

Do's & Don'ts of Cash Flow/Balance Sheet Forecasting

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Agenda

- ◆ Overview of Discounted Cash Flow (DCF) Method and Forecasting
- ◆ What to Forecast?
- ◆ Individual Statements & Issues
- ◆ Terminal Value Issues

Overview – When to Use DCF?

◆ DCF Method Useful When:

- Business in industry amenable to forecasting
 - Non-commodity
- When future cash flows expected to be materially different than recent past
 - Otherwise redundant with capitalization method
- When history difficult to determine or get
 - Divestiture of subsidiary
 - Turnaround situations
 - Transactions with changed assumptions

Overview - Key DCF “Components”

	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	Projections
Sales	500.0	550.0	600.0	600.0	650.0	Income Statement (Interest & Taxes)
Net Income	50.0	55.0	60.0	60.0	65.0	
Deprec.	12.5	13.8	15.0	15.0	16.3	Cash Flow Items driven by Balance Sheet Changes
Cap. Exp.	-13.1	-14.4	-15.8	-15.8	-17.1	
Wkg. Cap.	-2.5	-2.5	-2.5	0.0	-2.5	
Net Debt Pmts	-3.0	0.0	-3.0	-1.5	-1.5	
	43.9	51.8	53.8	57.8	60.2	
Equity Cash Flows:	43.9	51.8	53.8	57.8	<u>421.4</u> [1]	Terminal Value & Growth Rates
					481.6	

Equity Rate: 20% (Year end discounting)

Discount Rate

Net Present Value of Equity: \$325.1

Value & Adjustments

[1] Terminal Value Model: Gordon Growth Model: $CF \times (1 + g) / (ER - g)$

Overview – DCF Projections

◆ Current Appraisal Practice

- Some use projected net income/NOPAT only
- Many make only limited adjustments to NI based on estimates for certain items
- Full projections used more often today
- Probability weighted projections

◆ Sources of Projections

- Management (at more sophisticated companies)
- Valuation expert with management input

Overview – Why Full Projections?

- ◆ Cash Flows are Key Valuation Measure
 - Ibbotson return data relates to cash flows
 - Cleanest measure of economic income to investors
 - Most appraisers underestimate required investment in businesses over time, particularly in the “terminal value” calculations
 - Affords appraisers ability to explicitly examine assumptions and their impact on cash flow

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What to Forecast?

- ◆ Type of Analysis Being Done
 - Level of value
 - Paths to value
 - Direct-to-equity
 - Total invested capital

