Lecture 6

Capital Structure and Financial Distress

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Financial Distress. Some theory:

A firm is said to be ***financially distressed*** when such firm has difficulty in meeting its debt obligations. As opposed to *economically distressed*.

- → Financial distress is one of the reasons why firms do not raise very high levels of debt
- → Despite its tax advantage, a major disadvantage of taking high levels of debt is that it increases the risk of financial distress and ultimately liquidation.
- → Because the tax benefits are high (according to Graham's estimation), puzzling low level of debt have been explained with very high CFD

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outline

- Pre Shleifer-Vishny
  - Warner (1977)
  - Altman (1984)
  - Weiss (1990)
- Post Shleifer-Vishny
  - Pulvino
  - Benmelech
  - Stromberg

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Premise

There are two basic costs of financial distress:

- Direct costs: costs that come directly when entering financial distress or bankruptcy
  - legal fees, trustee fees, professional service fees, etc.
- Indirect costs: Value of business that is destroyed because of the presence of debt that would not be destroyed if firm did not have debt.
  - Cost of selling assets at a discount to fundamental value
  - Underinvestment
  - Overinvestment
  - Product market issues -- investments are not made, customers leave (worry about future service), etc
  - Employee issues -- employees leave.

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Financial Distress. Key questions:

What are the key questions in the literature about financial distress?

- How large are direct costs of financial distress / bankruptcy?
- How large are the indirect costs of financial distress / bankruptcy?
- What are the factors that influence financial distress?
- What are the implications for capital structure?
- What bankruptcy regime is most efficient?

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Financial Distress. Direct bankruptcy costs:

Original paper:

- Jerry Warner (1977)
  - Estimates direct bankruptcy costs using 11 bankrupt railroads.
    - Data from ICC.
  - 2.5% to 5.4% of estimated market value of assets from 3 years before to time of bankruptcy.

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Financial Distress. Indirect bankruptcy costs:

Indirect costs are much more difficult to value:

- Hard to distinguish whether poor performance caused by financial distress or factors that pushed firm into distress in first place.
  - Altman (1984) estimates indirect costs of distress. Looks at change in earnings from three years before distress .
    - Three yr. earnings shortfall = 25% of firm value.
    - Much larger than Warner and Weiss.
    - What do you think of this estimate?

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Financial Distress. Larry Weiss (1990)

In the paper "Bankruptcy resolution", Larry Weiss (JFE, 1990);

Presents evidence on:

- The direct costs of bankruptcy
- The violation of priority of claims

By examining the resolution of bankruptcy for 37 NYSE and AMEX firms that filed petitions under the 1979 Bankruptcy Code during the period 1979-1986.

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Financial Distress. Larry Weiss (1990)

Capital structure may be affected by two things that are analyzed in the paper:

1. Direct bankruptcy costs: legal and administrative fees
2. Violation of priority of claims: occurs when senior claimants are not fully satisfied before junior claimants receive any payment.

Results show that:

→ Direct costs are small: 3.1% of the book value of debt plus the market value of equity (end of year preceding bankruptcy)

→ Such small costs have virtually no impact on capital structure

→ Priority of claims is violated for 29 of the 37 firms studied: much more important

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Financial Distress. Larry Weiss (1990)

Data :

- 31 firms that filed for bankruptcy in the US between 1979 and 1986
- The authors goes to 7 federal courts to get the documents
- It is possible to collect data on direct bankruptcy costs because the US Code requires the court to list all fees paid for the bankruptcy procedure.
- Three measures are used to assess the magnitude of the direct costs of bankruptcy:
  1. Market value of equity
  2. Book value of debt plus market value of equity
  3. Book value of total assets

All measured at the fiscal year-end prior to the bankruptcy filing.

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Financial Distress. Larry Weiss (1990)

Table 2

Direct costs of bankruptcy and their relationship to firm size.

	Summary statistics				Number of firms	Time period
	Mean	Median	High	Low		
Current study						
Costs[a]/MVE[b]	20.6%	16.7%	63.6%	2.0%	31	1980–1986
Costs/D & E[c]	3.1%	2.6%	6.6%	1.0%	31	1980–1986
Costs/TA[d]	2.8%	2.5%	7.0%	0.9%	31	1980–1986
Prior studies						
Stanley & Girth[e]	24.9%	n/a	n/a	n/a	90	1964
Warner[f]	4.0%	n/a	9.8%	1.1%	11	1933–1955
Ang et al.[g]	7.5%	1.7%	100%	0.01%	55	1963–1978

Regression results (t-statistics in parentheses)

Costs = −0.9 + 0.028 · TA (R^2 = 0.83, Number of firms = 31)
(0.1) (11.9)

Costs = 2.6 + 0.005 · TA + 0.00001 · TA^2 (R^2 = 0.90, Number of firms = 31)
(0.5) (1.0) (5.5)

[a] Costs = legal and other professional fees associated with the bankruptcy filing.
[b] MVE = market value of equity at the fiscal year-end prior to the bankruptcy filing.
[c] D & E = book value of debt plus the market value of equity at the fiscal year-end prior to bankruptcy.
[d] TA = book value of total assets at the fiscal year-end prior to bankruptcy.
[e] Stanley and Girth (1971) use total assets (book value) from the last financial statement filed prior to bankruptcy.
[f] Warner (1977a) uses market value of debt + market value of equity immediately prior to bankruptcy.
[g] Ang et al. (1982) use the liquidated value of the firms at the end of the bankruptcy process.

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Financial Distress. Larry Weiss (1990)

Results on direct costs show that:

- Direct bankruptcy costs are lower as compared to findings in previous studies
- The direct costs of bankruptcy appear highly correlated with total assets (size of the firm) but do not fit a concave function
- This is in contrast with previous studies who find much higher fees as a percentage of firm size

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Financial Distress. Larry Weiss (1990)

For studying how priority claims can be violated it is necessary to first understand the bankruptcy codes.

Two types of bankruptcy filings are available to corporations:

- Chapter 7:
  - creditor-friendly code,
  - Appointed trustee in charge of liquidating the firm and paying claimants in order of priority
  - In chapter 7 priority of claims is maintained and most firms end up in liquidation
- Chapter 11:
  - debtor-friendly code,
  - favors reorganization of the firm
  - The manager stays as a 'debtor-in-possession' of the assets while creditors' claims are frozen
  - Debtor works out a reorganization plan for the firm to continue operations

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Big theoretical discussion on optimal bankrupt codes

- This is a digression – because it is about theory but it is important for you to know.
- Large debate about optimality of various bankruptcy procedure.
- Key ingredient is the balance between ex-ante efficiency and optimal continuation.
- The legal and economic scholar continues…the actual institutional details affect the term of the contracts, and the optimal managerial decision.
- More later….

