

Family Furniture Corporation: Analyzing the Effect of a Pure Capital Structure Change on the Value of a Firm

By
Robert Irons
and
Robert Weigand*

WASHBURN UNIVERSITY
SCHOOL OF BUSINESS
WORKING PAPER SERIES
Number 87

August 2007

Washburn University
School of Business
1700 SW College Ave.
Topeka, KS 66621
785-670-1308
www.washburn.edu/sobu

* Robert A. Weigand is professor of finance and Brenneman Professor of Business Strategy at the School of Business at Washburn University, Topeka, Kansas. Robert Irons is assistant professor of finance at Dominican University. Comments should be directed to Robert Weigand, School of Business, Washburn University, 1700 SW College Ave. Topeka, Kansas 66621, 785-670-1591, rob.weigand@washburn.edu.



FAMILY FURNITURE CORPORATION: ANALYZING THE EFFECT OF A PURE CAPITAL STRUCTURE CHANGE ON THE VALUE OF A FIRM

Robert Irons, Dominican University
Robert A. Weigand, Washburn University

The new CEO of a manufacturing firm is using the opportunity afforded by her recently-acquired leadership role to analyze how introducing debt into the firm's capital structure might increase the value of the firm. The case leads students through an analysis of the effect of leverage on a firm's equity risk, required return, weighted average cost of capital, and ultimately, its value. The first part of the analysis involves assessing the firm's financial strength using financial ratios and valuation metrics, and evaluating whether external capital markets are likely to view the firm positively and provide debt capital at a reasonable cost. The second part of the analysis involves estimating the expected impact of debt on the firm's value and risk using both the adjusted present value and adjusted discount rate method. The case is deliberately framed in terms of a relatively small, family-controlled company so students can more directly relate to the strategic reasons firms pursue pure capital structure changes, a topic that can appear abstract and theoretical when taught in the context of large multinational corporations. The level of the case is appropriate for undergraduate finance majors or MBA students in a first-semester corporate finance course. Expected time to complete the case analysis is 10-14 hours of outside class time.

INTRODUCTION

Family Furniture Corporation is a U.S.-based manufacturing firm that produces a unique line of furniture for the consumer market. The firm was founded in Chicago in 1960 by a European immigrant descended from a long line of hand-crafted furniture

growth and consistent profitability, even during economic slowdowns and recessions. By the late 1980s, when his daughter and son joined the firm, Family Furniture employed over 100 people in a variety of manufacturing, sales, distribution and clerical positions, and was generating \$3 million a year in profits on annual sales of over \$15 million. The firm's reputation for producing quality furniture at a reasonable price was well-established among many middle-class and upper middle-class families in the Chicago area, and the company enjoyed higher profit margins than its competitors due to a near-zero advertising budget. Shortly after the daughter and son joined the business the Chicago manufacturing facility was expanded, which allowed the company to begin distributing their product line in Milwaukee, Kansas City and St. Louis.

The daughter advanced quickly within the firm and eventually reached the position of chief financial officer, in charge of both accounting and finance, while the son gradually assumed the role of chief operating officer. The family members proved to be an effective management team, and the company's sales and profits continued to increase over time. By 1999 the company had reached the point where increasing demand for their furniture lines in the Milwaukee, Kansas City and St. Louis markets would require additional investment. The daughter wanted to acquire existing manufacturing facilities in each of these "rust-belt" cities and modify them to produce furniture. This would require an infusion of external capital, however, and the daughter lobbied hard to her father on behalf of two strategies: an initial public offering (IPO) of common equity and the introduction of debt into the firm's capital structure. She argued that floating public debt and equity and aggressively expanding into the three cities would provide growth

opportunities for the firm and its employees, and create significant new value for the firm.

The father struck a compromise with his MBA-educated daughter: they would sell a 50% stake in the firm in an initial public offering of 12.5 million shares of stock. Another 12.5 million shares would be retained by the family, with the father owning 7.5 million shares and the daughter and son owning 2.5 million shares each. The father was adamant on one additional condition before agreeing to sell stock to new shareholders: the firm had to begin paying a dividend to shareholders no later than its second year as a public company. The father envisioned shareholders as another type of customer, and he had built his business model on always treating his customers well. He would not agree to raise debt capital, however, as the proceeds from the IPO would be sufficient to fund their plans to expand regionally. His reasoning was "why pay to use someone else's money when we have plenty of our own?"

In the spring of 2000, with stock valuations peaking, the firm raised \$100 million in its equity IPO, issuing 12.5 million shares at a price of \$8 per share. Proceeds from the IPO were used to open new manufacturing facilities in Milwaukee, Kansas City and St. Louis, which resulted in a significant increase in sales as well as lower transportation costs to retail furniture stores in these markets. An additional strategy envisioned by Family Furniture also paid off: the company was able to hire many highly-skilled workers with experience in manufacturing due to a surplus of this type of labor in the rust-belt manufacturing economies. The father was particularly gratified by being able to

employ more "good working people," and spent a lot of time at the new plants to make sure that his family-friendly business culture was implemented properly.

The firm continued on a successful trajectory until late 2006, when, while recovering from an illness, the father decided to retire and turn full control of the company over to his daughter. While his heart was still in the business, he knew his physical health would not allow him to be as involved as he liked, and that his daughter had the knowledge and drive needed to continue to grow the company in the 21st century. Seizing the opportunity, the daughter, now CEO, hired a consultant to investigate the possibility of introducing debt into the firm's capital structure by issuing bonds. The daughter viewed her father's retirement as the perfect catalyst for issuing debt that would be used to fund a stock repurchase plan. Given the success of the company following its IPO, the key executives needed to diversify their wealth holdings, which had grown significantly and were highly concentrated in the stock of the firm. Additionally, the father had a need for short-term liquidity to make arrangements for his retirement. (On a strictly family level, the son and daughter agreed on another point as well — the father needed to find fulfillment in retirement, lest he become restless and desire to come back to a management role with the firm.) The firm's board of directors authorized the firm to investigate the economic benefits of a leveraged recapitalization, with the maximum amount of debt the firm would be allowed to raise strictly capped at \$200 million.

The consultant is charged with determining the impact adding debt to the capital structure will have on the firm's current common share price of approximately \$14.35. After consulting with the company's bank, the daughter and the consultant agree on a few

parameters that will be used in the analysis, including the firm's beta and other inputs into the firm's cost of equity calculation (provided in Exhibit 4), what the firm's market cost of debt would be at various debt/assets ratios (ranging from 10-50%, shown in Exhibit 3). The consultant and the CEO further agree that the best way to proceed with the analysis is as follows:

1. Analyze the firm's financial statements from the past 5 years (2002-2006) to determine whether or not the firm exhibits sufficient financial stability and success to raise debt from capital markets. The analysis will focus on trends in the usual financial ratio categories such as liquidity, asset management and profitability, as well as more finance-based metrics such as NOPAT, FCF, EVA, MVA, and an estimate of the firm's fair value based on a discounted cash flow model of FCF (specific metrics for the analysis are shown as Exhibit 5). Also, estimate the annual returns the firm has provided for shareholders since their IPO in 2000 (including the firm's dividend yield, which has averaged 3-4% since 2001).
2. Estimate the impact of debt on the risk and expected return of the firm's stock at various levels of borrowing, ranging from \$50 million to \$200 million. (The cost of debt capital to the firm at various debt/assets ratios and the borrowing break points at which the risk and expected return of the firm's equity should be computed are provided in Exhibit 3.)
3. Estimate the impact of debt on the firm's weighted average cost of capital (WACC) at various levels of borrowing (provided in Exhibit 3).
4. Estimate the impact changing the firm's capital structure will have on the value of the firm, the market value of the firm's equity, and the firm's market-value added. At each level of leverage, specifically indicate the overall gain in value achieved and the number of shares that must be repurchased to complete the leveraged recapitalization.
5. Make a recommendation regarding the optimal level of debt to use in the firm's capital structure.

The daughter also informs the consultant that she is going to conduct the same analysis based on her business experience and business school education. Formulas for the way the consultant will execute steps 1-4 are provided in Exhibit 6. Formulas for the way the daughter will execute steps 1-4 are provided in Exhibit 7.

CONCEPTUAL DISCUSSION QUESTIONS

(For consideration prior to executing the quantitative analysis)

1. Why is the new CEO interested in including debt in the firm's capital structure? Describe the expected benefits from changing the way the firm is financed (from all-equity to a mix of debt and equity).
2. Acquiring debt increases the risk to the shareholders (part of your analysis should demonstrate this). What (if any) compensation will the shareholders receive for taking on additional risk?
3. Which metrics are appropriate for measuring the benefits of adding debt to the firm's capital structure? Which metrics are appropriate for measuring the costs of adding debt to the firm's capital structure?
4. What method/metrics are appropriate for estimating the optimal capital structure for the firm?

