COMM 370

2020W Midterm Practice Answer Key

commerce undergraduate society

PREPARED BY

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QUESTION 1 (20 marks) **TIME: 20 Minutes**

Mamba Tech is a tech company founded by Kobe Wiseman in 2015. Kobe is planning an Initial Public Offering (IPO) in the near future on the New York Stock Exchange (NYSE) to raise additional financing for growth. Kobe currently serves as the Chief Executive Officer (CEO) of Mamba Tech and he is also the Chair of the Board of Directors. His wife, the HR Director of Mamba Tech, is also on the board and Kobe has given her the power to appoint the next CEO. Mamba Tech has a small board of six people, which includes only one independent director.

A) Identify the concerns with Mamba Tech's current board of directors. (5 marks)
- CEO is also chair of the Board. No governance mechanisms to keep CEO in check
- Lack of external directors / imbalance of internal and external
- May suffer from misaligned interests (Kobe and his wife may think differently about the company and not about maximizing shareholder value)
- System of succession planning is not ideal (his wife gets to appoint the next CEO), should have input from shareholders and the board
- Independent boards are more likely to replace bad managers
- Bonus: NYSE requires majority external board to list on their exchange.

B) Mamba Tech is currently in discussions with you, their investment banker, regarding an IPO. Kobe has asked you to outline briefly the process of doing an IPO. (5 marks)
- Hire investment banker/underwriter
- File IPO prospectus (registration and documents)
- Regulator reviews and approves the issuance of shares to public
- Establish valuation, price, and conduct a road show to get investor interest (book-building)
- Adjust price and set final price based on investor sentiment and subscription to the IPO
- Company files final prospectus and prepares to go public
- Share price moves and stabilizes following initial trading

C) List both direct and indirect flotation costs for the IPO. (5 marks)
- Direct costs: Filing fees, legal fees, taxes, underwriting fees, spread (offer price – price to issuer)
- Indirect costs: management time, abnormal returns, underpricing (in IPOs), overallotment option

D) Kobe Wiseman, the founder, plans to retain class B shares that will have 15 votes for every one vote of the class A common shares that will be issued in the IPO. What is this type of share structure called? What problems could arise from this form of share structure? (5 marks)
- Dual-class share structure (common in family owned businesses, because they want to raise capital through equity markets, but they don't want to give up control)
- Problems that could arise: Kobe having all the voting power, minority shareholders not protected.

QUESTION 2 (20 marks) **TIME: 25 Minutes**

CMP Holdings has hired you as their corporate finance advisor to help prepare a financial plan for their expansion strategy in 2020. You are given the following information for CMP Holdings for 2018 and 2019.

CMP Holdings has an opportunity to take on an additional contract with a new customer that will increase sales by 20%. If they go ahead with the contract, the increase in sales is expected to result in the same growth in all expense items, except for interest and taxes. Interest is expected to increase to $850 and taxes will remain at 40%. The company will also maintain its 2019 dividend payout ratio. Current assets and liabilities are expected to increase at the same rate as sales. The company is currently at capacity and net fixed asset additions of $5,000 will be required to take on the new contract. CMP Holdings would like you to determine what its financing needs will be if the new contract is undertaken (Option 1).

If CMP Holdings does not take on the contract (Option 2), zero sales growth for 2020 is expected. Under this scenario, all expense items, except interest and taxes will remain unchanged. The interest expense is expected to be $600. Current assets and current liabilities will remain unchanged and no addition to net fixed assets will be required.