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Financial Distress. Larry Weiss (1990)

- Creditors may also be willing to allow violation of priority to obtain their proceeds in a timely manner
  - Indeed, every time there is disagreement it must happen in front of court, and this delays the resolution.
- Secured creditors, whose collateral is worth less than the principal plus accrued interest, may give up part of their claims to avoid losing additional interest.
- Secured creditors may also be willing to violate priority to reduce the risk of decay in the value of their collateral.

→ The information about how much each claimant can expect to receive in the bankruptcy process is contained in the reorganization plan.

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Financial Distress. Larry Weiss (1990)

Results on deviations from strict priority of claims:

- Strict priority of claims is violated in 78% (29/37) of the cases
  - Shareholders (last priority claimants) received nothing in only 7 (19%) cases, of those, in 5 cases priority is maintained, in 2 cases it is violated.
  - In 3 cases (8%) shareholders receive a cash settlement ranging from $0.03 to $0.10 per share
  - In 15 cases (41%), shareholders receive a small portion (25% or less) of equity in reorganized company
  - In 12 cases (32%) shareholders receive a substantial portion (more than 25%) of the equity of the reorganized company

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Financial Distress. Larry Weiss (1990)

Results on deviations from strict priority of claims (cont.):

- In 6 cases shareholders retain virtually all (99% or 100%) of reorganized firm's equity
- In 2 other cases the secured creditors are paid fully and the unsecured creditors receive over 90% of their claims
- In the remaining 2 cases secured creditors are paid in full, but unsecured receive only 37% and 60% of their claims respectively

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Financial Distress. Larry Weiss (1990)

Conclusion:

- Direct bankruptcy costs are lower than in previous research
  - This may be due to the size and type of firms examined (e.g. in Warner's study direct costs are higher for firms with heavily regulated railroads with many more classes of debt)
- Priority of claims is violated in 29 out of 37 cases examined.
  - Unsecured creditors are frequently denied priority over both equity holders and lower-ranked unsecured creditors

→ Straightforward, if not boring, paper!

- Key differentiator → getting the data.
- Today, this and much more data are on line.

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Research question

- What are the consequences of allowing violation of absolute priorities if violation is known ex ante?
- How would you write a paper about this?
- Think hypothesis
- Think identification

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Financial Distress. Shleifer and Vishny (1992)

Concerning **asset sales in financial distress**,

The paper by Shleifer and Vishny (1992): "Liquidation values and debt capacity: a market equilibrium approach"

→ Develops a nice theory on the illiquid asset sales of financially distressed firms, and its implications for capital structure.

→ They want to explain:
- → Variation in debt capacity across industries and over the business cycle, and
- → The rise of corporate leverage in the 1980's in the US.

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Financial Distress. Shleifer and Vishny (1992)

- Asset redeployability is one important determinant of liquidation value and debt capacity:
  - Williamson (1988) stresses that redeployable assets (assets that have alternative uses):
    - have high liquidation values and
    - Are good candidates for debt finance

→ If those assets are managed improperly, the manager will be unable to pay debt, and then creditors will take the assets away from him and redeploy them

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Financial Distress. Shleifer and Vishny (1992)

- But most assets in the world are quite specialized and therefore ***not redeployable***,
- What happens in bankruptcy with no redeployable assets?
  - → Asset Illiquidity!: not redeployable assets are sold for a lower value than their value in best use when liquidation occurs
  - → Shleifer and Vishny Industry Equilibrium approach:
    - When firms have trouble meeting debt payments and sell assets or are liquidated,
    - ↓
    - The highest valuation potential buyers of these assets are likely to be other firms in the same industry
    - ↓

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Financial Distress. Shleifer and Vishny (1992)

- But these firms may have trouble meeting their own debt payments as long as the shock is industry- or economy-wide.
- ↓
- These industry buyers are likely to be unable to raise funds for buying the distressed firm's assets. (Even if industry buyers can raise funds, antitrust or other government regulations may prevent firms from buying assets from their competitors).
- ↓
- Assets have to be sold to industry outsiders who
  - don't know how to manage those assets
  - Face agency costs of hiring specialized employees who can manage those assets
  - Fear overpaying because they cannot value those assets properly (asymmetric information problem)

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Financial Distress. Shleifer and Vishny (1992)

- As a result, when industry outsiders face significant costs of acquiring and managing the assets,
  - (non-redeployable) assets in liquidation fetch prices below value in best use, which is the value when managed by specialists.

→ SV approach implies that:

- Liquidated assets are underpriced in recessions
- Asset illiquidity is a potential important cost of leverage
- Asset illiquidity reduces the optimal amount of leverage in the capital structure because having more debt implies more frequently costly liquidation

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Financial Distress. Shleifer and Vishny (1992)

Conclusions:

- Cross-sectional implications:
  - Illiquid assets are poor candidates for debt finance (and vice versa for liquid assets)
  - Growth and cyclical assets are poor candidates for debt finance because they have a high probability of a low cash flow and default on debt, in particular if they are illiquid
  - Conglomerates are better candidates for debt finance than pure plays of the same size (low volatility, diversified assets…)

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Financial Distress. Shleifer and Vishny (1992)

Conclusions (cont.):

- Time-series implications:
  - Asset liquidity and therefore optimal debt levels change over time. High markets tend to be liquid markets. Beliefs in high liquidity of assets can be self-fulfilling.
  - Well-documented increases in leverage in the 1980s, both by firms involved in corporate control transactions and by other firms, were attributable at least in part to the liquid market for corporate divisions. This liquid market for divisions was in turn the result of exogenous factors such as relaxed antitrust enforcement and the influx of foreign buyers as well as of an important self-reinforcing component. The widespread expectation of future liquidity and debt capacity created current liquidity and debt capacity.

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Financial Distress. Shleifer and Vishny (1992)

Shleifer and Vishny's model is a good theory to test. **Other things being equal**, it has clear predictions on capital structure. You can develop a clear-clean test without worrying on measuring things that are not measurable.

1. Cash auctions are likely to be inefficient when the same adverse shock that led one firm to sell off assets prevents industry insiders from bidding the next best-use value
   → tested by: -- Pulvino (1998)
   -- Stromberg (2000)

2. Asset liquidity can explain cross-section and time-series financing patterns
   → tested by: -- Benmelech (2009)

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Financial Distress. Todd Pulvino (1998)

A successful paper that looked at asset sales after bankruptcy is by

Todd Pulvino: "Do asset fire sales exist? An empirical investigation of commercial aircraft transactions" (JF, 1998)

This paper uses commercial aircraft transactions to examine an indirect cost of bankruptcy:

- → whether capital constraints cause firms to liquidate assets at discounts to fundamental values.
- → Specifically, it applies the Shleifer and Vishny (1992) industry-equilibrium model of asset liquidation to the commercial aircraft market.

