Chapter 13

Equity Valuation

(Cont'd)

Expected Holding Period Return

- The return on a stock investment comprises cash dividends and capital gains or losses
  - Assuming a one-year holding period

$$\text{Expected HPR} = E(r) = \frac{E(D_1) + \left[E(P_1) - P_0\right]}{P_0}$$

Required Return

- CAPM gave us required return, call it k:
- k = market capitalization rate

$$k = r_f + \beta\left[E(r_M) - r_f\right]$$

$$k = r_f + \beta\left[E(r_M) - r_f\right]$$

- If the stock is priced correctly
  - Required return should equal expected return

=

$$\text{Expected HPR} = E(r) = \frac{E(D_1) + \left[E(P_1) - P_0\right]}{P_0}$$

Intrinsic Value

Intrinsic Value

- The present value of a firm's expected future net cash flows discounted by a risk adjusted required rate of return.
- The cash flows on a stock are?
  - Dividends (D_t)
  - Sale price (P_t)
- Intrinsic Value today (time 0) is denoted V_0 and for a one year holding period may be found as:

$$V_0 = \frac{E(D_1) + E(P_1)}{1+k}$$

Intrinsic Value and Market Price

- Market Price
  - Consensus value of all traders
  - In equilibrium the current market price will equal intrinsic value

- Trading Signals

$$V_0 = \frac{E(D_1) + E(P_1)}{1 + k}$$

  - If $V_0 > P_0$
  - If $V_0 < P_0$
  - If $V_0 = P_0$

Buy
Sell or Short Sell
Hold as it is Fairly Priced

13.3 Dividend Discount Models

For now assume price = intrinsic value

Basic Dividend Discount Model

Intrinsic value of a stock can be found from the following:

$$V_0 = \sum_{t=1}^{\infty} \frac{D_t}{(1+k)^t}$$

V_0 = Intrinsic Value of Stock
D_t = Dividend in time t
k = required return

What happened to the expected sale price in this formula?

- Why is this an infinite sum?
- Is stock price independent of the investor's holding period?

Basic Dividend Discount Model

Intrinsic value of a stock can be found from the following:

V_0 = Intrinsic Value of Stock
D_t = Dividend in time t
k = required return

$$V_0 = \sum_{t=1}^{\infty} \frac{D_t}{(1+k)^t}$$

- **This equation is not useable because it is an infinite sum of variable cash flows.**
- Therefore we have to make assumptions about the dividends to make the model tractable.

No Growth Model

- Use: Stocks that have earnings and dividends that are expected to remain constant over time (zero growth)

$$V_0 = \frac{D}{k}$$

  - Preferred Stock
    - A preferred stock pays a $2.00 per share dividend and the stock has a required return of 10%. What is the most you should be willing to pay for the stock?

$$V_0 = \frac{\$2.00}{0.10} = \$20.00$$

Constant Growth Model

- Use: Stocks that have earnings and dividends that are expected to grow at a constant rate forever

$$V_0 = \frac{D_0 \times (1+g)}{k - g}; g = \text{perpetual growth rate in dividends}$$

- A common stock share just paid a $2.00 per share dividend and the stock has a required return of 10%. Dividends are expected to grow at 6% per year forever. What is the most you should be willing to pay for the stock?

$$V_0 = \frac{\$2.00 \times 1.06}{0.10 - 0.06} = \$53.00$$

Comparing Value and Returns

- Why do you have to pay more for the constant growth stock?
  - Must pay for expected growth

- What is the one year rate of return for each stock?

No Growth Stock

V_0 = \$20.00

D = \$2.00

V_1 =

\$2.00 / 0.10 = \$20.00

$$k = \frac{\$20 - \$20 + \$2}{\$20} = 10\%$$

Constant Growth Stock

V_0 = \$53.00; D_0 = \$2.00

$$V_1 = \frac{\$2.00 \times 1.06^2}{0.10 - 0.06} = \$56.18$$

$$k = \frac{\$56.18 - \$53 + \$2.12}{\$53} = 10\%$$

Comparing Value and Returns

- Both stocks given an investor a pre-tax return of 10%.
- Is one stock a better buy than the other?