CONCEPTUAL DISCUSSION QUESTIONS

(For consideration after executing the quantitative analysis)

1. Compare the quantitative decision metrics obtained from the consultant's analysis with those obtained by the daughter. Pay particular attention to differences in the estimated increase in the value of the firm and the recommended level of borrowing and number of shares that should be repurchased. Identify and discuss how their different quantitative approaches to solving the problem led to different estimates and recommendations on how the firm should proceed.
2. From a pure value creation perspective, does each analysis indicate that the leveraged recapitalization is worth pursuing?
3. Do you think deciding on how much debt to use in a firm's capital structure based on a purely quantitative analysis is the best way to solve a problem such as this in the real world? Discuss the qualitative factors Family Furniture might also want to consider before proceeding with the leveraged recapitalization, and how they would create a decision framework that balances the qualitative factors with the results of the quantitative analysis.

Exhibit 1. Family Furniture Corporation Balance Sheets 2002 – 2006

**Family Furniture Corporation
Annual Balance Sheet
Year Ending December 31 (000s)**

	2006	2005	2004	2003	2002
Assets					
Current assets					
Cash	14,769.7	14,270.2	13,787.6	13,321.4	12,870.9
Marketable Securities	2,267.3	2,178.0	2,092.2	2,009.8	1,930.6
Receivables	24,144.0	23,170.8	22,236.9	21,340.6	20,480.4
Inventories	36,951.8	35,599.0	34,295.8	33,040.3	31,830.7
Other Current Assets	10,295.5	9,805.2	9,338.3	8,893.6	8,470.1
Total current assets	88,428.2	85,023.2	81,750.8	78,605.6	75,582.7
Non-Current assets					
Property and equipment, gross	104,892.3	99,424.0	94,240.7	89,327.7	84,670.8
Accum. Depreciation and Depletion	35,422.5	30,571.7	25,911.0	21,441.0	17,140.3
Property and equipment, net	69,469.8	68,852.3	68,329.7	67,886.7	67,530.5
Intangibles	11,051.8	10,813.9	10,581.1	10,353.4	10,130.5
Other Non-Current Assets	9,093.2	8,928.0	8,765.9	8,606.6	8,450.3
Total Non-Current Assets	89,614.8	88,594.2	87,676.7	86,846.7	86,111.3
Total assets	178,043.0	173,617.4	169,427.5	165,452.3	161,694.0
Liabilities and stockholders' equity					
Current liabilities					
Accounts payable	29,917.5	29,216.3	28,531.5	27,862.8	27,209.8
Short-term Debt	0.0	0.0	0.0	0.0	0.0
Other Current Liabilities	26,676.6	24,348.4	22,154.0	20,086.6	18,139.9
Total current liabilities	56,594.0	53,564.6	50,685.5	47,949.4	45,349.6
Non-current liabilities					
Long-term debt	0.0	0.0	0.0	0.0	0.0
Deferred income taxes	0.0	0.0	0.0	0.0	0.0
Other non-current liabilities	0.0	0.0	0.0	0.0	0.0
Minority interest	0.0	0.0	0.0	0.0	0.0
Total non-current liabilities	0.0	0.0	0.0	0.0	0.0
Total liabilities	56,594.0	53,564.6	50,685.5	47,949.4	45,349.6
Stockholders' equity					
Preferred Stock	0.0	0.0	0.0	0.0	0.0
Retained Earnings	12,698.5	12,125.1	11,674.1	11,157.4	10,717.6
Common Stock	108,750.5	107,927.7	107,068.0	106,345.5	105,626.8
Total stockholders' equity	121,448.9	120,052.8	118,742.0	117,502.9	116,344.4
Total liabilities and stockholders' equity	178,043.0	173,617.4	169,427.5	165,452.3	161,694.0
Shares Outstanding (thousands)	25,000	25,000	25,000	25,000	25,000

Exhibit 2. Family Furniture Corporation Income Statements 2002 – 2006

Family Furniture Corporation
Annual Income Statement
Year Ending December 31 (000s)

	2006	2005	2004	2003	2002
Sales Revenue	145,520.5	140,940.4	136,490.4	132,300.1	128,510.0
Cost of sales	74,660.9	72,450.0	70,280.4	68,160.8	66,100.1
Gross Operating Profit	70,859.6	68,490.4	66,210.0	64,139.3	62,409.9
Selling, General and Administrative Expense	26,020.8	25,790.6	25,507.8	25,390.5	25,250.8
Other taxes	0.0	0.0	0.0	0.0	0.0
EBITDA	44,838.8	42,699.8	40,702.2	38,748.8	37,159.1
Depreciation and Amortization	4,850.8	4,660.7	4,470.0	4,300.7	4,190.7
EBIT	39,988.0	38,039.1	36,232.2	34,448.1	32,968.4
Other income (net)	0.0	0.0	0.0	0.0	0.0
Total Income available for interest expense	39,988.0	38,039.1	36,232.2	34,448.1	32,968.4
Interest expense	0.0	0.0	0.0	0.0	0.0
Minority interest	0.0	0.0	0.0	0.0	0.0
Pre-tax income	39,988.0	38,039.1	36,232.2	34,448.1	32,968.4
Income taxes	15,500.7	14,600.3	13,700.5	12,870.7	12,250.8
Special Income/Charges	0.0	0.0	0.0	0.0	0.0
Net Income from Continuing Operations	24,487.3	23,438.8	22,531.7	21,577.4	20,717.6
Net Income from Discontinued Operations	0.0	0.0	0.0	0.0	0.0
Normalized Income	24,487.3	23,438.8	22,531.7	21,577.4	20,717.6
Extraordinary Income	0.0	0.0	0.0	0.0	0.0
Income from Cumulative Effect of Acct					
Changes					
Income from Tax Loss Carryforward	0.0	0.0	0.0	0.0	0.0
Other Gains (Losses)	0.0	0.0	0.0	0.0	0.0
Total Net Income	24,487.3	23,438.8	22,531.7	21,577.4	20,717.6
Dividends per share	0.47	0.45	0.43	0.42	0.40
Preferred Dividends	0.00	0.00	0.00	0.00	0.00
Addition to Retained Earnings	12,698.5	12,125.1	11,674.1	11,157.4	10,717.6
EPS from Total Operations	0.98	0.94	0.90	0.86	0.83
Diluted EPS from Total Operations	0.98	0.94	0.90	0.86	0.83
Income Tax Rate	38.8%	38.4%	37.8%	37.4%	37.2%
Shares Outstanding (thousands)	25,000	25,000	25,000	25,000	25,000

Exhibit 3. Cost of Debt Schedule

Weight of Debt (W_d)	Cost of Debt (r_d)
0.0%	0.00%
10.0%	6.50%
20.0%	6.90%
30.0%	7.30%
35.0%	7.60%
40.0%	7.95%
45.0%	8.35%
50.0%	8.95%

Borrowing Schedule
\$0
\$50 million
\$75 million
\$100 million
\$125 million
\$150 million
\$175 million
\$200 million

Exhibit 4. Levered Beta, Capital Asset Pricing Model, and Valuation Data Items

Unlevered Beta (B_U)	1.15
Tax Rate (T)	Avg. tax rate from 2002-2006 Income Statements
Risk-free Rate (r_{RF})	4.25%
Expected Market Return	10.00%
Long-Term Growth Rate	Average rate of DPS and EPS growth 2002-2006

Exhibit 5. Financial Ratios and Valuation Metrics

Liquidity

- Current
- Quick
- Net Working Capital to Total Assets

Asset Management

- Days Sales Outstanding
- Inventory Turnover
- Fixed Assets Turnover
- Total Assets Turnover

Profitability

- Gross Profit Margin
- Operating Profit Margin
- Net After-Tax Profit Margin
- Total Assets Turnover
- Return on Assets
- Equity Multiplier
- Return on Equity

Growth Rates

- Dividend Growth Rate
- Earnings Growth Rate
- Sales Revenue Growth Rate
- EPS (earnings per share)
- DPS (dividends per share)

NOPAT, EVA and FCF

- NOPAT (net operating profit after tax)
- ROIC (return on invested capital)
- EVA (economic value added)
- FCF (free cash flow)
- Weighted Average Cost of Capital (Cost of Equity based on CAPM)

Calculations of Total Capital (supports FCF calculation)

