Total After-tax Cash Flows

Rearranging terms, we get

$$C = X(1-T_C)(1-T_E) + r_D D[(1-T_D)-(1-T_C)(1-T_E)]$$

By discounting the perpetuity payments at the after-(personal) tax rate of debt we get the gain from debt. The value of the levered firm is:

$$V_L = V_U + T_g D \text{ where } T_g = 1 - \frac{(1-T_C)(1-T_E)}{(1-T_D)}$$

Did personal taxes help?

Yes. Note that it is possible to have $T_g > 0$ or $T_g < 0$.

This means that we can justify high or low debt in the capital structure of firms.

(Though the conclusions are still a bit extreme…all debt or all equity.)

What about total debt? Miller (1977) provided a model of total debt.