Four Valuation Models—One Value[1]

This case is designed to give you some practice computing the inputs to and final value estimate from some of the most standard valuation models. After you do the computations by hand, or if you give up in frustration, you can verify them using *eVal* (the details for using *eVal* are given in part B of the case). Part C of the case illustrates how accounting distortions flow through the different valuation models. We refer you to Chapter 10, "Valuation," for the precise definitions of the valuation models and their inputs.

The forecasted financial statements that extend into the infinite horizon are given in Figure 1. In addition, you should assume that the cost of equity capital is 10 percent, the pretax cost of debt is also 10 percent, and the effective tax rate is 40 percent. Also assume there are 1,000 shares outstanding and divide your valuation by 1,000 to get the price per share.

FINANCIAL STATEMENT FORECASTS

Given in Figure 1 is one historical year and four forecasted years of financial statements for our example company. Note that the sales growth is 20 percent in year one and 5 percent in years two and beyond. However, because depreciation expense and interest expense are based on average balances, net income doesn't start growing at 5 percent each year until year three (i.e., $NI_{2002}(1 + .05) = NI_{2003}$). Common shareholders' equity also starts growing at 5 percent in year three (i.e., $CE_{2002}(1 + .05) = CE_{2003}$).

QUESTIONS

Part A. The Four Valuation Models

Free Cash Flow to Common Equity Valuation Model

1. Find the forecasted free cash flow to common equity for 2001 and beyond.
2. Compute the value of common equity as of December 31, 2000, using the free cash flow to common equity model.

7		Actual	Forecast	Forecast	Forecast	Forecast
8	Fiscal Year End (MM/DD/YYYY)	12/31/2000	12/31/2001	12/31/2002	12/31/2003	12/31/2004
10	**Income Statement**					
11						
12	Sales (Net)	20,000	24,000	25,200	26,460	27,783
13	Cost of Goods Sold	(12,000)	(14,400)	(15,120)	(15,876)	(16,670)
14	Gross Profit	8,000	9,600	10,080	10,584	11,113
17	EBITDA	8,000	9,600	10,080	10,584	11,113
18	Depreciation & Amortization	(2,000)	(2,200)	(2,460)	(2,583)	(2,712)
19	EBIT	6,000	7,400	7,620	8,001	8,401
20	Interest Expense	(1,000)	(1,100)	(1,230)	(1,292)	(1,356)
22	EBT	5,000	6,300	6,390	6,710	7,045
23	Income Taxes	(2,000)	(2,520)	(2,556)	(2,684)	(2,818)
25	Other Income (Loss)	0	0	0	0	0
26	Net Income Before Ext. Items	3,000	3,780	3,834	4,026	4,227
29	Net Income (available to common	3,000	3,780	3,834	4,026	4,227
30						
31	**Balance Sheet**					
32						
33	Operating Cash and Market. Sec.	1,000	1,000	0	0	0
37	Total Current Assets	1,000	1,000	0	0	0
38	PP&E (Net)	20,000	24,000	25,200	26,460	27,783
41	Other Assets	0	0	0	0	0
42	Total Assets	21,000	25,000	25,200	26,460	27,783
43						
49	Long-Term Debt	10,000	12,000	12,600	13,230	13,892
53	Total Liabilities	10,000	12,000	12,600	13,230	13,892
55	Paid in Common Capital (Net)	10,000	8,220	3,986	590	(2,975)
56	Retained Earnings	1,000	4,780	8,614	12,640	16,867
57	Total Common Equity	11,000	13,000	12,600	13,230	13,892
58	Total Liabilities and Equity	21,000	25,000	25,200	26,460	27,783

Figure 1: Financial Statements for Part A

Residual Income to Common Equity Valuation Model

3. Find the forecasted residual income for 2001 and beyond.
4. Compute the value of common equity as of December 31, 2000, using the residual income to common equity model.