Stock Prices and Investment Opportunities

- g = growth rate in dividends is a function of two variables:
  - ROE = Return on Equity for the firm
  - b = plowback or retention percentage rate
    - (1- dividend payout percentage rate)

$$g = ROE \times b$$

- g increases if a firm increases its retention ratio and/or its ROE

Value of Growth Opportunities

Value with 100% dividend payout

$$g = ROE \times b$$

Cash Cow, Inc. (CC)

E1 = $5

D1 = $5

b = 0; therefore g = 0

k = 12.5% ; Find V_{CC}

$$V_{CC} = \frac{\$5.00}{0.125} = \$40$$

ROE = 12.5%

Growth Prospects (GP)

E1 = $5

$$V_{GP} = \frac{\$5.00}{0.125} = \$40$$

D1 = $5

b = 0; therefore g = 0

k = 12.5%, Find V_{GP}

ROE = 15%

Should either or both firms retain some earnings?

Value of Growth Opportunities

Value with 40% dividend payout

$$g = ROE \times b$$

Cash Cow, Inc. (CC)

E1 = $5

b = 60%; therefore g 7.5%

D1 = 0.40 x $5 = $2.00

k = 12.5%; Find V_{CC}

ROE = 12.5%

CC value is the same, why?

Growth Prospects (GP)

E1 = $5

b = 60%; therefore g = 9%

D1 = 0.40 x $5 = $2.00

k = 12.5%; Find V_{GP}

ROE = 15%

GP Value has increased, why?

$$V_{CC} = \frac{2.00}{0.125 - 0.075} = \$40$$

$$V_{GP} = \frac{\$2.00}{0.125 - 0.09} = \$57.14$$

Value of Growth Opportunities

Value of assets in place for GP = $40.00 (value with all dividends paid out, with ROE = 12.5%)

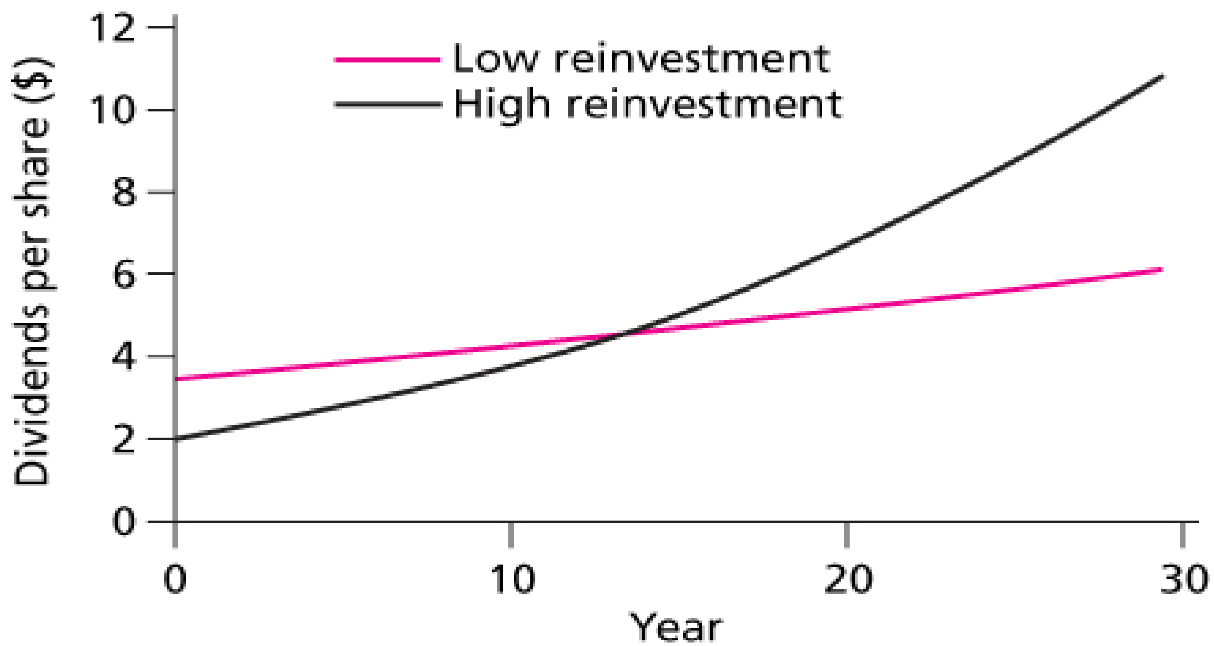
Value of growth opportunities with ROE = 15% may be inferred from the difference between the new V_{GP} = $57.14 and the no growth value of $40.00

