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Questrom vs. Federated Department Stores, Inc: A Question of Equity Value

Gary K. Taylor, William D. Samson, and Benton Gup

ABSTRACT: This case is based on a factual situation facing the courts. Allen Questrom, recently retired Chief Executive Officer (CEO) of Federated Department Stores, is suing the company for the amount of incentive compensation he earned during the five years he was Federated's CEO. This incentive compensation was to be based on the increase in the firm's total equity value over this five-year period, a time during which Questrom rescued the retailer from bankruptcy. Questrom and Federated are in dispute over Federated's equity value as of January 28, 1995. Therefore, the court is being asked to estimate Federated's equity value as of January 28, 1995 and then determine the amount of compensation that Federated owes Questrom.

The presiding judge (Gilbert Snider) wants you to analyze selected information from Federated's financial statements. As part of your analysis, the judge has asked you to explain the role that certain components of the financial statements have with respect to firm valuation. You are asked to estimate Federated's total equity value as of January 28, 1995 (the end of the five-year period under consideration) using the "free cash flow" and the "residual income" valuation models. The "residual income" model, which combines historical financial accounting and earnings forecasts to value companies, has generated considerable excitement in financial accounting academic circles and among accounting and consulting practitioners. Variants of the residual income valuation model, such as Stern and Stewart's EVA® (Economic Value-Added) and McKinsey's Economic Profit Model, have been widely discussed by academics and utilized by consultants to value businesses in a variety of settings and purposes.

INTRODUCTION

Federated Department Stores, Inc.[1] is the nation's leading operator of premier department stores, including Bloomingdale's, The Bon Marché, Burdine's, Goldsmith's, Lazarus, Broadway, R. H. Macy, Rich's, and Stern's. In 1988, a Canadian developer, Robert Campeau, acquired Federated via a

[1] The case is based on information that appeared in a *Wall Street Journal* article by Wendy Bounds (1998). Only selected details of the case are presented here.

Gary K. Taylor is an Assistant Professor, and William D. Samson and Benton Gup are both Professors, all at The University of Alabama.

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leveraged buy-out[2] (LBO) and merged it with his Allied Stores Corporation. The new entity, operating under Federated's name, faired poorly, primarily because of the heavy burden of interest and principal payments from the LBO that strained the company's operating cash flows. On January 16, 1990, Federated sought protection from creditors by filing for Chapter 11 bankruptcy. On February 3, 1990, Federated's restructuring committee, assigned the task of salvaging the company, hired Allen Questrom as Chief Executive Officer (CEO) to steer Federated out of bankruptcy protection and return the company to profitability.[3] Figure 1 provides a timeline that describes events surrounding Questrom's tenure as CEO.

Questrom as CEO

Questrom worked for Federated for many years, but left the firm when Campeau bought it in 1988. In 1990, believing Questrom to be the best choice for CEO, Federated's Board of Directors offered him a $1.2 million annual salary, guaranteed for five years, and a $2 million signing bonus to rejoin the company. In addition, his compensation would be based on the change in Federated's total *equity value* between the hiring date of February 3, 1990 and January 28, 1995. Specifically, he would receive 0.75 percent of the first $500 million of increase in Federated's value, 1.5 percent of any appreciation between $500 million and $1 billion, and 2 percent of any appreciation above $1 billion.

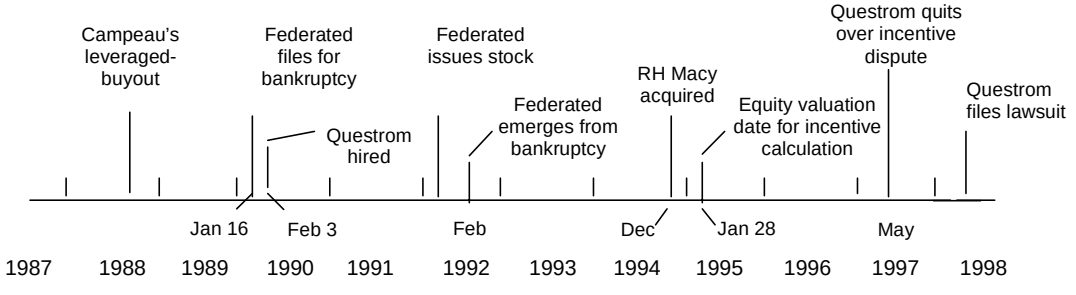
Because Federated was, as of February 1990, privately owned (the starting point for determining the amount of incentive compensation), it was agreed that

[2] An LBO is an acquisition of a company where substantial amounts of the purchase price, often over 90 percent, is debt-financed. For example, Campeau used short-term debt financing to purchase Federated's outstanding stock. Federated then borrowed a large amount to purchase most of the stock from Campeau. The net result was that Federated's debt increased and Federated's equity decreased. Campeau owned directly (or indirectly) Federated's remaining shares; thus Federated, formerly a publicly traded company, became privately held and controlled by Campeau.

In the LBO, the cash generated by the business and/or by the sale of divisions is to be used to pay off the LBO debt, leaving the LBO takeover investors owning the remaining business with a small initial investment. Campeau planned to sell several divisions (chains of department stores) owned by Federated, but failed to receive enough from the sales to reduce the debt as anticipated. The burden of the high-interest debt caused a cash flow problem for the remaining Federated stores, resulting in bankruptcy.

[3] Questrom's appointment as CEO was also approved by 80 percent of the creditors and by the bankruptcy court.

FIGURE 1
Federated Time Line



equity valuation at this point would be determined by an outside investment banker selected by the Board with the consent of Questrom. The agreement specified that if the company went public, the stock market price should be used to value the firm's common equity as of January 28, 1995, provided that the investment banker found that the stock market price "accurately reflected the market value of Federated…based on the market value of similar businesses…taking into account net income, cash flow, capital structure, and other such factors" (Bounds 1998).

Like other turnaround specialists, Questrom focused on cutting costs, centralizing the buying operation, closing unprofitable stores, and reducing the firm's debt. These actions enabled Federated to emerge from bankruptcy protection and, in 1992, return to profitability. In addition, by acquiring other troubled retailers, Federated became the nation's largest department store chain. For example, Federated acquired R. H. Macy in 1994 and made additional investments in Bloomingdale's and Rich's.

A Question of Value

In February 1992, Federated issued common stock at $11.50 per share as part of its bankruptcy reorganization. At this time, Federated also hired J. P. Morgan to determine Federated's estimated equity value (retrospectively) as of February 3, 1990. Using criteria including net income, cash flow, capital structure, and information about other retailers, J. P. Morgan determined that Federated's total equity value at February 3, 1990 was approximately $2.8 billion. Both Federated's compensation committee and Questrom agreed with this valuation, which became the uncontested benchmark for determining the change in equity over the five years ending January 28, 1995.

Immediately after the initial public offering (February 1992), the compensation committee assumed that Federated's market value at January 28, 1995 would best represent its *equity value* on that date. For example, in January 1993, G. William Miller, a member of the Board of Directors, wrote a memo that concluded if "the market price reflected market value, then the market price would be the best and proper measure" (Bounds 1998). Miller had apparently assumed that the market value accurately represents the present value of all expected future cash payoffs associated with holding the stock. On January 28, 1995, Federated was selling for $18.625 per share, which resulted in a total equity value of $3.4 billion.

Questrom, however, argued that *equity value* at any given point should be based on the "growth of full value" of the company, not necessarily the stock (market) price at this point. Questrom reasoned that the retail business is cyclical, that the economy or even the weather can affect sales, and that the late 1994 acquisition of the troubled R. H. Macy & Co. (Macy's) had hurt Federated's stock price. Questrom further argued that, while the purchase of Macy's had temporarily depressed Federated's stock price, the acquisition made Federated the nation's largest department store chain and was the "growth vehicle" to spur future profits.

Because of this disagreement over firm value, Federated in February 1995 again hired investment banker J. P. Morgan to estimate Federated's total equity value as of January 28, 1995. J. P. Morgan agreed that the share price on this

date did not necessarily represent Federated's value and noted that "valuing a multibillion dollar company is as much an art as science" (Bounds 1998). Accordingly, J. P. Morgan again used criteria such as net income, cash flow, capital structure, and information about other retailers in its assessment of firm value. In the investment banker's opinion, Federated was worth slightly more than $4 billion as of January 28, 1995 ($22 per share)—$1.2 billion higher than the initial market valuation of $2.8 billion and $0.6 billion more than the total market value ($3.4 billion) of the stock. As a result, Questrom's total incentive compensation would be approximately $15.3 million.

Dissatisfaction over the valuation and other factors led Questrom to retire from Federated in 1997. He then hired Seneca Financial Group, which estimated Federated's value as of January 28, 1995 to be in excess of $6.4 billion (or approximately $35.05 per share).[4] In late 1994, Federated hired Smith Barney Inc. to advise the Board about the Macy's acquisition. At that time, Smith Barney estimated that, based on six-year earnings projections, Federated's market value would be "well in excess of $5 billion" as of the end of its 1995 fiscal year. Based on these two favorable valuation estimates, Questrom sued Federated in 1997, claiming the company owed him $63 million.[5]

Your Assignment

You have been hired as a consultant by Judge Snider of the U. S. District Court of New York to advise the Court in the case of *Questrom v. Federated Department Stores, Inc*. The judge is relying heavily on your estimate of the January 28, 1995 equity value of Federated Department Stores to determine the amount of compensation owed to Federated's former CEO.

