SUGGESTED SOLUTIONS

PROBLEM 1 (20 POINTS)

Voila is an all-equity firm with pre-tax earnings expected to be $800,000 in perpetuity. The firm has 100,000 shares outstanding. The cost of capital is 20% and the firm faces a 40% tax on all corporate earnings.

Voila is considering a major expansion of its facilities, which will require an initial outlay of $750,000 and is expected to produce additional annual pre-tax earnings of $250,000 per year in perpetuity. Management considers the expansion to have the same risk as the firm's existing assets.

(a) What is the value of the firm's assets prior to announcing or undertaking the proposed expansion? What is the value of the firm's equity? What is the price per share? **(8 POINTS)**

$$S = V_u = \frac{EBIT(1-T_c)}{r_o} = \frac{800{,}000(1-0.4)}{0.2} = 2.4m$$

$$P = \frac{S}{n} = \frac{2.4m}{100{,}000} = \$24$$

PROBLEM 1 CONTINUED

(b) Assume that Voila has announced the expansion and markets have responded reasonably to the announcement. Suppose Voila plans to finance the expansion by issuing common stock. How many shares of stock must be issued? What is the value of the firm's equity after the new stock issue? What is the price per share of the firm's stock? **(12 POINTS)**

$$NPV = -750{,}000 + \frac{250{,}000(1-0.4)}{0.2} = \phi$$

$\Rightarrow P \text{ same}$

$$n^{+} = \frac{750{,}000}{24} = 31{,}250$$

$New\ value\ of\ equity$

$$= n^{+} \times P = V_u + 750{,}000 = 3.15m$$

PROBLEM 2 (15 POINTS)

Honey Bunch shareholders expect dividends next month to be $1.25. They estimate the cost of equity to be 13% and the growth rate of dividends to be 3%. [Assume these rates are on a per month basis – that is, don't worry about annual versus effective rates.]

Today is June 1, 201X. On July 1, Cheezie Inc's board of directors meets and decides to take over Honey Bunch by bidding $40/share on October 1. They decide to publicly announce their take-over bid on September 1.

Fill in the blanks in the following table and clearly explain all your work in the space provided below the table and on the next page. [I have filled in some values in order to get you started.]

	Honey Bunch stock price		
	Weak form	**Semi-strong form**	**Strong form**
June 1	$12.50	**$12.50**	**$12.50**
July 1	**$12.88**	**$12.88**	**$30.85**
August 1	**$13.26**	**$13.26**	**$33.57**
September 1	**$13.66**	**$36.61**	$36.61
October 1	**$40**	$40	**$40**

Weak form:

- Market adjusts in October
- Until then P increase @ 3%

Semi-strong form:

- Market adjusts in September
- Until then $P_{semi} = P_{weak}$

PROBLEM 2 CONTINUED
Use this space to continue working on Problem 2

Strong form:

- Market adjusts in July

$$P_{July} = \frac{DIV_{Aug}}{(1+r)} + \frac{\left(DIV_{Sep} + P_{Sep}\right)}{(1+r)^2} = \frac{1.2875}{1.13} + \frac{(1.3261 + 36.61)}{(1.13)^2} = 30.85$$

$$P_{Aug} = \frac{\left(DIV_{Sep} + P_{Sep}\right)}{(1+r)} = \frac{(1.3261 + 36.61)}{1.13} = 33.57$$

PROBLEM 3 (15 POINTS)

Finz is a financial institution that trades on the Toronto Stock Exchange. It is thinking of making a rights issue to raise $400 million, with a subscription price of $25 per share. The current price of its stock is $35 per share; and Finz has 80 million shares outstanding.

(a) What is the ex-rights price of the stock assuming all rights are exercised? **(5 POINTS)**

$$n = 80 \qquad \Rightarrow n^{+} = 16 \qquad n^{1} = 96$$
$$P = 35 \qquad S = 25 \qquad \Rightarrow P^{'} = 33.33$$
$$\Rightarrow V = 2{,}800 \qquad V^{+} = 400 \qquad V^{1} = 3{,}200$$

$$P_{100\%\ ex} = \$33.33$$

(b) Now assume that only 85 percent of the rights are exercised. What is the ex-rights price? **(5 POINTS)**

$$n = 80 \qquad \Rightarrow n^{+} = 13.6 \qquad n^{1} = 93.6$$
$$P = 35 \qquad S = 25 \qquad \Rightarrow P^{'} = 33.55$$
$$\Rightarrow V = 2{,}800 \qquad V^{+} = 340 \qquad V^{1} = 3{,}140$$

$$P_{90\%\ ex} = \$33.55$$

$$Check: P_{85\%\ ex} \rangle P_{100\%\ ex}$$

PROBLEM 3 CONTINUED

(c) Suppose that the firm anticipates that only 95 percent of the rights issued will be exercised and adjusts the number of shares that it announces will be made available for sale at the subscription price so that the issue will succeed in raising $400 million. How many shares will Finz announce for sale? What will be the ex-rights price in this case? **(5 POINTS)**

Let x *be the # shares announced for sale*

$$0.95x \times 25 = 400$$

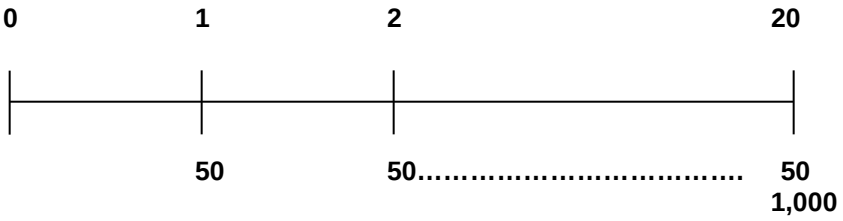
$$\Rightarrow x = 16.842105$$

If firm anticipates undersubscription,
and $\$400m$ *is raised, then* $V^1 = 3{,}200$ *and* $n^1 = 96$

$$\Rightarrow P^1 = \$33.33$$

PROBLEM 4 (10 POINTS)

A convertible bond is selling for $1,222.70. It has 10 years to maturity, a $1,000 face value, and a 10% coupon paid semi-annually. Similar non-convertible bonds are priced to yield 8%. The conversion ratio is 40. The stock currently sells for $30.125 per share. Calculate the convertible bond's option value.



$$SBV_0 = 50 \times PVAF_{4\%,20} + \frac{1{,}000}{(1.04)^{20}} = 1{,}135.90$$

Check: Coupon rate > YTM $\Rightarrow$ P> 1,000 $\surd$

$$CV = 40 \times 30.125 = 1{,}205$$

$$CBV = Max\{SBV, CV\} + OP$$
$$\Rightarrow 1{,}222.70 = 1{,}205 + OP$$
$$\Rightarrow OP = 17.70$$

Yipeeee…….now we are ready for the midterm. ☺