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Financial Distress. Todd Pulvino (1998)

Application of Shleifer and Vishny to the Used Aircraft Market:

- If factors causing the seller's distress are industry-wide, other airlines (industry insiders) may not be in the financial position to acquire additional aircraft even though doing so represents a positive NPV project

↓

- In severe recession, low-value users (industry outsiders like banks or aircraft leasing companies) may be able to outbid airlines for their distressed competitors' assets.

↓

- Unlike airlines, financial institutions cannot immediately place aircraft in service and generate revenue, they must find a lessee. As a result, the are willing to pay a lower price.

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Financial Distress. Todd Pulvino (1998)

Testable Hypotheses:

1. Price is decreasing in the seller's cost of raising capital
2. Price is positively related to the seller's valuation of the aircraft
3. Price is lower when the buyer is an industry outsider, especially during industry recessions
4. Financially constrained airlines are more likely to sell financial institutions, particularly during market recessions.
5. Spare debt capacity is positively related to the number of used aircraft purchases, particularly during market recessions.

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Financial Distress. Todd Pulvino (1998)

Data:

- Aircraft transactions for the period 1978 to 1991.
- Focuses on purchases and sales of used aircraft only by US airlines (no cross-country effects)
- Sales by other parties, like financial institutions, air cargo services, and foreign airlines, are used only to establish market prices.
- Data sources:
  - Department of Transportation (DOT) and Federal Aviation Administration (FAA).
  - Compustat
  - Moody's Transportation Manual
  - Air Carrier Traffic Statistics
  - Capital Changes Reporter (for bankruptcies and mergers)

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Financial Distress. Todd Pulvino (1998)

Empirical Methodology and Results:

A. Effects of Seller's Financial Characteristics and Buyer's Identity on Price

- Uses hedonic regression method to estimate the effects on price
- It requires a two step procedure:

i. First, hedonic prices for narrow-body aircraft are calculated using the following equation:

$$\log(PRICE) = \beta_0 + \sum_{i=1}^{I} \beta_i MODEL_i + \sum_{j=1}^{J} \beta_j QTR_j + \sum_{k=1}^{K} \beta_k STAGE_k + \beta_{AGE} \log(1 + AGE) + \varepsilon$$

Where

- Price = transaction price
- QTR = dummy variables representing calendar-quarters
- MODEL = dummy variables representing aircraft models
- STAGE = dummy variables representing engine stage categories
- AGE = aircraft age at time of transaction

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Financial Distress. Todd Pulvino (1998)

To the extent that Model, Stage and Age control for quality differences, residuals from this estimation are independent of aircraft quality and overall market conditions.

ii. In a second step of the hedonic pricing procedure, residuals (RES) are regressed on transaction-specific explanatory variables.

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Financial Distress. Todd Pulvino (1998)

$$RES = \beta_0 + \beta_1 CAPLO + \beta_2 CAPHI + \beta_3 ISSUE + \beta_4 (CAPLOxISSUE) + \beta_5 FIN + \beta_6 OTHER + \beta_7 Q + \beta_8 REV + \beta_9 COST + \beta_{10} NSALE + \varepsilon$$

CAPLO = identifies firms with **low spare debt capacities** (=1 if selling firm's leverage ratio is above industry median and its current ratio is below industry median in the calendar-quarter preceding the transaction)

CAPHI = 1 if a firm's **leverage ratio is below the industry median** and 0 if its current ratio is above the industry median.

ISSUES = **number of outstanding debt issues** at the end of the fiscal year preceding transaction.

FIN = 1 if buyer is a financial institution or a leasing company

OTHER = 1 if the buyer is a regional or foreign airline, foreign government or cargo company

Q = (BVD + MVE) / (BVD + BVE)

REV = load factor (revenue-passenger-miles divided by available-seat-miles) times revenue per revenue-passenger-mile.

→ Provides a measure of airlines' abilities to fill their planes with high-revenue passengers.

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Financial Distress. Todd Pulvino (1998)

Other controls:

- → COST = cost of goods sold divided by avaliable-seat-miles→ provides a measure of airlines' cost efficiencies and may provide a more accurate proxy for 'marginal' prospects.
- → NSALE = number of narrow-body aircraft that the selling airline sold in the quarter of the transaction→ used to determine how market thinness contributes to asset sale discounts → if market liquidity is important we should observe a negative relationship
- → INDEX is a price index variable which measures inflation-adjusted prices of narrow-body aircraft for each calendar-quarter

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Financial Distress. Todd Pulvino (1998)

<u>Results A:</u>

- → Firms classified as having **low spare debt capacities** (CAPLO=1) sell aircraft at **13 percent discounts** compared to firms classified as having neither low nor high spare debt capacities.
- → Discounts associated with financial distress are substantially reduced when the used aircraft market is booming (Panel C).
- → Interaction effects: for firms classified as having low spare debt capacities, the number of debt issues outstanding is negatively correlated with transaction price
- → Identity matters: when the market is depressed, the discount associated with selling to a financial institution increases to 30 percent, significant at 1% level. When the market is booming, the discount disappears
- → When the market is depressed, firm prospect coefficients are of expected signs but are not significant.

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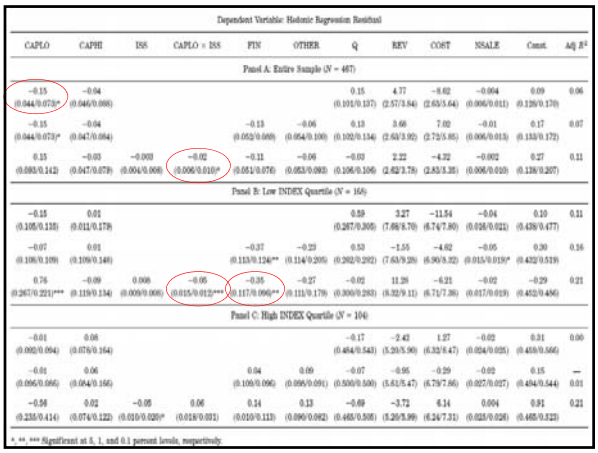