- Net Operating Working Capital
- Operating Long Term Assets
- Total Operating Capital

Discounted Cash Flow Valuation Model (using 2006 inputs)

- Long-term Growth Rate (average of DPS and EPS growth rates)
- Value of Operating Assets (PV of growing perpetuity of FCF)
- Value of Non-Operating Assets
- Total Intrinsic Value of the Firm
- Per Share Intrinsic Value of the Firm
- MVA (market value added)

Exhibit 6. Consultant's Work Flow and Formulas (Adjusted Discount Rate Method)

- 1.) Estimate the firm's unlevered cost of equity from the capital asset pricing model (the firm's unlevered beta is provided in Exhibit 3).

$$r_U = Rf + \beta_U [E(r_M) - Rf]$$

- 2.) Estimate the firm's levered beta using the Hamada equation.

$$\beta_L = \beta_U \times [1 + (1 - T_c)(D/S)]$$

- 3.) Create a schedule for the firm's cost of levered equity at different D/A ratios by substituting the levered beta into the capital asset pricing model.

$$r_L = Rf + \beta_L [E(r_M) - Rf]$$

- 4.) Create a WACC schedule at different w_D , r_D , and r_L .

$$WACC = \left[\left(\frac{S}{D+S} \right) \times r_s \right] + \left[\left(\frac{D}{D+S} \right) \times r_D \times (1 - T_c) \right]$$

- 5.) Value the firm at different levels of borrowing as the present value of a growing perpetuity of free cash flow discounted at the WACC (using the WACC schedule created in 4.) above).

$$V = \frac{FCF(1+g)}{WACC - g}$$

Exhibit 7. Daughter's Work Flow and Formulas (Adjusted Present Value Method)

- 1.) Estimate the firm's unlevered cost of equity from the capital asset pricing model (the firm's unlevered beta is provided in Exhibit 3).

$$r_U = Rf + \beta [E(r_M) - Rf]$$

- 2.) Estimate the firm's cost of levered equity using M&M proposition II.

$$r_L = r_U + \left[\frac{D}{E} \times (r_U - r_D) \times (1 - T_C) \right]$$

- 3.) Create a WACC schedule at different w_D , r_D , and r_L .

$$WACC = \left[\left(\frac{S}{D+S} \right) \times r_S \right] + \left[\left(\frac{D}{D+S} \right) \times r_D \times (1 - T_C) \right]$$

- 4.) Value the firm at different levels of borrowing as the value of the unlevered firm (growing perpetuity of FCF discounted at the cost of unlevered equity) plus the PV of the perpetual tax shield:

$$V = \frac{FCF(1+g)}{r_U - g} + T_C D$$

TEACHING NOTES

FAMILY FURNITURE CORPORATION: CAPITAL STRUCTURE AND FIRM VALUATION

Robert Irons, Dominican University
Robert Weigand, Washburn University

CASE DESCRIPTION

The new CEO of a manufacturing firm is using the opportunity afforded by her recently-acquired leadership role to analyze how introducing debt into the firm's capital structure might increase the value of the firm. The case leads students through an analysis of the effect of leverage on a firm's equity risk, required return, weighted average cost of capital, and ultimately, its value. The first part of the analysis involves assessing the firm's financial strength using financial ratios and valuation metrics, and evaluating whether external capital markets are likely to view the firm positively and provide debt capital at a reasonable cost. The second part of the analysis involves estimating the expected impact of debt on the firm's value and risk using both the adjusted present value and adjusted discount rate method. The case is deliberately framed in terms of a relatively small, family-controlled company so students can more directly relate to the strategic reasons firms pursue pure capital structure changes, a topic that can appear abstract and theoretical when taught in the context of large multinational corporations. The level of the case is appropriate for undergraduate finance majors or MBA students in a first-semester corporate finance course. Expected time to complete the case analysis is 10-14 hours of outside class time.

CASE SYNOPSIS

Family Furniture Corporation is a U.S.-based manufacturing firm founded in 1960 by a European immigrant. In the late 1980's his daughter and son joined the firm; the daughter grew quickly within the firm and eventually reached the position of CFO, while the son was groomed to run operations. This team of family members proved quite effective, and in 1995 the firm incorporated.

By the year 2000 the company had reached the point where further expansion would require additional investment. The daughter wanted the firm to turn to the capital markets for outside investors to provide funds. They floated 2.5 million shares of stock, 1.25 million shares to the public, with the father retaining 7,500,000 shares and his daughter and son retaining 2,500,000 shares each. The CEO would not agree to go into debt to fund the firm, however, citing their strong financial position.

At the end of 2006, the father chose to retire from the business, turning the reins over to his daughter. Seizing the opportunity, the new CEO quickly hired a consultant to investigate the possibility of issuing bonds to introduce debt into the firm's capital structure. The daughter saw her father's retirement as an opportunity to raise debt to

fund a stock repurchase plan that would diversify the executives' wealth holdings while also providing liquidity for her father's retirement plans. A consultant was hired to determine the impact adding debt to the capital structure will have on the firm's share price. Concurrently, the new CEO began a similar analysis of her own, using a different approach based on her MBA education.

Purpose

This case gives students an exposure into the way financial analysis supports strategic decisions. Students are required to quantitatively justify a solution to a complex problem by integrating financial ratio trend analysis, WACC calculations at different mixes of debt and equity, and a free cash flow valuation analysis.

The case provides students with the opportunity to improve their spreadsheet skills. The use of valuation modeling aligns students' thinking with the underlying "shareholder value creation" theme of most Financial Management courses. The case highlights the relationship between market risk and the required return on equity, as well as the link between capital structure and firm value. The case uses the MSN Money Central financial statement formats. This provides students with additional incentive to complete the spreadsheet models accurately, as they can use their spreadsheet models in subsequent coursework or for their own analysis of any publicly traded firm listed in the Money Central database (over 5,000 firms).

The case is an appropriate term project for advanced undergraduate finance majors or MBA students.

Family Furniture Corporation - Historical Analysis

Exhibit TN-1 shows Family Furniture's financial ratio and valuation metrics from 2002-2006 (calculations provided on spreadsheet tab "Ratio Analysis"). The Liquidity ratios are strong and stable over the period. The Asset Management ratios are the weakest part of the firm's financial statements; the DSO ratio is high while the turnover ratios are low. Profitability ratios are strong and increasing over the period, and the growth rates are stable. The value creation metrics are strong and increasing. It is clear from the ratios and valuation metrics that the firm has been successful in creating slow but steady growth in recent years.

The last part of Exhibit TN-1 shows the FCF valuation model used to value the firm as of year-end 2006. (These calculations are supported in the instructor spreadsheet on the tab "Ratio Analysis".) The steps in the valuation calculations are:

1. Compute the cost of equity from the CAPM (inputs provided in case Exhibit 4).
2. Estimate the firm's long-term growth rate using the trend in growth rates for earnings and dividends (we calculated the LT growth rate as the average of the growth rates in both earnings and dividends).
3. Estimate the value of the firm's operating assets as the present value of a growing perpetuity of free cash flow using the current WACC and long-term growth rate:

$$\text{Value}_{06} = \frac{FCF_{06} \times (1 + g)}{WACC - g} = \frac{21,745.6 \times (1.0423)}{0.1086 - .0423} = \$341,952$$

4. Estimate the total intrinsic value of the firm by adding the value of the operating assets to the value of non-operating assets (cash and equivalents from the balance sheet):

$$341,952 + 17,037 = \$358,989$$

5. Estimate the per share intrinsic value:

$$\frac{358,989}{25,000} = \$14.36$$

6. Estimate Capital City's MVA as the intrinsic value of common equity minus the book value of common equity:

$$358,959 - 121,449 = \$237,540$$

Family Furniture has positive MVA, consistent with the creation of value for their shareholders since going public in 1995.

Calculating the After-Tax Cost of Debt

Exhibit TN-2 shows the calculations used in deriving the after-tax cost of debt. Case Exhibit 3 contains the cost of debt schedule (the weights of debt and their associated pre-tax costs), as well as the available amounts of debt, obtained from a local bank. Case Exhibit 4 contains the firm's unlevered beta, estimates for the risk-free rate of return and the market rate of return (to be used in the CAPM model to calculate the WACC), and the instructions for determining the firm's tax rate (the average of the annual tax rates from the firm's 2002 – 2006 income statements). To calculate the after-tax cost of debt for each given weight, students merely need to multiply the pre-tax cost of debt by one minus the tax rate. (This is provided in the instructor spreadsheet in the tab "Cost of Debt Schedule").

