SPROTT
SCHOOL OF BUSINESS

BUSI 2504i - Essentials of Business Finance

Wednesday, February 3, 2010

§8	Stocks
3rd hour (optional)	midterm and more chapter 8 examples

- §8.1 - Common Stock Valuation
- §8.2 - Common Stock Features
- §8.3 - Preferred Stock Features
- §8.4 - Stock Market Reporting

- If you buy a share of stock, you can receive cash in two ways
  - The company pays dividends
  - You sell your shares, either:
    (1) to another investor in the market; or
    (2) back to the company
- As with bonds, the price of the stock is the present value of these expected cash flows

Suppose you are thinking of purchasing the stock of Moore Oil, Inc. and you expect it to pay a $2 dividend in one year and you believe that you can sell the stock for $14 at that time. If you require a return of 20% on investments of this risk, what is the maximum you would be willing to pay?

answer: $13.33

Now what if you decide to hold the stock for two years? In addition to the $2 dividend in one year, you expect a dividend of $2.10 in two years and a stock price of $14.70 at the end of year 2. Now how much would you be willing to pay now?

answer: $13.33

Finally, what if you decide to hold the stock for three periods? In addition to the dividends at the end of years 1 and 2, you expect to receive a dividend of $2.205 at the end of year 3 and a stock price of $15.435. Now how much would you be willing to pay?

answer: $13.33

- Zero growth
  - The firm will pay a constant dividend forever
  - This is like preferred stock
  - The price is computed using the perpetuity formula
- Constant growth
  - The firm will increase the dividend by a constant percent every period
- Supernormal growth
  - Dividend growth is not consistent initially, but settles down to constant growth eventually

8.1: dividend growth model - general case

present value of single cash flow

$$\text{PV} = \frac{\text{FV}}{(1+r)^t}$$

price today (P_0) is present value of all future dividends $D_1, D_2, D_3, \ldots$

$$P_0 = \frac{D_1}{1+r} + \frac{D_2}{(1+r)^2} + \frac{D_3}{(1+r)^3} + \cdots$$

zero growth (all future dividends are equal)

price today (P_0) is present value of all future dividends $D_1, D_2, D_3, \ldots$ which are all equal to same value D

$$P_0 = \frac{D_1}{1+r} + \frac{D_2}{(1+r)^2} + \frac{D_3}{(1+r)^3} + \cdots$$

$$= \frac{D}{1+r} + \frac{D}{(1+r)^2} + \frac{D}{(1+r)^3} + \cdots$$

$$= \frac{D}{r}$$

The Johnson Company just paid an annual dividend of $1.60. How much would you be willing to pay for one share of Johnson Company stock if the dividend remains constant and you require a 9% rate of return?

answer:

$$P_0 = \frac{D}{r} = \frac{1.60}{.09} = \mathbf{\$17.78}$$

next dividend is previous dividend multiplied by growth factor $(1+g)$

$$P_0 = \frac{D_1}{1+r} + \frac{D_2}{(1+r)^2} + \frac{D_3}{(1+r)^3} + \cdots$$

$$= \frac{D(1+g)}{1+r} + \frac{D(1+g)^2}{(1+r)^2} + \frac{D(1+g)^3}{(1+r)^3} + \cdots$$

$$= \frac{D_1}{r-g} \quad \text{(growing perpetuity)}$$

The Brown Company just announced that it will be increasing its annual dividend to $1.68 next year and that future dividends will be increased by 2.5% annually. How much would you be willing to pay for one share of the Brown Company stock if you require a 12% rate of return?

answer:

$$P_0 = \frac{D_1}{r - g} = \frac{1.68}{.12 - .025} = \$\mathbf{17.68}$$

Alhandro, Inc. just paid an annual dividend of \$1.03. It has been increasing its dividends by 4% annually and is expected to continue doing so. How much can it expect to receive for each new share of stock offered if investors require an 11% rate of return?

answer:

$$P_0 = \frac{D_0(1+g)}{r-g} = \frac{(1.03)(1.04)}{.11-.04} = \$\mathbf{15.30}$$

initial series dividends (discounted individually) ...
... then constant growth after (need to discount P_t back to time 0)

$$P_0 = \underbrace{\frac{D_1}{1+r} + \frac{D_2}{(1+r)^2} + \cdots + \frac{D_t}{(1+r)^t}}_{\text{initial dividends}} + \underbrace{\frac{P_t}{(1+r)^t}}_{\text{present value of constant growth starting at time } t}$$

$$= \frac{D_1}{1+r} + \frac{D_2}{(1+r)^2} + \cdots + \frac{D_t}{(1+r)^t} + \frac{\frac{D_t(1+g)}{r-g}}{(1+r)^t}$$