A) List CMP Holding's 2 main sources of cash and 2 main uses of cash for 2019. (4 marks)
- Sources of cash: Long-term debt increased, increases in Accounts Payable
- Uses of cash: Increases in net fixed assets, increases in inventory

B) Complete the pro-forma balance sheet for 2020 and assume that CMP Holdings goes through with the contract (2020F Option 1). Assume that any external financing needed (EFN) will be funded with long-term debt and any excess funds will result in repayment of long-term debt. (5 marks)
Refer to table for EFN needed for option 1 (3427), EFN needed, so financed through adding to LT-debt

See tables on next page for filled out pro-forma income statements + balance sheets

C) Complete the pro-forma balance sheet for 2020 and assume that CMP Holdings does not go through with the contract (2020F Option 2). Assume that any external financing needed (EFN) will be funded with long-term debt and any excess funds will result in repayment of long-term debt. (2 marks)
Refer to table for EFN needed for option 2 (-1570), used to pay down any long-term debt so subtract it from LT debt!

Income Statement	2019	2020 Pro-forma Option 1	2020 Pro-forma Option 2
Sales	40,991	49,189	40,991
Cost of goods sold	29,870	35,844	29,870
Other expenses	5,198	6,238	5,198
Depreciation	1,837	2,204	1,837
EBIT	4,086	4,903	4,086
Interest	642	850	600
Taxable Income	3,445	4,054	3,486
Taxes (40%)	1,378	1,621	1,395
Net Income	2,067	2,432	2,092
Dividends	517	608	523

Assets	2018	2019	Change from 2018	2020 Pro-forma Option 1	2020 Pro-forma Option 2
Cash (+20%)	397	445	48	534	445
A/R (+20%)	638	714	76	857	714
Inventory (+20%)	933	1,045	112	1,254	1,045
Total current assets	1,968	2,204	236	2,645	2,204
Net Fixed assets (+5000)	15,412	17,261	1,849	22,261	17,261
Total Assets	**17,380**	**19,465**	**2,085**	**24,906**	**19,465**

				Unbalanced		Balanced	
Liabilities and Owners' Equity	2018	2019	Change from 2018	2020 Pro-forma Option 1	2020 Pro-forma Option 2	2020 Pro-forma Option 1	2020 Pro-forma Option 2
Accounts payable (+20%)	845	946	101	1,135	946	1,135	946
Long-term debt	6,419	6,853	434	6,853	6,853	10,280	5,283
Total liabilities	7,263	7,798	535	7,988	7,799	11,415	6,229
Common stock	323	323	-	323	323	323	323
Retained earnings	9,794	11,344	1,550	13,168	12,913	13,168	12,913
Total Equity	10,116	11,666	1,550	13,491	13,236	13,491	13,236
Total L + E	**17,379**	**19,464**	**2,085**	**21,479**	**21,035**	**24,906**	**19,465**

Debt to Equity	0.72	0.67				0.85	0.47
Return on Assets		10.62%					
Return on Equity		17.72%					
Option 1 EFN Needed							
Assets for 2020F	24,906						
L+E for 2020F	21,479						
EFN Needed for Option 1	3,427						
Option 2 EFN Needed							
Assets for 2020F	19,465						
L+E for 2020F	21,035						
EFN Needed for Option 2	-1570						

D) Calculate the pro-forma book debt to equity ratio under both options. (2 marks)
- Refer to table above (0.85 and 0.47)

E) Comment on the impact of each option on CMP's financial leverage. CMP is currently close to its target book debt to equity ratio of 0.7. (2 marks)
- Option 1 will increase leverage due to the growth, you need financing to grow!
- Option 2 will decrease leverage since they are not taking on any more debt, but no growth!
- Would suggest option 2 if they don't want to exceed their 0.7 debt to equity ratio

F) If CMP's target debt to equity ratio was 1 instead, how would that change your answer in part E)? (1 mark)
- If their target debt to equity ratio was 1, then I would suggest option 1 since 0.88 < 1

G) CMP's management have heard about the sustainable growth rate and have asked your advice on using this rate as a guide for future growth.

i. Calculate the sustainable growth rate for CMP for 2019. (2 marks)
Sustainable growth rate = ROE * retention rate / (1 – ROE*r)
Payout ratio = Dividends/NI = 608/2432 = 0.25
Retention rate = 1 – payout ratio = 1 – 0.25 = 0.75
RoE = 17.72% (From the table)
Sustainable Growth Rate = (0.1772*0.75) / (1-0.1772*0.75)
Sustainable Growth Rate = 0.1329 / 0.8671 = 0.153269519 = 15.3%

ii. How can this growth rate be useful to CMP when making their decision regarding the new contract? (2 marks)
- Helpful as they know that they can grow sustainable at this rate without any additional financing.
- However, to get to 20%, they will need external financing, so they can evaluate their financing needs ahead of time.