Thus the present value of growth opportunities (PVGO) = $57.14 - $40.00 = $17.14

In general:

$$PVGO = \frac{D_0(1+g)}{(k-g)} - \frac{E_1}{k}$$

Figure 13.1 Dividend Growth for Two Earnings Reinvestment Policies



(for a given ROE)
High reinvestment increases stock price only if ROE > k

Multistage Growth Models

- As firms progress through their industry life cycle, earnings and dividend growth rates (ROE) are likely to change.
- A two stage growth model:

$$V_0 = \left[D_0 \sum_{t=1}^{T} \frac{(1+g_1)^t}{(1+k)^t} \right] + \frac{D_T(1+g_2)}{(k-g_2)(1+k)^T}$$

- g_1 = first growth rate
- g_2 = second growth rate
- T = number of periods of growth at g_1

Multistage Growth Rate Model: Example

- D0 = \$2.00   g1 = 20%   g2 = 5%
- k = 15%   T = 3
- D1 = 2.40   D2 = 2.88   D3 = 3.46   D4 = 3.63

$$V_0 = \frac{\$2.40}{1.15} + \frac{\$2.88}{1.15^2} + \frac{\$3.46}{1.15^3} + \frac{\$3.63}{(0.15 - 0.05)(1.15)^3}$$

- V_0 = 2.09 + 2.18 + 2.27 + 23.86 = \$30.40

Figure 13.2 Honda Motor

HONDA MOTOR (ADR) NYSE-HMC | RECENT PRICE **21.37** | P/E RATIO **10.4** (Trailing: 7.6, Median: 12.0) | RELATIVE P/E RATIO **1.02** | DIV'D YLD **4.1%** | VALUE LINE

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
High:	19.1	20.0	23.5	22.7	23.1	23.8	23.6	26.1	29.7	39.9	40.8	36.4
Low:	12.8	12.8	16.0	16.1	13.6	17.0	15.5	19.3	23.8	27.1	31.3	18.9

TIMELINESS **3** Raised 6/13/08
SAFETY **2** Raised 3/2/07
TECHNICAL **2** Raised 11/21/08
BETA 1.05 (1.00 = Market)

2011-13 PROJECTIONS

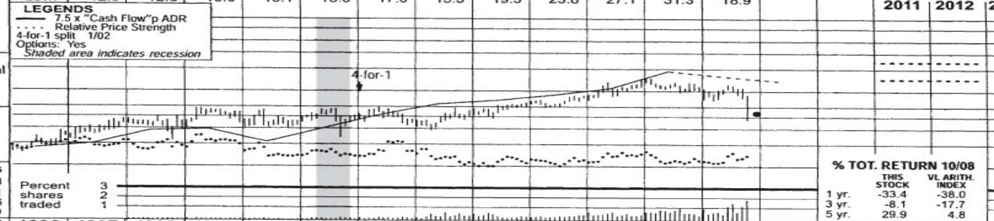
	Price	Gain	Ann'l Total Return
High	55	(+155%)	29%
Low	40	(+85%)	20%

Insider Decisions

NOT REPORTED

U.S. Institutional Decisions

	4Q2007	1Q2008	2Q2008
to Buy	114	108	121
to Sell	103	114	96
Hld's(000)	99011	90809	94029