8.1: dividend growth model - supernormal growth - example

Massey Motors is a new firm in a rapidly growing industry. The company is planning on increasing its annual dividend by 10 percent a year for the next 3 years and then decreasing the growth rate to 4 percent per year. The company just paid its annual dividend in the amount of $1.00 per share. What is the current value of one share of this stock if the required rate of return is 13.75 percent?

answer:

$$
\begin{aligned}
D_0 &= 1.00; \\
D_1 &= 1.00 \cdot 1.1 = 1.10; \\
D_2 &= 1.10 \cdot 1.1 = 1.21; \\
D_3 &= 1.21 \cdot 1.1 = 1.33; \\
D_4 &= 1.33 \cdot 1.04 = 1.38;
\end{aligned}
\qquad \Rightarrow P_3 = \frac{D_4}{r-g} = \frac{1.38}{.1375 - .04} = 14.20
$$

$$
\begin{aligned}
\therefore \; P_0 &= \frac{D_1}{1+r} + \frac{D_2}{(1+r)^2} + \frac{D_3}{(1+r)^3} + \frac{P_3}{(1+r)^3} \\
&= \frac{1.10}{1.1375} + \frac{1.21}{1.1375^2} + \frac{1.33 + 14.20}{1.1375^3} = \mathbf{\$12.45}
\end{aligned}
$$

Kettle Korn, Inc. just paid a $1.40 per share annual dividend. The company is planning on paying $1.50, $1.65, $1.90, and $2.00 a share over the next 4 years, respectively. After that, the dividend will be a constant $2.25 per share per year. What is the market price of this stock if the market rate of return is 12%?

answer: $17.19

solve constant growth equation for r

$$P_0 = \frac{D}{r - g}$$

$$\Rightarrow \quad r - g = \frac{D}{P_0}$$

$$\Rightarrow \quad r = \underbrace{\frac{D_1}{P_0}}_{\text{dividend yield}} + \underbrace{g}_{\text{capital gains yield}}$$

The common stock of J. K. Laminates sells for $32.60 a share. The stock is expected to pay $2.10 per share next year. J. K.'s has established a pattern of increasing its dividends by 3.5 percent annually and expects to continue doing so. What is the market rate of return on this stock?

answer:

$$R = \frac{D_1}{P_0} + g = \frac{2.10}{32.60} + .035 = \mathbf{9.94\%}$$

ABC stock closed yesterday at a price of $39.80 a share. The price today was down $2.10. ABC pays a $0.48 annual dividend which has remained constant for five years. What is the current dividend yield today?

answer: 1.27%

An 8% preferred stock closed yesterday at a price of $91.32. The stock closed today at par. What is the current dividend yield?

answer: 8.00%

The Battery Co. paid $1.20 in dividends last year. Margaret paid a price of $15.00 a share for Battery Co. stock and has an expected return of 8% on this investment. What is the growth rate of the Battery Co. stock?

answer: 0%

Leon purchased 1,000 shares of LJK stock this morning at a price of $45.67 a share. The stock paid a dividend last year of $1.80 per share. Leon's required rate of return is 13% on this type of investment. What is the capital gains yield on LJK stock?

answer: 8.72%

- **Shareholders' Rights** - right to vote for the board of directors and other important issues
- Other Rights
  - Share proportionally in declared dividends
  - Share proportionally in remaining assets during liquidation
  - **Preemptive right** - first shot at new stock issue to maintain proportional ownership if desired
- Classes of stock
  - Unequal voting rights
  - Control of firm

- Dividends are not a liability of the firm until a dividend has been declared by the Board
- Consequently, a firm cannot go bankrupt for not declaring dividends
- Dividends and Taxes
  - Dividend payments are not considered a business expense and are not tax deductible
  - Dividends received by individual shareholders are partially sheltered by the dividend tax credit
  - Dividends received by corporate shareholders are not taxed
  - This prevents double taxation of dividends

- Dividends
  - Most preferreds have a stated dividend that must be paid before common dividends can be paid
  - Dividends are not a liability of the firm and preferred dividends can be deferred indefinitely
  - Most preferred dividends are cumulative, any missed preferred dividends have to be paid before common dividends can be paid
- Preferred stock generally does not carry voting rights

- Stock market quotations are published in the newspapers and are also available on-line (usually with 15-minute delays)
- In Canada, large cap stocks trade on the TSE
- Quotes and corporate information on stocks that trade on the TSE can be found at the exchange's website

8.4: stock market quotes (figure 8.1, p.229)

Figures supplied by Thomson Financial.