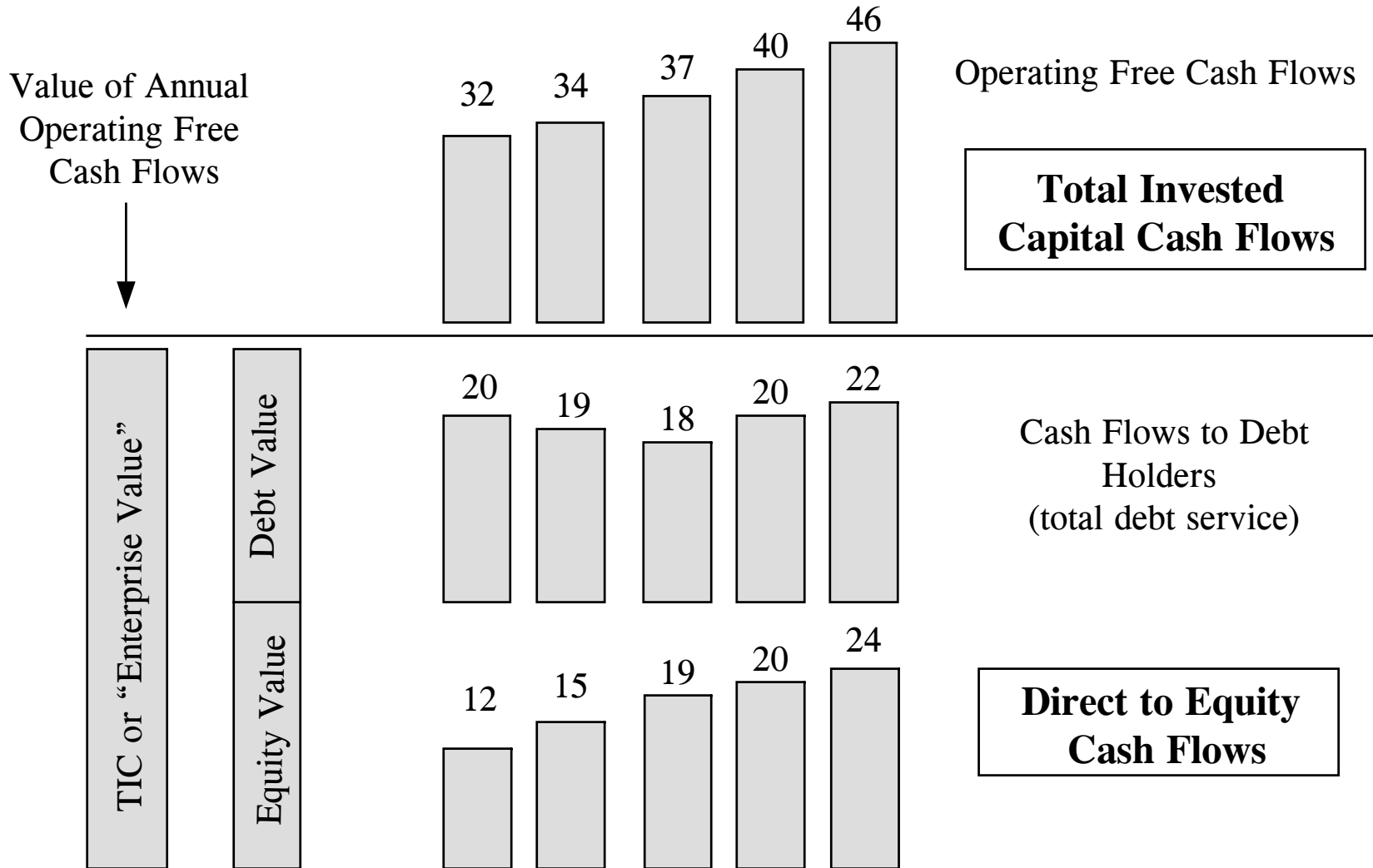
Level of Value

- ◆ Historical Income Statement Adjustments
 - Minority interest level of value adjustments
 - Normalize for unusual historical items
 - Normalize for owner-officer compensation
 - Generates freely-tradable value assuming normal industry compensation
 - Compensation adjustments alone does NOT generate a control level of value
 - Controlling interest level adjustments
 - All of the above adjustments
 - Streamlining of operations (if appropriate)
 - Synergistic Adjustments (if appropriate)
 - Consolidation savings
 - Lower financing costs
 - Wider or deeper product sales channels, etc.

“Paths” to Value

- ◆ Path determines balance sheet items to be forecasted and cash flows to be used
 - Direct-to-Equity - using an equity discount rate and equity cash flows (net of all debt service)
 - Total Invested Capital (“TIC”) - using a “WACC” discount rate and debt-free cash flows (before debt service)
 - Provides enterprise or total invested capital values (debt + equity)
 - Subtract existing debt from TIC to derive equity value

Annual Cash Flows By "Path"



Example: Net Cash Flow to Equity

◆ Traditionally:

Net income (after interest exp. & taxes)

- Plus: deprec., amort., & non-cash charges
- Less: working capital changes +/-
- Less: capital expenditures
- Plus: new debt incurred
- Less: principal repayments

Example: To Total Invested Capital - TIC

◆ Net Income

- Plus: deprec., amort., & non-cash charges
 - Less: working capital changes +/-
 - Less: capital expenditures
 - Plus: interest expense (after tax cost)
 - Note: Can also tax effect EBIT to get “debt-free” NI
- ◆ Equals: cash flow to debt & equity holders
(or operating cash flows)

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Statement Forecasts - General

- ◆ Spread and analyze full historical financials
 - Much better insight into history
 - “Normalize” to establish base for projections
- ◆ Do ratio analysis on historical and projected financials
 - Ratios should be consistent or explained if different
- ◆ Number of years - Until growth and cash flows normalize
 - Five years typical
 - 10 + years for large projects/utility/telecom type companies

Look to Each Type of Statement

- ◆ Projected Income Statements
- ◆ Projected Balance Sheets
- ◆ Projected Cash Flow Statements

