

Corporate Liabilities

Detailed Outline

1. Endogenous default
 - (a) Frictionless models
 - i. Zero-coupon debt
 - ii. Perpetual debt, constant interest rate
 - iii. Finite maturity debt, stochastic interest rates
 - (b) Endogenous capital structure choice with taxes, bankruptcy costs, restructuring costs
 - i. Perpetual debt
 - ii. Dynamic restructuring
 - (c) Renegotiation
2. Exogenous default, stochastic interest rates
 - (a) Minimum net worth covenant
 - (b) Reduced-form models, default according to hazard rate

Readings

Duffie, chapter 11.

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Problems

1. Consider a firm with perpetual fixed coupon debt, and asset value A_t that evolves according to

$$\frac{dA_t}{A_t} = (r - \delta) dt + \sigma dB^* , \quad (1)$$

where $r > 0$, $\delta \geq 0$, and $\sigma \neq 0$ are constants. Verify that the value function for equity's default option (or the value function for the perpetual American put) and the associated exercise policy proposed in class are in fact optimal by verifying the conditions of Proposition 1 from class.

2. Consider again the firm with perpetual fixed coupon debt above. Suppose that interest payments to debt are deductible from corporate taxes, so that from the equity holder's viewpoint, the effective coupon is $c(1 - x)$ where c is the stated coupon and x is the corporate tax rate. Suppose also that if the firm defaults, debt holders recover only $(1 - \alpha)A$ where A is the value of firm assets at the time of bankruptcy and α represents bankruptcy costs. Ignore personal taxes.
 - (a) Compute $\hat{e}(a, c)$ and $\hat{d}(a, c)$, the values of the firms levered equity and debt, as a function of the current asset value and the debt coupon. How would those values change with a change in bankruptcy costs α ?
 - (b) Let $\hat{v}(a, c) \equiv \hat{e}(a, c) + \hat{d}(a, c)$ be the value of the levered firm. Compute the debt level c^* that maximizes firm value.
 - (c) Verify that this level is increasing with the tax rate x and decreasing with the bankruptcy costs α .