The judge's staff has provided selected information from Federated's financial statements (Exhibits 1 through 3). The staff has also prepared a forecast of Federated's operating and financial performance based on analysts' projections, summarized in Exhibit 4.[6] The judge informs you that Federated's stock ($00.01 par value) was

[4] Seneca Financial Group (SFG) is a merchant banking firm specializing in the restructuring of public and private companies. SFG primarily focuses on measuring the changes in firm valuation during bankruptcies and reorganizations. SFG had been Federated's consultant during its bankruptcy and advised the retailer about its post-bankruptcy recapitalization.

[5] According to the Seneca Financial Group, the total increase in value exceeded $3.2 billion ($6.4 billion minus original value of $2.8 billion, based on the February 3, 1990 estimate provided by J. P. Morgan). The $63 million bonus is calculated as follows:

Increase in Value	Bonus
$500 million × (0.0075)	$3.75 million
($1 billion – $500 million) × (0.015)	$7.50 million
($6.4 billion – $1 billion – $2.8 billion) × (0.02)	$52.00 million
Total	$63.00 million

[6] The "forecast" data in Exhibit 4 represent actual *ex post* results obtained from Federated's financial statements. For purposes of this exercise, we have assumed that the analysts had perfect foresight not only about future net income, but also about future free cash flow. Obviously, in valuing a company, forecast data and not actual realizations would be used. Analysts generally forecast earnings, not "free cash flow (FCF)." Therefore, using the FCF model requires the preparation of *pro forma* cash flow statements. "Cash Flow from Operating Activities" can be derived from *pro forma* Income Statement and Balance Sheet information that is derived from forecasted net income. However, "Cash Flow from Investing Activities" must be based on the expected investments the firm is likely to make during the forecast period. See Penman (2000, Chapter 4) for a more detailed discussion on forecasting "free cash flows."

EXHIBIT 1
Selected Income Statement Items for Federated Department Stores
(in $ million)

	Year Ended					
	2/3/90	**2/2/91**	**2/1/92**	**1/30/93**	**1/29/94**	**1/28/95**
Net Sales	$ 7,578	$ 7,142	$ 6,932	$ 7,080	$ 7,229	$ 8,316
Cost of Goods Sold	(5,447)	(5,173)	(4,202)	(4,229)	(4,374)	(5,131)
Gross Profit	2,131	1,969	2,730	2,851	2,855	3,185
Selling and Administrative Expenses	(1,881)	(1,834)	(2,463)	(2,421)	(2,324)	(2,549)
Operating Income	250	135	267	430	531	636
Interest Expense	(915)	(640)	(504)	(258)	(214)	(262)
Other Gains (Losses)	(1,102)	(43)	(1,612)	60	49	(42)
Income (Loss) before Taxes and Extraordinary Items	(1,767)	(548)	(1,849)	232	366	332
Income Tax Expense	(7)	276	614	(99)	(171)	(143)
Income (Loss) before Extraordinary Items	(1,774)	(272)	(1,235)	133	195	189
Extraordinary Items Gain (Loss), net of tax	0	0	2,072	(20)	(4)	0
Net Income (Loss)	$(1,774)	$ (272)	$ 837	$ 113	$ 191	$ 189

EXHIBIT 2
Selected Cash Flow Data for Federated Department Stores
(in $ million)

	Year Ended					
	2/3/90	**2/2/91**	**2/1/92**	**1/30/93**	**1/29/94**	**1/28/95**
Net Income (Loss)	$(1,774)	$(272)	$837	$ 113	$ 191	$189
Net Operating Cash Flow	(873)	259	548	442	411	161
Net Investing Cash Flow	303	57	(24)	(188)	(405)	(953)
Net Financing Cash Flow	896	(308)	25	(689)	(350)	776
Net Changes in Cash	$ 326	$ 8	$549	$(435)	$(344)	$(16)

EXHIBIT 3
Selected Year-End Balance Sheet Items for Federated Department Stores
(in $ million)

	Year Ended					
	2/3/90	**2/2/91**	**2/1/92**	**1/30/93**	**1/29/94**	**1/28/95**
Current Assets	$2,276	$3,418	$3,841	$3,390	$3,298	$5,190
Noncurrent Assets	2,897	3,565	2,920	2,900	2,986	5,758
Other Assets	1,399	2,167	740	730	1,136	1,431
Current Liabilities	596	1,461	1,917	1,163	1,330	2,712
Noncurrent Liabilities	6,283	8,730	4,129	3,782	3,811	6,028

EXHIBIT 4
Financial Statement Forecasts as of January 28, 1995 for Federated Department Stores
(in $ million)

	Actual	**Forecasts as of 1/28/95 for Year Ended:**			
	1/28/95	**2/3/96**	**1/31/97**	**2/1/98**	**1/30/99**
Total Additional Paid-In Capital	$2,098				
Total Shareholders' Equity	3,639				
Net Interest Payments[a]	292	$383	$452	$461	$219
Income before Taxes and Extraordinary Items	332	202	441	958	1163
Net Income	189	75	266	536	662
Cash Flows from Operating Activities	161	295	1,220	1,573	1,690
Free Cash Flow	(616.8)	(108.2)	841.2	1,531.6	1,376.4
Average Shares Outstanding[b]	182.60	182.60	182.60	182.60	182.60

[a] "Net Interest Payments" represents the (pre-tax) difference between cash interest payments and cash interest receipts. Interest Expense in Exhibit 1 represents the interest recognized on the income statement based on accrual accounting.

[b] Average shares outstanding are in millions. The average shares outstanding (182.6 million) have been held constant to simplify the valuation calculations. Subsequent price per share numbers given in this case has been altered to reflect this simplification.

selling for $18.625 per share on January 28, 1995. As of January 28, 1995, Federated had never paid dividends. Further, Federated's management does not expect any capital contributions (i.e., stock sales), shares repurchases, or dividend distributions through 1999.

From Federated's 10-K filings, we find that Federated used its net investing cash flows from 1993 to 1995 primarily for renovations of existing stores rather than for opening new stores. From "Management's Discussion and Analysis of Financial Condition and Results of Operations" section of Federated's 1993–1995 10-K reports, we find that: (1) sales per square foot of retail space remained relatively constant from February 1990 through January 1995; (2) approximately one-fourth of the $1.6 million nonoperating loss for the year ending February 1, 1992 related to the closing of unprofitable stores and associated consolidation of operations, and gains and losses related to the disposition of assets associated with these stores; (3) the unprofitable stores in (2) do not represent a complete and separate line of business;[7] and (4) the extraordinary gain for the same period arose primarily because of debt prepayments.

The Macy's acquisition in December 1994 and the increased use of markdowns in fiscal 1994 caused a significant increase in sales from 1/29/94 to 1/28/95. Macy's reported net sales of $5,994 million for fiscal 1994. Of this amount, $608 million occurred after the acquisition and are included in Federated's sales for 1994. In addition, the sales "increase [of fiscal year 1994] reflects the impact of higher levels of markdowns taken to offer more value to customers consistent with the competitive environment and to keep in-store inventories fresh and fashion-current" (Federated's 10-K dated April 20, 1995).

REQUIRED

Given the selected financial and other information provided, prepare a memo with supporting documentation identifying the estimated equity value of the firm at January 28, 1995. As part of your analysis, answer the questions submitted by the judge below and provide explanations for your answers. These questions consider important factors in valuation.

Basic Valuation Concepts and Considerations

1. Explain to the court the difference between the "market" and "intrinsic" value of a firm. What factors determine intrinsic value?
2. Is the stock market price on January 28, 1995 a good measure of Federated's equity value?
3. Is it appropriate to use "book value of total shareholders' equity" to determine firm value? Identify the components of Federated's "book value of total shareholders' equity" as of January 28, 1995, and, given the earnings forecasts at the end of 1995, estimate Federated's shareholders' equity at January 30, 1999. (Hint: To estimate Federated's shareholders' equity at January 30, 1999, you need to take into account Federated's expected capital contributions and dividend payout schedule).
4. Is it appropriate to use Federated's 1995 par value to value the company?

[7] Per APB No. 30, in order for the disposal of assets to be classified as "discontinued operations," the assets must be clearly distinguishable from the other assets and operations of the firm. The disposal of a separate line of business would qualify as "discontinued operations."

Inputs to Advanced Valuation Techniques

5. What are the criteria for an item to qualify as either an "Extraordinary Item" or as a part of "Discontinued Operations"? Why are "Extraordinary Items" and "Discontinued Operations" placed below "Income from Continuing Operations" on the Income Statement? Why are the costs related to the closing of facilities for Federated in 1992 *not* treated as a part of "Discontinued Operations"? For valuation purposes, will "Extraordinary Items" and "Discontinued Operations" be treated as a lump sum or as an annuity? (Hint: Intermediate accounting textbooks identify the criteria needed for an item to qualify as an "Extraordinary Item" or as "Discontinued Operations." The discussion from the 10-K reports addresses the issue of the nature of the 1992 facility closings.)
6. "Cash Flows from Operating Activities" have decreased significantly from the year ending February 1, 1992 to the year ending January 28, 1995. What are the possible causes of this decrease? (Hint: Introductory and intermediate accounting textbooks describe the items in "Cash Flows from Operating Activities" using the "indirect method." Identify the likely components of Federated's "Cash Flows from Operating Activities" and then identify the item that is most likely causing the decrease in "Cash Flows from Operating Activities.")
7. "Cash Flows from Investing Activities" have decreased from a net inflow for the year ending February 3, 1990 to a net outflow for the year ending January 28, 1995. What types of activities are included in this section of the Cash Flow Statement? Would a "normal" use of cash from investing activities be considered a value-increasing or value-decreasing activity? (Hint: Introductory and intermediate accounting textbooks describe the items in "Cash Flows from Investing Activities." See Penman [2000, particularly Chapter 4] for a discussion of those issues.)
8. What is "free cash flow"? Is it a good measure of value created? (Hint: Penman [2000, Chapter 4] discusses this issue.)
9. What is the weighted average cost of capital (WACC)? Discuss how to calculate the WACC. Discuss the estimation process of the after-tax cost of debt. Discuss the cost of equity that is obtained by using the capital asset pricing model (CAPM). Discuss a reasonable approach that can be used to determine the proportion of the market value of equity to the market value of the firm to be used in determining the weights needed for the WACC calculation. Estimate the WACC for Federated as of January 28, 1995, assuming that, for the ideal capital structure of the industry, the proportion of the market value of debt to total firm value is 55 percent, the after-tax cost of debt for Federated is 5.5 percent, and the cost of equity (obtained from the CAPM) is 14 percent.
10. What is "economic goodwill" and why does it arise? What are the factors that may create economic goodwill? (Hint: See Student Handout 1 for a brief description of economic goodwill.)

