# Corporate Debt Maturity and Future Firm Performance Volatility

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Discussion by: Wasin Siwasarit

# Introduction

A simple idea that corporate debt maturity should serve as a leading indicator of future firm performance volatility.

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- This paper finds:
  1. Future firm operating performance volatility decreases as corporate debt maturity increases and that future firm value volatility is not associated with corporate debt maturity.

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2. Theoretical contribution

# Descriptive Statistics

1. This paper
   - Time series size:1993-2013;
   - 95,240 firm-year observations;
   - 8,593 firms;
   - How many firms in each country?;

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2. Findings

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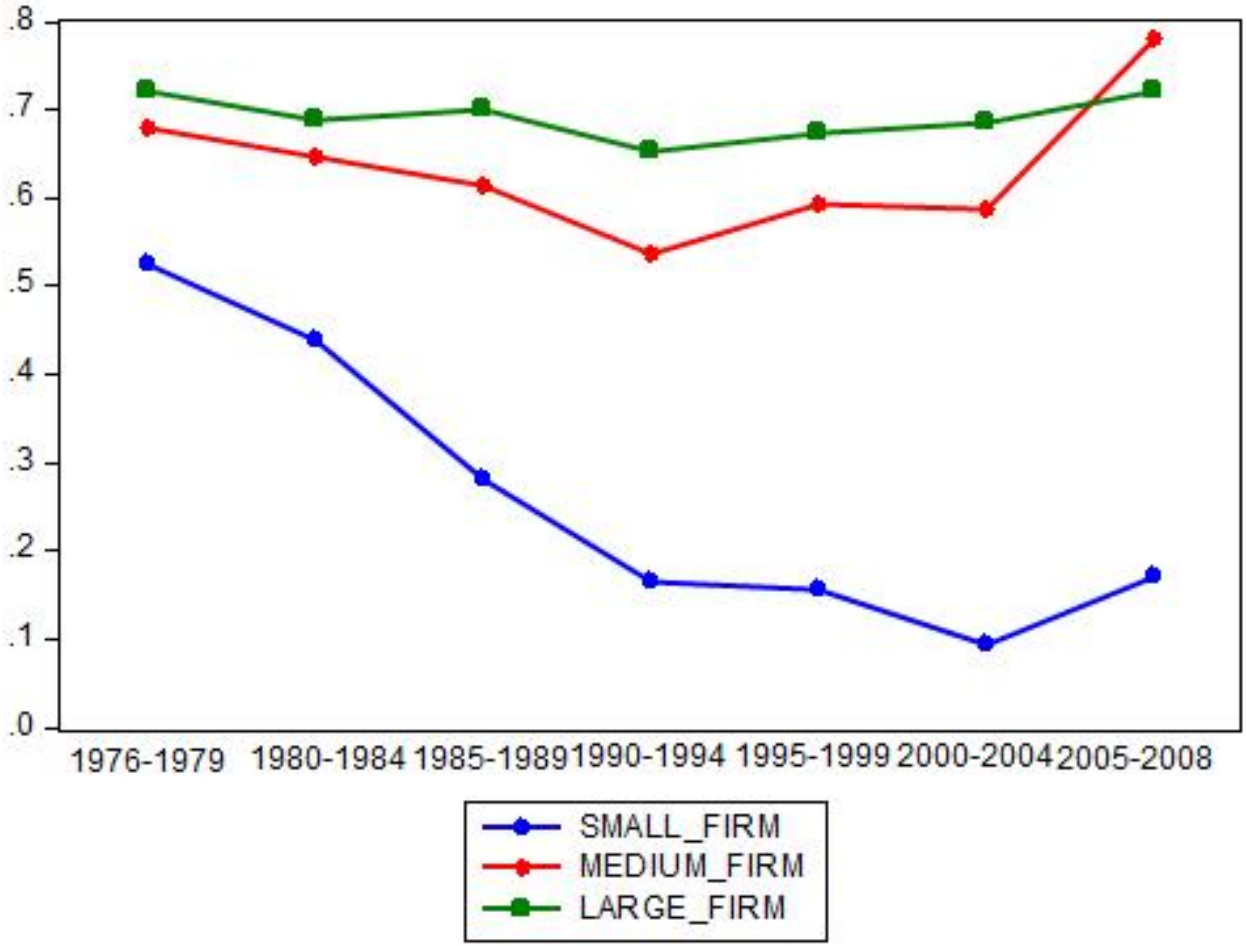
2. Findings
   - The mean value of SDROA is 4.83 and the mean value of SDTBQ is 0.26;
   - What are the time time-series average by groups of firms the mean/median debt maturity?