Calculating the Cost of Equity and the WACC using the CAPM

The first table in Exhibit TN-3 shows the calculations used in deriving the firm's cost of equity and weighted average cost of capital using the CAPM. Calculating the cost of equity is a 3-step process, with a 4th step required to calculate the WACC. The first 2 steps in the process are necessary in order to incorporate the Hamada model, which calculates the levered beta based on the unlevered beta, the firm's tax rate, and the Debt to Equity ratio. Step 1, the Debt to Equity ratio, is easily calculated from the Debt ratio data given in case Exhibit 3. Divide the Debt ratio by one minus the Debt ratio to calculate the Debt to Equity ratio. The levered beta is calculated as follows: $\beta_L = \beta_U(1+(1-T)(D/E))$, where β_L is the levered beta, β_U is the unlevered beta, T is the firm's tax rate, and D/E is the Debt to Equity ratio. The levered beta is then used in the CAPM to calculate the firm's cost of equity: $r_S = r_{RF} + (r_M - r_{RF})\beta_L$, where r_S is the cost of equity, r_{RF} is the risk-free rate of return, and r_M is the market rate of return.

The WACC is calculated as the sum of the weights of each component cost of capital multiplied by component costs: $WACC = W_D(r_D)(1-T) + W_S(r_S)$, where W_D is the weight of debt in the capital structure, $(r_D)(1-T)$ is the after-tax cost of debt, and W_S is the weight of common equity in the capital structure. (These calculations are supported in the instructor spreadsheet on the tab "WACC Calculations".)

Calculating the Levered Cost of Equity and the WACC using M&M II

The second table in Exhibit TN-3 shows the calculations used in deriving the firm's cost of equity and weighted average cost of capital using the M&M II approach. Calculating the cost of equity is a 2-step process, with a 3rd step required to calculate the WACC. Step 1, the unlevered cost of equity, is calculated using the CAPM and the beta given in Exhibit 3 (and matches the unlevered cost of equity in the prior step). The levered cost of equity is calculated as the unlevered cost of equity plus the product of the Debt to Equity ratio, the difference between the unlevered and levered costs of equity, and one minus the tax rate:

$$r_L = r_U + (D/E)[r_U - r_D][1-T].$$

The WACC is calculated as the sum of the weights of each component cost of capital multiplied by component costs: $WACC = W_D(r_D)(1-T) + W_S(r_L)$, where r_L is the levered cost of equity. (These calculations are supported in the instructor spreadsheet on the tab "WACC Calculations".)

Post-Leverage Valuation Analysis

Exhibit TN-4 shows the calculations used in deriving the value of the firm via the Adjusted Discount Rate method once leverage is introduced. The value of the firm is calculated using the FCF valuation model from the Ratio Analysis worksheet, substituting the WACC derived for each level of debt for the cost of equity used in the original model. The value at a zero weight of debt matches the value calculated previously, while increasing the weight of debt increases the value of the firm incrementally until the lowest WACC figure is used (this occurs at a weight of 43.2% debt based on borrowing \$175M). The values calculated beyond that point decrease incrementally due to the increase in the WACC. The market value of the debt is calculated as the weight of debt multiplied by the value of the firm, while the market value of the equity is the difference between the value of the firm and the value of the debt.

The stock price for each level of debt is equal to the intrinsic value divided by the number of shares outstanding. The highest intrinsic share price also occurs where the WACC is the lowest, at a weight of 43.2% debt. The number of shares remaining after the repurchase of the former CEO's shares is calculated as the market value of the equity divided by the intrinsic stock price. At the highest price of \$16.20 per share, almost 90% of the former CEO's shares can be purchased. The Market Value Added (MVA) is calculated as the difference between the intrinsic value of the firm and the most recent level of common equity from the balance sheet. MVA is also maximized at the lowest level of WACC. The value added through the repurchase is equal to the new intrinsic value of the firm less the intrinsic value in 2006 as calculated in the Ratio Analysis worksheet. This is also maximized at the minimum level of WACC. (These calculations are supported in the instructor spreadsheet on the tab "Valuation – Adj. Discount Rate".)

Exhibit TN-5 shows the calculations used in deriving the value of the firm via the Adjusted Present Value method once leverage is introduced. The value at a zero weight of debt matches the value calculated previously, while increasing the weight of debt increases the value of the firm incrementally until the lowest WACC figure is used (this occurs at a weight of 46% debt based on borrowing \$200M, the limit set by the board). In the adjusted present value method, the lower WACC does not directly affect the value of the firm because of the way the PV of the firm's FCFs is calculated: the PV of the unlevered firm (calculated using the cost of unlevered equity) plus the PV of the tax shield. Using this method, all of the increase in the value

of the firm comes from the PV of the tax shield, which increases as the level of debt used in the firm's capital structure increases. However, as is the case with the adjusted discount rate method, the lower WACC leads to a greater spread of $ROIC > WACC$, which increases other value metrics such as EVA and MVA.

The optimal capital structure Family Furniture should pursue will be the one that maximizes the value of the firm. In this scenario, using M&M Proposition II to directly adjust the cost of equity higher as leverage increases, and valuing the firm as a growing perpetuity of free cash flow plus the present value of the tax shield from debt, the optimal capital structure will be the one that maximizes the value of the levered firm. In this case the value of the firm is maximized when the firm borrows the entire \$200M, which is approximately 46% of the estimated total value of the firm after the leveraged recapitalization. Because the Adjusted Present Value method does not impose a numerical penalty for the expected costs of financial distress, the value of the levered firm keeps rising as more debt is used in the capital structure.

Since the M&M II analysis ignores the cost of financial distress, the outcome of that analysis must be weighed against the probability of bankruptcy at higher levels of debt. The M&M II analysis therefore serves to bolster the results from the Adjusted Discount Rate method, supporting the contention that adding debt to the capital structure will increase the value of the firm. Based on this analysis, the firm should issue debt securities in the amount of \$175M to create a capital structure of 43.2% debt and 56.8% equity (including the repurchase of most of the former CEO's shares), which will maximize the firm's common stock price and add considerable value to the firm.

CASE QUESTIONS -- Prior to Quantitative Analysis

1. Why is the new CEO interested in including debt in the firm's capital structure? Describe the expected benefits from changing the way the firm is financed (from all-equity to a mix of debt and equity).

In addition to offering a new source of capital for the firm to use for future growth plans, adding debt to the capital structure will reduce the firm's WACC, and therefore increase the present value of any cash flows analyzed after the introduction of debt. This will result in higher NPVs for future capital projects as well as a higher value for the firm (calculated using the FCF model). Further, the reduced WACC means the spread between ROIC and WACC will increase, which in turn will increase MVA and EVA.

2. Acquiring debt increases the risk to the shareholders (part of your analysis should prove this). What (if any) compensation will the shareholders receive for taking on additional risk?

Adding debt to the balance sheet will cause the firm's beta to increase – this becomes clear when using the Hamada model to calculate the firm's levered beta. The most direct compensation to the shareholders is the increase in the intrinsic common stock price. Less direct benefits include the lower WACC, the higher firm value, and the higher MVA and EVA.

3. Which metrics are appropriate for measuring the benefits of adding debt to the firm's capital structure? Which metrics are appropriate for measuring the costs of adding debt to the firm's capital structure?

The best metrics for determining the impact of adding debt to the balance sheet are the WACC, the value of the firm using the FCF valuation model, the intrinsic common stock price, and the Market Value Added. Those metrics best suited for measuring the costs of adding debt are the firm's beta, its credit rating, and its coverage ratios.

4. What method/metrics should you use to determine the optimal capital structure for the firm?

The optimal capital structure is the one that minimizes the WACC and maximizes the value of the firm, the intrinsic common stock price, and MVA.

CASE QUESTIONS -- Subsequent to Quantitative Analysis

1. Compare the quantitative decision metrics obtained from the consultant's analysis with those obtained by the daughter. Pay particular attention to differences in the estimated increase in the value of the firm and the recommended level of borrowing and number of shares that should be repurchased. Identify and discuss how their different quantitative approaches to solving the problem led to different estimates and recommendations on how the firm should proceed.

While both approaches calculated an increase in the firm's value and common stock price, the Adjusted Present Value method recommended a higher level of borrowing and calculated a higher value for the levered firm at higher debt ratios. It also gave higher values for the share price, the MVA, and the number of shares to repurchase. In the Adjusted Present Value method, the lower WACC does not directly affect the value of the firm because of the way the PV of the firm's free cash flows is calculated: the PV of the unlevered firm (calculated using the cost of unlevered equity) plus the PV of the tax shield. Using this method, all of the increase in the value of the firm comes from the PV of the tax shield, which increases as the level of debt used in the firm's capital structure increases. Because the Adjusted Present Value method does not impose a numerical penalty for the expected costs of financial distress, the value of the levered firm keeps rising as more debt is used in the capital structure. Since the APV analysis ignores the cost of financial distress, the outcome of that analysis must be weighed against the probability of bankruptcy at higher levels of debt.