Advanced Valuation Techniques

11. Complete Exhibit 5 regarding Federated's intrinsic value per share as of January 28, 1995 using (a) the "free cash flow" model, and (b) the "Residual

Income model." For each of these models, assume that "free cash flows" and "residual earnings" following the forecast horizon will variously be (i) zero, (ii) a perpetuity equal to the "free cash flow" and "residual earnings" forecasted for the period ending 1/30/99, and (iii) a growing perpetuity where the annual growth in "free cash flow" and "residual earnings" is equal to 3 percent. Assume that the market value of debt as of January 28, 1995 is $7,176 million. For each model and for each assumption regarding the pattern of cash flows and residual earnings (i, ii, iii), assume that the discount rate is variously 5 percent, 10 percent, and 15 percent. What roles do assumptions (i), (ii), and (iii) and the discount rate play in the valuation process? What is the market's estimated discount rate given the price of the firm on January 28, 1995?

In preparing for this case, you may want to reference Student Handout 1 ("Definitions") and the texts listed in Student Handout 2 ("Annotated Bibliography").

EXHIBIT 5
Intrinsic Value Per Share Using the:

	"Free Cash Flow" Model			**"Residual Income" Model**		
Discount Rate	(i)	(ii)	(iii)	(i)	(ii)	(iii)
5%						
10%						
15%						

EXHIBIT 6
Recommended Readings

Bounds, W. 1998. Why a former CEO says Federated still owes him $47 million. *Wall Street Journal* (April 20): A1.

Penman, S. H. 2000. *Financial Statement Analysis and Security Valuation*. New York, NY: McGraw-Hill.

STUDENT HANDOUT 1
DEFINITIONS

Terminal Value: The terminal value represents the estimated value at period T.

Continuing Value: The continuing value represents the estimated value beyond the forecast. For example, assume analysts forecast "free cash flows" of $2 for each of the next three periods. We then assume the firm will recognize a perpetuity of $3 a year, beginning in year four. The present value of the $3 perpetuity is the continuing value.

Economic Goodwill: Economic goodwill is the difference between the book value of equity (i.e., the accountants' measure of firm value) and the market value of the company's stock. This difference can occur because of (1) recording lags in accounting measurement, or (2) the degree of permanence in earnings. (See Easton et al. [2000] for further discussion.)

Weighted Average Cost of Capital (*WACC*): The weighted average cost of capital (WACC) is an estimate of the after-tax cost of capital. The WACC is weighted by the relative target amounts of long-term debt and equity of the firm and thus includes the after-tax cost of long-term debt (i.e., the net after-tax interest cost) as well as the cost of equity capital (common, preferred, and retained earnings). The WACC provides the discount rate used in the free cash flow valuation model.

Free Cash Flow (*FCF*): "Free cash flow" is the amount of cash remaining from operations after cash is used for new investments. It is the cash theoretically available to pay bondholders and shareholders. It is calculated as the sum of "net cash provided from operating activities," after adding back after-tax net interest payments, less (plus) "cash used for (generated from) investing activities." The resulting amount is the cash available to pay bondholders or shareholders, i.e., "free cash flow."

Residual Income: "Residual Income" is the earnings above "normal earnings." "Normal earnings" are the required earnings expected by investors, given the cost of capital, and is calculated by multiplying the beginning-of-the-period book value of equity (B_{t-1}) by the firm's cost of capital (r). Mathematically, residual income for period t is ($feps_t - rB_{t-1}$) where $feps_t$ is forecasted earnings for period t. Residual earnings are also called "abnormal earnings."

Residual Income Model: The "Residual Income" (RI) model is a valuation tool that is derived directly from the discounted dividend model. The RI model estimates intrinsic value by looking at both "stocks" (balance sheet equity amounts) and "flows" (earnings). The RI model estimates a firm's total equity value as a function of the book value of common equity and the present value of residual income. The mathematical relationship between per-share forecasted earnings, share price, and book value is: $P_0 = B_0 + \sum[(1 + r)^{-t} (feps_t - rB_{t-1})]$, where P_0 and B_0 represents today's price per share and book value per share of equity, respectively. Cost of capital is defined as r and forecasted earnings per share as "feps."

Price-to-Book Ratio: The price-to-book ratio is the market value of equity divided by the book value of equity. Only when the sum of forecasted residual earnings equals 0 will the firm sell at the book value of equity. However, this is not a common occurrence. Financial accounting rules determine when an economic event affects the firm's book value and this recording often differs from investors' reactions to the economic event. Therefore, accounting rules usually cause the price-to-book (PB) ratio to deviate from a "normal" PB ratio of 1.

A PB ratio greater than 1 implies that return on equity will exceed the cost of capital (future residual income is positive). However, a PB ratio greater than 1 does not necessarily mean that a firm is investing in positive net present value (NPV) projects, just as a PB ratio equal to 1 does not necessarily mean that the firm is investing in zero NPV projects. For example, a conservative recording of revenues can cause a PB ratio greater than 1 (positive residual income) even when the firm is only investing in zero NPV projects. Similarly, an aggressive recording of revenues can cause a PB ratio equal to 1 even when the firm is investing in positive NPV projects. In other words, a high PB ratio can occur via an aggressive recording of expenses and may not be related to an investment in positive NPV projects. See Ohlson (2000) for a complete discussion of positive residual income and positive (zero) NPV projects. Thus, positive residual earnings do not necessarily imply an increase in shareholder wealth, but rather the existence of a conservative accounting system. For an example of how residual earnings are created from conservative accounting, see Penman (2000, 562–566) and Ohlson (2000).

REFERENCES TO STUDENT HANDOUT 1

Easton, P., P. Shroff, and G. Taylor. 2000. Permanent and transitory earnings, accounting recording lag, and the earnings coefficient. *Review of Accounting Studies* (December): 281–300.

Ohlson, J. A. 2000. Positive (zero) NPV projects and the behavior of residual earnings. Working paper, New York University.

STUDENT HANDOUT 2
ANNOTATED BIBLIOGRAPHY

The books below are suggested as references for use with equity valuation cases.

1. Copeland T., T. Koller, and J. Murria. 2000. *Valuation: Measuring and Managing the Value of Companies*. New York, NY: John Wiley & Sons.

   This book describes discounted free cash flows as a means of firm equity valuation.

2. Diamond, M., E. Stice, and J. Stice. 1999. *Financial Accounting: Reporting and Analysis*. 5th edition. Cincinnati, OH: South-Western College Publishing Company.

   The discounted dividend and free cash flow models are covered in Chapter 14.

3. Ehrbar, A. 1998. *EVA®: The Real Key to Creating Wealth*. New York, NY: John Wiley.

   This book is nontechnical and explains the "Economic Value Added" (EVA®) model in the first few chapters. There are several examples for students to work through.

4. Hawkins, D. 1986. *Corporate Financial Reporting and Analysis*. 3rd edition. Homewood, IL: Irwin.

   Chapter 8 contains a discussion of the discounted dividend and free cash flow valuation models.

5. Kasper, L. 1997. *Business Valuation: Advanced Topics*. Westport, CT: Quorum Books.

   Part 4 presents a mathematical specification of the discounted dividend and free cash flow valuation models. Part 5 discusses the evaluation of unusual items such as extraordinary items and discontinued operations.

6. Link, A., and M. Boger. 1999. *The Art and Science of Business Valuation*. Westport, CT: Quorum Books.

   This is a practitioner-oriented book that covers the discount and capitalization rates and the residual income model. There is no discussion of the free cash flow model.

7. Palepu, K., P. Healy, and V. Bernard. 2000. *Business Analysis and Valuation: Using Financial Statements*. 2nd edition. Cincinnati, OH: South-Western College Publishing Company.

   The free cash flow model, weighted average cost of capital, and the residual income model are discussed in Chapters 9, 11, and 12.

8. Penman, S. H. 2000. *Financial Statement Analysis and Security Valuation*. New York, NY: McGraw-Hill.

   This book is about fundamental analysis and, specifically, the residual income model.

9. Pratt, S., R. Reilly, and R. Schweihs. 2000. *Valuing a Business*. 4th edition. Chicago, IL: Irwin.

   This text provides a useful overview of the free cash flow valuation model.

10. Rappaport, A. 2000. *Creating Shareholder Value.* New York, NY: The Free Press.

Chapters 2 and 3 deal with many of the issues developed in this case. Included are the shortcomings of traditional accounting measurements, such as cash flow from operations and free cash flow. The book also provides an in-depth analysis of the cost of capital and residual value issues. It also discusses issues regarding terminal value beyond the forecast horizon.

11. Revsine, L., D. Collins, and W. Johnson. 2000. *Financial Reporting and Analysis*. Upper Saddle River, NJ: Prentice Hall.

The discounted dividend and residual income model are covered in Chapter 5.