Dependent Variable: Hedonic Regression Residual

CAPLO	CAPHI	ISS	CAPLO × ISS	FIN	OTHER	Q	REV	COST	NSALE	Const.	Adj R^2
Panel A: Entire Sample (N = 467)											
−0.15 (0.044/0.073)*	−0.04 (0.046/0.088)					0.15 (0.101/0.137)	4.77 (2.57/3.84)	−8.62 (2.63/5.64)	−0.004 (0.006/0.011)	0.09 (0.129/0.170)	0.06
−0.15 (0.044/0.073)*	−0.04 (0.047/0.084)			−0.13 (0.052/0.069)	−0.06 (0.054/0.100)	0.13 (0.102/0.134)	3.66 (2.63/3.92)	7.02 (2.72/5.85)	−0.01 (0.006/0.013)	0.17 (0.133/0.172)	0.07
0.15 (0.083/0.142)	−0.03 (0.047/0.079)	−0.009 (0.004/0.008)	−0.02 (0.006/0.010)*	−0.11 (0.051/0.076)	−0.06 (0.053/0.093)	−0.03 (0.106/0.106)	2.22 (2.62/3.78)	−4.32 (2.83/3.35)	−0.002 (0.006/0.010)	0.27 (0.138/0.207)	0.11
Panel B: Low INDEX Quartile (N = 168)											
−0.15 (0.108/0.135)	0.01 (0.011/0.179)					0.59 (0.267/0.205)	3.27 (7.68/8.70)	−11.54 (6.74/7.80)	−0.04 (0.016/0.021)	0.10 (0.438/0.477)	0.11
−0.07 (0.108/0.109)	0.01 (0.109/0.146)			−0.37 (0.113/0.124)**	−0.23 (0.114/0.205)	0.53 (0.202/0.292)	−1.55 (7.63/9.29)	−4.02 (6.90/8.32)	−0.05 (0.015/0.019)*	0.30 (0.432/0.519)	0.16
0.76 (0.267/0.221)***	−0.09 (0.119/0.134)	0.008 (0.009/0.008)	−0.05 (0.015/0.012)***	−0.35 (0.117/0.096)**	−0.27 (0.111/0.179)	−0.02 (0.300/0.283)	11.28 (6.32/9.11)	−6.21 (6.71/7.36)	−0.02 (0.017/0.019)	−0.29 (0.452/0.456)	0.21
Panel C: High INDEX Quartile (N = 104)											
−0.01 (0.092/0.094)	0.08 (0.076/0.164)					−0.17 (0.484/0.543)	−2.42 (5.20/5.90)	1.27 (6.32/8.47)	−0.02 (0.024/0.025)	0.31 (0.459/0.566)	0.00
−0.01 (0.096/0.095)	0.06 (0.084/0.165)			0.04 (0.109/0.096)	0.09 (0.096/0.091)	−0.07 (0.500/0.500)	−0.95 (5.61/5.47)	−0.29 (6.79/7.86)	−0.02 (0.027/0.027)	0.15 (0.494/0.544)	— 0.01
−0.58 (0.235/0.414)	0.02 (0.074/0.122)	−0.05 (0.010/0.020)*	0.06 (0.018/0.031)	0.14 (0.010/0.113)	0.13 (0.096/0.092)	−0.69 (0.465/0.505)	−3.72 (5.20/5.99)	6.14 (6.24/7.31)	0.004 (0.025/0.026)	0.91 (0.465/0.523)	0.21

*, **, *** Significant at 5, 1, and 0.1 percent levels, respectively.

Financial Distress. Todd Pulvino (1998)

B. Effect of Seller's Capital constraints on Buyer Identity

- Use a probit model to calculate the probability of selling to a financial institution:

$$FIN = \beta_0 + \beta_1 CAPLO + \beta_2 CAPHI + \beta_3 Q + \beta_4 REV + \beta_5 COST + \beta_6 NSALE + \beta_7 \tau_{industry} + \varepsilon$$

FIN = 1 if the buyer is a financial institution (0 otherwise).

T (industry) = weighted average of US airlines' marginal tax rates using firm values as weights.

→ It is included in order to control for the possibility that airlines are more likely to sell aircraft to buyers that get the greatest benefit from depreciation tax shields.

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Financial Distress. Todd Pulvino (1998)

Results B:

- Financially constrained sellers are more likely than unconstrained sellers to sell to financial institutions when the market is depressed
- Economically distressed firms are also more likely to sell to financial institutions:
  - As Q increases the probability of selling to an industry outsider decreases
  - Firms that have a greater ability to fill their planes with high revenue passengers are less likely to sell to financial institutions
  - High cost airlines are more likely to sell to financial institutions

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Dependent Variable = 1 if Buyer is a Financial Institution, 0 Otherwise

CAPLO	CAPHI	Q	REV	COST	NSALE	$\tau_{industry}$	Constant	Pseudo R^2
Panel A: Complete Sample (N = 467)								
0.44 (0.335)	−0.34 (0.362)	−1.45 (0.852)	−16.39 (14.26)	31.26* (13.25)	−0.01 (0.067)		0.45 (1.01)	0.08
0.42 (0.335)	−0.32 (0.381)	−1.44 (0.857)	−14.88 (13.99)	28.75 (14.77)	−0.01 (0.067)	−0.62 (1.69)	0.68 (1.13)	0.08
Panel B: Low INDEX Quartile (N = 168)								
1.16 (0.429)**	0.11 (0.553)	−0.98 (1.35)	−46.4 (33.40)	54.94 (27.78)*	−0.09 (0.085)		0.66 (2.07)	0.14
1.16 (0.426)**	0.11 (0.555)	−0.97 (1.35)	−47.36 (31.33)	56.53 (27.45)*	−0.10 (0.085)	0.32 (3.05)	0.52 (2.49)	0.14
Panel C: High INDEX Quartile (N = 104)								
0.80 (0.510)	0.44 (0.404)	3.23 (1.86)	−25.31 (27.52)	36.55 (34.62)	−0.30 (0.090)***		−3.31 (1.62)*	0.19
0.94 (0.486)	0.87 (0.410)*	5.31 (2.32)*	2.94 (30.84)	−6.65 (42.38)	−0.31 (0.090)***	−5.01 (2.09)*	−3.25 (1.64)*	0.23

*, **, *** Significant at 5, 1, and 0.1 percent levels, respectively.

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Financial Distress. Todd Pulvino (1998)

C. Effect of Capital Constraints on US Airlines' Decisions to Buy

→ Use a Poisson model to estimate aircraft purchases decisions (because the dependent variable is a 'count' variable with many observations equal to zero):

$$\lambda_{it} = e^{X_{it-1}\beta}$$

- The expected number of purchases by firm i during quarter t equals the Poisson parameter λ_{it}
- X_{it-1} Is a matrix of explanatory variables. Two new variables: DELIV (equals number of new aircraft deliveries in the current quarter), OWN (equals number of narrow-bodies owned by the airline at the end of previous quarter)

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Financial Distress. Todd Pulvino (1998)

Dependent Variable = Number of Used Narrow-Body PURCHASES per Firm-Quarter

Model	CAPLO	CAPHI	Q	REV	COST	τ	DELIV	log(OWN)	Const.	log(δ)
Complete Sample (N = 1027)	−0.41 (0.238)	0.41 (0.188)*	−0.02 (0.013)	−13.98 (7.95)	13.16 (8.83)	1.27 (0.578)*	−0.07 (0.045)	−0.15 (0.079)	−1.96 (0.516)***	−1.53 (0.167)***
Low INDEX Quartile (N = 293)	0.27 (0.510)	1.07 (0.377)**	0.10 (0.074)	−7.18 (16.04)	−8.22 (17.00)	2.84 (1.04)**	0.01 (0.060)	0.06 (0.192)	−2.96 (1.33)*	−1.71 (0.300)***
High INDEX Quartile (N = 272)	−0.40 (0.417)	0.05 (0.367)	0.01 (0.018)	−19.8 (17.76)	28.0 (20.82)	0.86 (1.21)	−0.09 (0.088)	−0.11 (0.163)	−2.18 (1.06)*	−1.35 (0.313)***

*, **, *** Significant at 5, 1, and 0.1 percent levels, respectively.