# Paper: Why are U.S Firms using more short-term Debt? Custodio,Ferreira, and Laureano (2012)

**Debt Maturity by Size of Firms**



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1. Custodio,Ferreira, and Laureano (2012) collect data on debt maturity structure for non-U.S. firm (excluding utilities and financial firms) from Worldscope for the 1990-2008 period. The sample includes 184,727 observations from 28,501 unique firms in 23 developed countries.

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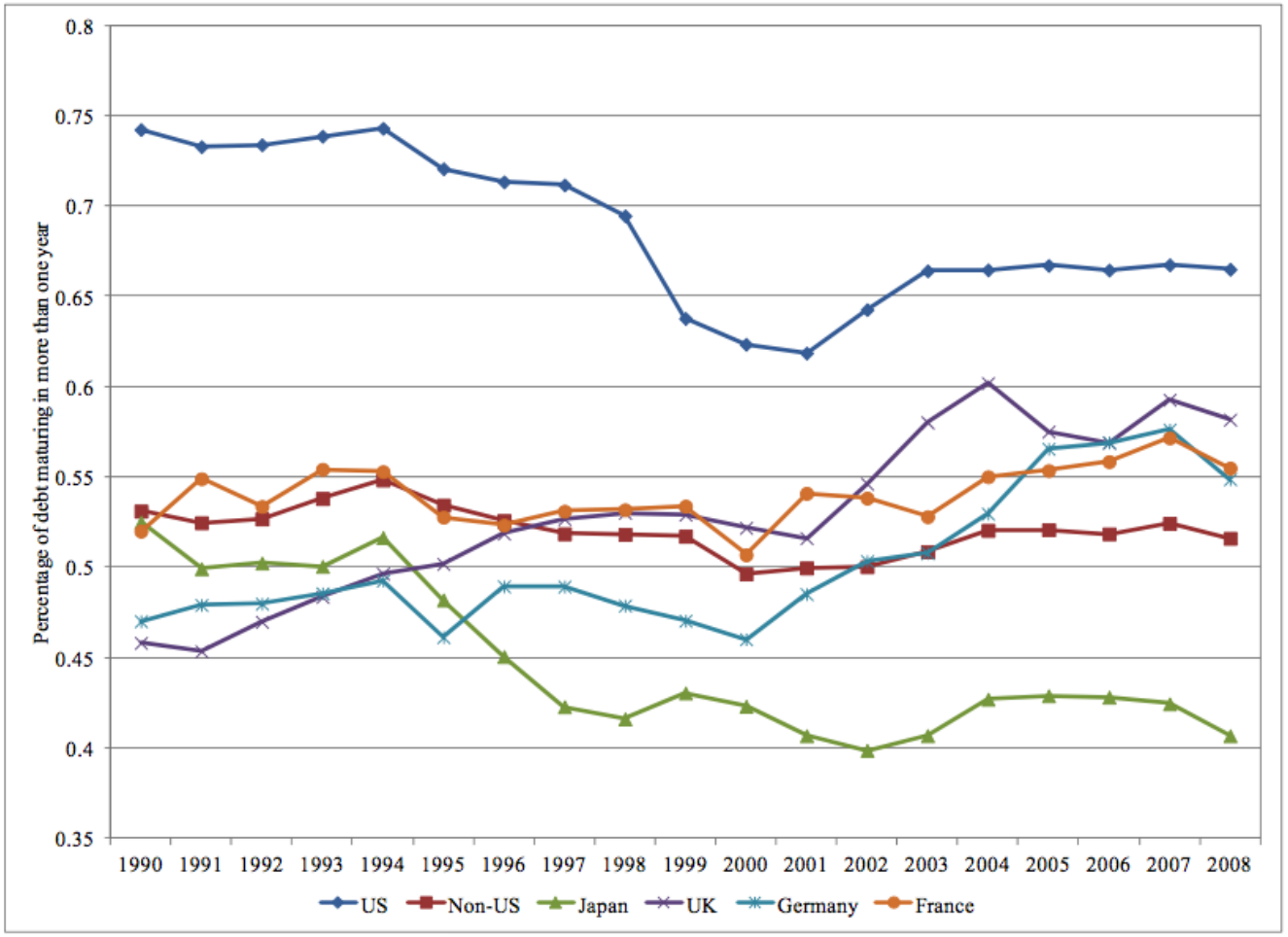
3. They find out that there is no evidence of a decrease outside of the U.S. !!
4. The average ratio of long-term debt to total debt has remained stable at about 52% over the sample period outside of the U.S., while it has decreased from about 75% to 65% in the U.S. .

# Figure: Debt Maturity: International Evidence




Source:Custodio,Ferreira, and Laureano (2012)

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4. Fama, E., and K. French, 2001, Disappearing Dividends: Changing Firm Characteristics or Lower Propensity to Pay? Journal of Financial Economics 60, 3-43.