Free Cash Flow to All Investors Valuation Model

5. Find the forecasted free cash flow to all investors for 2001 and beyond.
6. Compute the after-tax weighted-average cost of capital.
7. Compute the value of common equity by first computing the value of the free cash flows to all investors (i.e., the entity value) and then subtracting the value of the cash flows to debt holders. *Note*: At this point, the estimated value will only be approximately the same as in the other models.
8. Recompute the entity value using a discount rate of 9.3646 percent and then find the value of the equity. Why is there a discrepancy between the answers to questions 7 and 8?
9. Without doing any computations, contrast the residual income to all investors model with the free cash flow to all investors model.

Residual Income to All Investors Valuation Model

We will skip the computations for this model. You can see them in *eVal* under the Residual Income Valuations tab.

Practice on Haggar Inc. (the makers of the #2 brand in pants!)

In the appendix, you will find the income statement, balance sheets, and cash flow statement for Haggar Inc. for the fiscal year ending September 30, 2002.

10. Compute the free cash flow to common equity using only the income statement and balance sheet for Haggar in fiscal 2002 and then reconcile this amount with the free cash flow to common equity computed directly from the statement of cash flows.
11. Compute the free cash flow to all investors using only the income statement and balance sheet for Haggar in fiscal 2002 and then reconcile this amount with the free cash flow to all investors

computed directly from the statement of cash flows. *Note*: Book overdrafts are included in accounts payable.

Part B. Verifying Your Computations with *eVal*

Load the data for the case into *eVal*. (Note: case data can be imported by going to the Case Data sheet in *eVal* and selecting the yellow block of data for the company, and then pasting this block of data into the yellow cells at the bottom of the Financial Statements sheet using Paste Special - Values from the Edit menu.) To generate the financial statements shown in Figure 1, go to the Forecasting Assumptions sheet and set

- The forecast horizon to five years.
- The first year sales growth to 20 percent and the sales growth for years 2002 and beyond to 5 percent.
- The operating cash/sales ratio forecast to 4.167 percent in year 2001 and 0 percent in years 2002 and beyond.
- The long-term debt/total asset ratio forecast to 48 percent in year 2001 and 50 percent in years 2002 and beyond.

These changes will yield the financial statements shown in Figure 1. Finally, go to the Valuation Parameters sheet and set

- The cost of equity capital to 10 percent.
- The cost of debt capital to 10 percent.
- The valuation date to July 9, 2000.

By setting the valuation date halfway into the fiscal year, we remove the half-year time value adjustment in *eVal* and make the computations much easier to see. If you have followed all these instructions carefully, the price shown on the financial statements sheet (or anywhere else) should be $61.25. If this isn't the case, look carefully at the Financial Statements sheet in *eVal* and be sure that the forecasted net income and common shareholders' equity is exactly as shown in Figure 1. If these are okay and the price still isn't $61.25, then double-check your settings on the Valuation Parameters sheet. More importantly, if your answers to Part A of the case are not all $6,125,000/1,000 shares = $61.25 per share, then go to the Residual Income Valuations sheet or DCF Valuations sheet and see where your computations differ from *eVal*'s.

Part C. Accounting Distortions

This part of the case answers the question "how do accounting distortions, intentional or unintentional, affect the valuation models?" As an example, suppose that our company shifts $2,000 of noncash income from fiscal 2002 to fiscal 2001. There are many ways they could do this: accelerating the recognition of revenue or deferring the recognition of an expense. Because the shifted income is not a real cash flow, it must necessarily increase an asset account in 2001 by $2,000, and this account will reverse in 2002. To make the computations transparent, suppose the shifted income was in the line item Other Income and the associated asset account was Other Assets. Further, suppose that all other income statement items, assets, and liabilities remain the same (common shareholders' equity will obviously change).