- After controlling for firms prospects and fleet characteristics, airlines' spare debt capacities significantly affect the number of used aircraft purchased
- In market recessions (INDEX low), the effect of CAPHI is strong and significant: firms classified as having high spare debt capacities purchased 192% more used aircraft per quarter than other firms.
- Marginal tax rate is also significant for purchases

→ In downturns, assets are redeployed to financially unconstr. buyers

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Financial Distress. Todd Pulvino (1998)

Summary of findings:

A. Airlines with high leverage ratios and low current ratios receive lower prices for their aircraft than more conservatively financed rivals.
B. For sellers with low spare debt capacities, price is negatively related to the number of outstanding debt issues.
C. Prices are lower when buyers are industry outsiders, primarily when the used aircraft market is depressed
D. Firms with low spare debt capacities are more likely to sell to well financed industry outsiders, especially when the used aircraft market is depressed.
E. Airlines with high spare debt capacities are more likely to buy aircraft than those with low spare debt capacities, especially when aircraft prices are depressed.

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Financial Distress. Todd Pulvino (1998)

Conclusions:

- Results suggest that there are benefits from maintaining spare debt capacity: in addition to avoiding costly liquidation of assets at fire sale prices, it allows firms to be on the buy-side of industry fire sales.
- Costs of asset liquidation provide a disincentive to invest. This may help to explain high capital stock adjustment costs noted in the investment/cash flow literature.
- These finding have implications for bankruptcy law reform: immediate cash liquidation of insolvent firms may result in socially inefficient outcomes, not only because it fails to maximize proceeds to claimholders, but also because it allocates resources to low-value users.

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Financial Distress. Todd Pulvino (1998)

More importantly:

- The paper is an example of an extremely well done paper. Every alternative hypothesis is considered.
- The tests provided in the paper are designed to find confirmation of the same hypothesis from many different angles.
- Reading the paper as a list of results is a mistake. And does not help you developing the taste for good research.
- Before starting reading the paper, reconsider the aspects of the theory being tested.

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Financial Distress. Efi Benmelech (2009)

Efraim Benmelech: "Asset Salability and Debt Maturity: Evidence from 19th Century American Railroads" (2009)

This paper exploits the diversity of track gauges in the 19th century American railroads as a source for measuring the relationship between liquidation values and capital structure. The abundance of track gauges limited the redeployability of rolling stock and tracks to potential users with a similar track gauge and this had an impact on capital structures.

Really creative way aimed at measuring asset specificity.

Gauges = the horizontal distance between the two rails.

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Financial Distress. Effi Benmelech (2009)

Theory:

This paper aims to test the implications of liquidation values for debt maturity and leverage.

As for **debt maturity**, Shleifer and Vishny (1992) model implies that:

- Short-term debt is used to bring the firm to repay its debt in the first period, rather than let it invest its internal funds.
- Long-term debt disciplines management:
  - It avoids bad investments
  - It prevents raising money to delay liquidation when hit by an adverse shock
- But LTD has cost of liquidation!
- → Thus, for issuing long-term debt, the gains from avoiding negative NPV investments must outweigh potential losses from liquidation.

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Financial Distress. Effi Benmelech (2009)

Theory (continued):

Implications for railroad industry:

- → More long-term debt will be used in railroads with highly salable assets since the cost of liquidation is smaller in this case.

Note:

An asset is more salable if it retains its value in liquidation:

1. Its core attributes make the use of the asset less sensitive to its user
2. Its potential buyers have the financial resources to afford paying for its services.

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Why was this paper important?

- There was little empirical evidence on the relation between liquidation values and debt contracts
- Testing the theory requires detailed information about assets, liquidation values and capital structure of the firm.
- → Problem!!!: liquidation values are not observed ex-ante when the firm sets its capital structure.

Previous papers use balance-sheet proxies as measures of collateral values and liquidation costs:

- tangibility (Rajan and Zingales, 1995)
- market-to-book, and R&D-to-sales (Gilson, 1997)

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Financial Distress. Effi Benmelech (2009)

- In this paper the liquidation value of an asset is determined along two dimensions:
  - Physical attributes of an asset jointly with the number of its potential users determine *redeployability*
  - The financial strength of its potential users determine its *liquidity* (Shleifer and Vishny, 1992)

→ The term *salability* is used to describe how the combination of these two effects determine liquidation values.

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Clever idea: historical data -1

Table 1
The distribution of track gauge, 1868–1882

Panel A: Distribution of gauge across the pooled data

Gauge (inches)	36	56.5	57	57.25	57.5	58	60	65	66	72	Total
Frequency	3	252	32	1	14	14	64	1	3	6	390
Percent (%)	0.8	64.6	8.2	0.3	3.6	3.6	16.4	0.3	0.8	1.5	100.0

Panel B: Distribution of gauge by year

1868

Gauge (inches)	36	56.5	57	57.25	57.5	58	60	65	66	72	Total
Frequency	0	36	2	0	2	4	17	1	2	5	69
Percent (%)	0.0	52.17	2.9	0.0	2.9	5.8	26.6	1.5	2.9	7.3	100.0

1873

Gauge (inches)	36	56.5	57	57.25	57.5	58	60	65	66	72	Total
Frequency	2	59	7	1	7	5	19	0	1	1	102
Percent (%)	2.0	57.8	6.9	1.0	6.9	4.9	18.6	0.0	1.0	1.0	100.0

1877

Gauge (inches)	36	56.5	57	57.25	57.5	58	60	65	66	72	Total
Frequency	0	69	7	0	5	5	18	0	0	0	104
Percent (%)	0.0	66.4	6.7	0.0	4.8	4.8	17.3	0.0	0.0	0.0	100.0

1882

Gauge (inches)	36	56.5	57	57.25	57.5	58	60	65	66	72	Total
Frequency	1	86	16	0	0	0	9	0	0	0	112
Percent (%)	0.9	76.8	14.3	0.0	0.0	0.0	8.0	0.0	0.0	0.0	100.0

The sample consists of 390 railroad-year observations in the years: 1868, 1872, 1877, and 1882. The track gauge is the horizontal distance separating the two rails in inches. The "standard gauge" was 4'8.5" (or 56.5 inches).

