THE UNIVERSITY OF MELBOURNE

FNCE10002 Principles of Finance
Semester 1, 2019

Capital Structure and Payout Policy I
Suggested Answers to Tutorial Questions for Week 10

Note that detailed answers to tutorial questions from Part II will only be provided in tutorials. The following abridged answers are intended as a guide to those detailed answers. This policy is in place to ensure that you attend your tutorial regularly and receive timely feedback from your tutor. If you are unsure of your answers you should check with your tutor, a pit stop tutor, online tutor or me.

While detailed answers to Part I appear below, if you are not sure of the answers to these questions please ask your tutor in the following week's tutorial.

Part I – Answers Submitted to Your Tutor

A. Problems

A1. a) The logical starting point for this analysis is to calculate the total value of the company from its earnings before interest.

(i) Market value of firm, V_L (Old) = EBI/r_O = 2000000/0.08 = \$25,000,000.

(ii) Market value of equity, E_L (Old) = 25000000 − 5000000 = \$20,000,000.

(iii) Interest payable on debt = 5000000 × 0.04 = \$200,000.

(iv) Earnings available to shareholders = 2000000 − 200000 = \$1,800,000.

(v) Market value of firm, V_L (New) = EBI/r_O = 2000000/0.08 = \$25,000,000.

(*Note:* In our MM world, this must be unchanged from part (i) above.)

(vi) Market value of equity, E_L (New) = 25000000 − 10000000 = \$15,000,000.

(vii) Interest payable on debt = 10000000 × 0.04 = \$400,000.

(viii) Earnings available to shareholders = 2000000 − 400000 = \$1,600,000.

b) The cost of equity can be calculated for different levels of debt and equity using the following expression:

$r_E = r_O + (r_O - r_D)(D/E)$.

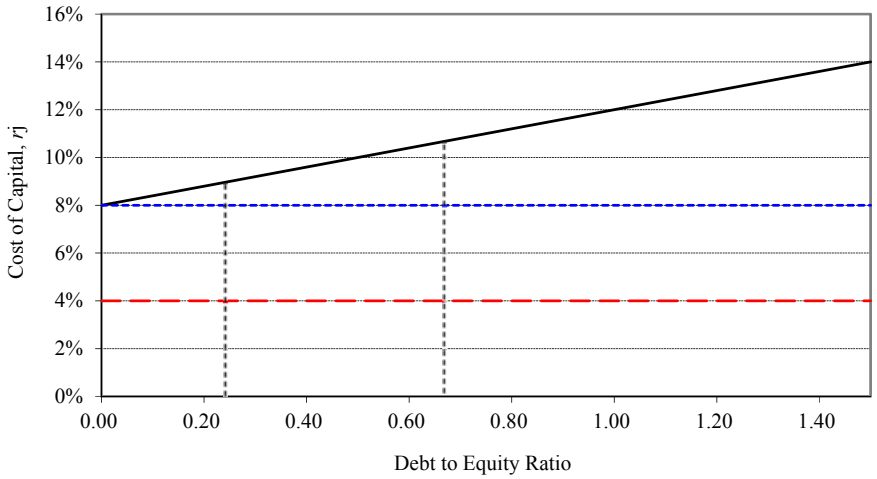
$r_E = 0.08 + (0.08 - 0.04)(5/20) = 9.0\%$.

Alternatively, r_E = Earnings to shareholders/E_L = 1800000/20000000 = 9.0%.

$r_E = 0.08 + (0.08 - 0.04)(10/15) = 10.67\%$.

Alternatively, r_E = Earnings to shareholders/E_L = 1600000/15000000 = 10.67%.

The graph is as follows.



c) The optimal capital structure is the mixture of debt and equity which maximizes the value of the firm. Under these assumptions the level of debt does not affect firm value and so there is no optimal capital structure.

A2. The level of debt, interest paid and interest tax shield each year are as follows:

Year	**0**	**1**	**2**	**3**	**4**	**5**
Debt	\$35.0*m*	\$28.0*m*	\$21.0*m*	\$14.0*m*	\$7.0*m*	\$0.0*m*
Interest		\$2.80*m*	\$2.24*m*	\$1.68*m*	\$1.12*m*	\$0.56*m*
Interest tax shield		\$1.120*m*	\$0.896*m*	\$0.672*m*	\$0.448*m*	\$0.224*m*

Interest on debt = 0.08(Debt outstanding).

Interest tax shield = 0.4(Interest on debt).

Part II – Submission of Answers Not Required

B. Short Answer Questions

B1. a) False. See your tutorial notes for further details.

b) False. See your tutorial notes for further details.

c) False. See your tutorial notes for further details.

C. Problems

C1. a) $r_E = 15\%$.

b) $r_E = 18\%$.

c) See your tutorial notes.

C2. We can use the following expression to calculate the cost of debt:

$r_E = r_O + (r_O - r_D)(D/E)$.

$r_D = 5\%$.

C3. Before the strike, the firm has \$200 million in equity and \$200 million in debt. The firm's weighted average cost of capital can be calculated as 8%. After the strike, the firm's market value of equity falls to \$150 million while the value of debt is unchanged. The firm's new equity cost of capital can be calculated as 12%.

C4. a) Interest tax shield = \$0.18 million.

b) PV(*TS*) = \$3.0 million.

c) Interest tax shield = \$0.15 million.

PV(*TS*) = \$3.0 million.

d) Interest tax shield = \$0.18 million.

e) PV(*TS*) = \$4.5 million.