Income Statements – Historical Perspective

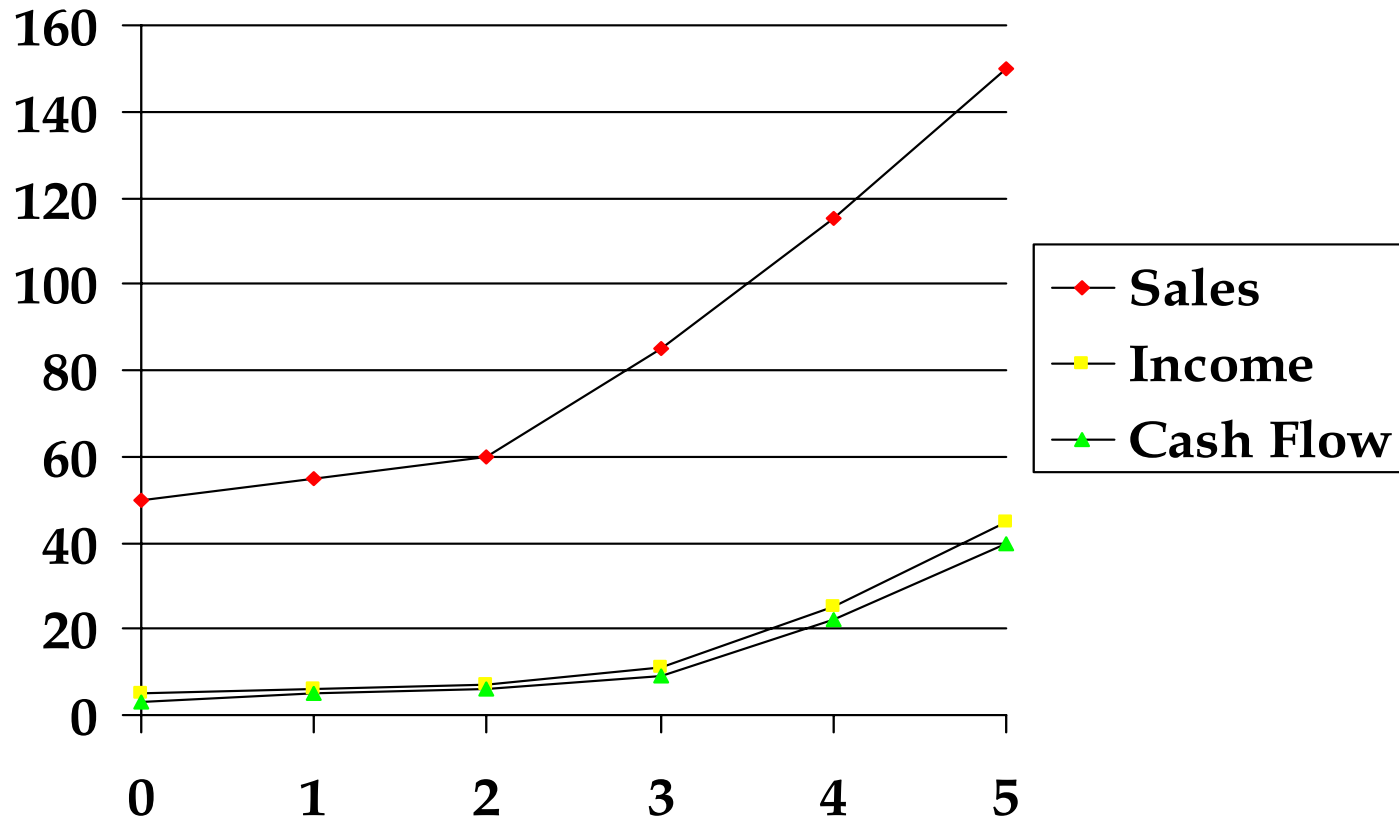
- ◆ **Minority interest level value adjustments**
 - Normalize for unusual historical items
 - Normalize for owner-officer compensation

- ◆ **Controlling interest level adjustments**
 - All of the above adjustments
 - Streamlining of operations (if appropriate)
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Income Statements - Projections

