Final Examination, BUS413

NAME: _____

SFU Student number: _____

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- **speaking or communicating with other students who are writing examinations.**
- **copying from the work of other candidates or purposely exposing written papers to the view of other candidates.**

Instructions: For qualitative questions, point form is not an acceptable answer. For quantitative questions, an indication of how you arrived at particular numbers is required for the purpose of assigning part marks. This examination is composed of 8 questions and 9 pages (**not** equally marked for a total of 100). Please answer all questions on the examination. The examination period is 3 hours.

1. Your firm is considering building a $600 million plant to manufacture HDTV circuitry. You expect operating profits (EBDITA) of $145 million per year for the next ten years. The plant will be depreciated on a straight-line basis over ten years (assuming no salvage value for tax purposes). After ten years, the plant will have a salvage value of $300 million (which, since it will be fully depreciated, is then taxable). The project requires $50 million in working capital at the start, which will be recovered when the project shuts down. The corporate tax rate is 35%. All cash flows occur at the end of the year.

(a) (12 marks) If the risk-free rate is 5%, the expected return of the market is 11%, and the asset beta for the consumer electronics industry is 1.67, what is the NPV of the project when disregarding financing issues (using the APV approach)?

(b) (8 marks) Suppose that you can finance $400 million of the cost of the plant using ten-year, 9% coupon bonds. This amount is incremental new debt associated specifically with this project and will not alter other aspects of the firm's capital structure. What is the value of the project, including the tax shield of the debt if the firm's borrowing rate is 6%.

2. Clark Industries has 200 million shares outstanding, a current share price of $30, and no debt. Clark's management believes that the shares are under-priced, and that the true value is $35 per share. Clark plans to pay $600 million in cash to its shareholders by repurchasing shares at the current market price.

(a) (10 marks) Suppose that soon after the transaction is completed, new information comes out that causes investor to revise their opinion of the firm and agree with

management's assessment of Clark's value. What is Clark's share price after the new information comes out?

(b) (5 marks) How would the share price and number of outstanding shares differ if Clark waited until the new information came out to repurchase the shares?

3. Baxter has loan of $1 million due at the end of the year. Without a change in strategy, the market value of its assets will be only $900,000 at that time, and Baxter will default on its debt.

(a) (5 marks) Baxter executives are considering a new strategy that requires no upfront investment, but it has only a 50% chance of success. If it succeeds, it will increase the value of the firm's assets to $1.3 million. If it fails, the value of the firm's assets will fall to $300,000.What is the firm value if the new strategy is pursued? Who gains and who losses if the firm pursues this strategy, by how much?

(b) (5 marks) The firm's managers consider an attractive investment opportunity that requires an initial investment of $100,000 and will generate a risk-free return of 50%. The only problem is that Baxter does not have the cash on hand to make the investment. Could Baxter raise the money by issuing new equity? Explain in detail (numerically).

4. Assume M&M assumptions hold (i.e., no taxes, transaction costs, asymmetric information, etc.). Genron Corporation has $20 million in excess cash, 10 million shares outstanding, and no debt. The firm expects to generate additional free cash flows of $48 million per year in subsequent years and its unlevered cost of capital is 12%. Genron's board is meeting to decide different payout policies.

(a) (5 marks) Suppose the board decides on a 100% payout policy, where all excess cash is paid immediately as dividends. What is the cum-dividend and ex-dividend price of Genron shares before and after the $20 million distribution?

(b) (5 marks) Suppose Genron decides to use the $20 million to repurchase shares. The cash flows in following years of $48 million will be paid as before as regular dividend. What is the dividend per share and price of a share after the repurchase? Show that M&M irrelevance theorem holds.

(c) (5 marks) Suppose the board decides to pay a dividend of $48 million now, and to fund the extra cash by issuing new shares. Show that M&M irrelevance theorem holds. What will be the ex-dividend price after the initial distribution?