Securities must trade a minimum of 1,000 shares to be listed.

52W high	52W low	Stock	Ticker	Yield Div	Yield %	P/E	Vol 00s	High	Low	Close	Net chg
A B											
1.15	0.37	ACD Sys	ASA	-	-	-	702	0.39	0.37	**0.38**	-
43.00	30.25	ACE Aviatn B.	ACE	p2.37	7.4	12.1	2129	32.08	31.07	**31.92**	+0.89
43.03	30.25	ACE Aviatn RV	..	p2.37	7.4	12.2	7213	32.15	31.05	**32.10**	+0.95
0.28	0.135	ADB Sys	ADY	-	-	-	2196	0.205	0.19	**0.20**	-
2.05	**0.42**	**ADF SV**	**DRX**	-	-	**26.3**	**135**	**1.05**	**1.00**	**1.05**	**-0.09**
2.20	0.96	ADS MV	AAL	0.05	3.0	16.4	80	1.66	1.64	**1.64**	+0.03
8.79	4.85	AEterna	AEZ	-	-	39.5	1690	8.08	7.80	**7.87**	-0.10
25.77	16.01	AGFMgmtB NV	AGF	0.72	3.0	28.0	616	24.75	23.76	**24.10**	-0.35
28.28	25.71	AIC Divrs pf	ADC	1.50	5.8	-	27	26.00	26.00	**26.00**	+0.24
16.25	12.50	AIC Glbl	ASC	1.20	7.5	7.5	47	16.15	16.10	**16.10**	+0.09
s 26.35	14.75	AKITA A NV	AKT	0.24	1.0	13.5	25	23.00	22.50	**22.90**	+0.14
12.47	6.85	AMVESCAP	AVZ	p0.19	1.6	44.7	283	12.28	12.02	**12.08**	-0.04
1.00	0.455	ART Advd	ARA	-	-	-	75	0.82	0.78	**0.82**	+0.09
s 44.08	31.20	ATCO 1 NV	ACO	0.82	2.4	12.3	5805	35.10	34.41	**34.75**	+0.25
21.18	12.40	ATI Tech	ATY	-	-	-	19169	18.59	17.70	**18.46**	+0.56
18.45	11.95	ATS Auto	ATA	-	-	90.2	1877	18.06	17.87	**18.04**	-0.01
0.97	0.46	AZCAR	AZZ	-	-	11.4	110	0.83	0.80	**0.80**	-
39.99	18.25	AastraTch	AAH	-	-	21.0	363	33.92	33.01	**33.11**	-0.39
49.35	33.08	AberDia	ABZ	u1.00	2.6	27.2	1812	42.86	41.58	**42.25**	-0.50
9.75	7.87	AberdnAP	FAP	0.72	9.0	35.1	1045	8.00	7.93	**7.98**	-0.03
6.33	3.48	AbitibCons	A	0.10	2.3	-	28548	4.60	4.35	**4.37**	-0.18
n 4.00	2.75	AbsltSftwr	ABT	-	-	-	711	3.85	3.75	**3.83**	-0.02
8.40	6.65	AccordFn	ACD	0.18	2.3	11.4	800	8.10	7.85	**7.90**	+0.05
10.95	7.01	AccreteEng	GZ	-	-	36.1	32	8.35	8.21	**8.30**	-
4.10	2.22	Adaltis	ADS	-	-	-	304	3.00	2.98	**3.00**	+0.01
3.78	1.13	AdastraMin	AAA	-	-	-	886	3.70	3.56	**3.56**	-0.10
n 31.00	19.65	Addax Pete	AXC	-	-	-	1693	30.00	29.30	**29.30**	-0.36
33.00	23.50	Addenda	ADV	1.20	4.5	19.3	176	27.00	26.50	**26.50**	-0.50
0.29	0.11	Adeptron	ATQ	-	-	-	358	0.20	0.18	**0.20**	+0.02
c 2.70	0.80	Adherex	AHX	-	-	-	112	1.05	1.01	**1.01**	-0.05
0.25	0.05	Advantex	ADX	-	-	-	1160	0.145	0.13	**0.14**	+0.01
7.04	5.25	AeconGrp	ARE	-	-	-	64	5.93	5.90	**5.93**	+0.03
n 2.60	0.82	AfrcnCppr	ACU	-	-	-	369	1.79	1.64	**1.71**	+0.08
4.80	1.30	AfriOre	AFO	-	-	-	490	4.80	4.70	**4.71**	-0.04
42.41	13.63	AgnicoEag	AEM	u0.03	0.1	88.2	13019	42.28	39.73	**41.06**	-0.79
↑ 20.95	1.18	AgncEaglwt*		-	-	-	130	20.95	19.00	**19.75**	-0.25
9.25	6.40	Agricore LV	AU	0.12	1.4	42.0	110	8.43	8.30	**8.39**	+0.04
32.66	22.39	Agrium	AGU	u0.11	0.4	11.9	2551	29.10	28.15	**28.30**	-0.26
43.82	26.55	CdnWstBk	CWB	0.48	1.1	22.5	201	43.29	42.75	**43.29**	+0.54
1.63	0.38	Cdn Zinc	CZN	-	-	-	5348	1.31	1.22	**1.25**	-0.05
11.66	6.02	Canam A SV	CAM	0.16	1.5	10.7	1210	10.70	10.20	**10.39**	-0.20
0.95	0.31	CanarcRes	CCM	-	-	-	1302	0.91	0.83	**0.89**	-