- ◆ Revenues to operating income levels
- ◆ Interest expense
- ◆ Taxes

Beware of the “Hockey Stick” Forecast



Projected Operating Income

- ◆ Need solid reasons for rapid changes in revenues and operating income
- ◆ Reasonableness Check: Consistent with public company levels or own restated history (particularly if start-up situation with high op. inc. projected later...high tech cos.)
- ◆ Calculate/check depreciation & amortization separately
 - May have to revise as analysis proceeds
- ◆ Know what went into the projections
 - Client projections may intermix key expenses (e.g., int. exp., deprec., owner perks) without breakouts

Sources for Insights into Projections

- ◆ Management estimates
- ◆ Historical performance of subject company
- ◆ Historical performance of public, guideline companies
- ◆ 10-K discussions on industry trends from guideline companies
- ◆ Analyst (e.g., I/B/E/S) estimates for guideline companies or industry
- ◆ Government - industry growth estimates
- ◆ Internally generated growth – self funding ability

Income Statements – Interest Expense

- ◆ Direct to Equity Path - Interest expense left in as expense
- ◆ Total Invested Capital Path
 - Intra year, short term working capital debt (interest related to spikes in borrowings) costs may be left in and viewed as almost an operating expense
 - Interest on permanent short term debt can/should be added back – but the market value of debt should also be subtracted at the end (if an equity value is to be determined)
 - Interest on long-term debt usually added back, and its market value subtracted at the end (again, to determine equity)
- ◆ Key is to be consistent to the “Path” selected

Income Statements – Taxes

- ◆ Adjust Subchapter-S taxes as appropriate
- ◆ Determine tax rate to use
 - Potential hypothetical willing buyer
 - Tax levels for standalone business
- ◆ Use marginal tax rate (w/depreciation on tax basis)
- ◆ Incorporate existing Net Operating Loss Carryforwards, where appropriate (non-change in control situations)

Income Statements – Common Errors

- ◆ “Hockey Stick” projections w/out consideration to history, capital requirements and market realities
 - Revenue Rocket
 - Margin Creep
 - Off the Books Revenue/Income

- ◆ Improper add backs for level of value being considered

- ◆ Non-operating asset/liability impacts on earnings not eliminated from income or expenses

Look to Each Type of Statement

- ◆ Projected Income Statements

- ◆ Projected Balance Sheets

- ◆ Projected Cash Flow Statements

Balance Sheets – Function in Valuation

- ◆ Allows for analyzing and tracking all working capital accounts (including cash)
 - Historically
 - Projected basis
- ◆ Validates capital exp. and depreciation ratios going forward
 - Explicit forecast of PP&E
- ◆ Tracks other non-current assets/liabilities levels that the company needs to operate
- ◆ Tracks debt assumptions if appropriate

Balance Sheets – Forecasting

- ◆ Review History
- ◆ Establish Assumptions and Ratios
 - Ratios can be used to drive projections
- ◆ Focus on:
 - Net Property/Plant/Equip (PPE)/Net Sales
 - Days or turns for major working capital categories
 - Debt and equity financings that may be imbedded in projections (need to account for properly or remove)
 - Intangible Asset Treatment
 - Other ratios as appropriate

Balance Sheets – Forecasting

- ◆ Minor misalignments in depreciation and capital expenditures potentially cause major issues
- ◆ Issue occurs with most projections

SAMPLE COMPANY

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>Terminal</u>
SALES	1,000	1,200	1,440	1,699	1,954	2,149
Growth		20%	20%	18%	15%	10%
PP&E	200	190	178	164	147	127
CAPITAL EXPENDITURE	50	60	72	85	98	107
% of Sales						5%
DEPRECIATION	60	72	86	102	117	129
% of Sales						6%
NET PP&E	190	178	164	147	127	114
SALES/NET PP&E	5.26	6.74	8.80	11.59	15.38	18.87

Balance Sheets – Forecasting

- ◆ Consider building own capital expenditure tax based depreciation “water fall” to test or as part of own projections

Five Year Asset Depreciation Schedule - MACRS 200% DDB

3% Projected Growth in Capex per Year

Year	NEW CAPEX	Depreciation							
		Year							
		1	2	3	4	5	6	7	8
1	1,000	200	320	190	115	115	60		
2	1,030		206	330	196	119	119	62	
3	1,061			212	339	202	122	122	64
4	1,093				219	350	208	126	126
5	1,126					225	360	214	130
6	1,159						232	371	220
New Tax Depreciation		200	526	732	869	1,010	1,101	895	539
Existing Tax Depreciation		1,000	800	600	400	200	100	100	100
Total Tax Depreciation		1,200	1,326	1,332	1,269	1,210	1,201	995	639