% TOT. RETURN 10/08

	THIS STOCK	VL ARITH. INDEX
1 yr.	-33.4	-38.0
3 yr.	-8.1	-17.7
5 yr.	29.9	4.8

VALUE LINE, INC.	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Translation Rate (Yen/$)A	116	103	89.00	107	124	133	121	106	124	133
Sales per ADR B	18.29	19.26	22.87	20.39	21.89	23.15	26.52	29.52	26.77	28.41
"Cash Flow" per ADR	.94	.83	1.00	.94	1.48	1.60	2.05	2.10	1.67	2.15
Earnings per ADR BC	.17	.12	.28	.34	.90	1.01	1.30	1.27	.96	1.40
Gross Div'ds Decl'd/ADR D	.06	.07	.08	.07	.06	.07	.09	.10	.09	.10
Cap'l Spending per ADR	.74	.61	.74	.72	.90	1.19	1.01	1.08	1.18	1.17
Book Value per ADR	4.59	4.82	5.87	5.49	5.74	6.20	7.51	9.34	9.24	9.93
Equiv ADRs Outst'g E	1947.3	1947.4	1948.4	1948.6	1948.7	1948.8	1948.8	1948.8	1948.8	1948.8
Avg Ann'l P/E Ratio	32.1	NMF	30.3	26.5	14.3	16.5	13.6	16.0	19.3	14.3
Relative P/E Ratio	1.95	NMF	1.99	1.77	.90	.95	.71	.91	1.25	.73
Avg Ann'l Div'd Yield	1.1%	1.0%	.9%	.7%	.4%	.4%	.5%	.5%	.5%	.5%
Sales ($mill) B							51688	57536	52170	55357
Operating Margin							11.7%	9.8%	8.9%	11.3%
Depreciation ($mill)							1473.8	1624.0	1375.0	1466.0
Net Profit ($mill)							2530.4	2475.6	1874.4	2727.0
Income Tax Rate							44.1%	41.0%	46.3%	41.9%
Net Profit Margin							4.9%	4.3%	3.6%	4.9%
Working Cap'l ($mill)							868.2	2390.6	d1310	d162.0
Long-Term Debt ($mill)							5583.4	5420.4	2971.5	5388.0
Shr. Equity ($mill)							14632	18211	18001	19353
Return on Total Capital							12.9%	10.8%	9.1%	11.1%
Return on Shr. Equity							17.3%	13.6%	10.4%	14.1%
Retained to Com Eq							16.1%	12.5%	9.4%	13.1%
All Div'ds to Net Prof							7%	8%	10%	7%