2. From a pure value creation perspective, does each analysis indicate that the leveraged recapitalization is worth pursuing?

The results from the Adjusted Present Value analysis support the results from the Adjusted Discount Rate method, sustaining the contention that adding debt to the capital structure will increase the value of the firm. Both methods lead to a lower WACC, a higher value for the firm, and an increase in both the stock price and the MVA.

3. Do you think deciding on how much debt to use in a firm's capital structure based on a purely quantitative analysis is the best way to solve a problem such as this in the real world? Discuss the qualitative factors Family Furniture might also want to consider before

proceeding with the leveraged recapitalization, and how they would create a decision framework that balances the qualitative factors with the results of the quantitative analysis.

Two related qualitative issues that bear directly upon the matter of capital structure are financial flexibility and excess debt capacity. Financial flexibility deals with the firm's targeted credit rating; by maintaining their credit rating at a targeted level, firms will have the financial resources necessary to respond quickly to problems or opportunities that require a substantial investment. Similarly, by holding excess debt capacity (using less debt than they are capable of issuing), the firm leaves themselves in position to raise more debt on short notice without increasing their cost of debt or their potential for financial distress. Thus these qualitative issues can be used to offer the firm strategic options in the future.

ADDENDUM

The case document was deliberately written to include some small measure of ambiguity, which requires students to think carefully about how to approach the analysis. For teachers who wish to give their students additional structure, exhibits TN-6 and TN-7 have been included. TN-6 is a template that can be used to guide students on how to organize their output for analyzing the historical financial statements (and will make what they turn in for grading generic). TN-7 includes the specifics of the financial and valuation metrics used in the analysis.

Exhibit TN-1. Historical Financial Ratio and Valuation Analysis

Family Furniture Corporation Financial Ratios

	2006	2005	2004	2003	2002
Liquidity					
Current	1.56	1.59	1.61	1.64	1.67
Quick	0.91	0.92	0.94	0.95	0.96
Net Working Capital to Total Assets	0.18	0.18	0.18	0.19	0.19
Asset Management					
Days Sales Outstanding	60.56	60.01	59.47	58.88	58.17
Inventory Turnover	3.94	3.96	3.98	4.00	4.04
Fixed Assets Turnover	2.09	2.05	2.00	1.95	1.90
Total Assets Turnover	0.82	0.81	0.81	0.80	0.79
Profitability					
Gross Profit Margin	48.7%	48.6%	48.5%	48.5%	48.6%
Operating Profit Margin	27.5%	27.0%	26.5%	26.0%	25.7%
Net After-Tax Profit Margin	16.8%	16.6%	16.5%	16.3%	16.1%
Total Assets Turnover	0.82	0.81	0.81	0.80	0.79
Return on Assets	13.8%	13.5%	13.3%	13.0%	12.8%
Equity Multiplier	1.00	1.00	1.00	1.00	1.00
Return on Equity	13.8%	13.5%	13.3%	13.0%	12.8%
Growth Rates					
Dividend Growth Rate	4.2%	4.2%	4.2%	4.2%	
Earnings Growth Rate	4.5%	4.0%	4.4%	4.2%	
Sales Revenue Growth Rate	3.2%	3.3%	3.2%	2.9%	
EPS (earnings per share)	\$0.98	\$0.94	\$0.90	\$0.86	\$0.83
DPS (dividends per share)	\$0.47	\$0.45	\$0.43	\$0.42	\$0.40

(NOPAT, EVA and FCF in thousands)

	Valuation Metrics Trend Analysis			
	2006	2005	2004	2003
NOPAT (net operating profit after tax)	\$24,487.3	\$23,438.8	\$22,531.7	\$21,577.4
ROIC (return on invested capital)	21.2%	20.8%	20.5%	20.0%
EVA (economic value added)	\$11,950.0	\$11,199.4	\$10,570.1	\$9,875.7
FCF (free cash flow)	\$21,745.6	\$20,881.3	\$20,139.3	\$19,354.0
Weighted Average Cost of Capital (Cost of Equity, based on CAPM)	10.86%			

(in thousands)

	2006	2005	2004	2003	2002
Net Operating Working Capital	\$45,948.0	\$43,823.8	\$41,788.8	\$39,839.4	\$37,972.2
Operating Long Term Assets	\$69,469.8	\$68,852.3	\$68,329.7	\$67,886.7	\$67,530.5
Total Operating Capital	\$115,417.8	\$112,676.0	\$110,118.5	\$107,726.1	\$105,502.7

Valuation (in thousands where appropriate)

Long-term Growth Rate (average of DPS and EPS growth rates)
 PV of perpetual FCF growing as above, discounted at 10.86%
 Value of Non-Operating Assets (2006)
 Total Intrinsic Value of the Firm (2006)
 Per Share Intrinsic Value of the Firm (2006)
 MVA (market value added)

4.23%
\$341,952
\$17,037
\$358,989
\$14.36
\$237,540

Exhibit TN-2. Cost of Debt Calculation

W_d	r_d	Debt/Equity	B_L	$r_d(1 - T_c)$
0.0%	0.00%	0.00	1.15	0.00%
10.0%	6.50%	0.11	1.23	4.04%
20.0%	6.90%	0.25	1.33	4.29%
30.0%	7.30%	0.43	1.46	4.53%
35.0%	7.60%	0.54	1.53	4.72%
40.0%	7.95%	0.67	1.63	4.94%
45.0%	8.35%	0.82	1.73	5.19%
50.0%	8.95%	1.00	1.86	5.56%

Exhibit 3

Weight of Debt (W_d)	Cost of Debt (r_d)
0.00%	0.00%
10.00%	6.50%
20.00%	6.90%
30.00%	7.30%
35.00%	7.60%
40.00%	7.95%
45.00%	8.35%
50.00%	8.95%

Inputs

B_U	1.15	Provided in the case
T_c	37.90%	Average tax rate from 2002-2006
r_{RF}	4.25%	Provided in the case
$E(r_M)$	10.00%	Provided in the case
V_{2006}	358,989	PV of a growing perpetuity of FCF discounted at the WACC
Long-term g	4.23%	Avg. of DPS and EPS growth rates
# Shares ₂₀₀₆	25,000	Provided in the case

Exhibit TN-3. Weighted Average Cost of Capital Calculations

Calculation 1:

Beta Calculated as Hamada Levered Beta, Cost of Equity from CAPM

W_d	r_d	Debt/Equity	B_L	$r_d(1 - T_c)$	r_s	WACC
0.0%	0.00%	0.00	1.15	0.00%	10.86%	10.86%
10.0%	6.50%	0.11	1.23	4.04%	11.32%	10.59%
20.0%	6.90%	0.25	1.33	4.29%	11.89%	10.37%
30.0%	7.30%	0.43	1.46	4.53%	12.62%	10.20%
35.0%	7.60%	0.54	1.53	4.72%	13.07%	10.15%
40.0%	7.95%	0.67	1.63	4.94%	13.60%	10.14%
45.0%	8.35%	0.82	1.73	5.19%	14.22%	10.16%
50.0%	8.95%	1.00	1.86	5.56%	14.97%	10.26%

Calculation 2:

Unlevered Cost of Equity from CAPM, Levered Cost of Equity from M&M II

W_d	r_d	Debt/Equity	r_u	$r_d(1 - T_c)$	r_L	WACC
0.0%	0.00%	0.00	10.86%	0.00%	10.86%	10.86%
10.0%	6.50%	0.11	10.86%	4.04%	11.16%	10.45%
20.0%	6.90%	0.25	10.86%	4.29%	11.48%	10.04%
30.0%	7.30%	0.43	10.86%	4.53%	11.81%	9.63%
35.0%	7.60%	0.54	10.86%	4.72%	11.95%	9.42%
40.0%	7.95%	0.67	10.86%	4.94%	12.07%	9.22%
45.0%	8.35%	0.82	10.86%	5.19%	12.14%	9.01%
50.0%	8.95%	1.00	10.86%	5.56%	12.05%	8.80%

Inputs

B_U	1.15	Provided in the case
T_c	37.90%	Average tax rate from 2002-2006
r_{RF}	4.25%	Provided in the case
r_M	10.00%	Provided in the case
V_{2006}	358,989	PV of a growing perpetuity of FCF discounted at the WACC
Long-term g	4.23%	Avg. of DPS and EPS growth rates
# Shares ₂₀₀₆	25,000	Provided in the case

