Advanced Corporate Finance
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Problem Set 3
Due: April 11, 2018

Capital structure

Question 1

Gladstone Corporation is about to launch a new product. Depending on the success of the new product, the company may have one of four values next year: $150 million, $135 million, $95 million, and $80 million. These outcomes are all equally likely, and this risk is idiosyncratic (diversifiable). Assume the risk-free interest rate is 5% and that we're in perfect capital markets.

Suppose Gladstone has no debt.

a. What Gladstone's current equity value?

Suppose instead Gladstone has zero-coupon debt with a $100 million face value due next year.

b. What is the current value of Gladstone's debt?
c. What is the yield of the debt? What is its expected return?
d. What is the firm's current equity value? What is the firm's total value (equity+debt)? Does Modigliani&Miller I hold here?

Question 2

Milton Industries expects free cash flow (FCF) of $5 million each year in perpetuity. Milton's corporate tax rate is 35%, and its unlevered cost of capital is 15%.

Suppose Milton has no debt.

a. What would be the value of Milton without leverage?

Suppose instead the firm has debt of $19.05 million, and expects to maintain this level of debt permanently.

b. What would be the value of Milton with leverage?

Question 3

Kurz Manufacturing is currently an all-equity firm with 20 million shares outstanding and a stock price of $7.50 per share. Kurz plans to announce that it will borrow $50 million and use the funds to repurchase shares. Kurz will pay interest only on this debt, and expects to maintain this level of debt permanently. Kurz' corporate tax rate is 40%.

a. What is the total value of Kurz before the announcement?

b. What is the total value of Kurz (including any tax shields) just after the debt is issued, but before the shares are repurchased?

c. What is Kurz's share price just before the share repurchase? How many shares will Kurz repurchase?

d. What is Kurz' Equity value and share price after the repurchase?

Question 4

Your firm is considering issuing one-year debt, and has come up with the following estimates of the value of the interest tax shield and the probability of distress for different levels of debt:

	Debt Level ($ million)						
	0	40	50	60	70	80	90
PV (interest tax shield, $ million)	0.00	0.76	0.95	1.14	1.33	1.52	1.71
Probability of Financial Distress	0%	0%	1%	2%	7%	16%	31%

Suppose the appropriate discount rate for expected financial distress costs is the risk-free rate of 5%. Which level of debt above is optimal if, in the event of distress, the firm will have distress costs equal to:

a. $2 million?

b. $5 million?

c. $25 million?

Payout Policy

Question 5

Natsam Corporation has $250 million of excess cash. The firm has no debt and 500 million shares outstanding with a current share price of $15. Natsam's board has decided to pay out this cash as a one-time dividend. Assume perfect capital markets.

a. What is the will the price per share be after the dividend is paid (or more precisely, on the ex-dividend date)?

b. If the board instead decided to use the cash to do a one-time share repurchase, what will the share price be after the repurchase?

c. Which policy, (a) or (b), makes the firm's investors better off?

Question 6

Suppose the board of Natsam Corporation decided to do the share repurchase in part (b) of the last problem, but you, as an investor, would have preferred to receive a dividend payment. How can you leave yourself in the same position as if the board had elected to make the dividend payment instead?

Question 7

Explain under which conditions an increase in the dividend payment can be interpreted as a signal of the following:

a. Good news

b. Bad news

APV and FTE

Question 8

XL Sports is expected to generate free cash flows of $10.9 million per year. XL has permanent debt of $40 million, a tax rate of 40%, and an unlevered cost of capital of 10%. Suppose the firm's debt cost of capital is 5% and its equity cost of capital is 11.4%.

a. What is the value of XL's equity using the APV method?

b. What is XL's equity value using the FTE method?