Financial Accounting

Financial Statement Analysis

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Financial Analysis Ratio Formula Sheet

Profitability Ratios

• Gross margin ratio	Gross profit / sales
• Operating income ratio	Sustainable operating income / sales
• R&D expense percent	R&D / sales
• SGA expense percent	SGA / sales
• Net margin ratio	Sustainable net income / sales
• Effective tax rate	Income tax provision / Income before taxes
• Return on total assets	Sustainable net income / total assets
• Return on equity	Sustainable net income / shareholders' equity
• DuPont Analysis	Net margin ratio X total asset turnover X total assets to equity
• Economic value added (EVA)	(Return on total assets% – Cost of capital%) x Total assets

Liquidity Ratios

• Current ratio	Current assets / current liabilities
• Quick ratio	Cash + ST investments + accounts receivable / current liabilities
• Defensive interval	Cash + ST investments + accounts receivable / Daily spending on operating expenses and interest

Leverage Ratios

• Total assets to equity	Total assets / shareholders' equity
• Total liabilities to equity	Total liabilities / shareholders' equity
• Debt to equity	Debt financing / shareholders' equity
• Times interest earned	EBITDA / interest expense
• Altman's Z bankruptcy	3.3(EBT/TA)+1.2(WC/TA)+.6(MktEq/BkDebt) 1.4(RE/TA) + 1(Revenue/TA)
• Book value per share	Common shareholders' equity / number of shares outstanding

Activity Ratios

• Receivables turnover	Revenue / accounts receivable
• Days receivables	365 / receivables turnover
• Inventory turnover	Revenue / inventory
• Days inventory	365 / inventory turnover
• Payables turnover	Revenue / accounts payable
• Days payables	365 / payables turnover
• Cash cycle	Days inventory - Days payables + Days receivables
• Fixed assets turnover	Revenue / PP&E
• Cash cycle	Days inventory - Days payables + Days
• Days fixed assets	365 / fixed assets turnover
• Total assets turnover	Revenue / total assets
• Days total assets	365 / total assets turnover

Cash Flow Ratio

• Net cash margin	Operating cash flow / sales
• Capital expend. To depreciation	Additions to PP&E / depreciation expense

Valuation Ratios

• Earnings per share (EPS)	Net income / common shares outstanding
• Price / earnings ratios (PE)	Market price / EPS
• Price to book value	Market price / book value per share

Financial Statement Analysis

The financial statements for BGS Technologies are provided below:

BGS Technologies
Income Statement
Year Ended December 31, 2017

Sales	$ 1,000,000
Cost of goods sold	550,000
Gross profit	450,000
Research and development expense	100,000
Selling, general and admin. expenses	150,000
Operating income	200,000
Other income (expense):	
Special item – Lawsuit settlement	(125,000)
Special item – Loss from flood	(25,000)
Interest income	50,000
Interest expense	(25,000)
Income from continuing operations before taxes	75,000
Income tax provision	18,750
Income from continuing operations	56,250
Gain from discontinued operations (net of tax)	110,250
Net Income	$ 166,500

BGS Technologies
Balance Sheet
As of December 31, 2017

Assets		
Current Assets:		
Cash and cash equivalents	$ 25,000	
Short-term investments	50,000	
Accounts receivable	80,000	
Inventory	150,000	
Total current assets		$ 305,000
Property, Plant & Equipment:		
Land	80,000	
Buildings	475,000	
Equipment, furniture & fixtures	310,000	
Less: accumulated depreciation	(320,000)	
Net property, plant and equipment		545,000
Total Assets		$ 850,000
Liabilities and Stockholders' Equity		
Current Liabilities:		
Accounts payable	$ 55,000	
Current portion of long-term debt	20,000	
Income taxes payable	10,000	
Total current liabilities		$ 85,000
Noncurrent Liabilities:		
Long-term debt		150,000
Total liabilities		235,000
Stockholders' Equity:		
Common stock (100,000 shares)	10,000	
Additional paid-in capital	290,000	
Retained earnings	315,000	
Total stockholders' equity		615,000
Total Liabilities and Stockholders' Equity		$ 850,000

BGS Technologies
Cash Flow Statement
Year Ended December 31, 2017

Cash Provided (Used) by Operating Activities:		
Net income		$ 166,500
Depreciation expense		32,000
(Increase) Decrease in operating current assets		(45,000)
Increase (Decrease) in operating current liabilities		(8,000)
Cash provided by operating activities		145,500
Cash Provided (Used) by Investing Activities:		
(Increase) in property, plant & equip.	$ (315,000)	
Decline in ST investments	110,000	
Cash (used) in investing activities:		(205,000)
Cash Provided (Used) by Financing Activities:		
(Decrease) in long-term debt	(50,000)	
Dividends paid	(30,000)	
Increase in common stock	10,000	
Increase in additional paid in capital	140,000	
Cash provided by financing activities		70,000
Increase in cash and equivalents		10,500
Cash and cash equivalents, beginning of year		14,500
Cash and cash equivalents, end of year		$ 25,000

Analyzing the Income Statement

How is BGS Technologies doing?