12. Stewart III, G. B. 1991. *The Quest for Value.* New York, NY: Harper Business.

This book examines the economic value added (EVA®) model, which is a variation of the residual income (RI) model.

13. White, G., A. Sondhi, and D. Fried. 1997. *The Analysis and Use of Financial Statements*. New York, NY: John Wiley & Sons, Inc.

Chapter 15 presents the free cash flow model and a valuation model utilizing net income (not the RI model) and compares these valuation approaches.

STUDENT HANDOUT 3
MODEL DERIVATIONS

Part I: Calculating the Present Value of a Perpetuity and a Growing Perpetuity[1]

The present value of any investment is equal to the discounted cash flows of the investment. The present value of $1 to be received one year from now is 1/(1 + r) where r is the interest discount rate (cost of capital). The present value of $1 to be received two years from now is $1/(1 + r)^2$. Let PV represent the present value of the investment[2] and C the cash flows of the investment. Then, based on the above logic, the present value of an investment (PV) is defined as:

$$PV = \frac{C_1}{(1+r)} + \frac{C_2}{(1+r)^2} + \frac{C_3}{(1+r)^3} + \frac{C_4}{(1+r)^4} + \ldots \quad (1)$$

A *perpetuity* is a neverending stream of constant cash flows discounted at the same interest rate. To find the present value of a perpetuity, where the constant cash flow per period is equal to C, let a = C/(1 + r) and y = 1/(1 + r). The sum of such a constant, infinite geometric series is "a/(1 – y)." We can derive this equation using elementary algebra. Substituting a and y into equation (1) gives us:

$$PV = a(1 + y + y^2 + y^3 + y^4 + \ldots) \quad (2)$$

Now multiply both sides of equation (2) by y. Subtracting this product from equation (2) yields:

$$PV(1 - y) = a \tag{3}$$

Thus:

$$PV = \frac{a}{1 - y} \tag{4}$$

Substituting for a and y results in the present value of a perpetuity for a given constant cash flow, C, and discount rate, r:

$$PV[1 - \frac{1}{(1 + r)}] = \frac{C}{(1 + r)} \tag{5}$$

Rearranging terms yields:

$$PV = \frac{C}{r} \tag{6}$$

Thus, the present value of a perpetuity is simply the annuity amount divided by the discount rate. A *growing perpetuity* is very similar to a perpetuity except that we assume that the cash flows grow at some constant (annual) rate, g. Letting the cash flows grow by a rate of g changes equation (1) as follows:

$$PV = \frac{C}{(1 + r)} + \frac{C(1 + g)}{(1 + r)^2} + \frac{C(1 + g)^2}{(1 + r)^3} + \frac{C(1 + g)^3}{(1 + r)^4} + \ldots \tag{7}$$

From equation (4), we know that the sum of a perpetuity is a/(1 – y). Therefore let a = C/(1 + r) and y = (1 + g)/(1 + r). Substituting into equation (7) yields:

$$PV = \frac{\frac{C}{(1 + r)}}{1 - \frac{(1 + g)}{(1 + r)}} \tag{8}$$

Rearranging terms yields the present value of a growing perpetuity:

$$PV = \frac{C}{(r - g)} \tag{9}$$

Thus, a perpetual annuity that increases at a constant rate is valued by dividing the annuity amount by the discount rate less the growth rate.

Part II: Derivation of Discounted Dividend and Free Cash Flow Models

The FCF model is derived from the discounted dividend model, which states that firm common equity value is equal to the present value of future dividends:

$$V_o^E = \sum_{t=1}^{\infty} (1+r)^{-t} D_t \tag{10}$$

where:

V_0^E = intrinsic value of equity,
D = dividends.

"Free cash flow" can be defined as net payments to shareholders and debtholders. Thus the value of the firm (VF) can be defined as:

$$V_0^F = \sum_{t=1}^{\infty} (1+r)^{-t} FCF_t \tag{11}$$

where:

V_0^F = value of the firm,
FCF = free cash flows.

Subtracting the market value of debt from equation (11) derives the value of equity from the FCF model:

$$V_0^E = V_0^F - V_0^D \tag{12}$$

where:

V_0^D = market value of firm debt.

Part III: Derivation of Residual Income Model[3]

Total firm equity value today, V_0^E, is equal to the present value of next year's dividends (D_1) and the intrinsic value at the end of next year, V_1^E:

$$V_0^E = \frac{D_1 + V_1^E}{(1+r)} \tag{13}$$

"Clean surplus"[4] accounting states:

$$BV_t = BV_{t-1} + X_t - D_t \tag{14}$$

where:

BV = book value of equity,
X = earnings,
D = dividends.[5]

Substituting equation (14) into equation (13) yields:

$$V_0^E = \frac{X_1 + BV_0 - BV_1 + V_1^E}{(1 + r)} \tag{15}$$

Adding and subtracting r^*BV_0 to the right-hand side of equation (15) yields:

$$V_0^E = \frac{[X_1 - rBV_0] + rBV_0 + BV_0 - BV_1 + V_1^E}{(1 + r)} \tag{16}$$

Rearranging terms yields:

$$V_0^E = BV_0 + \frac{[X_1 - rBV_0] - BV_1 + V_1^E}{(1 + r)} \tag{17}$$

However, V_1^E is still in equation (17). At time 0, we do not know the intrinsic value at time 1. Therefore, we must arrive at a solution that does not include a future intrinsic value. We can define V_1^E as:

$$V_1^E = \frac{X_2 + BV_1 - BV_2 + V_2^E}{(1 + r)} \tag{18}$$

Adding and subtracting r^*BV_1 to the right-hand side of equation (18) and rearranging terms (similar to equation (16) and then substituting the rearranged equation into (17)) yields:

$$V_0^E = BV_0 + \frac{X_1 - rBV_0}{(1 + r)} + \frac{X_2 - rBV_1 + V_2^E}{(1 + r)^2} \tag{19}$$

However, a future intrinsic value, V_2^E, is still in equation (19). Defining V_2^E as:

$$V_2^E = \frac{X_3 + BV_2 - BV_3 + V_3^E}{(1 + r)} \tag{20}$$

Substituting V_2^E into equation (19), adding and subtracting r^*BV_2, rearranging terms similar to equations (15)–(19) yields:

$$V_0^E = BV_0 + \frac{X_1 - rBV_0}{(1 + r)} + \frac{X_2 - rBV_1}{(1 + r)^2} + \frac{V_3^E - BV_3}{(1 + r)^3} \tag{21}$$

Continuing this process yields the residual income (RI) model:

$$V_0^E = BV_0 + \sum_{t=1}^{\infty} \frac{X_t - rBV_{t-1}}{(1 + r)^t} \tag{22}$$

where the term $X_t - (r^*BV_{t-1})$ represents "residual income" for period t.

Notes to Student Handout 3

(1) Brealy, R., and S. Myers. 1991. *Principles of Corporate Finance*. New York, NY: The McGraw-Hill Companies.
(2) The present value of an investment is the sum of all expected future payoffs from the investment that are discounted to the present at an appropriate discount rate. Net present value is the present value of the investment less the present value of the cost of the investment.
(3) This derivation of the Residual Income Model relies heavily on class notes from Peter Easton's (1997) AMIS 828, *Financial Information and Valuation*. The Ohio State University.
(4) "Clean-surplus" accounting is defined as an equity statement that has no income other than net income. In other words, "clean surplus" accounting does not include any unrealized gains or losses that appear in the "accumulated other comprehensive income" section of owners' equity.
(5) In this model, dividends include dividend payments, share repurchases, and capital contributions. Dividend and share repurchases decrease the book value of equity, while capital contributions increase the book value of equity.

TEACHING NOTES

Overview

This case bridges a gap between material found in financial accounting textbooks and a decade of accounting firm valuation research using the residual income (RI) model. The case compares the RI model to the better known free cash flow (FCF) model predominantly used in finance classes. This case is intended for use in graduate accounting and finance courses. As Lee (1999) pointed out, though the RI model was a dominant paradigm in the financial accounting literature during the 1990s, many textbooks failed to include this development. For additional background on the RI model, its relationship with the FCF model, and its impact on the valuation research paradigm, see Lee (1999) and Penman (2000).

Interestingly, practice has seized on the valuation work of accounting academic researchers, and RI modeling has become an increasingly important tool. For example, valuation services have emerged as a specialty in the CPA profession with each of the Big 5 accounting firms providing valuation services (for example see the Ernst & Young web site: http://www.ey.com/global/gcr.nsf/US/Services~Valuation_Services-_-Corporate_Finance_-_Ernst_&_Young_LLP). In addition, accountants can become accredited in business valuation from the National Association of Certified Valuation Analysts (http://www.nacva.com).

Suggestions for Implementation

This case has been used in master's level finance and an executive M.B.A. accounting course. The following suggestions are based on our experiences with this case. The valuation models and case can be covered in two class sessions. In the first, we distribute the case and introduce the valuation models. We require the case to be completed prior to the second class session. The students' knowledge about the respective valuation models will determine the amount of in-class time required for introduction of the models. For example, students with extensive finance backgrounds require less discussion about the discounted dividend and FCF models.

We introduce the valuation models with Student Handout 3. Part I reviews present value calculations. Part II derives the discounted dividend model and the FCF model. Part III derives the RI model from the discounted dividend model. As the models are being introduced, class discussion focuses on the inputs to each model and the strengths and weaknesses of each model.[8]

One advantage to the discounted dividend model is that, because shareholders will ultimately receive dividends, this cash flow is what the model uses to value the owners' investment. However, since dividends are not related to value creation, forecasting dividends may be difficult. For example, many growth firms will pay zero dividends into the foreseeable future. In this case, the discounted dividend model requires forecasting the timing and amount of future dividends beyond the forecast horizon. This then requires an estimation of the firm's terminal value. Estimating the terminal value, however, is no easier than estimating the current intrinsic value.