Exhibit TN-4. Post-Leverage Valuation Analysis – Adjusted Discount Rate Method

WACC Calculation

Beta = Hamada Levered Beta, Cost of Equity from CAPM

WACC Calculation				Valuation Analysis Using Adjusted Discount Rate Method										
Beta = Hamada Levered Beta, Cost of Equity from CAPM				Values in \$000s (except Stock Price)										
W_d	r_d	Debt/Equity	B_L	$r_d(1 - T_c)$	r_s	WACC	Value of Firm	MV Debt	MV Equity	Stock Price	# Shares to Repurchase	MVA	Repurchase	Value Added by
0.0%	0.00%	0.00%	1.15	0.00%	10.86%	10.86%	358,989	0	358,989	14.36	14.36	0	237,540	0
13.2%	6.50%	15.22%	1.26	4.04%	11.49%	10.50%	378,577	50,000	328,577	15.14	15.14	3,302	257,128	19,588
19.3%	6.50%	23.93%	1.32	4.04%	11.85%	10.34%	388,406	75,000	313,406	15.54	15.54	4,827	266,957	29,417
25.3%	6.90%	33.94%	1.39	4.29%	12.26%	10.24%	394,654	100,000	294,654	15.79	15.79	6,335	273,205	35,665
31.3%	7.30%	45.60%	1.48	4.53%	12.74%	10.17%	399,108	125,000	274,108	15.96	15.96	7,830	277,659	40,119
37.2%	7.60%	59.26%	1.57	4.72%	13.30%	10.10%	403,115	150,000	253,115	16.12	16.12	9,303	281,666	44,126
43.2%	7.95%	76.09%	1.69	4.94%	13.99%	10.08%	404,982	175,000	229,983	16.20	16.20	10,803	283,534	45,994
50.8%	8.95%	103.33%	1.89	5.56%	15.11%	10.25%	393,559	200,000	193,559	15.74	15.74	12,705	272,110	34,570

Inputs

B_U	1.15	Provided in the case
T_c	37.90%	Average tax rate from 2002-2006
r_{RF}	4.25%	Provided in the case
$E(r_M)$	10.00%	Provided in the case
V_{2006}	358,989	PV of a growing perpetuity of FCF discounted at the WACC
Long-term g	4.23%	Avg. of DPS and EPS growth rates
# Shares ₂₀₀₆	25,000	Provided in the case

Borrowing Schedule
0
50,000
75,000
100,000
125,000
150,000
175,000
200,000

Exhibit TN-5. Post-Leverage Valuation Analysis – Adjusted Present Value Method

WACC Calculation

r_u from CAPM, r_s Adjusted per M&M Prop. II

W_d	r_d	Debt/Equity	r_u	$r_d(1 - T_c)$	r_s	WACC
0.0%	0.00%	0.00%	10.86%	0.00%	10.86%	10.86%
13.2%	6.50%	15.25%	10.86%	4.04%	11.28%	10.32%
19.4%	6.50%	24.01%	10.86%	4.04%	11.51%	10.07%
25.2%	6.90%	33.68%	10.86%	4.29%	11.69%	9.83%
30.8%	7.30%	44.43%	10.86%	4.53%	11.85%	9.60%
36.1%	7.60%	56.43%	10.86%	4.72%	12.01%	9.38%
41.1%	7.95%	69.91%	10.86%	4.94%	12.13%	9.17%
46.0%	8.35%	85.19%	10.86%	5.19%	12.19%	8.97%

Valuation Analysis Using Adjusted Present Value Method

Values in \$000s (except Stock Price)

Levered		# Shares to			Value Added by	
Firm Value	MV Debt	MV Equity	Stock Price	Repurchase	MVA	Repurchase
358,989	0	358,989	14.36	0	237,540	0
377,937	50,000	327,937	15.12	3,307	256,488	18,948
387,411	75,000	312,411	15.50	4,840	265,962	28,422
396,885	100,000	296,885	15.88	6,299	275,436	37,896
406,359	125,000	281,359	16.25	7,690	284,910	47,370
415,833	150,000	265,833	16.63	9,018	294,384	56,844
425,307	175,000	250,307	17.01	10,287	303,858	66,318
434,781	200,000	234,781	17.39	11,500	313,332	75,792

Inputs

B_u	1.15	Provided in the case
T_c	37.90%	Average tax rate from 2002-2006
r_{RF}	4.25%	Provided in the case
$E(r_M)$	10.00%	Provided in the case
V_{2006}	358,989	PV of a growing perpetuity of FCF discounted at the WACC
Long-term g	4.23%	Avg. of DPS and EPS growth rates
# Shares ₂₀₀₆	25,000	Provided in the case

Borrowing Schedule
0
50,000
75,000
100,000
125,000
150,000
175,000
200,000

Exhibit TN-6. Financial Ratio and Valuation Metrics Template

Family Furniture Corporation Financial Ratios

	2006	2005	2004	2003	2002
Liquidity					
Current					
Quick					
Net Working Capital to Total Assets					
Asset Management					
Days Sales Outstanding					
Inventory Turnover					
Fixed Assets Turnover					
Total Assets Turnover					
Profitability					
Gross Profit Margin					
Operating Profit Margin					
Net After-Tax Profit Margin					
Total Assets Turnover					
Return on Assets					
Equity Multiplier					
Return on Equity					
Growth Rates					
Dividend Growth Rate					
Earnings Growth Rate					
Sales Revenue Growth Rate					
EPS (earnings per share)					
DPS (dividends per share)					

(NOPAT, EVA and FCF in thousands)

Valuation Metrics Trend Analysis

	2006	2005	2004	2003
NOPAT (net operating profit after tax)				
ROIC (return on invested capital)				
EVA (economic value added)				
FCF (free cash flow)				
WACC (Cost of Equity, based on CAPM)				
(in thousands)				
Net Operating Working Capital				
Operating Long Term Assets				
Total Operating Capital				

Valuation (in thousands where appropriate)

Long-term Growth Rate	
PV of perpetual FCF growing as above, discounted at 7.59%	
Value of Non-Operating Assets (2005)	
Total Intrinsic Value of the Firm (2005)	
Per Share Intrinsic Value of the Firm (2005)	
MVA (market value added)	

Exhibit TN-7. Glossary of Financial and Valuation Metrics

Metric	Calculation
Net Operating Working Capital	Operating current assets – Operating current liabilities
Total Operating Capital	NOWC + Operating long-term assets
Net Operating Profit After Taxes	EBIT(1 – Tax rate)
Free Cash Flow	NOPAT – Net investment in operating capital
Return on Invested Capital	NOPAT/Total Operating Capital
Intrinsic Market Value of Equity	Intrinsic value of firm – BV Debt
Market Value Added	Intrinsic value of firm – BV Debt – BV Equity
Economic Value Added	NOPAT – WACC(Total Operating Capital)
Current Ratio	Current assets/Current liabilities
Quick Ratio	(Current assets – Inventory)/Current liabilities
Net Working Capital	Current assets – Current liabilities
Days Sales Outstanding	Receivables/(Sales/365)
Inventory Turnover	Sales/Inventory
Fixed Assets Turnover	Sales/Net Property & Equipment
Total Assets Turnover	Sales/Total assets
Gross Profit Margin	Gross Operating Profit/Sales
Operating Profit Margin	EBIT/Sales
Net After-Tax Profit Margin	Net Income/Sales
Return on Assets	Net After-Tax Profit Margin(Total Assets Turnover)
Equity Multiplier	Total Assets/Total Stockholders' Equity
Return on Equity	ROA(Equity Multiplier)
Hamada model to estimate levered beta based on unlevered beta	$b = b_U[1 + (1 - T)(D/E)]$

Family-Furniture-July-07.xls Balance Sheet

Family Furniture Corporation
Annual Balance Sheet
Year Ending December 31 (000s)

