Material II

Valuation of Stock of Walgreens Company

Discounted Cash Flow Techniques

Estimating Intrinsic Value

Now we estimate the intrinsic value of the firm's common stock. If the intrinsic value estimate exceeds the stock's current market price, the stock should be purchased. In contrast, if the current market price exceeds our intrinsic value estimate, we should avoid the stock or sell it if we own it.

We talk about a brief presentation for some of the techniques as applied to Walgreens (whose ticker symbol is WAG), the largest retail drugstore (RDS) chain in the United States. It operates 5,997 drugstores in 48 states and Puerto Rico. Its pharmacy operation generates over 64 percent of sales.

We estimate the share price for Walgreens for the year 2008.

1 Present Value of Dividends

Recall that

$$Intrinsic\ Value = \frac{D_1}{k - g}$$

Because the current dividend is known, to estimate intrinsic value we need only estimate the dividend growth rate and investors' required rate of return. Table 1 contains historical data for Walgreens required for the PVCF models.

Table 1 Walgreen Co.'s Input Data for Alternative Present Value of Cash Flow Models (Dollars in millions, except per share data) 1983-2007

Year	Dividend Per Share	Net Income	Depreciation Expense	Capital Spending	Change in Working Capital	Principal Repayment	New Debt Issued	FCFE	EBIT	Tax Rate	FCFF	100%-Tax Rate	Time
1983	0.02	70	25	-71	-15	-3	0	6	147	45	20	55	1
1984	0.03	85	29	-68	-56	-3	0	-13	181	45	5	55	2
1985	0.03	94	34	-97	-61	-3	20	-13	209	46	-11	54	3
1986	0.03	103	44	-156	-72	-5	92	6	229	45	-58	55	4
1987	0.04	104	54	-122	-118	-4	5	-81	243	46	-55	54	5
1988	0.04	129	59	-114	49	-4	31	150	263	38	157	62	6
1989	0.05	154	64	-121	-97	-4	0	-4	301	37	36	63	7
1990	0.05	175	70	-192	-69	-4	0	-20	344	38	22	62	8
1991	0.06	195	84	-202	-129	-24	0	-76	381	38	-11	62	9
1992	0.07	221	92	-145	-32	-6	0	130	429	37	185	63	10
1993	0.08	245	105	-185	-28	-112	0	25	483	39	187	61	11
1994	0.09	282	118	-290	-58	-6	0	46	550	38	111	62	12
1995	0.10	321	132	-310	-104	-7	0	32	629	39	102	61	13
1996	0.11	372	147	-364	-116	0	2	41	725	39	109	61	14
1997	0.12	436	164	-485	34	-1	0	148	842	39	227	61	15
1998	0.13	511	189	-641	-143	0	0	-84	878	39	-59	61	16
1999	0.13	624	210	-696	-206	0	0	-68	1028	39	-65	61	17
2000	0.14	777	230	-1119	-140	0	0	-252	1264	39	-258	61	18
2001	0.14	886	269	-1237	-569	0	0	-651	1426	38	-653	62	19

2002	0.15	1019	307	-934	-830	0	0	-438	1637	38	-442	62	20
2003	0.16	1176	346	-795	-726	0	0	1	1889	38	-4	62	21
2004	0.18	1360	403	-940	-748	0	0	75	2176	38	64	62	22
2005	0.22	1560	482	-1238	-149	0	0	655	2456	36	667	64	23
2006	0.27	1751	572	-1338	-115	0	0	870	2754	36	882	64	24
2007	0.33	2041	676	-1785	1184	0	879	2995	3189	36	2116	64	25
10 yr Growth Rate	10.65 %	16.69 %	15.22%	13.92 %					14.24 %		25.03 %		

Determining g

If the stock has had fairly constant dividend growth over the past 5 to 10 years, one estimate of the constant growth rate is to use the actual growth of dividends over this period. The average compound rate of growth is found by computing

$$Average\ Dividend\ Growth\ Rate = \sqrt[n]{\frac{D_n}{D_0}} - 1$$

In the case of Walgreen, the 1983 dividend (D_0) was \$0.02 a share and the 2007 dividend (D_{24}) was \$0.33 a share. The average dividend growth rate was

$$\sqrt[24]{\frac{0.33}{0.02}} - 1 = 0.1233$$

Clearly, blindly plugging historical growth rates into our formulas ignores our analysis of economic, structural, industry, and company influences. Our analysis may have indicated that growth is expected to increase or decrease due to such factors as changes in government programs, demographic shifts, or changes in product mix. The historical growth rate may need to be raised or lowered to incorporate our findings.

Also the sustainable growth rate can be computed from the retention ratio and ROE. For Walgreens, the sustainable growth rate calculation using the average data for the recent three years: 2005-2007.

$$g = b \times ROE = 0.84 \times 0.177 = 0.1487$$

Average the historical growth rate of dividends (12.33 percent) and the implied sustainable growth estimate of 14.87 percent indicates a value of 13.60 percent. We will use a conservative 13 percent for Walgreen Co.'s estimated g.

Determining k

Estimates of the economy's risk-free rate, the future long-run market return, and an estimate of the stock's beta help estimate next year's required rate of return:

$$E(R_{stock}) = E(RFR) + \beta_{stock}[E(R_{market}) - E(RFR)]$$

The firm's systematic risk value (beta) can be found based upon the following

regression model

$$R_{WAG} = \alpha + \beta_{WAG} R_M$$

When this regression was run using monthly rates of return during the five-year period 2003-2007, the beta coefficient was estimated at 0.90.