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[8] See Penman (2000) for a thorough discussion of the strengths and weaknesses of each model.

This forecast problem exists even when the firm is currently paying dividends. It is heroic to assume that the firm will maintain its current dividend payout schedule through infinity. One suggestion around this problem is to estimate the terminal value using a growing perpetuity (see Student Handout 3). However, this is problematic in that the question arises: what is a reasonable dividend growth factor?

To summarize, problems with implementing the discounted dividend model arise because dividends are a financing activity, which is not associated with the creation of value. Different companies can adopt different dividend policies that are not related to value creation. Therefore, estimates of intrinsic value require forecasts of dividends through infinity. Forecasts, however, are generally for finite time periods, rarely exceeding five years. See Penman (2000) for a detailed discussion concerning the difficulties associated with the discounted dividend model.

For those firms whose free cash flows have reached a steady state, the FCF model can be used to estimate intrinsic value. For these firms, the continuing value can be reasonably estimated. However, the FCF model does not do well when the firm's "free cash flows" have not reached a steady state. FCF does not measure the value created from operations because investing activities decrease "free cash flows." Thus, the longer the firm invests, the longer the forecasting horizon must be to identify the cash inflows generated from these investments. Therefore, for those firms whose "free cash flows" have not reached a steady state, the FCF model also has a forecast horizon problem. For example, the FCF model has difficulty in estimating intrinsic value for firms whose forecasts predict negative "free cash flows" into the foreseeable future. Penman (2000) notes that, from 1963–1996, negative free cash flows occurred in over 40 percent of the firm year observations. See Penman (2000) for further discussion on the FCF model.

One of the direct benefits of the RI model is that, contrary to the "discounted dividend" and "free cash flow" models, the RI model uses data (earnings forecasts) regularly provided by analysts. Another benefit of the RI model is that it is based on accrual accounting net income, which attempts to measure the economic value created by the firm (net income) during a period. Using a valuation model whose inputs focus on value creation, as accrual accounting attempts to do, is in contrast to the discounted dividend model whose inputs focus on *financing* activities and the FCF model whose inputs focuses on operating and *investing* activities.

While similar to the FCF model in that the RI model still requires the calculation of a continuing value, the RI model is anchored by the book value of common equity. Therefore, for most firms, the continuing value amount is not as important to the intrinsic value calculation as it is for the FCF model.

Student Handout 3 shows that the FCF and RI models are derived from the discounted dividend model. If the forecast horizon is sufficiently long, then all three models will yield the same estimate of intrinsic value. However, analysts' forecasts are generally for finite periods (generally not longer than five years), which are not long enough to overcome the forecast horizon problems discussed above. Therefore, in practice, the three models will generally not generate the same intrinsic values. Since the continuing value from the RI model is generally a smaller part of firm value, the RI model produces a more accurate estimate of the current security price since less weight is given to forecasted data.

Overview of Case Questions

The first four case questions introduce students to basic valuation concepts. In these questions, students evaluate "below the line items" of the income statement and the components of shareholders' equity. They are asked to describe how these items relate to firm value. The next group of questions introduces students to needed inputs for the valuation models.

The final question requires students to compare the valuations of the RI and discounted FCF models. For both models, students estimate the stock price given the cost of capital and estimate the cost of capital given the stock price. In estimating the stock price, students consider three different scenarios where: (1) FCF and RI equal zero beyond the forecast horizon, (2) FCF and RI are constant perpetuities beyond the forecast horizon, and (3) FCF and RI are growing perpetuities beyond the forecast horizon. In addition, students prepare valuation estimates for three different costs of capital, illustrating that an increasing cost of capital decreases intrinsic value.

The primary purpose of this case is to introduce students to relative strengths and weaknesses of the FCF and RI models. Specifically, questions go to the core of why financial accounting information can be used for valuation purposes. For example, it enables students to see why the financial press focuses on accounting earnings rather than cash flows.

The case provides information to students in order to minimize confusion about data to be used in the analysis, obtained from financial statements and 10-K reports. Forecast data are actual results for Federated from 2/3/96 through 1/30/99. To simplify the analysis, we have assumed that the number of shares outstanding remained constant from 1992 through 1999. Price per share has been adjusted accordingly.

SUGGESTED ANSWERS

Question #1

Students generally understand the market value of the firm. Class discussion should focus on the difference between market value and intrinsic value. Students rely generally on the market efficiency arguments and argue equality between the firm's market and intrinsic value. The instructor can generate discussion by referring the students to Questrom's arguments concerning firm value detailed in the case. The discussion of this question leads directly into Question 2.

The *market value* represents the firm's stock price at a given point multiplied by the number of shares outstanding. The *intrinsic value* of the firm is the present value of the forecasted payoffs of income, cash flow, or other economic variables to the stockholder; thus, the intrinsic value represents the value implied by available information. The intrinsic value is the theoretical value of the firm based on any one of a variety of valuation methods such as free cash flow, residual income, or dividend discount. Consequently, wide variation can exist in estimates of a firm's intrinsic value.

During the 1980s, a significant amount of research suggested that financial markets are informationally efficient. However, in recent years, research has revealed many market imperfections. Size and seasonality effects temper the assumption that stocks are fairly priced at any given time. In addition, Wall Street spends a considerable amount of time and money on identifying "mispriced stocks,"

where market price differs from the intrinsic value estimated by an analyst. Thus, an important role of financial statement analysis is to use economic information to estimate intrinsic value. Subsequent questions ask students to use the FCF and RI valuation models to value Federated. Discussion about the strengths and weaknesses of each of these models for estimating intrinsic value is an important dimension to the case. This is done via the class discussion of Question 11.

Question #2

Stock price may or may not be a good indication of value. To stimulate interest about this issue, it is suggested that students read the article by Shleifer and Malkiel (2000) prior to class. Students can debate the pros and cons whether the stock price is a good valuation tool.

On the pro side, buyers and sellers in a competitive market set the stock price. In theory, investors use known information about a company to predict future earnings and cash flows, which are rapidly impounded in the current price of the security. Basically, investors can earn above-average returns only by taking above-average risks (Shleifer and Malkiel 2000).

On the con side, the stock price on a particular day derives from the trading of a relatively few shares of stock, not the entire company. Furthermore, stock price is notoriously volatile, influenced by a market that has been known, for example, to plummet 25 percent in one day (October 1987). There are numerous examples of stock prices that fall or rise over 30 percent on a given day. Thus, it may not be correct to infer the value of a company as a whole from the price of a marginal number of shares traded on a single day, given the short-term swings in the prices of stocks.

For example, Shleifer and Malkiel (2000) point to the irrational relationship between the stock price of Royal Dutch and Shell as an example arguing against the efficient-market hypothesis. Royal Dutch and Shell are independent entities that have agreed to split profits on a 60–40 basis. Based on this relationship, the market value of Royal Dutch should equal 1.5 times the market value of Shell. Shleifer and Malkiel (2000) present a chart showing that, during the 1990s, Royal Dutch was rarely equal to 1.5 times the market value of Shell.

Question #3

The purpose of this question is to ensure that students understand the components of shareholders' equity and how the financial statements articulate. Students having difficulty with this question will also have difficulty calculating residual income in Question 11 because beginning-of-the-year equity must be calculated for each year.

Students should present their schedules of total shareholders' equity. Retained earnings is found by subtracting par value and additional paid-in capital from total shareholders' equity, as follows:

Shareholders' equity as of January 28, 1995 (in millions):	
Par value of stock ($0.01/share times 182.60 million shares)	$ 1.8
Additional Paid-in Capital (Exhibit 4, line 1):	2,098.0
Retained Earnings (plug figure):	1,539.2
Total Shareholders' Equity (Exhibit 4, line 2):	$3,639.0

Additional paid-in capital represents the excess of the original selling price of the stock over its par value. Students should remember that additional paid-in capital does not represent profit for a firm, but rather an investment by owners, and that retained earnings represent past earnings that were reinvested in the firm. At January 28, 1995, 58 percent [(1.8 + 2,098)/3,639)] of the equity came directly from shareholders, while 42 percent (1,539.2/3,639) was from reinvested profits. As noted in the case, Federated has not paid any dividends.

The book value of shareholders' equity is not a good estimate of Federated's value as of January 28, 1995. GAAP accounting is, for the most part, based on historical cost rather than fair market value accounting. Theoretically, the book value of equity should equal the market value of equity when all assets and liabilities are carried at fair value (marked-to-market accounting). The only times equality is necessarily realized, however, are at the firm's inception and at liquidation, when all assets have been converted into cash.

Because of historical cost accounting rules, "economic earnings" occurring in a given period may not be recorded in the accounting system until future periods. At this point we introduce students to the accounting recognition lag issue. As discussed in Easton et al. (1992), accounting recognition lags have two effects: (1) value-relevant events captured in stock price in a current period may not be reported in accounting earnings of the current period, and (2) value-relevant events captured in stock price in a prior period may be included in accounting earnings of the current period. The following is an example of accounting lag (1): Federated may sign a new contract with a major vendor that will result in significant cost savings and increase future earnings. Once this information becomes public knowledge, estimates of future economic income will likely be impounded into the firm's stock price. However, the accounting system will not recognize these earnings until they manifest themselves as lower cost of goods sold in future periods. An example of accounting lag (2) is the recording of the revenues and expenses in the current period that the market has recognized in a previous period. Given Federated's recent history, especially its emergence from bankruptcy, the company is likely to exhibit economic earnings that have not yet been recognized by its accounting system.