(d) (5 marks) Suppose that eventfully the firm decides to either select the payout policy of (a) or the repurchase of (b). John and Marle each have 2000 shares of Genron corporation. John prefers the policy in (a) while Marle prefers the policy in (b). Show how each can achieve a homemade policy of his/her preference even if the firm decides the opposite.

5. (15 marks) Assume you are the CFO of a publicly traded nationwide chain of gourmet food stores. Your company is considering opening a new store in the recently renovated Ferry Building in New York. If you do not sign the lease of the store today, you will not have the opportunity to open a store later. While the lease payments are to be paid in perpetuity, there is a clause in the lease that allows you to break the lease at no cost in two years.
Including the lease payment, the new store will cost $120,000 per year to operate. Because the building has just reopened, you do not know what the pedestrian traffic will be. If your customers are mainly limited to morning and evening commuters, you expect to generate $96,000 year in revenue in perpetuity. If, however, the building follows the lead of the Ferry Building in San Francisco and becomes a tourist attraction, you believe the revenue will double that amount. The cost to set up the store will be $400,000. Assume the risk is completely diversifiable so the correct discount rate to use is the risk-free rate of 7%. What is the value of the clause that allows you to break the lease at no cost in two years. Does it affect your decision to open the store?

6. (5 marks) An analysts suggests using the ratio EPS/(Cost of Labor hour) as a ratio for analyzing the productivity of firm in the auto manufacturer industry? What may be a concern with this ratio (20 words max)?

7. Timberland Corporation is a furniture manufacturer that is considering installing a milling machine for $420,000. The machine carries straight line deprecation to zero over a 7 year period. Timberland has been financially distressed and thus the company does not expect to get tax shields over the next seven years as it **won't pay taxes**. Canadian Leasing Company (a tax paying company) has offered to lease the machine over the seven year. The corporate tax rate is 35%. The appropriate before-tax interest rate is 6% for both firms. Lease payments occur **at the end** of the year.

a. (5 marks) What is the highest leasing price (before tax) that Timberland would agree too?

b. (5 marks) What is the lowest leasing price that Canadian Leasing would agree too?

8. (10 marks) Tag's engineers have developed a new GPS- watch, which the company is considering developing commercially. Management views the risk of this investment as similar to that of other technology companies' investments; with comparable firms typically having an average debt to value ratio of 20%, an average cost of equity capital of 13%, and an average cost of debt of 8%. Suppose Tag's plans to finance the new division using a constant debt-to-value ratio of 10% and a borrowing rate of 6%. The corporate tax rate is 40%. Estimate the WACC that should used to value the GPS-watch project.

Answers

1.

(a)

Time	0	1-9	10
Investment +NWC	-650m		300m (1-0.35)+50m = 245m
Operating cash flow			
EBDITA		$145m	$145m
DEP		$60m	$60m
EBIT		$85m	$85m
EBIT(1-TAX)		$55.25m	$55.25m
OCF		$115.25m	$115.25m
Total	-650m	$115.25m	$360.25m

R_A=5+1.67 * (11-5) = 15.02

APV (real project) = -650m + 115.25 *PVAF(15.02%, 9) + 360.25/(1.1502)^10

=-650 m +115.25m * 4.768 +88.89m =-11.60m

(c) Tc*rD= .35*0.09*400m = 12.6m

NPV (Tax shields) = 36m *PVAF (10,6%)= 12.6m*7.36 = 92.73m
Total NPV = -11.6m+92.73m = 81.13m

2.

(a) Current market value: 30*200m = 6 billion

Market value according to management: 35*200m = 7 billion

Number of shares bought back at current market share: 600m/30 = 20m

Total shares outstanding: 180 million.

Value per share at new information valuation: (7 billion-600m)/180 million = $35.56

(b) Clark would have to buy at $35 per share, which means buying back (600m/35) = 17.143m shares.

Total shares outstanding 182.857 m shares.

3.

a) If the firm succeeds the value of the assets is $1.3, equity value will be 300k, debt value is $1m.

If the firm fails the value of the asset is $300k, equity value will be zero, debt value is 300k.