VALUE LINE, INC.	2002	2003	2004	2005	2006	2007	2008	2009	11-13
Translation Rate (Yen/$)A	120	106	107	118	118	100	***103***	***101***	***100***
Sales per ADR B	34.09	40.49	43.55	45.82	51.53	65.99	***61.60***	***62.90***	***72.65***
"Cash Flow" per ADR	2.77	3.36	3.58	3.97	4.48	6.15	***5.55***	***5.10***	***7.20***
Earnings per ADR BC	1.83	2.30	2.42	2.76	2.75	3.30	***2.50***	***1.95***	***3.75***
Gross Div'ds Decl'd/ADR D	.13	.15	.23	.33	.66	.76	***.84***	***.90***	***1.15***
Cap'l Spending per ADR	1.36	1.43	1.88	2.13	2.78	3.60	***3.45***	***3.60***	***3.80***
Book Value per ADR	11.25	14.26	16.56	19.08	20.83	24.98	***26.65***	***27.70***	***33.75***
Equiv ADRs Outst'g E	1948.8	1907.3	1849.7	1840.8	1824.7	1815.4	***1810.0***	***1800.0***	***1770.0***
Avg Ann'l P/E Ratio	10.8	8.8	10.0	9.8	12.7	10.1	*Bold figures are*	*Value Line*	***13.0***
Relative P/E Ratio	.59	.50	.53	.52	.69	.54	*estimates*		***.85***
Avg Ann'l Div'd Yield	.7%	.8%	1.0%	1.2%	1.9%	2.3%			***2.4%***
Sales ($mill) B	66429	77232	80549	84345	94018	119801	***111500***	***113250***	***128610***
Operating Margin	11.4%	10.0%	9.9%	10.0%	11.0%	12.3%	***11.0%***	***9.5%***	***12.0%***
Depreciation ($mill)	1840.6	2019.5	2102.2	2232.0	3150.0	5174.0	***5500***	***5650***	***6000***
Net Profit ($mill)	3555.5	4393.4	4527.4	5082.0	5023.0	5989.0	***4515***	***3500***	***6710***
Income Tax Rate	40.2%	39.4%	40.6%	38.9%	35.8%	43.3%	***35.0%***	***35.0%***	***38.5%***
Net Profit Margin	5.4%	5.7%	5.6%	6.0%	5.3%	5.0%	***4.0%***	***3.1%***	***5.2%***
Working Cap'l ($mill)	1416.4	3013.0	2422.7	5418.0	8182.0	5520.0	***6920***	***5200***	***7715***
Long-Term Debt ($mill)	9501.5	13195	14522	15996	16160	18332	***19000***	***17500***	***15500***
Shr. Equity ($mill)	21914	27197	30629	35122	38012	45356	***48230***	***49860***	***59770***
Return on Total Capital	11.4%	10.9%	10.1%	10.0%	9.8%	10.3%	***8.5%***	***7.0%***	***10.0%***
Return on Shr. Equity	16.2%	16.2%	14.8%	14.5%	13.2%	13.2%	***9.5%***	***7.0%***	***11.0%***
Retained to Com Eq	15.1%	15.0%	13.3%	12.7%	10.7%	9.8%	***6.0%***	***4.0%***	***8.0%***
All Div'ds to Net Prof	7%	7%	10%	12%	19%	25%	***34%***	***46%***	***30%***

CAPITAL STRUCTURE as of 9/30/08
Total Debt $29358 mill. **Due in 5 Yrs** $27870 mill.
LT Debt $21058 mill. **LT Interest** $1370 mill.
(31% of Cap'l)

Pension Assets-3/08 $11.5 bill. **Oblig.** $16.1 bill.
Pfd Stock None

Common Stock 1814.5 mill. shares
(equivalent to 1814.5 ADRs)

MARKET CAP: $38.8 billion (Large Cap)

CURRENT POSITION ($MILL.)	2006	2007	9/30/08
Cash Assets	8018	10489	9215
Receivables	8950	10198	14670
Inventory (FIFO)	10033	11970	12889
Other	17539	19560	15902
Current Assets	44540	52217	52676
Accts Payable	9892	10132	8587
Debt Due	17310	8694	8300
Other	9156	27871	28904
Current Liab.	36358	46697	45791

ANNUAL RATES of change (per ADR)	Past 10 Yrs.	Past 5 Yrs.	Est'd '05-'07 to '11-'13
Sales	9.5%	13.0%	*5.0%*
"Cash Flow"	14.0%	17.5%	*6.5%*
Earnings	14.5%	16.0%	*4.0%*
Dividends	25.0%	40.0%	*12.0%*
Book Value	14.0%	16.5%	*7.5%*

Fiscal Year Begins	QUARTERLY SALES ($ mill.) B Jun.30	Sep.30	Dec.31	Mar.31	Full Fiscal Year
2005	19278	19900	21044	24123	84345
2006	22045	22310	23478	26185	94018
2007	29256	29657	30390	30498	119801
2008	26943	27294	***27285***	***29978***	***111500***
2009	***25530***	***27145***	***28540***	***32035***	***113250***