Based on information provided, net income is the only item that will affect shareholders' equity, because no capital transactions (dividends, capital contributions, or share repurchases) are expected. Dividend payments (capital contributions) would decrease (increase) ending shareholders' equity. Accordingly, projected shareholders' equity on January 30, 1999 can be calculated from Exhibit 4 as follows (in millions):

Beginning Shareholders' Equity (1/28/95)	$3,639
Forecasted 1996 Net Income	75
Forecasted 1997 Net Income	266
Forecasted 1998 Net Income	536
Forecasted 1999 Net Income	662
Projected Shareholders' Equity (1/30/99)	$5,178

As mentioned before, those students having difficulty calculating shareholders' equity as of January 30, 1999 will have difficulty calculating residual earnings in Question 11.

Question #4

Accounting students seem to have no problem differentiating between the par and market value of stock. Most students understand that par value of stock does not indicate the firm's market or intrinsic value. The par value specified in incorporation documents is usually an arbitrary and small amount. Students may not realize that, because some states (such as Alabama) tax the corporation based on its par value, par value often is unrealistically small. In some states, par value represents the amount below which shareholders' equity cannot be reduced from dividend payments or treasury stock purchases. For a more thorough discussion on allowable dividend payments across different states see Bline and Chapman (1995).

Question #5

Most students will identify the criteria for an item to be classified as an extraordinary item or as discontinued operations. The instructor should lead the discussion beyond the accounting treatment of this issue to its importance in valuation. The distinction between recurring or nonrecurring items is important for valuation purposes. A recurring item should be treated as a perpetuity, while a nonrecurring item should be treated as a one-time gain or loss. This distinction can have a dramatic impact on the intrinsic value of a company. Extraordinary items and discontinued operations are generally nonrecurring items, and theoretically the stock price effect on nonrecurring items should be lower than the effect for recurring items.

Per APB Opinion No. 30, an extraordinary item is an event or transaction that is both unusual in nature and infrequent in occurrence for a particular company. If an event or transaction meets one, but not both, of the criteria, then the transaction is treated as part of continuing operations. APB Opinion No. 30 also states that for an asset disposal to be treated as discontinued operations, the asset and associated operating results must be clearly separate from the firm's remaining assets.

The financial impact of shutting down or selling a division can be treated as a "discontinued operation" on the income statement only when the unit represents a major line of business or class of customers. Per the information in Federated's Management Discussion and Analysis, given in the student handout, $400,000 of the nonoperating loss in 1992 ($1.6 million Other Gains/(Losses) multiplied by 25 percent) relates primarily to restructuring costs from the closing of facilities, consolidation of operations, and gains and losses related to the disposition of related assets. Per APB No. 30, this loss is not treated as "Discontinued Operations" because the company is closing specific facilities, not a complete business segment. A large department store chain can be expected to close or move a few stores regularly.

Extraordinary items are classified below "Income from Continuing Operations" because they are not considered a part of continuing operations. The APB decided that a company should separate continuous operations from one-time items to enhance the usefulness of financial statements. Today, however, many "Extraordinary Items" result from *financing transactions*, as prescribed by the FASB. For example, one of the items most commonly reported as an extraordinary item is the early extinguishment of debt. While this does not fit the criteria for an

extraordinary item, the FASB requires it to be reported as an extraordinary item to attract the attention of outside investors. For some companies, these transactions are recurring. Analysts must determine if the items are recurring or nonrecurring gains and losses. If recurring, then the estimated recurring gains or losses should be included in the forecasts of future results.

Because, in general, firms are not in the business of bond arbitrage, they cannot create value by engaging in financing activities. However, as mentioned in Penman (2000), firms can transfer wealth from bondholders to shareholders via early extinguishment of debt. For example, the firm can issue debt and invest in risky projects that increase the required return on debt. The firm can then redeem the debt now selling at a discount. This gain reflects the wealth that has been shifted from debt-holders to shareholders.

Question #6

Students should easily identify the components of "Cash Flow from Operating Activities." From the income statement, students recognize that, in the case of Federated, a significant portion of the decline in "Cash Flow from Operating Activities" is related to the $648 million decrease in net income earned over this period. The discussion of this question should emphasize that "Cash Flow from Operating Activities" is calculated by adjusting net income for changes in current assets and current liabilities, and for noncash expenses. Net income includes accruals in addition to cash collections and payments. In other words, "Cash Flow from Operating Activities" represents the net cash generated from net income. Students do not generally realize that the large increase in current assets in the year ending January 28, 1995, which was not matched by a corresponding increase in current liabilities, accounts for some of the decline in operating cash flow in the last year. Given the increase in sales detailed in the case, the increase in current assets probably results primarily from inventory and accounts receivable.

Question #7

This question asks the students to identify the components of "Cash Flows from Investing Activities." The instructor should move quickly from this discussion to how investing activities affect firm value. Specifically, are investing activities generally considered a value increasing or value decreasing activity? This concept of investing activities and whether they are value increasing or value decreasing activities is important in Question 8.

The investing activities undertaken by Federated resulted in the negative "Cash Flows from Investing Activities." These activities involved opening new stores, remodeling old stores, and the acquisition (in December 1994) of R. H. Macy. Such investments in property, plant, and equipment represent expenditures of cash and, thus, an outflow of "Cash from Investing Activities." However, buying property, plant, and equipment to support future sales and production activities helps create value. A business should make such expenditures only if there is confidence that they will result in higher sales or cost savings.

Investing activities typically result in cash outflows. Only when a business is downsizing will there be a net investing inflow. The free cash flow model treats investing activities as a reduction in the intrinsic value of a firm even though one would logically think of investing activities as a value-enhancing activity.

Question #8

The purpose of this question is to discuss the inputs of the FCF model. Students are introduced to free cash flows in Student Handout 1. If students have difficulty with this question, then the instructor should refer them to the references in Student Handout 2. FCF is defined here as the sum of cash flow from operating activities (OP), after-tax interest payments (IP), and cash flow from investing activities (INV). Some firms (as demonstrated, for example, by the Black Box Corporation [2000] Annual Report) include other items of comprehensive income (such as the impact of foreign currency translation) in their calculation of free cash flow. FCF is used for valuation purposes because the difference between cash flow from operations and cash investment in operations represents the cash that is left over and therefore available for payment of principal to debtholders or stockholders.

However, FCF is not a true measure of value created, as evidenced by the FCF calculation: FCF = OP + IP + INV. As discussed in Question 7, cash outflows for investing activities reduce FCF. However, as long as the company is not investing in negative NPV projects, investing activities should increase firm value. Problems with the FCF model are evident for firms whose FCFs have not reached a steady state. For these firms, it is difficult to predict the timing of future investing activities, making it difficult to predict expected future free cash flows. If these firms are successful, they will ultimately incur positive free cash flows, but only in the future, when returns from their investment are realized.

Wal-Mart illustrates the problems associated with using the FCF model to estimate the intrinsic value of a firm whose FCFs have not reached a steady state. From 1988 through 1996, Wal-Mart's FCFs were positive only in 1989. The negative FCF amounts during these years were due to the large outflows of cash used to expand its retail stores; these outflows for investing activities exceeded Wal-Mart's operating cash flow. Despite its negative FCFs, Wal-Mart's price per share increased from $6.875 in 1988 to $20.375 in 1996. In addition, Wal-Mart notes in its 2000 annual report plans to expand in international markets, thereby making additional negative free cash flows likely for the foreseeable future. Yet the price per share continues to increase.

After this discussion, the instructor should note that the FCF model works well for those firms that have reached a steady state. Investing activities of these firms represent asset replacements rather than asset growth. Consequently, it is easier to predict the investing activities and free cash flows for these firms. See Penman (2000, Chapter 4) for a more detailed discussion concerning the use of the FCF valuation approach.

Question #9

Students are asked to discuss the WACC. By the end of this discussion it is important for students to realize the imperfections associated with the measures used in the WACC. Students should understand the importance of performing sensitivity analysis of their valuation estimates with respect to assumptions regarding cost of capital.

As discussed in Student Handout 1, the WACC is the expected return to investors on all of the firm's securities—both debt and equity. Since the FCF model finds the combined intrinsic value for both debt and equity holders, it is appropriate to discount the cash flows by a weighted average cost of capital, taking into

account the cost to both bondholders and shareholders. Assuming no preferred stock, the WACC can be estimated as follows:

$$WACC = [MV_D/(MV_D + MV_E)] * r_D + [MV_E/(MV_D + MV_E)] * r_{ES}$$

where:

MV_D = the market value of debt;
MV_E = the market value of equity;
r_D = the after-tax cost of debt; and
r_{ES} = the cost of common equity capital.

The cost of debt, r_D, uses the current market rate of interest, adjusted by the firm's combined federal and state income tax rate. If the interest rates have not changed much since the issuance of the firms' debt, stated interest rates may be a reasonable substitute. Alternatively, the current interest rate for corporate bonds, based on the firm's credit rating, can be used as the pretax cost of debt.

In estimating the WACC, students need to calculate the proportion of debt in the capital structure, $MV_D/(MV_D + MV_E)$. However, the purpose of the WACC is to determine a cost of capital to be used in estimating MV_E. To avoid the circular problem of the MV_E variable, the "ideal" or "target" capital structure for the firms in the industry can be used as a proxy for $MV_D/(MV_D + MV_E)$. The average capital structure for the industry can be a substitute for the ideal capital structure of the company. If the firm is publicly traded, then the ideal capital structure also can be proxied by the book value of debt and market value of equity (price per share multiplied by shares outstanding). Alternatively, if the firm is a privately owned or thinly traded firm, the book value of debt and equity can be used to estimate the "ideal" capital structure of the firm.