	2006	2005	2004	2003	2002
Assets					
Current assets					
Cash	14,769.7	14,270.2	13,787.6	13,321.4	12,870.9
Marketable Securities	2,267.3	2,178.0	2,092.2	2,009.8	1,930.6
Receivables	24,144.0	23,170.8	22,236.9	21,340.6	20,480.4
Inventories	36,951.8	35,599.0	34,295.8	33,040.3	31,830.7
Other Current Assets	10,295.5	9,805.2	9,338.3	8,893.6	8,470.1
Total current assets	88,428.2	85,023.2	81,750.8	78,605.6	75,582.7
Non-Current assets					
Property and equipment, gross	104,892.3	99,424.0	94,240.7	89,327.7	84,670.8
Accum. Depreciation and Depletion	35,422.5	30,571.7	25,911.0	21,441.0	17,140.3
Property and equipment, net	69,469.8	68,852.3	68,329.7	67,886.7	67,530.5
Intangibles	11,051.8	10,813.9	10,581.1	10,353.4	10,130.5
Other Non-Current Assets	9,093.2	8,928.0	8,765.9	8,606.6	8,450.3
Total Non-Current Assets	89,614.8	88,594.2	87,676.7	86,846.7	86,111.3
Total assets	178,043.0	173,617.4	169,427.5	165,452.3	161,694.0
Liabilities and stockholders' equity					
Current liabilities					
Accounts payable	29,917.5	29,216.3	28,531.5	27,862.8	27,209.8
Short-term Debt	0.0	0.0	0.0	0.0	0.0
Other Current Liabilities	26,676.6	24,348.4	22,154.0	20,086.6	18,139.9
Total current liabilities	56,594.0	53,564.6	50,685.5	47,949.4	45,349.6
Non-current liabilities					
Long-term debt	0.0	0.0	0.0	0.0	0.0
Deferred income taxes	0.0	0.0	0.0	0.0	0.0
Other non-current liabilities	0.0	0.0	0.0	0.0	0.0
Minority interest	0.0	0.0	0.0	0.0	0.0
Total non-current liabilities	0.0	0.0	0.0	0.0	0.0
Total liabilities	56,594.0	53,564.6	50,685.5	47,949.4	45,349.6
Stockholders' equity					
Preferred Stock	0.0	0.0	0.0	0.0	0.0
Retained Earnings	12,698.5	12,125.1	11,674.1	11,157.4	10,717.6
Common Stock	108,750.5	107,927.7	107,068.0	106,345.5	105,626.8
Total stockholders' equity	121,448.9	120,052.8	118,742.0	117,502.9	116,344.4
Total liabilities and stockholders' equity	178,043.0	173,617.4	169,427.5	165,452.3	161,694.0
Shares Outstanding (thousands)	25,000	25,000	25,000	25,000	25,000

Family Furniture Corporation
Annual Income Statement
Year Ending December 31 (000s)

	2006	2005	2004	2003	2002
Sales Revenue	145,520.5	140,940.4	136,490.4	132,300.1	128,510.0
Cost of sales	74,660.9	72,450.0	70,280.4	68,160.8	66,100.1
Gross Operating Profit	70,859.6	68,490.4	66,210.0	64,139.3	62,409.9
Selling, General and Administrative Expense	26,020.8	25,790.6	25,507.8	25,390.5	25,250.8
Other taxes	0.0	0.0	0.0	0.0	0.0
EBITDA	44,838.8	42,699.8	40,702.2	38,748.8	37,159.1
Depreciation and Amortization	4,850.8	4,660.7	4,470.0	4,300.7	4,190.7
EBIT	39,988.0	38,039.1	36,232.2	34,448.1	32,968.4
Other income (net)	0.0	0.0	0.0	0.0	0.0
Total income available for interest expense	39,988.0	38,039.1	36,232.2	34,448.1	32,968.4
Interest expense	0.0	0.0	0.0	0.0	0.0
Minority interest	0.0	0.0	0.0	0.0	0.0
Pre-tax income	39,988.0	38,039.1	36,232.2	34,448.1	32,968.4
Income taxes	15,500.7	14,600.3	13,700.5	12,870.7	12,250.8
Special Income/Charges	0.0	0.0	0.0	0.0	0.0
Net Income from Continuing Operations	24,487.3	23,438.8	22,531.7	21,577.4	20,717.6
Net Income from Discontinued Operations	0.0	0.0	0.0	0.0	0.0
Normalized Income	24,487.3	23,438.8	22,531.7	21,577.4	20,717.6
Extraordinary Income	0.0	0.0	0.0	0.0	0.0
Income from Cumulative Effect of Acct Changes	0.0	0.0	0.0	0.0	0.0
Income from Tax Loss Carryforward	0.0	0.0	0.0	0.0	0.0
Other Gains (Losses)	0.0	0.0	0.0	0.0	0.0
Total Net Income	24,487.3	23,438.8	22,531.7	21,577.4	20,717.6
Dividends per share	0.47	0.45	0.43	0.42	0.40
Preferred Dividends	0.00	0.00	0.00	0.00	0.00
Addition to Retained Earnings	12,698.5	12,125.1	11,674.1	11,157.4	10,717.6
EPS from Total Operations	0.98	0.94	0.90	0.86	0.83
Diluted EPS from Total Operations	0.98	0.94	0.90	0.86	0.83
Income Tax Rate	38.8%	38.4%	37.8%	37.4%	37.2%
Shares Outstanding (thousands)	25,000	25,000	25,000	25,000	25,000

Family-Furniture-July-07.xls Ratio Analysis

Family Furniture Corporation Financial Ratios						
	2006	2005	2004	2003	2002	
Liquidity						
Current	1.56	1.59	1.61	1.64	1.67	
Quick	0.91	0.92	0.94	0.95	0.96	
Net Working Capital to Total Assets	0.18	0.18	0.18	0.19	0.19	
Asset Management						
Days Sales Outstanding	60.56	60.01	59.47	58.88	58.17	
Inventory Turnover	3.94	3.96	3.98	4.00	4.04	
Fixed Assets Turnover	2.09	2.05	2.00	1.95	1.90	
Total Assets Turnover	0.82	0.81	0.81	0.80	0.79	
Profitability						
Gross Profit Margin	48.7%	48.6%	48.5%	48.5%	48.6%	
Operating Profit Margin	27.5%	27.0%	26.5%	26.0%	25.7%	
Net After-Tax Profit Margin	16.8%	16.6%	16.5%	16.3%	16.1%	
Total Assets Turnover	0.82	0.81	0.81	0.80	0.79	
Return on Assets	13.8%	13.5%	13.3%	13.0%	12.8%	
Equity Multiplier	1.00	1.00	1.00	1.00	1.00	
Return on Equity	13.8%	13.5%	13.3%	13.0%	12.8%	
Growth Rates						
Dividend Growth Rate	4.2%	4.2%	4.2%	4.2%		
Earnings Growth Rate	4.5%	4.0%	4.4%	4.2%		
Sales Revenue Growth Rate	3.2%	3.3%	3.2%	2.9%		
EPS (earnings per share)	\$0.98	\$0.94	\$0.90	\$0.86	\$0.83	
DPS (dividends per share)	\$0.47	\$0.45	\$0.43	\$0.42	\$0.40	
(NOPAT, EVA and FCF in thousands)						
	Valuation Metrics Trend Analysis					
	2006	2005	2004	2003	2002	
NOPAT (net operating profit after tax)	\$24,487.3	\$23,438.8	\$22,531.7	\$21,577.4		
ROIC (return on invested capital)	21.2%	20.8%	20.5%	20.0%		
EVA (economic value added)	\$11,950.0	\$11,199.4	\$10,570.1	\$9,875.7		
FCF (free cash flow)	\$21,745.6	\$20,881.3	\$20,139.3	\$19,354.0		
Weighted Average Cost of Capital (Cost of Equity based on CAPM)	10.86%					
	(in thousands)					
Net Operating Working Capital	\$45,948.0	\$43,823.8	\$41,788.8	\$39,839.4	\$37,972.2	
Operating Long Term Assets	\$69,469.8	\$68,852.3	\$68,329.7	\$67,886.7	\$67,530.5	
Total Operating Capital	\$115,417.8	\$112,676.0	\$110,118.5	\$107,726.1	\$105,502.7	
	Valuation (in thousands where appropriate)					
Long-term Growth Rate (average of DPS and EPS growth rates)	4.23%					
PV of perpetual FCF growing as above, discounted at 10.86%	\$341,952					
Value of Non-Operating Assets (2006)	\$17,037					
Total Intrinsic Value of the Firm (2006)	\$358,989					
Per Share Intrinsic Value of the Firm (2006)	\$14.36					
MVA (market value added)	\$237,540					

Family-Furniture-July-07.xls Cost of Debt Schedule

After-Tax Cost of Debt at Different Levels of Leverage

W_d	r_d	Debt/Equity	B_L	$r_d(1 - T_c)$
0.0%	0.00%	0.00	1.15	0.00%
10.0%	6.50%	0.11	1.23	4.04%
20.0%	6.90%	0.25	1.33	4.29%
30.0%	7.30%	0.43	1.46	4.53%
35.0%	7.60%	0.54	1.53	4.72%
40.0%	7.95%	0.67	1.63	4.94%
45.0%	8.35%	0.82	1.73	5.19%
50.0%	8.95%	1.00	1.86	5.56%