QUESTION 3 (16 marks) TIME: 20 Minutes

Tiffany & Partners is evaluating an investment project to produce volleyballs.

A new machine will be required for the project which will cost $900,000 and have a useful life of 6 years. At the end of six years, the machine will be sold with the salvage value expected to be 5% of the initial purchase cost of the machine.

Production and sales from the new machine are expected to be 100,000 volleyballs per year. Each volleyball can be sold for $20 and will incur variable costs of $12. Additional overhead costs arising directly from the operation of the machine will be $180,000 per year.

The level of net working capital required each year is equal to 10% of the expected sales for the next year. Tiffany & Partners has a tax rate of 30%, a WACC of 12%, and the CCA rate for the new machine is 30%. Tiffany & Partners has many other assets in this asset class and plans to finance the project in the same way as the rest of the firm, since the firm is at its target capital structure.

A) Calculate the project NPV, being sure to include all tax effects. Should Tiffany & Partners invest in the new machine to produce volleyballs? (16 marks)

Assumptions		
Useful Life		6
Initial Investment	$	900,000
Salvage Value	$	45,000
Price per unit	$	20
Variable Cost	$	12
Additional Expenses	$	180,000
NWC		10%
Tax Rate		30%
WACC		12%
CCA Rate		30%

Unit Sales				100000		100000		100000		100000		100000		100000
Income Statement														
Year		0		1		2		3		4		5		6
Revenue	$	-	$	2,000,000	$	2,000,000	$	2,000,000	$	2,000,000	$	2,000,000	$	2,000,000
(-) COGS	$	-	$	1,200,000	$	1,200,000	$	1,200,000	$	1,200,000	$	1,200,000	$	1,200,000
(-) Overhead Expense	$	-	$	180,000	$	180,000	$	180,000	$	180,000	$	180,000	$	180,000
Pre-tax profit	$	-	$	620,000	$	620,000	$	620,000	$	620,000	$	620,000	$	620,000
(-) Taxes (@ 30%)	$	-	$	186,000	$	186,000	$	186,000	$	186,000	$	186,000	$	186,000
Net Income	$	-	$	434,000	$	434,000	$	434,000	$	434,000	$	434,000	$	434,000
Cash Flow Statement														
NWC	$	200,000	$	200,000	$	200,000	$	200,000	$	200,000	$	200,000	$	-
Change in NWC	-$	200,000	$	-	$	-	$	-	$	-	$	-	$	200,000
CF From Salvage													$	45,000
Initial Investment	-$	900,000												
Free Cash Flow	-$	1,100,000	$	434,000	$	434,000	$	434,000	$	434,000	$	434,000	$	679,000
PV of FCF	-$	1,100,000	$	387,500	$	345,982	$	308,913	$	275,815	$	246,263	$	344,003
Sum of PV of FCF	$	808,475												
Tax Shields gained	$	182,526	From the detailed computations in the answer key											
Tax Shields Lost	$	4,885												
PV of Project	$	986,116												

Detail version of how to solve for PV of tax shields gained and PV of tax shields lost

PV of Tax Shields Gained

C = *Cost of an asset acquired in year 0*
d = *CCA rate for the asset class of the asset*
τ = *Corporate tax rate*

$$\frac{Cd\tau}{(r+d)} \times \frac{[1+.5(r)]}{(1+r)}$$

$$\frac{(900{,}000)*(0.30)*(0.30)}{(0.12+0.30)} \times \frac{[1+0.5(0.12)]}{(1+0.12)}$$

