

Strategic Default and Equity Risk Across Countries

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- **Is strategic default an important determinant of corporate decisions and outcomes?**
 - Theoretically, yes (e.g., Berglöf and von Thadden, JPE 94; Hart and Moore, QJE 98; Bolton and Scharfstein JPE 96; Anderson and Sundaresan, RFS 96; Fan and Sundaresan, RFS 2000)
 - Empirically, still an open question
- **This paper:** does strategic default matter for the firm's equity risk?

Why focus on equity risk?

- Theoretically:
 - The systematic risk of equity depends on the uncertainty of equity holders' payoff **in default**.
- Empirically:
 - equity risk is observable/measurable
 - important for firms' financing & investment decisions

Is strategic default relevant?

- Mixed evidence for the US: does strategic default affect
 - **stock returns**? Garlappi, Shu, and Yan (RFS 2006) say **yes**.
 - **debt pricing**? Davydenko and Strebulaev (JF 2007) say **yes**, but the economic significance is very small.
- Caveat: in these studies
 - the expected value of equity in default depends **only** on firm characteristics
 - **not** on bankruptcy laws (e.g., suppose APR violations are infrequent, as in Bharat et al., 2008).

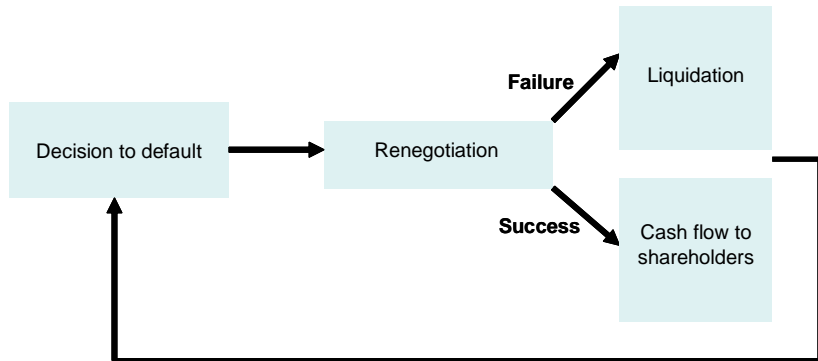
This paper

- We use an international cross-section of stocks (8,700 firms, 38 countries, 93 to 2006)
- We exploit cross-country variation in bankruptcy laws
- We test whether strategic default matters for equity risk.

How we do it?

- ① We use a contingent claim model to derive hypotheses relating firm and institutional characteristics to equity risk.
- ② We estimate market betas using market model.
- ③ We use Djankov, Hart, McLiesh, and Shleifer (JPE 2008) dataset on international debt enforcement procedures.
- ④ We run cross-country-firm regressions of equity betas on firm characteristics and characteristics of the **debt enforcement procedure**.

The mechanism



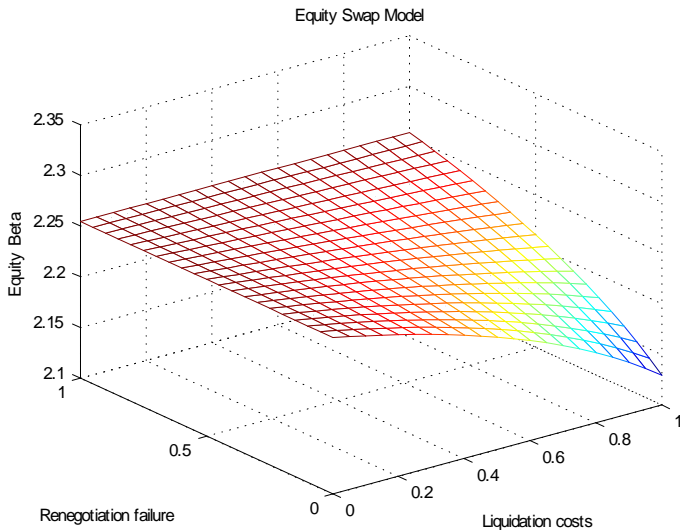
Model: based on Davydenko and Strebulaev (JF 2007)

- Renegotiation failure, q , liquidation cost α , and shareholders' bargaining power η .
- The Beta of equity is

$$\beta = \frac{\partial E X}{\partial X} \frac{X}{E} = 1 + \frac{(1-\tau) \frac{c}{r}}{E} - \underbrace{\frac{(1-\tau) \frac{c}{r}}{E} \left(\frac{X}{X_B} \right)^\lambda}_{\text{default option effect}},$$

$$\text{where } \frac{X_B}{r-\mu} = \frac{c}{r} \times \frac{-\lambda}{1-\lambda} \frac{1}{1-(1-q)\eta\alpha}.$$

