−0.23 (0.579)
Regulation dummy	−42.02 (0.001)	15.00 (0.001)	−1.89 (0.729)	8.94 (0.140)	19.65 (0.001)
Abnormal earnings	−0.63 (0.466)	0.29 (0.766)	−1.15 (0.134)	−0.37 (0.785)	3.17 (0.003)
Average tax rate	−1.89 (0.094)	0.40 (0.755)	0.15 (0.883)	−10.31 (0.001)	−2.09 (0.160)
ITCs	−16.22 (0.001)	14.99 (0.001)	1.04 (0.569)	−20.19 (0.001)	7.61 (0.002)
Tax-loss carryforward	3.34 (0.001)	−2.94 (0.002)	−8.27 (0.001)	17.76 (0.001)	18.32 (0.001)
1986 dummy	−4.07 (0.001)	2.73 (0.058)	−3.84 (0.001)	3.48 (0.092)	−3.50 (0.038)
1987 to 1991 dummy	−7.16 (0.001)	1.37 (0.134)	−4.31 (0.001)	2.70 (0.038)	−2.34 (0.027)
Log of firm value	−1.66 (0.001)	−11.48 (0.001)	11.02 (0.001)	−5.73 (0.001)	4.21 (0.001)
R^2	0.04[a]	0.13[a]	0.22[a]	0.01[a]	0.02[a]
Number of observations	23958	23958	23958	23958	23958

[a] R^2 from ordinary least squares regressions.

regression, insignificantly different from zero in the ordinary-debt regression, and negative in the subordinated-debt regression. The DeAngelo and Masulis analysis would predict that the ITC and tax-loss-carryforward coefficients in the debt regressions all would be negative. Yet, the ITC coefficient in the secured-debt regression and the tax-loss-carryforward coefficient in the subordinated-debt regression are both positive.

Again, a potential explanation for these anomalous results is that the tax variables proxy for things other than the firms' tax status. For example, the

existence of tax-loss carryforwards also might proxy for financial distress. Thus, the increased use of subordinated debt by firms with tax-loss carryforwards is potentially explained by the financing choices of firms facing financial distress (Gilson (1994)). Similarly, ITCs might proxy for aspects of the firms' investment opportunities. Thus, the increased use of secured debt by firms with more ITCs potentially reflects incentives to secure debt issued to finance tangible assets. Finally, our ITC variable is unlikely to offer a powerful test of the tax-based incentive to lease, specifically because lease contracts can be structured to shift the ITC from the lessee to the lessor.

D. Firm Size

Although firm size is one of the firm's endogenous choices, our understanding of the determinants of firm size is limited. Size should depend on economies of scale in both production and organization of the firm—size is thus a function of the firm's past investment opportunities. We believe that it is important to control for firm size in this analysis, in part, to guard against the possibility that some other variable is simply proxying for size.

We expect firm size to affect corporate priority choices. Because public securities have large fixed costs and substantial scale economies, large firms should have a comparative advantage in issuing securities publicly. This would imply that large firms would issue more preferred stock, since it is rarely privately placed, and fewer capital leases, since they never are issued publicly.

We measure firm size as the natural logarithm of the market value of the firm in constant dollars. The evidence in Tables III and IV indicate that larger firms issue significantly more ordinary debt, subordinated debt, and preferred stock, but significantly less secured debt. The economic impact ranges from 158.9 to 469.6 percent. Larger firms use fewer capitalized leases as a fraction of total fixed claims, but there is no significant difference in their use of capitalized leases as a fraction of firm value.

Since firm value is the denominator of the dependent variables in Table III, we were concerned about potential spurious correlations from using the log of firm value to measure size. To check for this possibility, we reestimated the regressions in Table III using the log of real sales to measure firm size. Only 3 of the 25 coefficients changed materially.[7]

E. Regression Specification

Since the typical assumption of independent errors is unlikely to be satisfied in the pooled regressions reported in Tables IV and V, the t-statistics are potentially overstated. To account for this potential error-dependence problem, Panel A of Table VI reports cross-sectional Tobit regressions using the

[7] In the leasing regression, size became significantly positive; in the secured debt regression, abnormal earnings became insignificant; and in the preferred stock regression, regulation became insignificant.