27.00	25.51	CanCap5.4	CAC	1.35	5.3	-	20	25.51	25.51	**25.51**	-
0.42	0.15	CancorMns	KCR	-	-	-	125	0.34	0.34	**0.34**	-
n 1.48	0.39	Candax En	CAX	-	-	-	12237	1.31	1.23	**1.27**	-0.04
1.11	0.31	Candente	DNT	-	-	-	794	1.02	0.97	**0.97**	-0.03
16.12	11.26	Canfor	CFP	-	-	33.5	8950	14.09	13.65	**14.06**	-0.06
10.63	7.25	Cangene	CNJ	-	-	-	132	9.75	9.75	**9.75**	+0.05
15.75	8.80	CanWest NV	CGS	-	-	-	20	9.58	9.56	**9.56**	-0.02
15.78	8.80	CanWest SV		-	-	-	1756	9.66	9.55	**9.60**	-0.03
†n 14.50	13.00	Jade Enrg	FRC	-	-	-	4705	14.50	14.00	**14.15**	+0.15
15.95	14.25	CapGneqdv	CGQ	1.05	7.0	-	30	14.92	14.92	**14.92**	+0.04
x 2.68	**0.67**	**Capstone**	**CS**	-	-	-	**8683**	**2.20**	**1.85**	**1.95**	**-0.60**
16.39	6.47	Cardiome	COM	-	-	-	215	11.65	11.40	**11.62**	-0.07
12.27	10.50	CaribUtilA*	CUP	u0.66	5.6	14.0	23	11.80	11.75	**11.80**	-
n 4.19	2.80	Carmanah	CMH	-	-	-	310	3.61	3.50	**3.61**	-
0.65	0.33	cars4U	CFU	0.04	6.3	63.0	95	0.63	0.63	**0.63**	+0.03
12.60	7.35	Cascades	CAS	0.16	1.5	-	3769	11.55	10.86	**10.99**	-0.49
3.68	1.33	Caspian En	CEK	-	-	-	593	2.98	2.92	**2.94**	-0.06
3.51	2.40	CatalystPpr	CTL	-	-	-	5144	3.04	2.77	**2.93**	-0.12
18.06	10.18	CelesticaSV	CLS	-	-	-	2716	12.75	12.40	**12.61**	+0.08
14.80	8.91	CelticExp	CLT	-	-	21.2	123	14.03	13.65	**14.00**	+0.15
47.90	16.81	CenterraGld	CG	-	-	60.3	670	46.75	44.75	**44.76**	-0.73
11.30	6.05	CentFundA NV	CEF	u0.01	0.1	4.8	2786	11.04	10.50	**10.64**	+0.22
15.25	9.66	CentrnEng	CUX	-	-	-	11780	11.57	10.85	**11.00**	-0.55
4.25	1.12	Centuryll	CH	-	-	12.8	48	4.24	4.10	**4.10**	+0.10
n 23.50	13.25	CermicPro	CEP	-	-	22.1	18	23.06	23.00	**23.00**	-
8.75	3.97	Certicom	CIC	-	-	-	392	7.01	6.77	**6.79**	-0.13
1.35	0.225	CervusFinl	CFG	-	-	-	1816	0.33	0.25	**0.33**	+0.06
n 8.38	5.57	ChamaeloEx	CXN	-	-	-	763	6.70	6.65	**6.70**	+0.05
0.65	0.27	ChariotRs	CHD	-	-	-	38472	0.56	0.51	**0.53**	-
0.31	0.05	ChariotRs wt		-	-	-	6021	0.26	0.235	**0.26**	-
↓ 11.90	3.45	Chartwell	CWH	-	-	21.6	468	3.49	3.45	**3.45**	-0.04
59.40	29.10	LeChateauSV	CTU	1.00	1.8	14.4	118	57.25	56.80	**56.91**	-0.19
1.43	0.89	Chemokine	CTI	-	-	-	1924	1.05	1.00	**1.05**	-
0.29	0.14	ChromosMl	CHR	-	-	-	95	0.24	0.24	**0.24**	-
4.70	2.36	Chrchill A	CUQ	-	-	19.2	228	4.60	4.50	**4.60**	-
3.77	**2.00**	**Cinch Enrg. CNH**		-	-	**28.5**	**585**	**2.37**	**2.20**	**2.28**	**-0.14**
30.30	22.05	Cinram	CRW	0.12	0.4	18.3	867	29.50	29.11	**29.25**	-0.25
5.40	1.00	CipherPhrm	DND	-	-	-	1810	4.95	4.85	**4.95**	-
11.49	9.14	Clairvest	CVG	0.10	0.9	40.8	10	11.01	11.01	**11.01**	-0.09
s 12.25	7.00	Clarke	CKI	0.15	1.4	8.4	17	11.40	11.01	**11.01**	+0.01
1.69	0.82	ClaudeRes	CRJ	-	-	-	1741	1.62	1.52	**1.57**	-0.03
n 10.52	9.92	ClaymorETFs	CRQ	-	-	-	177	10.38	10.22	**10.22**	-0.07
6.03	3.68	Clear Enrg	CEN	-	-	79.2	461	4.75	4.62	**4.75**	+0.03
n 1.17	0.50	ClineMng	CMK	-	-	-	913	0.60	0.57	**0.57**	-0.03
27.05	25.70	Co-opApf	CCS	f1.37	5.3	-	10	26.10	26.10	**26.10**	-