The prevailing nominal risk-free rate (RFR) is estimated at about 3.8 percent—the current yield to maturity for the intermediate-term (10 year) government bond. The market risk premium is 0.040, which implies an expected market return (R_M) of 0.078. Thus,

$$E(R) = RFR + \beta_i(R_m - RFR) = 0.038 + 0.90 \times 0.04 = 0.074$$

Given that the 10-year Treasury yield is currently at an abnormally low value and we assumed a market risk premium at the low end of the historical range, we will round this to 8 percent for our intrinsic valuations.

At this point, if we use the basic DDM assuming a constant growth rate for an infinite period, we need to have the required rate of return k larger than the expected growth rate g, which is not true in this case. Therefore, the analyst must employ a two- or three-stage growth model.

Because of the fairly large difference between the current growth rate of 13 percent and the long-run constant growth rate of 7 percent, it seems reasonable to use a three-stage growth model, which includes a gradual transition period. We assume that the growth periods are as follows:

$$g_1 = 5\ years\ (growing\ at\ 13\%\ a\ year)$$
$$g_2 = 6\ years\ (during\ this\ period\ it\ is\ assumed\ that\ the\ growth\ rate\ declines\ 1\%\ per\ year\ for\ 6\ years)$$
$$g_3 = constant\ perpetual\ growth\ of\ 7\%$$

Therefore, beginning with 2008 when dividends were expected to be \$0.37 (0.33×1.13), the future dividend payments will be as follows

Year	Gr. Rate	Div.	8% PV Factor	PV
	High-Growth Period			
2009	0.13	0.42	0.926	0.39
2010	0.13	0.47	0.855	0.40
2011	0.13	0.53	0.794	0.42
2012	0.13	0.60	0.735	0.44
2013	0.13	0.68	0.680	0.46
			Sum	2.11
	Declining-Growth Period			

2014	0.12	0.76	0.629	0.48
2015	0.11	0.85	0.585	0.50
2016	0.10	0.93	0.541	0.50
2017	0.09	1.01	0.500	0.51
2018	0.08	1.09	0.463	0.51
2019	0.07	1.17	0.429	0.50
			Sum	3.00

Constant Growth Period:

$$\frac{1.17 \times 1.07}{0.08 - 0.07} \times PV\ factor = 125.00 \times 0.429 = \$53.63$$

The total value of the stock is the sum of the three present-value streams discounted at 8 percent:

1) Present value of high-growth period dividends: $2.11
2) Present value of declining-growth period dividends: $3.00
3) Present value of constant-growth period dividends: 53.63
   Total present value of dividends 58.74

The estimated value based on the DDM ($58.74) is substantially above the market price in mid 2008 of about $37.00.

2 Present Value of Free Cash Flow to Equity

Given the current FCFE values, the forms of the model are similar to those available for the DDM, which in turn depends on the firm's growth prospects. Specifically, if the firm is in its mature, constant-growth phase, it is possible to use a model similar to the reduced from DDM:

$$Value = \frac{FCFE_1}{k - g_{FCFE}}$$

The historical data in Table 2 shows a growth rate that exceeded 20 percent during some periods since 1983, in contrast to the negative values in 1998-2002.

Notably, 2007 was unusual because of an inflow from working capital and a new bond issue. Thus, it is estimated that in 2008 the FCFE will be about $780 million. Such volatility makes it appropriate to use the conservative 13 percent growth rate going forward after 2008.

The following example again uses a three-stage growth model with characteristics similar to the dividend growth model except that constant growth will only be 6 percent.

$$g_1 = 13\%\ for\ the\ five\ years\ after\ 2008$$
$$g_2 = a\ constantly\ declining\ growth\ rate\ to\ 6\%\ over\ seven\ years$$
$$k = 8\%\ cost\ of\ equity$$

The specific estimates of annual FCFE, beginning with the estimated value of $780 million in 2008 are as follows:

Year	Growth Rate	$ Million	8% PV Factor	PV
	High-Growth Period			
2009	0.13	881	0.926	816
2010	0.13	996	0.855	852
2011	0.13	1,125	0.794	893
2012	0.13	1,271	0.735	934
2013	0.13	1,437	0.680	977
			Sum	$4,472
	Declining-Growth Period			
2014	0.12	1,609	0.629	1012
2015	0.11	1,786	0.585	1045
2016	0.10	1,965	0.541	1063
2017	0.09	2,142	0.500	1071
2018	0.08	2,313	0.463	1071
2019	0.07	2,475	0.429	1062
2020	0.06	2,624	0.397	1042
			Sum	$7,366

Constant Growth Period:

$$\frac{2{,}624 \times 1.06}{0.08 - 0.06} \times PV\ factor = \$139{,}050 \times 0.397 = \$55{,}203$$

The total value of the stock is the sum of the three present-value streams discounted at 8 percent:

1) Present value of high-growth period FCFEs: $4,472
2) Present value of declining-growth period FCFEs: $7,366
3) Present value of constant-growth period FCFEs $55,203

Total present value of FCFEs $67,041

The outstanding shares in 2007 were approximately 1,006 million. Therefore, the per share value, based on the present value of FCFE is $66.64 (67,041/1,006). Again, the estimated value is above the prevailing market price of about $37.00.