Equity beta, renegotiation failure and liquidation costs



Model's predictions

- 1 Firms in a legal regime with **stricter enforcement** of debt contracts have a **higher** equity beta.
- 2 Firms with **higher** liquidation costs or where shareholders have a **higher** bargaining power in case of debt renegotiations have a **lower** equity beta.
- 3 The **difference** in equity beta between firms facing different liquidation costs or shareholders' bargaining power is **smaller** in countries with **stricter enforcement** of creditors' rights.

- Firm and country specific data:
 - Liquidation costs, bargaining power, controls (leverage, book-to-market, size, momentum)
 - Source: Worldscope, Datastream, World Bank
- Institutional data:
 - *Renegotiation failure*
 - Source: Djankov, Hart, McLiesh, and Shleifer (JPE 2008)

Renegotiation failure

Renegotiation failure $\in [0, 1]$

May creditors seize collateral out-of-court?
No judgement for enforcement of security?
Floating charge?

Is a reorganization not mandatory?
Must operations stop upon start of insolvency procedure?
Will management lose control upon start of insolvency procedure?
May creditors enforce security at the start of insolvency procedure?

May an insolvency ruling not be appealed?
Is the procedure not suspended while appeal is resolved?
Can creditors appoint insolvency administrator?
Can creditors dismiss insolvency administrator?
Can creditors vote on reorganization plan?

Renegotiation failure index

| Country | <i>Renegotiation failure</i> | <i>Creditors' recovery</i> |
|-------------|------------------------------|----------------------------|
| Chile | 0.00 | 0.22 |
| China | 0.00 | 0.42 |
| Italy | 0.23 | 0.37 |
| France | 0.23 | 0.47 |
| Russia | 0.25 | 0.33 |
| . | | |
| . | | |
| Germany | 0.45 | 0.56 |
| . | | |
| . | | |
| USA | 0.54 | 0.86 |
| Korea | 0.54 | 0.88 |
| Japan | 0.54 | 0.96 |
| . | | |
| . | | |
| New Zealand | 1.00 | 0.80 |
| Australia | 1.00 | 0.85 |
| Hong Kong | 1.00 | 0.86 |
| UK | 1.00 | 0.91 |
| Singapore | 1.00 | 0.95 |

Data and empirical design (II)

- Basic empirical framework:

$$\beta_{it} = \underbrace{\mathbf{x}'_{it}\boldsymbol{\gamma}}_{\text{controls}} + \delta_q \text{Renegotiation failure}_C + \delta_\alpha \text{Liquidation Costs}_{it} \\ + \delta_{q\alpha} \text{Renegotiation failure}_C \times \text{Liquidation Costs}_{it} + \varepsilon_{it}.$$

- First stage: compute the orthogonal projection of leverage from

$$\text{Leverage}_{it} = \gamma_0 + \gamma_1 \times \text{Leverage}_{i0} + \boldsymbol{\gamma}'_z \mathbf{z}_{it} + \boldsymbol{\gamma}'_x \mathbf{x}_C + v_{it}.$$

Results: Renegotiation failure (Table V)

| | Domestic beta <i>N</i> = 351,099 | | Overall beta <i>N</i> = 347,211 | |
|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|----------------------|------------------------------------|----------------------|
| | (1) | (2) | (3) | (4) |
| <i>Renegotiation failure</i> | 0.222*** (0.052) | -0.038 (0.1) | 0.539*** (0.12) | 0.201 (0.203) |
| <i>Insiders' share</i> | -0.422*** (0.063) | | -0.907*** (0.125) | |
| <i>Insiders' share</i> × <i>Renegotiation failure</i> | 0.328*** (0.096) | | 1.036*** (0.195) | |
| <i>Intangibles</i> | | -0.813*** (0.137) | | -1.788*** (0.256) |
| <i>Intangibles</i> × <i>Renegotiation failure</i> | | 0.872*** (0.201) | | 1.602*** (0.382) |
| Average adjusted <i>R</i> ² | 0.14 | 0.13 | 0.18 | 0.18 |
| $H_0 : \frac{\partial \mathbb{E}(r_i - r \text{Renegotiation failure} = 1)}{\partial \text{Intangibility or Insiders' share}} = 0$ | -0.078** (0.036) | 0.049 (0.075) | 0.052 (0.036) | -0.079 (0.072) |
| $H_0 : \mathbb{E}(r_i - r \text{Reneg. failure} = 1) - \mathbb{E}(r_i - r \text{Reneg. failure} = 0) = 0$ | 0.456*** (0.057) | 0.588*** (0.072) | 0.631*** (0.058) | 0.630*** (0.068) |

