Discussion of:

Voluntary Debt Reductions

by Thomas Dangl and Josef Zechner

Kent Daniel

Kellogg-Northwestern

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Outline

- A Review of the Model
- Model Implications
- Alternative Mechanisms
- Other Debt Hypotheses, Empirical Implications
- Other Questions

Cash Flow Process

- The firm's after-corporate-tax cash flows are exogenous GBM:

$$\frac{dc}{c} = \mu dt + \sigma dW$$

or, under the risk-neutral measure:

$$\frac{dc}{c} = \hat{\mu} dt + \sigma d\hat{W}$$

- The all equity firm value is given by:

$$V_t^U = \frac{c_t}{r(1-\tau_p) - \hat{\mu}}$$

Leverage

- However, the firm can increase value by using debt.
- In the DZ model, the firm issues identical coupon bonds:
  - continuous coupon rate i
  - continuous proportional maturation rate m
  - covenants prevent firm ever increasing B_t.
- Thus, the cashflow to debt holders (over dt) is:

$$(i(1-\tau_C)+m)\,B_t\,dt$$

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  - *This tax shield is the unique benefit to debt in this model.*
  - The value of the tax-shield is $\hat{E}_0\left[\int_{t=0}^{\infty} e^{-rt} i\tau_C B_t dt\right]$

Costs of Debt

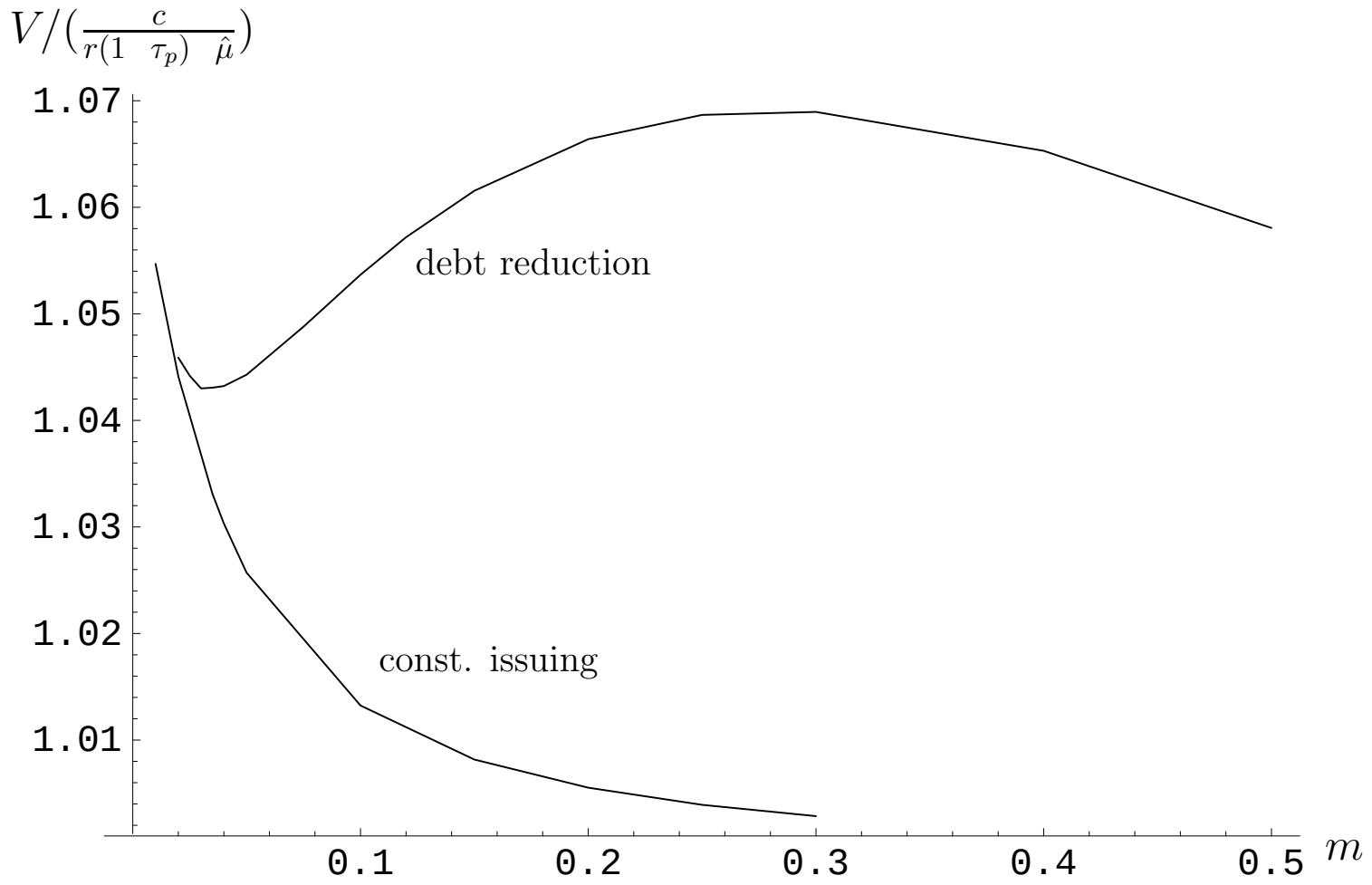
There are 2 costs of debt in the model:

- Proportional Transaction Costs of k on all debt issued.
  - To maintain a constant debt level, the firm must continuously issue $mD(y, B_t)dt$ of new debt, and pay proportional costs of k on this amount.
  - *This cost is proportional to m, and pushes the firm towards long-term debt*.
- In contrast, the model's bankruptcy costs push the firm towards short-term debt:

Bankruptcy Costs & Short Term Debt

- The equityholders have the option of putting the firm to the bondholders in exchange for the promised debt payments.
  - However, in this case, the bondholders must then pay a proportional bankruptcy cost of g.
- *Debt Reduction:*
  1. Since bondholders pay all bankruptcy costs, and renegotiation and writedowns are not allowed, *it is never in the stockholders interest to buy back debt*
  2. However, with bankruptcy costs, the firm will retire debt (*i.e., not issue*) if c_t is sufficiently low.
  - Thus, short term debt precomits the firm to retire debt in bad states.

Optimal Maturity Determination:



Other Mechanisms?

- In the DZ setting, equity holders would like to be able to commit to Pareto-optimally retiring debt as they enter distress.
  - Here, they do this by issuing substantial short-term debt
- In this model, the key problem with short term debt is that it forces the firm to continuously bear large dissipative transaction/issuance costs.
- Given this, one would expect to see other mechanisms arise which are less costly
  - Covenants?, Sinking Fund Provisions?, *etc.*

Bankruptcy Cost Structure

- Direct Bankruptcy Costs appear to be a small fraction of total bankruptcy costs.
- Indirect bankruptcy costs (*e.g.,* as in Maksimovic and Titman) are probably far more important.
- *How would this change the model?*
  - Indirect bankruptcy costs are (partly) borne by the equityholders
  - thus equityholders would have *some* incentive to retire non-maturing long-term debt.
  - What magnitude of direct bankruptcy costs are necessary to get a reasonable preference for short term debt?

Empirical Predictions

- Barclay and Smith (1995) show small growth firms issue shorter term debt
- They argue that this supports a contracting-cost hypothesis based on the Myers (1997) underinvestment problem.
  - Firms pass up positive NPV projects, since some of the project benefits would accrue to the debt holders.
- Empirically, how could this and the DZ hypothesis be distinguished?

Other Questions:

- *Subordinated Debt*
  - The model assumes that firms must retire all debt before increasing outstanding debt. Do any firms ever do this?
- *Debt for Equity Swaps:* Firms do sometimes retire debt (and not reissue). Why? (Indirect Bankruptcy Costs?)
- Role of *Debt Renegotiations*?
- Discrete Issuance Rule
  - DZ assume that firm will either issue at rate m or not at all
  - Why is this discrete? Is it never optimal to issue at rate $m/2$?

Detail Gripes:

- The authors prove (Appendix A.3) that it isn't optimal to repurchase all outstanding debt, and reissue a smaller amount.
  - Should prove that firm won't repurchase slightly more than m at the market price?