Value of stragegy = 0.5*1.3m +0.5*300k = 800k (loss of 100k)
Value for equityholders is V_e=0.5*300k = 150k (they gain 150k)
Value for debtholders is V_d= 0.5*1m + 0.5 *300k = 650k (they lose 250k)

b) Baxter would find it hard to raise the cash from equity holders because they could at most get back a $50,000 for putting in $100,000. The firm owes $1m and the company's assets are worth 900k. Thus, an extra 100k is sill owed to debtholders. It is not worth for equity holders to put in 100k to get back 50k.

4.

(a) As there are 10 million shares outstanding, the per share distribution is $2 immediately and a perpetuity of $4.8.

Cum dividend price is P_c=2+ 4.8/0.12 = 2+40 = 42

Ex dividend price is 40.

(b) The firm will buy back shares at a cost of $42. Number of shares bought is $20m/42=476,190

Total number of shares outstanding 9,523,810
Dividend per share 48m/9.523 = 5.04

The price after repurchase is 5.04/0.12 = 42

(c) Each share will be given $4.8 dollars. Needed extra $28 million.

Price will drop to 42-4.8=37.2

New shares: 28m/37.2 = 752,688 Total 10,752,688

Cash flows to old shareholders (10/10.752 * 48m/0.12) = 372m
Thus old shareholders would receive $ 37.2 per share.

Price of share from the perspective of old shareholders, cum dividend

4.8 + 37.2 = 48

(d) 2000 shares dividend of $2 is $4000. Investment in stock is 40*2000 = $80,000

If the firm decides to pay dividends, the ex dividend price is $40. So Marle can buy 100 shares to get a total of 2100 shares invested in stock

$40*2100 - $84,000

If the firm decides to repurchase, the price is $42. So John can sell 95 2000/42 = 95 shares (95.23) to get in cash around $4000 and the rest of $80,000 be invested in stock.

5.:

NPV (no clause) = -400k+(0.5(96k+96*2k)-120k) / 0.07 = -400k+ 24k/0.07 =
-400+342.85 = -57.14k

With clause after if 96, you stop in two years.

NPV(with clause) = -400k +0.5*PVAF(2,7%) *(96k-120k) + 0.5*(192k-120k)/0.07 =

-400k +0.5 (-22.43-20.96)k+0.5*72k/0.07 = (-400-21.7+514.29)k = 92.59k

The value of the clause is the difference in NPV, = 92.59k+57.14k = 149.73k

Yes it makes a difference on the decision to open the store.

6. The numerator goes to shareholders while cost of labor is for all firm's asset holders.

7. Answer

a.
Depreciation per year: 420,000/ 7 = 60,000
Depreciation tax shield = DT = 60k*0.35 = 21k
After-tax discount rate = 0.06 (1 - 0.35)
= 0.039
Timberland's (the lessee) reservation price is:

Set the NPV = 0, and solve for L:
NPV (lease) = 0 = 420k - L × PVAF (6%, 7)

420k - L × 5.582 = 0
L = 420k / 6.0243 = 75.24k

b. NPV (buy and then lease) =0

0= -$420k + L (1 - 0.35) PVAF(3.9%,6) + 21k × PVAF(0.039, 7)

0=-420k + 126.51K + L (0.65)(6.0243)

L = 74.95k

8.
a. Find R_a : r_e=13.0%, r_d=8%, D/V=0.2 ➔ D/E=0.25

$$R_a = \frac{r_e + r_d \frac{D}{E}(1-T_c)}{1+\frac{D}{E}(1-T_c)} = 12.34\%$$

Also accepted (ignoring taxes in prop 2)

The unlevered cost of equity is r_a=0.2*8%+0.8*13% = 12%

Project D/V = 0.1 ➔ D/E = 0.111

R_e = 0.1234+0.111*(0.1234-0.06) (1-0.4) = 0.1276

(alternatively, with no taxes M&M prop 2, 0.1266)

The WACC = 0.1*6%*(1-0.4)+0.9*12.76= 11.84%
(alternatively, with no taxes M&M prop 2, 11.75%)