Financial ratios provide a framework for comparison with:

- Prior years
- Other companies in the same industry
- Other investment alternatives

Selected *profitability* ratios:

- Gross profit or gross margin ratio = gross profit / sales
  Measures percentage of each sales dollar available to cover selling, general and administrative expenses, financing costs, and to provide a return to investors. Measures basic profitability of company's product line.

  For BGS Technologies: $450,000 / $1,000,000 = 45.0%

- Operating income ratio = operating income / sales
  Measures percentage of each sales dollar available to cover financing costs and to provide a return to investors. Measures overall profitability of core company operations, before interest and income tax effects.

  For BGS Technologies: $200,000 / $1,000,000 = 20%

Before calculating the operating income ratio, operating income should be adjusted for included nonrecurring items. Examples include restructuring charges, merger-related expenses and acquired in-process research and development.

This adjustment is not applicable for BGS Technologies.

A closer look at operating profit.

Two operating expense categories which can play a significant role in changes in operating profit over time are research and development (R&D) and Selling, general and administrative expense (SGA).

Management has more control over R&D and SGA spending than over cost of goods sold. Thus changes in operating profit over time can typically be more readily explained by changes in these expense categories than by changes in gross profit, which is determined by spending on cost of goods sold.

- R&D expense percent = R&D / sales
  Measures the percent of each sales dollar invested in research and development.

  Changes in operating profit from one period to the next may be due to discretionary changes in research and development spending.

  For BGS Technologies: $100,000 / $1,000,000 = 10%

- SGA expense percent = SGA / sales
  Measures the percent of each sales dollar spent on operating overhead.

  Changes in operating profit from one period to the next may be due to discretionary changes in spending on SGA.

  For BGS Technologies = $150,000 / $1,000,000 = 15%

Exercise in Understanding Changes in Operating Profit

Pharmaceuticals, Inc.

For the quarter ended December 31, 2017, Pharmaceuticals reported an improvement in operating profit to $1,731 from an operating loss of $403 during the same quarter in 2016.

Use the following data to make requested calculations:
(amounts in thousands)

For 3 months ended December 31,	2017	2016
Sales, net	$19,550	$14,937
Cost of goods sold	14,989	12,188
Gross profit	4,561	2,749
Research and development	205	218
Selling, general and administrative	2,625	2,934
Operating profit (loss)	$1,731	$(403)

Calculate gross margin and operating margin.

Calculate the R&D percent and SGA percent.

What has the company done to improve its performance?

Back to selected profitability ratios.

- Net margin ratio = net income / sales.

  Measures percentage of each sales dollar available for shareholders. Measures overall profitability of the company after inclusion of all expenses.

  For BGS Technologies: $166,500 / $1,000,000 = 16.5%

  Caution: the net margin ratio is influenced greatly by items of income or expense that will not recur and may not provide an accurate assessment of the operating performance to be expected in future years.

  For BGS Technologies, the following are nonrecurring:

  - Lawsuit settlement (pretax) $(125,000)
  - (Loss) from flood (pretax) (25,000)
  - Gain from discontinued operations (after tax) 110,250

  A more accurate measure of the net margin ratio requires that a sustainable measure of net income first be computed, as shown below:

Income from continuing operations before taxes (as reported)	$ 75,000
Adjust for Special item – lawsuit settlement	125,000
Adjust for Special item – loss from flood	25,000
Sustainable Income from continuing operations before taxes	225,000
Income tax provision (using 25% tax rate)	(56,250)
Sustainable net income	$ 168,750

Recomputed net margin ratio = 16.9%

Note: the company's 25% effective tax rate is calculated as follows:

- Effective tax rate = Income tax provision / Income from continuing operations before taxes, or, $18,750 / $75,000.

At present this is about right for a combination of the U.S. federal tax rate (21%) plus state tax rate (4%) combined. If the rate were significantly less than 25%, the 25% should be used in computing sustainable earnings.

Exercise in Calculating Sustainable Net Income
Trey Systems, Inc.

Use the income statement for Trey Systems, Inc. provided below to calculate sustainable net income for the year ended September, 2017 (amounts in thousands).