1. Alter the financial statements in Figure 1 to show the income shifting just described. Based on these new financial statements (*not eVal*), compute the value of common equity as of December 31, 2000, using the residual income to common equity model.
2. The income shifting clearly moves the recognition of net income forward in time and money has time value, so why has this accounting distortion not changed the value of the equity? (*Hint*: Your answer to question 1 should match the value you computed in Part A: $61.25 per share.)
3. To completely clarify the answer to question 2, compute the free cash flows to common equity from the revised financial statements. Compare your answer to the cash flows you computed in Part A.
4. To illustrate the irrelevance of accounting distortions in *eVal*, make the following changes to the financial statement forecasts that you entered in Part B:
   - Hit the Enter Raw Forecast Data button on the financial statements sheet and enter $2,000 of Other Income in year 2001 and $2,000 in year 2002.

• Enter $2,000 for Other Assets in year 2001. It is already entered as zero in 2002.
• Reenter $12,000 for Long-Term Debt in 2001; otherwise the default forecasting algorithms in *eVal* will change debt slightly. *eVal* will automatically change Retained Earnings so that the balance sheet balances.

If you made all these changes correctly, you should once again have a $61.25 per share value. Now, to see how general this result really is, alter your forecasts so that the distortion doesn't reverse until 2004 (i.e., that Other Asset maintains its balance of $2,000 until 2004, when the $2,000 of Other Income is recorded). Note once again that the value is unchanged.

5. What about distortions in the existing financial statements? Suppose that you feel that there are $1,000 of unrecorded assets, such as an internally developed intangible asset. Suppose that you restate the year 2000 financial statements in Figure 1 by adding $1,000 to Other Assets and Retained Earnings. Further, suppose that your forecasted financial statements remain exactly as in Figure 1, with the exception that Retained Earnings is $1,000 larger and Paid in Common Capital is $1,000 smaller. In *eVal* be sure to set Other Assets back to zero in 2001 and beyond. What is your valuation now? Explain why the valuation changed in the amount that it did. (*Hint*: Follow the net dividends each period.)

Appendix
Haggar Inc. Financial Statements

Consolidated Statements of Operations and Comprehensive Income
(In thousands, except per share amounts)

	Year Ended September 30,		
	2002	2001	2000
Net sales	$ 481,831	$ 444,570	$ 432,855
Cost of goods sold	351,704	307,796	287,392
Reorganization costs	(3,812)	20,150	-
Gross profit	133,939	116,624	145,463
Selling, general and administrative expenses	(118,442)	(123,972)	(128,849)
Royalty income	1,326	1,856	2,436
Other income (expense), net	613	(107)	1,370
Interest expense	(3,600)	(5,140)	(4,084)
Income (loss) before provision (benefit) for income taxes and cumulative effect of accounting change	13,836	(10,739)	16,336
Provision (benefit) for income taxes	5,823	(2,069)	7,054
Income (loss) before cumulative effect of accounting change	$ 8,013	$ (8,670)	$ 9,282
Cumulative effect of accounting change	(15,578)	-	-
Net income (loss)	$ (7,565)	$ (8,670)	$ 9,282
Other comprehensive income (loss):			
Cumulative translation adjustment	16	15	(565)
Comprehensive income (loss)	$ (7,549)	$ (8,655)	$ 8,717

NET INCOME (LOSS) PER COMMON SHARE:

BASIC			
Income (loss) before cumulative effect of accounting change	$ 1.25	$ (1.34)	$ 1.38
Cumulative effect of accounting change	(2.44)	-	-
Net income (loss)	$ (1.19)	$ (1.34)	$ 1.38
DILUTED			
Income (loss) before cumulative effect of accounting change	$ 1.25	$ (1.34)	$ 1.37
Cumulative effect of accounting change	(2.42)	-	-
Net income (loss)	$ (1.17)	$ (1.34)	$ 1.37
Weighted average number of common shares outstanding-Basic	6,385	6,485	6,733
Weighted average number of common shares and common share-equivalents outstanding-Diluted	6,429	6,485	6,786

Haggar Corp. and Subsidiaries

Consolidated Balance Sheets
(In thousands)