Results: Leverage interactions (Table VI)

- The **difference** in equity beta between firms in different countries is **larger** the **more** levered they are.

| | Domestic beta | | | |
|----------------------------------------------------------------|---------------|----------|---------|----------|
| | (1) | | (2) | |
| | LL | HL | LL | HL |
| $\frac{\partial \beta}{\partial \text{Renegotiation failure}}$ | 0.305*** | 0.391*** | 0.539** | 1.117*** |
| | (0.099) | (0.101) | (0.219) | (0.205) |

Creditors' recovery rate

- We can show that the creditors' **expected recovery rate**, R is

$$\begin{aligned}\frac{rE(C)}{c} &\equiv \frac{(1-q)(1-\eta\alpha)X_B + q(1-\alpha)X_B}{\frac{c}{r}} \\ &= \frac{\lambda}{\lambda-1} \left[1 - \frac{\alpha q}{1-(1-q)\eta\alpha} \right]\end{aligned}$$

so that $\frac{\partial R}{\partial q} > 0$.

Results: Creditors's recovery (Table VII)

| | Domestic beta N = 351,099 | | | |
|-----------------------------------------------------|------------------------------|----------------------|----------------------|----------------------|
| | (1) | (2) | (3) | (4) |
| <i>Priority</i> | -0.103*** (0.023) | 0.169*** (0.042) | | |
| <i>Recovery</i> | | | -0.719*** (0.090) | 0.166 (0.115) |
| <i>Insiders' share</i> | -0.920*** (0.132) | | -0.791*** (0.082) | |
| <i>Intangibles</i> | | 1.079*** (0.351) | | 0.449** (0.195) |
| <i>Insiders' share</i> × <i>Priority</i> | 0.174*** (0.035) | | | |
| <i>Intangibles</i> × <i>Priority</i> | | -0.362*** (0.091) | | |
| <i>Insiders' share</i> × <i>Creditors' recovery</i> | | | 0.739*** (0.103) | |
| <i>Intangibles</i> × <i>Creditors' recovery</i> | | | | -0.890*** (0.237) |
| Average adjusted R ² | 0.12 | 0.11 | 0.14 | 0.13 |

Results: Returns volatility (Table VIII)

$N = 351,082$

| | Total volatility | | Systematic volatility | | Idiosyncratic volatility | |
|-----------------------------------------------------------|----------------------|----------------------|-----------------------|----------------------|--------------------------|----------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| <i>Renegotiation failure</i> | -0.073*** (0.013) | -0.069*** (0.026) | -0.012 (0.012) | -0.031 (0.022) | -0.078*** (0.011) | -0.069*** (0.021) |
| <i>Insiders' share</i> | -0.080*** (0.017) | | -0.106*** (0.014) | | -0.030** (0.013) | |
| <i>Insiders' share</i> × <i>Renegotiation failure</i> | 0.105*** (0.024) | | 0.145*** (0.02) | | 0.031 (0.02) | |
| <i>Intangibles</i> | | -0.149*** (0.033) | | -0.176*** (0.029) | | -0.073*** (0.027) |
| <i>Intangibles</i> × <i>Renegotiation failure</i> | | 0.076 (0.049) | | 0.159*** (0.042) | | 0.005 (0.04) |
| <i>Volatility</i> ($q=1$) - <i>Volatility</i> ($q=0$) | -2.50% | -3.82% | 5.42% | 3.34% | -6.38% | -6.70% |
| Average adjusted R^2 | 0.08 | 0.09 | 0.11 | 0.11 | 0.17 | 0.18 |

Using an international cross-section of stocks, we find:

- 1 **Stricter** debt enforcement procedures **increase** equity risk
- 2 **Higher** liquidation costs or equity holders' bargaining power **decrease** equity risk; but less so
 - 1 the **lower** the leverage and,
 - 2 the **stricter** the country's debt enforcement.