The capital asset pricing model (CAPM) estimates the firm's cost of equity capital. Because a significant body of literature exists about the CAPM, it will be only briefly reviewed here. The CAPM has three components (1) the riskless rate, r_f, (2) the risk premium for the entire market ($r_m - r_f$), and (3) the systematic risk of the security, β. The r_{ES} is estimated as:

$$r_{ES} = r_f + \beta(r_m - r_f).$$

In the question, we assume that r_{ES} is approximately 14 percent. r_{ES} is calculated in the following manner. The riskless rate (7.8 percent) is proxied by the 1995 yield on a ten-year Treasury Security (7.8 percent) (Ibbotson and Associates 1995). Betas can be obtained from financial services such as Bloomberg's, or they can be calculated from a database such as CRSP. Federated's five-year monthly Beta for 1998 (obtained from Bloomberg) was 0.93. We have assumed that the 1995 beta would not be significantly different from this amount. At the end of 1995, the risk premium was approximately 7 percent (Ibbotson and Associates 1995). Based on this data, the r_{ES} is approximately 14 percent [0.078 + (0.93 × 0.07)] and WACC is 9% [(0.55 × 0.055) + (0.45 × 0.14)].

Even though Federated does not have any preferred stock, a potential question that might arise is how should preferred stock be treated in the calculation. While preferred stock is included in the equity section of the balance sheet, it is treated as a financial obligation for valuation purposes. Preferred stock is a third

term on the right-hand side of the WACC equation. The cost of preferred stock can be obtained from the security rating of the firm's preferred stock. Because preferred stock is generally a small part of a firm's capital structure, it is generally either included with debt or ignored in the WACC calculation. The adjusted WACC is:

$$WACC = [MV_D/(MV_D + MV_E + MV_{PS})] * r_D + [MV_E/(MV_D + MV_E + MV_{PS})] * r_{ES} + [MV_{PS}/(MV_D + MV_E + MV_{PS})] * r_{PS}$$

where:

MV_D = the market value of debt;
MV_E = the market value of equity;
MV_{PS} = the market value of preferred stock;
r_D = the after-tax cost of debt;
r_{ES} = the cost of common equity capital; and
r_{PS} = the cost of preferred stock.

At the end of the discussion, it is important to note the number of assumptions that have been made in estimating the WACC. Among these are the cost of common equity capital and its components such as the riskless rate, beta, and the risk premium. Other assumptions made in calculating the WACC are the ideal capital structure for the industry and the after-tax cost of debt. Obviously, the WACC is only as reliable as the assumptions. For example, assuming that Federated's ideal capital structure is 70 percent (40 percent), equity yields a WACC of 8 percent (10 percent). As shown in Question 11, changes in estimates of the cost of capital can yield a wide range of estimates in intrinsic value. Therefore, students should realize that sensitivity analysis should be conducted on the valuation estimate with respect to different WACC estimates.

It is important to discuss the inputs to Federated's estimated value as of February 1990. Federated was a private firm at this time, therefore many of the firm-specific inputs to the WACC estimate were not available. For example, a firm-specific beta as of 1990 is not available. Beta can be obtained by estimating the beta for publicly traded firms that are comparable to Federated; these comparable firms can be identified by industry identification code and by a firm size variable.

Question #10

Students are introduced to "economic goodwill" in Student Handout 1. Students who have difficulty with residual income in Question 11 should be referred back to this handout. "Economic goodwill" is defined as the difference between the book and market value of equity (Ohlson 1995) and arises because of accounting recognition lag and the degree of permanence in earnings (see Easton et al. 2000).

The fact that book value is determined only by past events captured in accounting income, while market value incorporates both past and expected events, creates "economic goodwill." Timing differences between accounting income and market returns are often referred to as "accounting recognition lags." These

accounting recognition lags exist because the accounting system uses arbitrary time periods (i.e., quarters and years). As shown in Easton et al. (1992), as the time period increases from years to decades the relationship between returns and earnings increases, which decreases the effects of accounting recognition lags on economic goodwill. A definition and an example of accounting recognition lags are given in the answer to Question 3.

The degree of permanence in earnings may also cause "economic goodwill." For example, suppose the firm has a permanent $50 increase in income. If the cost of capital is 10 percent, the theoretical price increase will be $550. Because the accounting system records only the $50 in earnings, "economic goodwill" increases by $500. See Easton et al. (2000) for a more thorough description of how the degree of permanence in earnings may affect "economic goodwill."

Question #11

This requirement asks students to estimate intrinsic values using different valuation models. Students should realize that the discounted dividend model is inappropriate here. In using the FCF model, students generally estimate the intrinsic value of the firm, but fail to deduct the market value of debt to get to the intrinsic value of equity. For the RI model, students who had difficulty with Question 3 will have difficulty calculating residual earnings.

The reason for using the discounted dividend model is that a firm's intrinsic value can be defined as the present value of expected future dividends (Penman 2000). However, since Federated has not paid a dividend and does not expect to do so in the foreseeable future, it is not possible to use the discounted dividend model directly. Therefore, the "ability" to pay a dividend must be used instead of the actual dividend. Dividend-paying ability requires production of cash that could then be used to pay dividends. Consequently, this approach leads to the FCF model to determine the firm value.

Using the forecasts of FCF presented in Exhibit 4, and the appropriate discount rates, we arrive at the various per-share estimated values for Federated Department Stores reported in Table 1. Column 2 assumes no FCFs after 1/30/99. Column 3 assumes that the FCF reported on 1/30/99 continues as a constant perpetuity while Column 4 assumes that FCF will grow at a 3 percent annual rate.[9]

[9] The $7,176 excludes a deferred tax liability. Excluding deferred taxes is justifiable when a company has a long-term growth horizon (i.e., assuming long-term assets [tax vs. financial depreciation difference] continues to grow). Thus, the liability will not be paid as long as the firm continues to grow. Including deferred taxes in total liabilities changes the estimated per share price to the following:

Valuation Estimates Using Free Cash Flow (FCF) Model
Subtracting Deferred Taxes

	Intrinsic Value (IV) Per Share		
Discount Rate	**No Perpetuity**	**Perpetuity**	**Growing in Perpetuity**
5%	$(30.80)	$93.22	$279.26
10%	(33.15)	18.34	40.40
15%	(35.07)	(6.34)	0.84

TABLE 1
Valuation Estimates Using Free Cash Flow (FCF) Model

	Intrinsic Value (IV) Per Share		
Discount Rate	**No Perpetuity**	**Perpetuity**	**Growing in Perpetuity**
5%	$(22.24)	$101.79	$287.83
10%	(24.58)	26.90	48.97
15%	(26.51)	2.23	9.41

As an example of calculations in Table 1, consider the case where the discount rate, r, is 5 percent.

No Perpetuity

$$IV = [FCF_1/(1 + r) + FCF_2/(1 + r)^2 + FCF_3/(1 + r)^3 + FCF_4/(1 + r)^4 - \text{market value of debt (MD)}]/(\text{shares outstanding}).$$

$$IV = [-108.2/1.05 + 841.2/(1.05^2) + 1531.6/(1.05^3) + 1376.4/(1.05^4) - 7176]/182.6 = (\$22.24).$$

Perpetuity

$$IV = [FCF_1/(1 + r) + FCF_2/(1 + r)^2 + FCF_3/(1 + r)^3 + FCF_4/(1 + r)^4 + (FCF_4/r)/(1 + r)^4 - (MD)]/(\text{shares outstanding}).$$

$$IV = [-108.2/1.05 + 841.2/(1.05^2) + 1531.6/(1.05^3) + 1376.4/(1.05^4) + (1376.4/0.05)/(1.05^4) - 7176]/182.6 = \$101.79.$$

Growing in Perpetuity at an Annual Rate of g

$$IV = [FCF_1/(1 + r) + FCF_2/(1 + r)^2 + FCF_3/(1 + r)^3 + FCF_4/(1 + r)^4 + (FCF_4/(r - g))/(1 + r)^4 - (MD)]/(\text{shares outstanding}).$$

$$IV = [-108.2/1.05 + 841.2/(1.05^2) + 1531.6/(1.05^3) + 1376.4/(1.05^4) + (1376.4/(0.05 - 0.03)/(1.05^4)) - 7176]/182.6 = \$287.83.$$

Not surprisingly, in the "no perpetuity" situation, the value per share is much lower than the actual price of $18.625/share. Share price increases dramatically once the perpetuity is included in the calculation. The "value" of the perpetuity decreases as the discount rate increases.

Results reported in Table 1 illustrate that assumptions about continuing value and cost of equity affect estimates of firm value. The value of the firm is enhanced when the duration of positive FCF exceeds one year. In fact, the assumption of a perpetuity or a growing perpetuity significantly increases the estimates of firm value, regardless of the estimate of the cost of capital. For example, assuming a 10 percent cost of capital, the value from a perpetuity growing at an annual rate

of 3 percent increases the intrinsic value by 82 percent [(48.97 – 26.90)/26.90] compared to a no-growth perpetuity.

From available short-term forecasts and assuming that FCFs are constant in perpetuity, the cost of capital needed to justify a price of $18.625/share using the FCF model is approximately 11.3 percent [$18.84 = {[–108.2/1.113 + 841.2/(1.113^2) + 1531.6/(1.713^3) + 1376.4/(1.113^4) + (1376.4/0.113)/(1.113^4)] – 7176}/182.6]. Different assumptions about the duration of FCFs would yield different discount rates.

Valuation can be based on accounting income, rather than on free cash flow. The Residual Income (RI) model is one such approach. As noted in Student Handouts 1 and 3, the RI model is $V_0^E = B_0 + (\sum(1 + r)^{-t} (feps_t - rB_{t-1}))$, where V_0^E is the intrinsic value of equity at time 0, B_0 is the book value of common equity at time 0, r is the cost of equity capital, and $feps_t$ is forecasted earnings for period t.