Fiscal Year Begins	EARNINGS PER ADR BC Jun.30	Sep.30	Dec.31	Mar.31	Full Fiscal Year
2005	.51	.62	.61	1.02	2.76
2006	.67	.59	.67	.82	2.75
2007	.91	1.15	1.10	.14	3.30
2008	.93	.66	***.46***	***.45***	***2.50***
2009	***.49***	***.48***	***.50***	***.48***	***1.95***

Cal-endar	GROSS QUARTERLY DIV'DS PAID D Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2004	--	--	.099	.126	.23
2005	--	--	.163	.167	.33
2006	--	--	.258	.258	.52
2007	.140	.162	.191	.202	.70
2008	.204	.203	.200		

BUSINESS: Honda Motor Company, Ltd. is Japan's second-largest auto maker & the world's biggest motorcycle producer. Manufactures cars in Japan, United States, Canada, United Kingdom; cycles in 32 countries. Fiscal 2007 unit sales: autos, 3.9 million; cycles, 9.3 mill.; power products, 6.1 mill. Sales by region: United States & Canada, 57%; Japan, 13%; Europe, 13%; other, 23%. Research & development, 4.9% of sales. Has about 178,960 employees. Financial institutions control 41.6% of common stock (6/08 proxy). President & CEO: Takeo Fukui. Inc.: Japan. Address: 1-1, 2-chome, Minami-Aoyama, Minato-ku, Tokyo 107, Japan. United States address: 540 Madison Ave. 32nd Floor, New York, NY 10022. Telephone: 212-355-9191. Internet: www.honda.com.

Honda Motor cannot circumvent the industry downturn. The global automotive market continues to deteriorate and, despite boasting one of the industry's more fuel-efficient lineups, HMC is feeling the impact. Owing to withering demand in the U.S., as well as Europe, the Japanese car maker experienced an 8% sales decline in the second quarter (ended September 30th), with a much more substantial regression on the bottom line.

It seems to only be getting worse. In October, Honda's U.S. auto sales fell over 25%, from 114,800 vehicles last year. Despite earlier gains, sales dipped 3%, to 1.27 million units, year to date through October. On a global scale, the company now appears on track to reach sales of 4.015 million, down from its previous forecast of 4.08 million. All told, we have shaved $0.20 off our 2008 share-net estimate, which now sits at $2.50.

The near-term horizon remains very cloudy. The company has a robust new vehicle pipeline set to roll out through the early part of fiscal 2009. That said, it does not appear as though the demand will be there. Honda is taking some action, such as strict inventory management and streamlining production to focus on popular models. However, an earnings decline seems inevitable next year.

Honda is making a big hybrid bet. Although these versions of the *Civic* and *Accord* have not had the success the company had anticipated, a bevy of new models is on the way. In fact, Honda is targeting annual hybrid sales of 500,000 by 2010.

The stock's appeal is specific. Honda's sound product lineup and growing global business should help drive substantial share-earnings growth annually out to 2011-2013. The stock offers laudable appreciation potential over that span, though it is below average. What the issue does offer, though, is a bit more stability than most of its industry peers, as exhibited in its Above-Average Safety rank (2).

Jason A. Smith *November 28, 2008*

Sales (and Operating Margins*) by Business Line

	2006	2007	2008	2009
Automobiles	75378(6.7%)	94714(7.0%)	***85300(5.5%)***	***86070 (6.5%)***
Motorcycles	11623(7.3%)	15557(9.7%)	***15760(9.5%)***	***16155(9.0%)***
Finl Svcs & Other	7017(17.8%)	9530(14.1%)	***10440(10.5%)***	***11025(12.0%)***
Company Total	94018(7.7%)	119801(7.9%)	***111500(6.5%)***	***113250(8.0%)***

*After depreciation and corporate expenses

(A) At fiscal yearend.
(B) FY ends Mar. 31 of following year. Most recent qtl'y figs. based on estimate avg. exch. rate for the full year. (C) Dil. egs., based on U.S. accounting. Primary through 1996. Excl. nonrecur. gains: '94, 29¢; '96, 8¢. Next egs. rpt. due late Feb.
(D) Before 15% Japanese withholding tax. Dividends historically paid in early March, July, Sept., and December. (E) In mill. of American Depositary Receipts, adj. for split. Each common share represents 1 ADR.