Table VI

Regressions of the value of claims in each priority class as a fraction of total fixed claims (capitalized leases, debt, plus preferred stock) on the firm's market-to-book ratio, a regulation dummy variable, the log of firm value, the firm's abnormal earnings, and a dummy variable for tax-loss carryforwards. Sample: All firms on COMPUSTAT between 1981 and 1991 with Standard Industrial Classification (SIC) codes between 2000 and 5999 (p-values in parentheses).

	Dependent Variable				
Independent Variable	(1) Capitalized Leases	(2) Secured Debt	(3) Ordinary Claims	(4) Subordinated Debt	(5) Preferred Stock
Panel A: Cross-Sectional Tobit Regressions					
Intercept	4.19	70.58	4.02	−38.47	−52.17
	(0.029)	(0.001)	(0.012)	(0.001)	(0.001)
Market-to-book ratio	2.59	−2.29	−3.44	−2.72	1.04
	(0.001)	(0.001)	(0.001)	(0.001)	(0.077)
Regulation dummy	−31.71	10.35	5.55	−2.61	17.23
	(0.001)	(0.168)	(0.360)	(0.761)	(0.019)
Abnormal earnings	−1.65	1.60	−1.66	1.36	4.57
	(0.426)	(0.449)	(0.338)	(0.591)	(0.053)
Tax-loss carryforward	4.62	−3.86	−7.51	15.54	21.10
	(0.005)	(0.023)	(0.001)	(0.001)	(0.001)
Log of firm value	−1.16	−7.91	8.08	4.67	3.48
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
R^2	0.03[a]	0.12[a]	0.21[a]	0.01[a]	0.03[a]
Number of observations	4995	4995	4995	4995	4995
Panel B: Fixed Effects Ordinary Least Squares Regressions					
Intercept	NA	NA	NA	NA	NA
Market-to-book ratio	2.81	0.55	−1.86	−2.14	0.64
	(0.001)	(0.010)	(0.001)	(0.001)	(0.001)
Regulation dummy	−4.70	−0.71	0.83	3.88	0.70
	(0.043)	(0.829)	(0.793)	(0.085)	(0.597)
Abnormal earnings	−0.09	0.38	−0.64	0.07	0.41
	(0.724)	(0.286)	(0.064)	(0.786)	(0.004)
Tax-loss carryforward	−1.32	1.98	−4.10	2.58	0.86
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Log of firm value	−4.42	−2.78	4.17	4.03	−1.00
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
R^2	0.71[b]	0.73[b]	0.75[b]	0.67[b]	0.70[b]
	0.02[c]	0.01[c]	0.01[c]	0.02[c]	0.01[c]
Number of observations[c]	23947	23947	23947	23947	23947

[a] R^2 from ordinary least squares regression.
[b] R^2 for the fixed-effects regression including the influence of the fixed effects.
[c] R^2 for the fixed-effects regression excluding the influence of the fixed effects.
[d] The fixed-effects regression excludes firms with only one observation.

time-series mean of each variable by firm (4995 observations). By running the regression in a single cross-section, the problem of serially correlated errors is eliminated. This regression preserves the dispersion across firms, but exploits no time-series variation in the observations.

In Panel B of Table VI, we estimate fixed-effects regressions as an alternate method for dealing with the problem of serially correlated errors. In this regression, the firm-specific time-series mean for each variable is subtracted from each observation. (This technique is equivalent to adding a dummy variable to the regression for each firm in the sample.) Thus, although the regression preserves the time-series dispersion in the sample, it ignores most of the information from differences across firms. We use OLS for the fixed-effects regressions, since the dependent variables are no longer restricted to the range zero to one.

The results from Table VI are generally consistent with the results using the pooled regressions reported in Table IV. Of the 25 estimated coefficients, the sign and significance of 23 are the same, using either the pooled or cross-sectional regressions.[8] Of the 25 estimated coefficients, the size and significance of 18 are the same using either the cross-sectional or the fixed-effects regressions.[9] This sensitivity to estimation method indicates that these coefficient estimates are less robust.

The cross-sectional and fixed-effects regressions in Table VI indicate that the explanatory power of the pooled regressions is primarily attributable to the cross-sectional variation in the sample rather than to the time-series variation. The R^2s in the cross-sectional regressions are approximately equal to the R^2s in the pooled regression, while the R^2s in the fixed-effects regressions fall to the range of 0.01 to 0.02.