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Clever idea: historical data -2

Table 2
The geographical distribution of the track gauge

Gauge (inches)	36	56.5	57	57.25	57.5	58	60	62	65	66	72	Total
New England												
Frequency	0	53	0	0	0	0	0	0	0	2	0	55
Percent (%)	0.0	96.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.0	100.0
East												
Gauge (inches)	36	56.5	57	57.25	57.5	58	60	62	65	66	72	Total
Frequency	0	81	14	0	2	4	3	0	0	0	5	109
Percent (%)	0.0	77.3	12.8	0.0	1.8	3.7	2.8	0.0	0.0	0.0	4.6	100.0
South												
Gauge (inches)	36	56.5	57	57.25	57.5	58	60	62	65	66	72	Total
Frequency	1	22	9	0	0	0	60	0	0	0	1	93
Percent (%)	1.1	23.7	9.7	0.0	0.0	0.0	64.5	0.0	0.0	0.0	1.1	100.0
Midwest												
Gauge (inches)	36	56.5	57	57.25	57.5	58	60	62	65	66	72	Total
Frequency	2	112	12	1	13	14	7	0	1	0	2	164
Percent (%)	1.2	68.3	7.3	0.6	7.9	8.5	4.3	0.0	0.6	0.0	1.2	100.0
West												
Gauge (inches)	36	56.5	57	57.25	57.5	58	60	62	65	66	72	Total
Frequency	0	16	0	0	0	0	1	0	0	1	0	18
Percent (%)	0.0	88.9	0.0	0.0	0.0	0.0	5.6	0.0	0.0	5.6	0.0	100.0

This table reports the distribution of the railroads sample across geographical regions and track gauges in the entire (pooled) sample. The geographical categories are in accordance with the railroads geographical groups, as reported in the *Poor's Manuals of the Railroads*. The frequencies sum up to more than the 390 railroad-year observations, since several railroads operate in more than one region.

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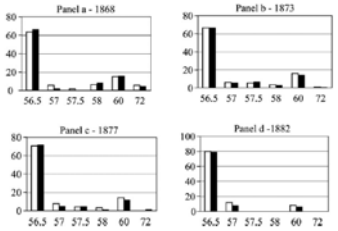
Clever idea: historical data -3



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Financial Distress. Effi Benmelech (2009)

Redeployability of rolling stock and tracks:

- Gauge diversity made the interchange of equipment between different-gauge tracks almost impossible:
  - Both rolling stock (locomotives, freight cars, passenger coaches, etc.) and tracks had lower values in alternative uses outside the railroad industry and potential buyers in railroads where those where same gauges were used
  - Yet rolling stock was more redeployable than tracks because whereas rolling stock was mobile by nature, tracks are highly immobile.
  - Tracks' potential buyers were only the local railroads who would benefit unification in the same region.

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Financial Distress. Effi Benmelech (2009)

Data:

- To capture time-series dynamics and cross-sectional variation, he collects firm data for the years: 1868, 1873, 1877, 1882.
- Source: Poor's Manual of Railroads.
- Panel data set contains 390 firm-year observations, representing 221 different railroads.
- Data from balance-sheets: total value of assets, value of equipment and constructions, debt maturity, leverage, profitability
- Data on the firm's assets: length and location of lines operated, whether rails are made of iron or steel, number of locomotives, passenger coaches, freight cars and other specialized cars.

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Key variables

- Measure of leverage:
  - book value of total funded debt divided by the book value of the assets.
- Measure of debt maturity $Maturity = \sum_{j}^{J} D_j M_j \Big/ \sum_{j}^{J} D_j,$
- Measures of salability
  - Road salability
  - Rolling stock salability

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Financial Distress. Effi Benmelech (2009)

Proxies for asset salability:

Road salability:

- To obtain the adjusted demand of potential buyers that are not financially constrained, the author excludes railroads in equity receivership (those that are in financial distress are not likely to be buyers).
- Computes two numbers:
  - State-wide track mileage for each gauge = sum of mileage length of roads in state s, for gauge g, at time t, that are not in receivership.
  - State-wide number of railroads for each gauge = number of roads in state s, for gauge g, at time t, that are not in receivership.

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Financial Distress. Effi Benmelech (2009)

Proxies for asset salability:

Road salability:

- Computes two proxies for potential buyers:
  - Mileage weighted average of the state salability index corresponding to the states of the railroad's line

$$mileage_{i,t}^{road} = \sum_{s}^{S}\sum_{g}^{G} w_{i,s,g,t}(mileage_{s,g,t}^{road} - length_{i,s,g,t})$$

$$with \quad w_{i,s,g,t} = length_{i,s,g,t} \Big/ \sum_{s}^{S}\sum_{g}^{G} length_{i,s,g,t}$$

  - Same for number of railroads in the state:

$$number_{i,t}^{road} = \sum_{s}^{S}\sum_{g}^{G} w_{i,s,g,t}(number_{s,g,t}^{road} - 1)$$

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Financial Distress. Effi Benmelech (2009)

Proxies for asset salability:

→ In each case he substracts the railroad's own mileage or number in order to account for the *residual demand* for its road.

Rolling stock salability:

Similarly to before, but at the country level.

$$mileage_{i,t}^{rolling} = \sum_{g}^{G} \pi_{i,g,t}(mileage_{g,t}^{rolling} - length_{i,g,t})$$

$$with \quad \pi_{i,g,t} = length_{i,g,t} \Big/ \sum_{g}^{G} length_{i,g,t}$$

$$number_{i,t}^{rolling} = \sum_{g}^{G} \pi_{i,g,t}(number_{g,t}^{rolling} - 1)$$

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Financial Distress. Effi Benmelech (2009)

Descriptive stats:

Leverage results:

Leverage ranges	0–0.18	0.19–0.29	0.30–0.43	0.438–0.55	0.56–0.66	0.67+	Kruskal-Wallis
Road (mileage)	1797.8 (1236.6)	1805.0 (1104.7)	1661.0 (999.3)	2203.2 (1389.4)	2039.7 (1181.1)	1541.9 (1069.7)	0.46
Road (number of buyers)	32.6 (22.0)	30.1 (19.6)	26.2 (13.2)	28.9 (21.0)	34.7 (18.0)	20.7 (14.0)	0.34
Rolling stock (mileage)	31376.9 (19658.5)	37618.3 (37352.4)	34802.3 (36692.9)	37760.4 (37405.9)	39173.4 (37376.9)	33390.1 (37171.9	0.75
Rolling stock (number of buyers)	395.2 (217)	474.0 (456)	453.5 (456)	499.5 (649)	514.5 (456)	417.0 (456)	0.84
Receiverships share (mileage)	4.90% (0.00%)	2.19% (0.00%)	3.62% (0.00%)	3.47% (0.00%)	3.50% (0.001%)	3.19% (0.00%)	0.32

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Financial Distress. Effi Benmelech (2009)

Descriptive stats:

Maturity results:

Panel B: Salability proxies stratified by debt maturity

Maturity ranges	1–8	9–14	15–20	21–27	28–30	31+	Kruskal-Wallis
Road (mileage)	1265.0 (991.4)	1472.1 (1026.8)	1596.3 (1002.2)	1781.2 (1181.1)	2479.0 (2359.5)	3170.6 (3680.8)	0.0001
Road (number of buyers)	23.93 (12.1)	23.46 (15.83)	27.4 (17.0)	22.7 (15.3)	33.5 (31.8)	50.2 (30.6)	0.0034
Rolling stock (mileage)	20171.6 (7226)	29723.5 (19535)	34323.1 (37334.9)	33593.8 (37218.9)	48117.8 (48289.1)	55142.4 65310.9	0.0001
Rolling stock (number of buyers)	265.4 (105)	366.0 (217)	452.0 (456)	437.0 (456)	622.4 (649)	710.8 (874.5)	0.0001
Receiverships share (mileage)	5.23% (0.00%)	4.26% (0.00%)	3.56% (0.00%)	3.58% (0.00%)	2.03% (0.00%)	1.77% (0.00%)	N/A[a]

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Financial Distress. Effi Benmelech (2009)

Proxies for asset salability:

Some results from summary statistics:

- → Summary statistics on these proxies reveal a positive correlation between asset salability and debt maturity.
- → Leverage however shows no correlation with measures of asset salability.

Results on OLS regressions for the relationship between Asset Salability and Debt Maturity follow:

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Financial Distress. Effi Benmelech (2009)

OLS results (regressions include year and state FE):

1. Larger firms have longer average maturities (5% level)
2. More profitable firms have shorter maturities
3. Hard assets (proxied by tangibility) have a positive impact on debt maturity
4. The composition of assets is also important: the proportion of freight cars is positively correlated with debt maturity.
5. Road salability affects debt maturity:
   Measured by mileage or number of potential buyers, salability of the road is positively correlated with debt maturity
6. The salability of rolling stock has a positive and statistically significant impact on debt maturity.

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Asset salability and debt maturity

	Dependent variable=Debt maturity									
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Size	2.37 ***	2.28 ***	2.34 ***	2.22 ***	2.25 ***	1.31 ***	1.19 **	1.17 **	1.22 **	1.20 **
	(5.35)	(5.00)	(4.80)	(4.75)	(4.98)	(2.75)	(2.54)	(2.30)	(2.42)	(2.28)
Tangibility	7.75 ***	8.03 ***	7.87 ***	8.15 ***	7.87 ***	4.07 *	4.43 *	4.04 *	4.12 *	3.91
	(2.61)	(2.73)	(2.61)	(2.65)	(2.69)	(1.72)	(1.91)	(1.72)	(1.82)	(1.54)
Profitability	-26.86 **	-27.40 **	-29.04 **	-28.82 ***	-29.00 **	-28.87 *	-26.36 *	-29.46 **	-28.49 **	-29.57 **
	(-1.97)	(-2.13)	(-2.30)	(-2.23)	(-2.15)	(-1.95)	(-1.89)	(-2.16)	(-2.10)	(-2.02)
Freight	13.25 ***	13.31 ***	13.70 ***	13.61 ***	13.45 ***	6.96 *	6.67 *	7.24 **	7.42 **	7.66 **
	(4.17)	(4.25)	(4.02)	(4.17)	(3.98)	(1.94)	(1.87)	(2.06)	(2.22)	(2.17)
Road salability (mileage)	0.262 ** (2.20)					0.380 ** (2.37)				
Road salability (number of buyers)		0.023 *** (2.66)					0.040 *** (3.20)			
Rolling stock salability (mileage)			0.633 *** (2.61)					0.749 *** (2.62)		
Rolling stock salability (number of buyers)				0.004 *** (2.62)					0.003 * (1.82)	
Leadership share (mileage)					-11.14 ** (-4.75)					-4.83 (-1.51)
1873 dummy	3.56 ***	3.57 ***	3.19 ***	3.09 **	3.59 ***	3.84 ***	3.40 ***	3.28 ***	3.23 ***	3.71 ***
	(3.26)	(2.94)	(2.78)	(2.47)	(3.09)	(3.98)	(3.19)	(3.14)	(3.06)	(3.42)
1877 dummy	2.14	1.76	1.74	1.12	2.79 *	2.26 *	1.58	1.91	1.43	2.58 *
	(1.62)	(1.33)	(1.32)	(0.84)	(1.95)	(1.78)	(1.02)	(1.48)	(1.10)	(1.89)
1892 dummy	6.04 ***	5.29 ***	5.05 ***	3.49 **	6.30 ***	6.32 ***	4.51 **	5.31 ***	4.34 ***	6.54 ***
	(3.08)	(3.00)	(3.01)	(2.02)	(3.20)	(3.96)	(2.72)	(3.09)	(2.11)	(3.81)
State Fixed Effects	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.29	0.29	0.29	0.21	0.22	0.29	0.29	0.28	0.28	0.27
Observations	379	379	379	379	379	379	379	379	379	379

*,** and*** denote significance at the 10, 5, and 1 percent levels, respectively.

Financial Distress. Effi Benmelech (2009)

Asset salability or profitability?

Previous results suggest that the number of potential buyers is correlated with debt maturity

→ The interpretation of the paper is that a larger number of potential buyers leads to higher liquidation values.

However, the number of railroads with similar gauge is possibly correlated with profitability. Is the result driven by profitability then?

→ An additional regression shows that the salability proxies are correlated with debt maturity controlling for profitability.

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Financial Distress. Effi Benmelech (2009)

Conclusions:

- The evidence in this paper suggests that more salable assets support longer maturities of debt.
  - If long term debt is designed to discipline managers by creating debt overhang → preventing managers to borrow against future earnings to finance negative NPV projects and prevent liquidation when hit by an adverse shock
  - And more salable assets have lower liquidation costs (or higher liquidation values).
  - Then more salable assets are positively correlated with long term debt → because the gains from avoiding negative NPV investments outweigh potential liquidation losses.
- There seems to be no association between asset salability and leverage.

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Bankruptcy regimes: Per Stromberg (2000)

Next paper relates asset liquidity to different bankruptcy regimes:

Per Stromberg (2000): "Conflicts of Interest and Market Illiquidity in Bankruptcy Auctions: Theory and Tests".

Two current bankruptcy regimes prevail around the world:

- → Cash-auction procedures (Chapter 7)
  Manager is dismissed, and administrative receiver is appointed to manage liquidation and distribute the proceeds to creditors.
- → Structured bargaining procedures (Chapter 11)
  Manager stays in control, creditor's claims are frozen, a reorganization plan is proposed and voted upon.

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Bankruptcy regimes: Per Stromberg (2000)

- → The Chapter 11 code has been criticized to result in long and wasteful negotiations
- → The Chapter 7 code has been criticized to suffer from inefficiencies arising from transaction costs and market illiquidity.

Whereas the nature and costs of Chapter 11 are well documented, Chapter 7 is less documented empirically.

The present paper fills this gap by building a model on cash auction procedures and estimating its prediction with data on Swedish bankruptcies.