Using the forecasts of net income presented in Exhibit 4 and the specified discount rates, we arrive at the various estimates of firm value reported in Table 2. Column 2 assumes no RI after 1/30/99. Column 3 assumes that the RI reported on 1/30/99 continues as a perpetuity while Column 4 assumes that RI will grow at a 3 percent annual rate.

Using the residual earnings calculations from Table 3, the intrinsic value (IV) amounts shown in Table 2, assuming a discount rate of 5 percent are calculated as follows:

No Perpetuity

$$IV = [B_0 + (eps_1 - rB_0)/(1 + r) + (eps_2 - rB_1)/(1 + r)^2 + (eps_3 - rB_2)/(1+r)^3 + (eps_4 - rB_3)/(1 + r)^4]/(\text{shares outstanding}).$$

$$IV = [3639 + (-106.95)/(1.05) + (80.3)/(1.05^2) + (337)/(1.05^3) + (436.2)/(1.05^4)]/182.6$$

$$= \$23.33.$$

Perpetuity

$$IV = [B_0 + (eps_1 - rB_0)/(1 + r) + (eps_2 - rB_1)/(1 + r)^2 + (eps_3 - rB_2)/(1 + r)^3 + (eps_4 - rB_3)/(1 + r)^4 + ((eps_4 - rB_3)/r)/(1 + r)^4]/(\text{shares outstanding}).$$

$$IV = [3639 + (-106.95)/(1.05) + (80.3)/(1.05^2) + (337)/(1.05^3) + (436.2)/(1.05^4) + ((436.2)/0.05)/(1.05^4)]/182.6$$

$$= \$62.64.$$

TABLE 2
Valuation Estimates Using the Residual Income (RI) Model

	Intrinsic Value (IV) Per Share		
Discount Rate	**No Perpetuity**	**Perpetuity**	**Growing in Perpetuity**
5%	$23.33	$62.64	$121.59
10%	19.37	27.24	30.61
15%	16.21	15.89	15.81

TABLE 3
Residual Income Calculations
Discount Rate is 5 Percent

	1995	1996	1997	1998	1999
End-of-Year Book Value	$3,639	$3,714	$3,980	$4,516	$5,178
Forecasted Earnings		$75	$266	$536	$662
Residual Income (RI)		–$106.95	$80.3	$337	$436.2

Growing in Perpetuity

$$IV = [B_0 + (eps_1 - rB_0)/(1 + r) + (eps_2 - rB_1)/(1 + r)^2 + (eps_3 - rB_2)/(1 + r)^3 + (eps_4 - rB_3)/(1 + r)^4 + ((eps_4 - rB_3)/(r - g))/(1 + r)^4]/(\text{shares outstanding}).$$

$$IV = [3639 + -106.95/1.05 + 80.3/(1.05^2) + 337/(1.05^3) + (436.2)/(1.05^4) + ((436.2)/(0.05 - 0.03))/(1.05^4)]/182.6$$

$$= \$121.59.$$

Based on available short-term forecasts and assuming that RIs are a constant perpetuity, the cost of capital needed to justify a price of $18.625/share using the RI model is approximately 13.5 percent [$18.37 = (3639 – 416.25/1.135 – 235.39 /1.135^2 – 1.3/1.135^3 + 52.34/1.135^4 + ((52.34/.135)/1.135^4)/182.6)$]. Again, different assumptions about the nature and timing of RI would yield different implied discount rates.

In the class discussion, it is emphasized that the RI Model measures both "stocks" (book value of equity) and "flows" (abnormal earnings). Second, the discussion points out that residual income is created when a firm generates earnings above normal earnings, where "normal earnings" are defined as book value of equity multiplied by the cost of capital. At this point, we discuss how conservative or aggressive accounting affects the creation of residual earnings and refer students to Student Handout 1. The following discussion shows how accounting can create residual earnings. Suppose a firm's PB ratio is 1.0 and the firm invests in zero NPV projects. After the investment, assume that the firm's PB ratio stays at unity. Therefore, expected earnings will equal normal earnings and, by definition, residual earnings equal 0. However, in contrast to the previously mentioned example, assume that the firm aggressively records expenses after investing in zero NPV projects. Because expenses have been recorded earlier than incurred, the book value of equity will decrease, the price-to-book ratio will exceed 1, creating economic goodwill and, by definition, positive residual earnings. Explicitly, next periods earnings will be higher and normal earnings will be lower than those in the first scenario, again resulting in positive residual earnings.

If one compares Federated's market price per share ($18.625) to the intrinsic value calculations, the RI model does slightly better than the FCF model in the present case. This difference occurs because of difficulty in estimating the continuing value since Federated's free cash flows have not reached a steady state (see Student Handout 1 for more detail). In theory, the forecasts should be long enough so that a firm reaches its competitive equilibrium. If the financial statements were

forecasted until Federated achieved a steady state, then all three models (discounted dividend, free cash flow, and residual income) should yield the same estimate of firm value (Francis et al. 2000).

Penman and Sougiannis (1998) and Francis et al. (2000) find that, on average, the RI model is more accurate than the FCF model or the discounted dividend model in estimating current security price. As Francis et al. (2000) point out, the RI model valuation is anchored by the book value of equity and the forecasting precision affects only residual earnings. Thus, the higher the percentage of book value to the current security price, the greater the precision of the RI model.

Francis et al. (2000) report that, with the RI model, 72 percent of the intrinsic value (IV) calculation is determined by the book value of equity. On the other hand, a significant portion of the IV is determined by the terminal value under the discounted dividend and FCF models (65 percent and 82 percent, respectively). However, the continuing value accounts for only 21 percent of the intrinsic value under the RI model. Thus, with regard to forecasting errors in either earnings or free cash flow, the growth rate or discount factor will likely create larger errors using the discounted dividend model and the FCF model than using the RI model.

In the class discussion, it is important to note the way estimated RI values change because of different assumptions about continuing value and cost of equity capital. The first item to examine, similar to the FCF example, is the continuing value assumption's effect on the estimate of IV. Because of the effect that cost of equity capital has on abnormal earnings, changing assumptions about continuing value does not necessarily increase estimates of IV. IV increases when the firm's expected returns on common equity (ROCE) are greater than the cost of equity capital. However, as the cost of equity capital increases, ROCE falls below the cost of equity capital, causing negative abnormal earnings. In the present case, when the cost of equity capital reaches 15 percent, the residual earnings become *negative*, thus causing a *decrease* in IV.

Based on these forecasts and assuming that the RI is a constant perpetuity, the cost of equity capital needed to justify a price of $18.625/share using the RI model is approximately 13.2 percent. Different assumptions about firm performance beyond the forecast horizon will yield different discount rates.

Another interesting discussion is that firm value may be very different depending on the time at which value is measured. For example, Federated's stock price ranged from $57.0625/share in the summer of 1999 to $39.125 in March 2000. This steep decline occurred even though Federated recorded a 20 percent growth in EPS from the year ending January 1999 to the year ending January 2000. This drop in value was possibly a result of Federated's entrance into the Internet business. Comments in the financial press (Quirk 2000b) suggest that many analysts did not believe that Federated would realize any significant economic profits from its investment in e-commerce retailing. On the other hand, other analysts did not believe that Federated had invested enough money in the Internet and, hence, the traditional retail businesses would suffer in the new economy if e-commerce firms flourished. Either way, changes in earnings expectations have caused a dramatic decrease in Federated's stock price.

SUMMARY

In the first part of the case, students are asked to evaluate some basic valuation concepts and potential inputs to valuation models. Next, they are asked to compare and contrast the results of the FCF and RI equity valuation models. Students are asked to discuss how the assumptions about the results beyond the forecast horizon may affect the values derived from these valuation models.

The two valuation models provide a wide range of estimated values for Federated Department Stores' equity at January 1995. The lesson reinforced here is that valuation, despite the exactness of the models, is subjective because of the underlying assumptions (estimates) that are required. These assumptions include, but are not limited to, the inputs to the respective models, the cost of capital, and continuing values (i.e., the present value of free cash flows or residual earnings following the forecast horizon).

POSTSCRIPT

The Questrom lawsuit, filed in January 1998 against Federated, was dismissed in February 2000 by the federal judge hearing the case. The judge found that some of Questrom's claims were "patently false" and dismissed all claims against Federated. Questrom received bonus compensation of approximately $15.3 million (Quick 2000a).

In May 1999, Questrom became the CEO of Barney's, an insolvent upscale retailer. Within a year of his hiring, he led Barney's back to solvency and profitability. At the end of July 2000, Questrom resigned from Barney's to become the CEO of JCPenney. Once again his stated mission was to turn around a troubled retail firm. While not in bankruptcy, JCPenney had recently experienced a decline in sales, a sharp drop in profits, and a stock price plunge of 75 percent. Operational problems and an "identity crisis" seemed to plague the company.

While Questrom seems to be doing very well, his former employer, Federated, has been experiencing problems recently. In March 1999, it acquired the catalog retailer, Fingerhut, for $1.7 billion. This investment has proven costly, as Fingerhut's operation of selling to lower-tiered customers on credit has not fit well with the upscale image of the Federated-Macy's department stores. Further, the Fingerhut acquisition was made to help develop an e-commerce business, which has not done well. Worse, Fingerhut has experienced problems with receivables that caused bad debts to soar and profits to be less than expected. Analysts slashed their estimates of Federated's future profits (Quick 2000b) leading to a 50 percent decline in Federated's stock price, from almost $54 in the summer of 1999 to $24 as of July 31, 2000.

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