Exhibit 3

Weight of Debt (W_d)	Cost of Debt (r_d)
0.00%	0.00%
10.00%	6.50%
20.00%	6.90%
30.00%	7.30%
35.00%	7.60%
40.00%	7.95%
45.00%	8.35%
50.00%	8.95%

Inputs

B_U	1.15	Provided in the case
T_C	37.90%	Average tax rate from 2002-2006
r_{RF}	4.25%	Provided in the case
$E(r_M)$	10.00%	Provided in the case
V_{2006}	358,989	PV of a growing perpetuity of FCF discounted at the WACC
Long-term g	4.23%	Avg. of DPS and EPS growth rates
# Shares ₂₀₀₆	25,000	Provided in the case

Cost of Equity and WACC at Different Levels of Leverage

Calculation 1:

Beta Calculated as Hamada Levered Beta, Cost of Equity from CAPM

W_d	r_d	Debt/Equity	B_L	$r_d(1 - T_c)$	r_s	WACC
0.0%	0.00%	0.00	1.15	0.00%	10.86%	10.86%
10.0%	6.50%	0.11	1.23	4.04%	11.32%	10.59%
20.0%	6.90%	0.25	1.33	4.29%	11.89%	10.37%
30.0%	7.30%	0.43	1.46	4.53%	12.62%	10.20%
35.0%	7.60%	0.54	1.53	4.72%	13.07%	10.15%
40.0%	7.95%	0.67	1.63	4.94%	13.60%	10.14%
45.0%	8.35%	0.82	1.73	5.19%	14.22%	10.16%
50.0%	8.95%	1.00	1.86	5.56%	14.97%	10.26%

Calculation 2:

Unlevered Cost of Equity from CAPM, Levered Cost of Equity from M&M II

W_d	r_d	Debt/Equity	r_U	$r_d(1 - T_c)$	r_L	WACC
0.0%	0.00%	0.00	10.86%	0.00%	10.86%	10.86%
10.0%	6.50%	0.11	10.86%	4.04%	11.16%	10.45%
20.0%	6.90%	0.25	10.86%	4.29%	11.48%	10.04%
30.0%	7.30%	0.43	10.86%	4.53%	11.81%	9.63%
35.0%	7.60%	0.54	10.86%	4.72%	11.95%	9.42%
40.0%	7.95%	0.67	10.86%	4.94%	12.07%	9.22%
45.0%	8.35%	0.82	10.86%	5.19%	12.14%	9.01%
50.0%	8.95%	1.00	10.86%	5.56%	12.05%	8.80%

Inputs

B_U	1.15	Provided in the case
T_c	37.90%	Average tax rate from 2002-2006
r_{RF}	4.25%	Provided in the case
r_M	10.00%	Provided in the case
V_{2006}	358,989	PV of a growing perpetuity of FCF discounted at the WACC
Long-term g	4.23%	Avg. of DPS and EPS growth rates
# Shares ₂₀₀₆	25,000	Provided in the case

Valuation Analysis Using Adjusted Discount Rate Method

WACC Calculation													
Beta = Hamada Levered Beta, Cost of Equity from CAPM													
W_d	r_d	Debt/Equity	B_L	$r_d(1 - T_c)$	r_s	WACC	Value of Firm	MV Debt	MV Equity	Stock Price	# Shares to Repurchase	MVA	Value Added by Repurchase
0.0%	0.00%	0.00%	1.15	0.00%	10.86%	10.86%	358,989	0	358,989	14.36	0	237,540	0
13.2%	6.50%	15.22%	1.26	4.04%	11.49%	10.50%	378,577	50,000	328,577	15.14	3,302	257,128	19,588
19.3%	6.50%	23.93%	1.32	4.04%	11.85%	10.34%	388,406	75,000	313,406	15.54	4,827	266,957	29,417
25.3%	6.90%	33.94%	1.39	4.29%	12.26%	10.24%	394,654	100,000	294,654	15.79	6,335	273,205	35,665
31.3%	7.30%	45.60%	1.48	4.53%	12.74%	10.17%	399,108	125,000	274,108	15.96	7,830	277,659	40,119
37.2%	7.60%	59.26%	1.57	4.72%	13.30%	10.10%	403,115	150,000	253,115	16.12	9,303	281,666	44,126
43.2%	7.95%	76.09%	1.69	4.94%	13.99%	10.08%	404,983	175,000	229,983	16.20	10,803	283,534	45,994
50.8%	8.95%	103.33%	1.89	5.56%	15.11%	10.25%	393,559	200,000	193,559	15.74	12,705	272,110	34,570

Borrowing Schedule	
	0
	50,000
	75,000
	100,000
	125,000
	150,000
	175,000
	200,000

Inputs

B_U	1.15	Provided in the case
T_C	37.90%	Average tax rate from 2002-2006
r_{RF}	4.25%	Provided in the case
$E(r_M)$	10.00%	Provided in the case
V_{2006}	358,989	PV of a growing perpetuity of FCF discounted at the WACC
Long-term g	4.23%	Avg. of DPS and EPS growth rates
# Shares ₂₀₀₆	25,000	Provided in the case

The optimal capital structure Family Furniture should pursue will be the one that maximizes the value of the firm. In this scenario, using the Hamada equation to adjust beta higher as leverage increases and valuing the firm as a growing perpetuity of free cash flow, the optimal capital structure will be the one that minimizes the WACC. In this case the optimal capital structure occurs when the firm borrows \$175M, which is approximately 43% of the estimated total value of the firm after the leveraged recapitalization.

WACC Calculation
 r_u from CAPM, r_s Adjusted per M&M Prop. II

W_d	r_d	Debt/Equity	r_u	$r_d(1 - T_c)$	r_s	WACC
0.0%	0.00%	0.00%	10.86%	0.00%	10.86%	10.86%
13.2%	6.50%	15.25%	10.86%	4.04%	11.28%	10.32%
19.4%	6.50%	24.01%	10.86%	4.04%	11.51%	10.07%
25.2%	6.90%	33.68%	10.86%	4.29%	11.69%	9.83%
30.8%	7.30%	44.43%	10.86%	4.53%	11.85%	9.60%
36.1%	7.60%	56.43%	10.86%	4.72%	12.01%	9.38%
41.1%	7.95%	69.91%	10.86%	4.94%	12.13%	9.17%
46.0%	8.35%	85.19%	10.86%	5.19%	12.19%	8.97%

Valuation Analysis Using Adjusted Present Value Method

Values in \$000s (except Stock Price)							
Levered	Firm Value	MV Debt	MV Equity	Stock Price	# Shares to Repurchase	MVA	Value Added by Repurchase
	358,989	0	358,989	14.36	0	237,540	0
	377,937	50,000	327,937	15.12	3,307	256,488	18,948
	387,411	75,000	312,411	15.50	4,840	265,962	28,422
	396,885	100,000	296,885	15.88	6,299	275,436	37,896
	406,359	125,000	281,359	16.25	7,690	284,910	47,370
	415,833	150,000	265,833	16.63	9,018	294,384	56,844
	425,307	175,000	250,307	17.01	10,287	303,858	66,318
	434,781	200,000	234,781	17.39	11,500	313,332	75,792

Inputs

B_u	1.15	Provided in the case
T_c	37.90%	Average tax rate from 2002-2006
r_{RF}	4.25%	Provided in the case
$E(r_M)$	10.00%	Provided in the case
V_{2006}	358,989	PV of a growing perpetuity of FCF discounted at the WACC
Long-term g	4.23%	Avg. of DPS and EPS growth rates
# Shares $_{2006}$	25,000	Provided in the case

Borrowing Schedule	
	0
	50,000
	75,000
	100,000
	125,000
	150,000
	175,000
	200,000

The optimal capital structure Family Furniture should pursue will be the one that maximizes the value of the firm. In this scenario, using M&M Proposition II to directly adjust the cost of equity higher as leverage increases and valuing the firm as a growing perpetuity of free cash flow plus the present value of the tax shield from debt, the optimal capital structure will be the one that maximizes the value of the levered firm. In this case the value of the firm is maximized when the firm borrows the entire \$200M, which is approximately 46% of the estimated total value of the firm after the leveraged recapitalization. Because the Adjusted Present Value method does not impose a numerical penalty for the expected costs of financial distress, the value of the levered firm keeps rising as more debt is used in the capital structure.