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5. What are the correlation between SDROA /SDTBQ and $DEBTA_{t-3}/DEBTA_{t-2}/DEBTA_{t-1}$ ?
6. We might have the stronger correlation between these variables if we use only U.S. small firms?

# Predicting Future Firm Operating Performance Volatility

Panel OLS regression 1993-2013

| | SDTBQ | SDROA |
|---|---|---|
| $DEBTMAT_{t-3}$ | 0.000 | -0.008 |
| | (0.000) | (0.001) |
| $CAPEXTA_{t-3}$ | 0.002 | 0.012 |
| | (0.000) | (0.004) |
| $LNTA_{t-3}$ | -0.119 | 0.902 |
| | (0.003) | (0.060) |
| $CACL_{t-3}$ | -0.011 | 0.116 |
| | (0.002) | (0.028) |
| $FATA_{t-3}$ | -0.227 | 0.649 |
| | (0.017) | (0.306) |
| $LEV_{t-3}$ | 0.000 | 0.008 |
| | (0.000) | (0.003) |
| $MBV_{t-3}$ | 0.009 | -0.004 |
| | (0.001) | (0.011) |
| $ROA_{t-3}$ | 0.000 | -0.025 |
| | (0.000) | (0.002) |
| $GPM_{t-3}$ | 0.000 | -0.021 |
| | (0.000) | (0.003) |
| Adj. $R^2$ | 0.50 | 0.462 |

# Comments:Predicting Future Firm Operating Performance Volatility

1. Comment on the SDTBQ : the relationship between firm performance and Tobin's Q is confounded by endogeneity !. Inefficiency due to underinvestment lowers firm performance but increases Tobin's Q. See Dybving and Warachka(2012) for a formal theory and further details.

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2. Comment on the econometrics: Selection of Optimal Lag Length, Measurement Errors, Multicollinearity.
3. Comment on the definition of SDROA.

# A Two-Period model

Firms have their own funds ($\bar{I}$) but need to borrow additional funds I from investors at time 0.

| | 0 | 1 | 2 |
|---|---|---|---|
| Short-term Debt | $\alpha * I$ | $\omega(S_1 - S_1) + (1-\omega)S_1$ | $\omega E(\theta) S_2$ |
| Long-term Debt | $(1-\alpha) * I$ | $(1-\omega)\kappa(V - S_1)$ | $\omega E(\theta) L$ |

# The expected discounted payoff of the short-term and long-term bonds for investors

The expected discounted payoff of the long-term bond

$$(1-\alpha)\mathrm{I} = \frac{1}{(1+r_t)}(1-\omega)\kappa(V-S_1)+\frac{1}{(1+r_t)^2}\omega E(\theta)L$$

The expected discounted payoff of the short-term bond

$$(\alpha)\mathrm{I} = \frac{1}{(1+r_t)}[\omega(S_1-S_1)+(1-\omega)S_1]+\frac{1}{(1+r_t)^2}\omega E(\theta)S_2$$

# Equilibrium

In equilibrium, $S_1, S_2,$ and L are simultaneously determined.

$$
\begin{aligned}
S_1 &= (1+r_t)\alpha I \\
S_2 &= \frac{(1+r_t)^2}{E(\theta)}\alpha * I \\
L &= \frac{(1+r_t)^2}{\omega E\theta}\left\{[1\alpha+\alpha(1-\omega)\kappa]I-\frac{(1-\omega)\kappa V}{(1+r_t)}\right\}
\end{aligned}
$$

With the present discounted value of expected net profit of the firm with the success probability $\theta$ is given by .

$$\pi = \frac{1}{(1+r_t)^2}\omega\theta[R-S_2-L]-\bar{I}$$

# Equilibrium

$$\bar{\theta} = \frac{(1+r_t)^2 \bar{I}}{\omega[R - S_2 - L]} > 0$$

then,

$$\bar{\theta} = \frac{(1+r_t)^2 \bar{I}}{\omega[R - \frac{(1+r_t)^2}{E(\theta)}\alpha * I - \alpha\frac{(1+r_t)^2(1-\omega)(1-\kappa)}{\omega E[\theta]} + \frac{(1+r_t)(1-\omega)\kappa}{\omega E[\theta]} V]}$$

Differentiating $\bar{\theta}$ with respect to $\alpha$, we get $\frac{\bar{\theta}}{d\alpha} < 0$.

# Comments: Equilibrium

1. we get $\frac{\bar{\theta}}{d\alpha} < 0$. Depend on the restriction of
$$[R - \frac{(1+r_t)^2}{E(\theta)}\alpha * I - \alpha\frac{(1+r_t)^2(1-\omega)(1-\kappa)}{\omega E[\theta]} + \frac{(1+r_t)(1-\omega)\kappa}{\omega E[\theta]}V] > 0$$

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4. Other issues.