	September 30,	
	2002	2001
Assets		
Current assets:		
Cash and cash equivalents	$ 4,124	$ 7,800
Accounts receivable, net	64,284	71,299
Inventories	100,996	97,726
Property held for sale	2,157	-
Deferred tax benefit	12,087	11,290
Other current assets	2,766	2,215
Total current assets	186,414	190,330
Property, plant and equipment, net	46,195	51,975
Goodwill, net	9,472	25,050
Other assets	7,896	7,870
Total assets	$ 249,977	$ 275,225
Liabilities and Stockholders' Equity		
Current liabilities:		
Accounts payable	$ 30,542	$ 35,645
Accrued liabilities	39,448	25,374
Accrued wages and other employee compensation	6,713	5,103
Accrued workers' compensation	4,468	3,645
Current portion of long-term debt	3,742	4,021
Total current liabilities	84,913	73,788
Long-term debt	21,343	49,338
Total liabilities	106,256	123,126
Stockholders' equity:		
Common stock-par value $0.10 per share; 25,000,000 shares authorized and 8,660,609 and 8,591,000 shares issued at September 30, 2002 and 2001, respectively	866	859
Additional paid-in capital	42,911	42,014
Cumulative translation adjustment	(534)	(550)
Retained earnings	125,439	134,310
	168,682	176,633
Less-Treasury stock, 2,242,205 and 2,203,705 shares at cost at September 30, 2002 and 2001, respectively	(24,961)	(24,534)
Total stockholders' equity	143,721	152,099
Total liabilities and stockholders' equity	$ 249,977	$ 275,225

Haggar Corp. and Subsidiaries
Consolidated Statements of Cash Flows
(In thousands)

	Year Ended September 30, 2002	2001	2000
Cash Flows from Operating Activities			
Net income (loss)	$ (7,565)	$ (8,670)	$ 9,282
Adjustments to reconcile net income (loss) to net cash provided by (used in) operating activities:			
Cumulative effect of accounting change	15,578	-	-
Depreciation and amortization	8,561	11,813	13,824
(Gain) loss on disposal of property, plant and equipment	(272)	2,458	(867)
Reversal of net realizable value on property held for sale	(2,157)	-	-
Deferred tax expense (benefit)	(129)	(666)	1,476
Changes in assets and liabilities:			
Accounts receivable, net	7,015	(2,986)	(4,791)
Inventories	(3,270)	(5,145)	(6,596)
Other current assets	(551)	(478)	(98)
Accounts payable	(11,103)	10,469	(7,854)
Accrued liabilities	14,074	2,404	(4,984)
Accrued wages and other employee compensation	1,610	(1,003)	(908)
Accrued workers' compensation	823	(296)	(834)
Deferred long-term income tax liability	-	-	(867)
Net cash provided by (used in) operating activities	22,614	7,900	(3,217)
Cash Flows from Investing Activities			
Purchases of property, plant and equipment	(3,334)	(5,266)	(10,626)
Proceeds from sale of property, plant and equipment	135	38	1,563
Increase in other assets	(4)	(1,075)	(2,852)
Net cash used in investing activities	(3,203)	(6,303)	(11,915)
Cash Flows from Financing Activities			
Purchases of treasury stock at cost	(427)	(1,807)	(8,191)
Proceeds from issuance of long-term debt	494,000	105,000	156,000
Proceeds from issuance of common stock	904	84	72
Payments on long-term debt	(522,274)	(102,020)	(131,064)
Increase in book overdrafts	6,000	-	-
Payments of cash dividends	(1,306)	(1,307)	(1,262)
Net cash (used in) provided by financing activities	(23,103)	(50)	15,555
Effects of exchange rates on cash and cash equivalents	16	15	(565)
Increase (decrease) in cash and cash equivalents	(3,676)	1,562	(142)
Cash and cash equivalents, beginning of period	7,800	6,238	6,380
Cash and cash equivalents, end of period	$ 4,124	$ 7,800	$ 6,238

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