Company's Financial Strength	B++
Stock's Price Stability	85
Price Growth Persistence	80
Earnings Predictability	80

Two Stage DDM for Honda

Year	Dividend
2009	0.90
2010	0.98
2011	1.06
2012	1.15

Assume the dividend growth rate will be steady beyond 2012. Value Line forecasts b = 70% and ROE of 11.0%. What should be the long term growth rate?

$$g = ROE \times b$$

$$g = 11.0\% \times 70\% = 7.70\%$$

Two Stage DDM for Honda

The required rate of return:

β_{Honda} = 1.05 From Value Line

R_f in 2008 = 3.5%

Market risk premium = historical average of 8%

$$k_{Honda} = R_f + (R_M - R_f)\beta_{Honda}$$

$$k_{Honda} = 3.5\% + (8\% \times 1.05) = 11.90\%$$

Two Stage DDM for Honda

Year	Divid end
2009	0.90
2010	0.98
2011	1.06
2012	1.15

k = 11.90%

g = 7.70%

Find the intrinsic value

$$V_0 = \$21.88$$

$$V_0 = \frac{\$0.90}{1.119} + \frac{\$0.98}{1.119^2} + \frac{\$1.06}{1.119^3} + \frac{\$1.15}{1.119^4} + \frac{\$1.15 \times 1.077}{(0.119 - 0.077)(1.119)^4}$$

Value Line reported the actual price = $21.37, so Honda was undervalued by $0.51 or about 2.4%.

Two Stage DDM for Honda

Should we trust the valuation result?

What if the beta is slightly incorrect, suppose it is 1.10 (< 5% error) rather than 1.05?

Now k = 12.3% and the intrinsic value estimate V_0= $19.98, reversing our conclusion that Honda is undervalued

Actual price = $21.37

Year	Dividend
2009	0.90
2010	0.98
2011	1.06
2012	1.15

13.4 Price-Earnings (P/E) Ratios

P/E Ratio and Growth Opportunities

- P/E Ratios are a function of two factors
  - Required Rates of Return (k) (inverse relationship)
  - Expected Growth in Dividends (direct relationship)
- Uses
  - Estimate intrinsic value of stocks
    - Conceptually equivalent to the constant growth DDM
  - Extensively used by analysts and investors

P/E, ROE and Growth

With positive growth:

$$g = ROE \times b$$

$$\frac{P_0}{E_1} = \frac{(1-b)}{k-g}$$

With zero growth:

If g = 0 then b should = 0 and the ratio simplifies to:

$$\frac{P_0}{E_1} = \frac{1}{k}$$

Numerical Example: No Growth

- E_1 = \$2.50 g = 0 k = 12.5%;

Find P/E and V_0

- P/E = 1/k = 1/.125 = 8

- V_0 = P/E x E_1 = 8 x \$2.50 = \$20.00

Numerical Example with Growth

- b = 60% ROE = 15%; k = 12.5% (1-b) = 40%, E_0 = $2.50

- Find the P/E and V_0:
- g = ROE x b = 15% x 60% = 9%
- E_1 = $2.50 (1.09) = $2.725

- P/E = (1 - .60) / (.125 - .09) = 11.4

- V_0 = P/E x E_1 = 11.4 x $2.73 = $31.14

P/E Ratios and Stock Risk

$$\frac{P_0}{E_1} = \frac{(1-b)}{k-g}$$

- Riskier firms will have higher required rates of return (higher values of k)

- Riskier stocks will have lower P/E multiples

Pitfalls in Using P/E Ratios

- Earnings management is a serious problem,
- P/E should be calculated using pro forma earnings,
- A high P/E implies high expected growth, but not necessarily high stock returns,
- Simplistic, assumes the future P/E will not be lower than the current P/E. If expected growth in earnings fails to materialize the P/E will fall and investors may incur large losses.