C = 900,000
d = 0.30
t = 0.30

$$= \frac{14400}{0.42} \times \frac{1.06}{1.12}$$

$$= 192{,}857 \times 0.946429$$

PV of CCA TS Gained = **182,525.5**

$$\frac{Sd\tau}{(r+d)} \times \frac{1}{(1+r)^n} = \frac{(45000)*(0.30)*(0.30)}{(0.12+0.30)} \times \frac{1}{(1+0.12)^{(6)}}$$

PV of CCA TS Lost = **4885.372**

When computing the NPV, make sure to subtract this value as it is LOST

QUESTION 4 (20 marks) **TIME: 25 Minutes**

Corgi Co. has perpetual EBIT (Revenues-Costs-Depreciation) of $130 million per year, starting one year from now. Every year, depreciation will be $10 million and capital expenditures will be $16.4 million. Corgi Co. is financed 80% with equity and 20% with debt and it faces a corporate tax rate of 30%. Corgi Co. pays all excess cash flow as dividends, has a beta (B) of 1.3, risk-free rate is 3%, and expected return on the market portfolio is 11%. Corgi Co's cost of debt (Rd) is 4%, and the firm's unlevered cost of capital (Ru) is 12%. Corgi Co. has $150 million of perpetual debt.

A) Use the CAPM to calculate Corgi Co's cost of equity (1 mark)
Re = rf + B*(rm – rf) = 0.03 + 1.3(0.11-0.03) = 13.4%
B) Compare Re to Ru and explain why they differ. (2 marks)
Re = cost of equity (required return to equity holders)
Ru = cost of equity for unlevered firm, if unlevered, Re = Ru, if levered
Re > Ru because debt is cheaper cost of capital and less risky than equity

C) Calculate Corgi Co's perpetual free cash flows (FCF). (3 marks)
FCF = EBIT*(1-T) + Dep - CAPEX - NWC
FCF = 130M*(1-0.30) + 10M - 16.4M – 0 = 84.6M
D) Calculate Corgi Co's perpetual free cash flows to equity (FCFE). (3 marks)
FCFE = FCF – Interest * (1-T) + LTD
FCFE = 84.6M – 6M * (1-0.30) + 0
FCFE = 84.6M – 4.2M = 80.4M
E) Calculate Corgi Co's WACC. (1 mark)
rWacc = (E/V) * Re + (D/V) * Rd * (1-T)
rWacc = (0.8) * (0.134) + (0.20) * (0.04) * (1-0.3)
rWacc = 0.1072 + 0.0056 = 0.1128 = 11.28%
F) Value Corgi Co. using the WACC method. (2 marks)
VL = FCF / WACC = 84.6M/0.1128 = $750M
G) What would Corgi Co. be worth if it were financed entirely with equity? (2 marks)
Since Ru = Re when all equity financed, then
Vu = FCF / Ru = 84.6M / 0.12 = $705M
H) Use the APV method to value Corgi Co. (3 marks)
APV = Vu + PV(ITS)
PV(ITS) = (150M)*(0.04)*(0.3) / (0.04) = 45M
***Alternative way to get PV(ITS) = (Interest expense * Tax) / Rd = (6M)*(0.30) / 0.04 = 45M
APV = $705M + 45M = $750M
I) Use the CFTE method to determine the value of Corgi Co. (3 marks)
CFTE = FCFE / Re + LTD
CFTE = (80.4M / 0.134) + 150M
CFTE = 600M + 150M = 750M

QUESTION 5 (20 marks) **TIME: 25 Minutes**

The business descriptions for three companies are provided below:

Corgi Co.
Corgi Co. designs, sells, and distributes athletic apparel and accessories. Corgi Co. sells its products directly to end consumers through more than 450 company owned stores and online. Extensive credit terms are offered to Corgi Co's customers.