IV. The Dispersion of Debt Priority Claims

Table VII reports regressions of the Herfindahl index on various firm-specific characteristics. We report a censored (Tobit) regression using the entire pooled time series and cross-section in regression (1), a cross-sectional censored regression using the time-series mean of each variable by firm regression (2), and a fixed-effects regression in regression (3). We view the regression results reported in this table as descriptive, rather than as hypothesis tests, since currently there is little theory to explain the dispersion of priorities among fixed claims. The independent variables in this regression

[8] The exceptions are that (1) the market-to-book ratio is marginally positive in the cross-sectional preferred-stock-to-fixed-claims regression but insignificant in the pooled regression, and (2) the regulation coefficient is significantly positive in the pooled secured-debt regression but insignificant in the cross-sectional regression.

[9] In three cases (regulation on subordinated debt and preferred stock and abnormal earnings on ordinary debt) one estimation method suggests an insignificant effect, while the other suggests it is significant. In four cases, the sign of the estimated coefficient changes, depending on the estimation method employed (market-to-book on secured debt, size on preferred stock, and tax-loss carryforwards on capitalized leases and secured debt).

Table VII

Censored (Tobit) regressions of the Herfindahl index for the dispersion of debt-priority classes on the firms' market-to-book ratio, a regulation dummy variable, the log of firm value, the firm's abnormal earnings, and a dummy variable for tax-loss carryforwards. Sample: all firms on COMPUSTAT between 1981 and 1991 with Standard Industrial Classification (SIC) codes from 2000 to 5999 (p-values in parentheses).

Independent Variable	(1) Pooled Tobit Regression	(2) Cross-Sectional Regression	(3) OLS Fixed Effects Regression
Intercept	0.84 (0.001)	0.82 (0.001)	NA
Market-to-book ratio	0.04 (0.001)	0.04 (0.001)	0.01 (0.001)
Regulation dummy	−0.03 (0.127)	−0.04 (0.325)	0.03 (0.165)
Abnormal earnings	−0.01 (0.497)	−0.01 (0.700)	−0.00 (0.789)
Tax-loss carryforward	−0.03 (0.001)	−0.04 (0.001)	−0.01 (0.001)
Log of firm value	−0.02 (0.001)	−0.02 (0.001)	−0.01 (0.001)
R^2	0.04[a]	0.08[a]	0.64[b] 0.01[c]
Number of observations	24,571	4995	23,947[d]

[a] R^2 from ordinary least squares regression.
[b] R^2 for the fixed-effects regression including the influence of the fixed effects.
[c] R^2 for the fixed-effects regression excluding the influence of the fixed effects.
[d] The fixed-effects regression excludes firms with only one observation.

are suggested by the literature on optimal capital structure and are the same as those we used in the previous regressions.

The regression coefficient for the market-to-book ratio is positive and statistically significant in all three regressions in Table VII. This suggests that firms with more growth options in their investment opportunity sets (as proxied by the market-to-book ratio) tend to have fixed claims that are concentrated in fewer priority classes. The regulation dummy variable is not statistically significant in any of these regressions. Therefore, given the other characteristics of regulated firms, the dispersion of their fixed claims does not differ materially from that of unregulated firms. Larger firms tend to have more disperse fixed claims. The coefficient on the abnormal-earnings variable is not significant in any of these regressions. Finally, the tax-loss carryforward variable is negative and significant in all three regressions, suggesting

that firms with lower effective marginal tax rates have more disperse liability claims. (Again, this effect is potentially attributable to financial distress rather than to tax status.)

V. Conclusions

This article provides an initial empirical investigation of the priority structure of corporate liabilities. Since there is little available evidence on variation in priority structure across firms, an important contribution of this article is to document variation in the use of claims of different priorities for a large sample of industrial firms. We characterize priority classes both as a percentage of firm value and as a percentage of total fixed claims. We report both aggregate measures of priority structure as well as the distribution of the use of each of these instruments.

We examine several hypotheses that predict variation in priority structure. Our primary focus in these tests is to provide a better understanding of the relative important of incentive-contracting, information-asymmetry, and tax hypotheses in explaining the use of various debt instruments of different priorities. Our evidence offers consistent support for the incentive contracting hypotheses, mixed support for the tax hypotheses, and little support for the signaling hypothesis.

Our preliminary work suggests several ways in which empirical tests of these theories can be improved. For example, typical proxies for the firms' effective marginal tax rate also appear to proxy for other firm characteristics, such as the nature of the firm's investment opportunity set or the likelihood of financial distress. More powerful tests of the tax hypotheses will require proxies that better isolate the firm's tax status.

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