Balance Sheets – Forecasting Issues

◆ Tricky Areas:

- Debt and working capital
 - Short and long-term debt forecasting
 - “Path to value” determines treatment
- Capitalized leases vs operating leases
- Depreciation/Amortization
- Excess Assets/Liabilities
- Cash balances
 - Requirements of business – rest “distributed” for value
- Terminal (or normalized) year cash flows in high growth to lower growth situations

Balance Sheets – Common Errors

- ◆ Depreciate PP&E to negative or insupportably low numbers given growth in revenues over projection period
 - Look at NET PP&E to sales ratio over time to check
 - Capital expenditures usually understated for depreciation taken
- ◆ Ignore smaller but important working capital accounts (both asset and liabilities)
- ◆ Overly aggressive changes in required current assets or liabilities
 - Reductions in Accts. Rec. from 60+ days to 30 days or vice versa for Accts. Pay, without adequate reasoning
 - Inventory turns adjusted without consideration to margin impacts
- ◆ Ignore long-term net asset investments required
- ◆ Ignore deferred taxes if income statements not on tax basis

Look to Each Type of Statement

- ◆ Projected Income Statement Topics
- ◆ Projected Balance Sheets
- ◆ Projected Cash Flow Statements

Cash Flow Statements

- ◆ Ties projections together so all are functioning properly
- ◆ Easy place to spot anomalies in cash flows and trouble shoot unbalanced balance sheet forecasts/histories

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Terminal Value is Very Important

- ◆ 50% to 80% of value typically captured in Terminal Value
- ◆ Terminal year projections and adjustments have major impacts on values
- ◆ Many appraisers project a “normalized” terminal year (different from the last projection year) to ensure proper cash flow levels

Terminal Value Cash Flows

- ◆ Adjustments needed if long-term growth expected to be lower than last year of projections
 - Explicitly project extra year at normalized growth rate
 - Confirm correct relationship between capital expenditures and depreciation
 - Confirm proper treatment of tax amortization benefit or other cash flow benefits that may not be in perpetuity

- ◆ Confirm your discount/WACC rate agrees with the cash flows you are forecasting for valuation purposes (consistent “path to value”)

Terminal Value Cash Flows

- ◆ Many use short cut with only NI, Depreciation, Capex, and Working Capital needs in calculation (vs full balance sheet forecast). Consider:
 - Depreciation to capital expenditure ratio
 - Consistent with long-term growth assumption
 - 3% vs 6% growth rates = very diff. net levels
 - Depreciation – capital exp. ratio calculator
 - Working capital assumptions
 - Consistent with long-term growth assumption
 - 3% vs 6% growth rates = very diff. net levels
 - Working capital ratio calculator

Cap. Exp. vs Depreciation vs Growth

◆ Capital Exp. vs Depreciation Calculator

- Based on MACRS depreciation schedule

Ratio of Capital Expenditures to Depreciation at Equilibrium

Five year Assets

Assumed LT Growth	Ratio	Reciprocal*
3.0%	105%	95%
4.0%	107%	93%
5.0%	109%	92%
6.0%	111%	90%
7.0%	112%	89%
8.0%	114%	88%
9.0%	116%	86%

Seven year Assets

Assumed LT Growth	Ratio	Reciprocal*
3.0%	108%	93%
4.0%	110%	91%
5.0%	113%	88%
6.0%	116%	86%
7.0%	118%	85%
8.0%	121%	83%
9.0%	123%	81%

* Reciprocal = Depreciation as % of Capex

Example: If Depreciation = \$100 in terminal year then Capex should = \$107, if mostly 5-year assets with 4% growth assumed.