Mamba Tech
Mamba Tech is a large information technology provided in the world. Mamba Tech mainly sells products to enterprises and offers no credit terms to these enterprises. Mamba Tech outsources all of its components and makes use of full supplier credit terms. Pays most of suppliers within discount period.

Bev & Co.

Bev & Co. operates over 11,300 company-owned stores world-wide, selling general merchandise and grocery items directly to end consumers with no credit terms offered. Around 50% of sales come from groceries and the balance from general merchandise. Bev & Co. makes use of all credit terms offered by suppliers.

A selection of 2019 financial ratios for the three companies are listed below. Later in part C) of this question, you will be asked to identify each of the three companies

Ratios based on 2019 Financial Statements	**Company A**	**Company B**	**Company C**
Profitability Ratios			
Profit margin %	12.2	21.5	4.27
Revenue Growth % (5-year average)	7.1	15.6	1.55
Efficiency Ratios			
Accounts Receivable Period	36.3	3.1	4.2
Inventory Period	91.8	91.1	41.7
Accounts Payable Period	41.2	14.9	44.1
Asset Turnover	1.69	1.61	2.43

A) Calculate the operating and cash cycles for all 3 companies. (3 marks)

Company A

Operating Cycle = IP + RP = 91.8 + 36.3 = 128.1 days

Cash Cycle = OC – PP = 128.1 – 41.2 = 86.9 days

Company B

Operating Cycle = IP + RP = 91.1 + 3.1 = 94.2 days

Cash Cycle = OC – PP = 94.2 – 14.9 = 79.3 days

Company C

Operating Cycle = IP + RP = 41.7 + 4.2 = 45.9 days

Cash Cycle = OC – PP = 45.9 – 44.1 = 1.8 days

B) Compare the cash cycles of companies A, B, and C. Comment on the cash cycle's impact on the financing needs of each company. (3 marks)

- Company A has longest cash cycle, will need short term financing
- Company B is in the middle, it may need short-term financing, or it can give up its trade discount and extend its payables period if it needed a source of cash
- Company C has short cash cycle, and limited need for financing

C) Company B has an Accounts Payable Period of 14.9 days. Company B is offered credit terms by their main supplier of 3/15 net 45. Company B has surplus cash and an unused bank line of credit at a rate of 10%

i. Calculate the implied financing cost represented by the credit terms above. Express the rate as an effective annual interest rate. (4 marks)'

Cost of trade credit = $EAR = \left(1 + \left(\frac{Discount\ Rate}{1-Discount\ Rate}\right)\right)^{\left(\frac{365}{Net\ Days-Discount\ Days}\right)} - 1$

Where,
Discount Rate = 0.03
Net Days = 45
Discount days = 15

Therefore:

$$EAR = \left(1 + \left(\frac{0.03}{1 - 0.03}\right)\right)^{\left(\frac{365}{(45-15)}\right)} - 1$$

$$EAR = \left(1 + \left(\frac{0.03}{0.97}\right)\right)^{\left(\frac{365}{30}\right)} - 1$$

$$EAR = (1.030927835)^{(12.16666667)} - 1$$

$$EAR = 1.448584719 - 1$$
$$EAR = 0.448584719 = 44.85\%$$

ii. Is Company B likely to make use of the credit terms offered by their supplier? (4 marks)

- Yes because the company has surplus cash, they can use it to pay their supplier within the 15 day period to get the 3% discount
- If they pay after the period, then the interest on that credit would be nearly 44.85%! Not worth it

D) Determine which company (A, B and C) is represented by Corgi Co., Mamba Tech, and Bev & Co. (6 marks)

Company A is: Corgi Co.

Reason:

- Corgi co offers long credit terms to customers, thus A/R period is high

Company B is: Mamba Tech

Reason:

- Uses full supplier discount and thus payables period is less than 15 days
- Tech companies usually have higher profit margins
- Tech companies typically have really high growth early on

Company C is: Bev & Co.

Reason:

- Very mature company indicated by low revenue growth and many stores
- High asset turnover and low inventory period makes sense for a grocery chain