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Bankruptcy regimes: Per Stromberg (2000)

Chapter 11 is criticized because it entails:

- absolute priority violations
- excessive continuation
- costly delays of liquidation

- → These are due, in part, to the fact that it is the same people who decide how assets should be used, and how proceeds should be distributed.

- Cash auctions, on the other hand, are believed to avoid such problems altogether because they separate the decision of how assets should be used from the problem of how the proceeds should be distributed ~see, e.g., Baird (1993) and Bebchuk (1998)
- Criticism to this idea is related to Shleifer and Vishny's model.

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Bankruptcy regimes: Per Stromberg (2000)

The author develops a theoretical model which incorporates two elements:

1) the conflicts of interest among claimholders in bankruptcy

2) the effect of illiquidity in the market for the firm's assets.

Summary of the model and its predictions:

→ Upon bankruptcy, two things can happen:

1. Liquidation: operations are sold to new owners, either piecemeal or as a going concern
2. Continuation with sale-back: operations can be sold back to the pre-bankruptcy manager, who is assumed to own all equity of the bankrupt firm.

   But because the pre-bankruptcy owner-manager has no funds of her own, the sale-back involves a renegotiation of the existing bank loan to finance the acquisition. Thus, whether the firm will be sold back or liquidated depends on whether or not it is optimal for the bank to finance a sale-back.

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Bankruptcy regimes: Per Stromberg (2000)

When is it optimal for the bank to finance a sale back:

- *Liquidity*: when the market for the firm's assets is less liquid, sale-backs should be relatively more common.
- *Seniority*: the seniority of bank debt relative to that of other creditors also affects this choice by determining the surplus the bank must share with other passive creditors.

  Since banks are usually senior, they would bear most losses of an unsuccessful liquidation. Instead, in a sale-back (even to an inferior manager) the senior creditor can capture the upside gain as well, through its new claim on the continued firm. Thus, banks will tend to favor excessively sale-backs especially when liquidity is low.

Bankruptcy regimes: Per Stromberg (2000)

Data:

- Hand collected data for 263 Swedish bankruptcies.
- Source: Supervisory Authority for Bankruptcies.
- Period: 1988 – 1991
- Firms: >20 employees
- Financial data comes from Swedish credit bureau.
- Number of observations after filters: 205.

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Bankruptcy regimes: Per Stromberg (2000)

Sale-back decision:

Three determinants:

1. Market liquidity:
   - → Proxied by the specificity of the assets. Three groups: very specific (machinery and equipment), non-specific (current assets, land and commercial real estate), intermediate (the rest of the firm's assets)
   - → Proxied by 'industry distress'. Industry insider buyers should be lower when industry firms are financially constrained. He uses firms that have industry coverage ratio <1, or going bankrupt within one year after the firm's date of bankruptcy.
   - → Proxied by 'number of firms in the industry' because this increases the probability of finding an insider. He includes the number of firms with more than 20 employees in the bankrupt firm's industry.

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Bankruptcy regimes: Per Stromberg (2000)

Sale-back decision (continued):

2. Manager quality
   1. Proxied by "firm profitability": performance of the bankrupt firm relative to its industry peers
   2. Proxied by 'bank-initiated filing': might indicate that the bank has information on the quality of the manager. Takes the value 1 if the bank forced the firm into bankruptcy.
   3. Proxied by 'start-up': the value of keeping the entrepreneur in young start-ups may be different than in older ones. Takes the value 1 if the firm is less than 2 years old, 0 otherwise.

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Bankruptcy regimes: Per Stromberg (2000)

Sale-back decision (continued):

3. Sale-back bias:

If the bank's private incentives are important for the bankruptcy outcome, the seniority structure of the firm's debt should affect the sale-back probability.

- Proxied by *the debt senior to the bank*, which is calculated as the sum of senior rent claims, debt secured by specific senior collateral, and floating charge and real-estate mortgage claims that are senior to one bank. According to the model, the sale-back bias should depend on:

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Bankruptcy regimes: Per Stromberg (2000)

Results

- The liquidation probability decreases significantly with industry distress
- And also, the probability of liquidation increases with the proportion of nonspecific assets of the bankrupt firm
  - → Shleifer and Vishny argument (1992)
- The more senior the bank debt is relative to other creditors, the more likely it is that a sale-back takes place.
- Firm profitability and managerial quality increase the probability of a sale-back
- The liquidation probability is also significantly higher for the cases when the bank forced the firm into bankruptcy
  - → indicative of monitoring role of bank
- Start-up firms are significantly more likely to be sold back to their owner-entrepreneurs.
  - → indicative of entrepreneurs being more crucial at early stages.

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Bankruptcy regimes: Per Stromberg (2000)

Results (cont.):

The empirical results show that:

1. the liquidation probability depends on the capital structure in a way consistent with the bank's incentives biasing the outcome
2. Liquidations occur less often when the risk of fire sales is high, that is, when the industry is more distressed and the fraction of nonspecific assets is low.

→ Thus, if industry distress and asset specificity truly proxy for illiquid asset markets, these variables should also affect the probability of finding an alternative industry buyer as well as the realized liquidation values.

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Bankruptcy regimes: Per Stromberg (2000)

Results (cont.):

A more detailed examination of liquidations shows that:

- When the industry is more distressed, the likelihood of having to sell the assets to someone outside of the firm's industry is significantly higher. (Shleifer and Vishny 1992)
- Moreover, asset sales to industry outsiders actually yields lower values, and this effect is strongest when assets re more specific (again consistent with Shleifer and Vishny argument).

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Bankruptcy regimes: Per Stromberg (2000)

Conclusions:

- Even when the law looks like a textbook cash auction procedure, the practical implementation ends up looking more like a reorganization procedure:
  - Even in cash auctions, fire-sale liquidations are frequently avoided in a sale-back procedure that is very similar to the kind of debt restructuring that takes place in Chapter 11.

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Bankruptcy regimes: Per Stromberg (2000)

Conclusions (cont.):

- Cash auctions do not guarantee a separation between distribution and investment decision either: conflicts of interest between the bank and the other creditors of the firm can lead to inefficient continuation decisions being taken about the firms operations.
- Whenever a sale-back transaction occurs, there will, in principle, be a deviation from absolute priority because the bank and the owner-manager often share some going-concern surplus of the continued firm at the expense of the junior creditors.

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Conclusions

- Interesting examples on how to write good papers:
- Pulvino (1998) JF- Brattle Prize – first prize(Harvard->Kellogg)
- Stromberg (2000) JF- Brattle Prize – first prize (Carnegie->uchicago)
- Benmelech (2009) RFS (Uchicago->Harvard)
  - Find a really nice interesting testable paper (Shleifer and Vishny, 1992)
    - Why is it testable?
    - Why is it nice?
    - Why is it interesting?
  - Be creative about the identification strategy. Three very successful job market papers!

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