Working Capital "Calculator"

TERMINAL YEAR WORKING CAPITAL CALCULATOR FOR NORMALIZING WORKING CAPITAL TO LONG-TERM GROWTH ASSUMPTIONS

(\$000)	HISTORY					AVERAGE DAYS OVER PERIOD	ANALYST'S NORMALIZED VALUES
	1999	2000	2001	2002	2003		
SALES:	\$50.0	\$55.0	\$60.0	\$65.0	\$70.0		
RECEIVABLES:	\$6.0	\$7.0	\$7.0	\$8.0	\$9.0		
INVENTORY:	\$10.0	\$11.0	\$13.0	\$13.5	\$15.0		
PAYABLES:	\$4.0	\$5.0	\$5.0	\$6.0	\$6.0		
OTHER CURRENT A.	\$0.1	\$0.2	\$0.4	\$0.5	\$0.6		
OTHER CURRENT L.	\$3.0	\$3.0	\$4.0	\$4.0	\$5.0		
<u>DAYS IN SALES OF EACH ITEM</u>							
DAYS REC	(43.8)	(46.5)	(42.6)	(44.9)	(46.9)	(44.9)	(45.0)
DAYS INVENTORY	(73.0)	(73.0)	(79.1)	(75.8)	(78.1)	(75.8)	(75.0)
DAYS PAYABLE to SLS	29.2	33.2	30.4	33.7	31.3	31.6	33.0
DAYS OTHER A. to SLS	(0.7)	(1.3)	(2.3)	(2.7)	(3.4)	(2.1)	(2.5)
DAYS OTHER L. to SLS	21.9	19.9	24.3	22.5	26.1	22.9	23.0
WORKING CAP LINE	0.0	0.0	0.0	0.0	0.0	<u>0.0</u>	<u>0.0</u>
						(68.3)	(66.5)
<u>TERMINAL VALUE WKG CAPITAL INV CALCULATIONS</u>							
TERMINAL VALUE GROWTH ASSUMPTION:	4.00%						
NORMALIZED OR BASE YEAR'S SALES VOLUM	\$70.00						
NEXT YEAR'S SALES VOLUME:	\$72.80 [BASE YEAR'S SALES + GROWTH]						
RESTATE PRIOR YEAR'S SALES BASED ON TERMINAL GROWTH ASSUMPTION:	\$70.00						
NORMALIZED TOTAL WKG CAP INV FOR:							
NEXT YEAR'S SALES:	(\$13.26) [FUNCTION OF DAYS OF SALES]						
LESS: PRIOR YEAR	(\$12.75)						
CHANGE IN WKG CAP AT L-T. GROWTH RATE:	(\$0.510)						

Appendix

Balance Sheets – Forecasting Ratios

◆ Liquidity Ratios

➤ Current Ratio

- Current Assets/Current Liabilities

➤ Quick Ratio

- $$\frac{\text{Cash \& Equivalents} + \text{Invests} + \text{Accts. Receivables}}{\text{Current Liabilities}}$$

Balance Sheets – Forecasting Ratios

◆ Activity Ratios

- **Days Payables (Payment Policy Measure)**
 - $365 / (\text{Cost of Goods Sold} / \text{Average Accts. Payables})$
- **Days Receivables (Collection Measure)**
 - $365 / (\text{Sales} / \text{Average Accts. Receivables})$
- **Days Inventory (Inventory Age/Costs)**
 - $365 / (\text{Cost of Goods Sold} / \text{Average Inventory})$
- **Working Capital to Sales**
 - $(\text{Current Assets} - \text{Current Liabilities}) / \text{Sales}$
- **Sales to Net PP&E (PP&E Utilization & Adequacy)**
 - Average Net PP&E/Sales or reciprocal

Balance Sheets – Forecasting Ratios

◆ Profitability & Return Ratios

- EBITDA to Sales
 - EBITDA = Earnings b/Interest, Taxes, Deprec. & Amort.
- Operating Profit to Sales
- Net Income to Sales
- Return on Equity
 - Net Income/Average Stockholder's Equity
- Return on Total Assets
 - EBIT/Average Total Assets
 - EBIT = Earnings b/Interest & Taxes

Balance Sheets – Forecasting Ratios

- ◆ Leverage Ratios – Direct-to-Equity Path Model
 - Total Interest Bearing Debt to Total Assets
 - Equity to Total Book Capital
 - $\text{Total Equity} / (\text{Long Term Debt} + \text{Book Equity})$
 - Times Interest Earned
 - $\text{EBIT} / \text{Interest Expense}$
 - Fixed Charges Coverage
 - $\text{EBIT} + \text{Lease Pmts.} / (\text{Interest} + \text{Current Debt Due} + \text{Lease Pmts. Due})$

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