- **ticker symbol** - short abbreviation representing a stock
- **open** - first trade in a trading day
- **high** - highest trade in a trading day
- **low** - lowest trade in a trading day
- **close** - last trade in a trading day
- **bid** - price somebody willing to pay
- **ask** - price somebody willing to sell
- **volume** - number of shares traded in a day

What would you pay today for a stock that is expected to make a $1.50 dividend in one year if the expected dividend growth rate is 3% and you require a 16% return on your investment?

answer: $11.54

Suppose Pale Hose, Inc. has just paid a dividend of $1.40 per share. Sales and profits for Pale Hose are expected to grow at a rate of 5% per year. Its dividend is expected to grow by the same amount. If the required return is 10%, what is the value of a share of Pale Hose?

answer: $29.40

The stock of MTY Golf World currently sells for $133.75 per share. The firm has a constant dividend growth rate of 7% and just paid a dividend of $6.21. If the required rate of return is 12%, what will the stock sell for one year from now?

answer: $143.11

Confectioners' Corner wants to offer some preferred stock that pays an annual dividend of $4.50 a share. The company has determined that stocks with similar characteristics provide an 11 percent rate of return. What price should Confectioner's expect to receive per share for this stock offering?

answer: $40.91

Daily Movers is a relatively new firm. The company paid its first annual dividend yesterday in the amount of $.40 a share. The company plans to double each annual dividend payment for the next 2 years. After that time, it is planning on paying a constant $2 per share indefinitely. What is one share of this stock worth today if the market rate of return on similar securities is 14.5%?

answer: $12.44

Etling Inc.'s dividend is expected to grow at 6% for the next two years and then at 3% forever. If the current dividend is $3 and the required return is 16%, what is the price of the stock?

answer: $25.10

The dividend on Simple Motors common stock will be $2 in one year, $3.50 in two years, and $5.00 in three years. You can sell the stock for $75 in three years. If you require a 10% return on your investment, how much would you be willing to pay for a share of this stock today?

answer: $64.82