Revenues	$ 175,676
Cost of sales	93,808
Gross margin	81,868
Marketing	48,688
Product development	8,414
General and administrative	10,233
Restructuring charge	9,000
Total operating expenses	76,335
Operating income	5,533
Interest income (expense)	(5,944)
Gain on sale of fixed assets	2,926
Income before income taxes and extraordinary charge	2,515
Provision for income taxes	956
Income before extraordinary charge	1,559
Discontinued operations, net of taxes	377
Net income	$ 1,182

Trey Systems, Inc. (cont'd)

Calculation of Sustainable Net Income

	Amount
Income from continuing operations before income taxes	
Add: Nonrecurring pretax expenses:	
	_____
	_____
	_____
Deduct: Nonrecurring pretax income:	
	_____
	_____
	_____
Sustainable pretax income	_____
Less income taxes	(_____)
Sustainable net income	_____

Additional *profitability* ratios:

- Return on total assets = sustainable net income / total assets

  Measures effectiveness of management in employing the resources available to it (can be compared with investment alternatives available to management)

  For BGS Technologies: $168,750 / $850,000 = 19.9%

  Note that sustainable net income is used in the calculation.

- Return on equity =

  sustainable net income / shareholders' equity

  Measures effectiveness of management in employing shareholders' equity funds (can be compared to investment alternatives available to shareholders).

  Will exceed return on assets provided return on assets exceeds interest rates incurred on borrowed funds.

  For BGS Technologies: $168,750 / $615,000 = 27.4%

  Note again that sustainable net income is used in the calculation.

Using Return on Assets and Return on Equity to Compare Performance Across Companies

Thiokol Corp. and Wyman-Gordon, Inc.

In a recent fiscal year, Thiokol Corp. reported sales of $889.5 million and net income of $51.4 million. For the same year, Wyman-Gordon, reported sales of $499.6 million and net income of $25.2 million, about half the income of Thiokol.

Both companies are in the same industry, aerospace and defense.

Use the data provided below to compare financial performance for the two companies (amounts in millions).

	Thiokol	Wyman-Gordon
Sales	$ 889.5	$ 499.6
Net income	$ 51.4	$ 25.2
Total assets	$ 818.3	$ 375.9
Shareholders' equity	$ 447.9	$ 109.9

Calculate:

Return on assets _____ _____

Return on equity _____ _____

Why is Return on equity so different for the two companies?

Economic Value Added (EVA)

Measures value added by management calculated as the incremental rate of return on a firm's assets over the firm's total cost of capital.

EVA = (After-tax return on total assets% – After tax cost of capital%) x Total assets

A positive measure indicates that the company is creating value.

For BGS Technologies:

Co. has $235,000 in liabilities and $615,000 in shareholders' equity. Total liabilities and equity is $850,000

Relative debt is 235 / 850 = 27.65%.
Relative equity is 615 / 850 = 72.35%

Cost of debt financing:

Interest expense / total liabilities = $25,000 / $235,000 = 10.64%
To tax effect at 35% = 10.64% x .65 = 6.92%.

Cost of equity financing: assume 11% long-term cost of equity capital. The cost of equity financing is already an after-tax measure.

To compute cost of capital:

Debt:	6.92% x 27.65% =	1.91%
Equity:	11% x 72.35% =	7.96%
Total cost of capital		9.87%

EVA = 16.4% - 9.87% ($850,000) = $55,505 in value created over cost of capital.

Using EVA

Ziegler is considering adding a new customer projected to generate $300,000 in new sales annually with a pre-tax profit margin (including adequate projections of bad debts) of 20%.

Taxes consume 25% of pre-tax profit.

Manufacturing capacity is available to handle the new business. No new hires are necessary.

To generate this business, Ziegler must carry inventory of $40,000 and accounts receivable of $35,000.

Assuming a cost of capital of 9.87%, will the new business add economic value?

Analyzing the Balance Sheet

How does BGS Technologies look? As with analysis of the income statement, the correct response is, compared to what?

Typical comparisons:

- Prior years
- Other companies in the same industry
- Debt covenants established by lenders to protect their credit position

Financial ratios provide a framework for comparison. Selected *liquidity* ratios:

- Current ratio = current assets / current liabilities
  Measures the ability of the firm to service current obligations.
  For BGS Technologies: $305,000 / $85,000 = 3.59

- Quick ratio or acid test ratio = quick assets* / current liabilities
  * Cash and cash equivalents, ST investments and accounts receivable: $25,000 + $50,000 + $80,000 = $155,000

  Measures the extent to which current obligations are covered by the company's most liquid of assets.

  For BGS Technologies: $155,000 / $85,000 = 1.82

- Defensive Interval = Quick assets / Daily spending on operating expenses and interest.

Conservative measure of how long a company can operate on liquid assets with no additional revenue.

Daily spending on operating expenses and interest = Spending / 365 = ($550,000-$32,000+$100,000+$150,000+$25,000) / 365 = $2,173 / day.

For BGS Technologies: $155,000 / $2,173 = 71.3 days.

Borrowing Oneself Into Financial Health?

A condensed balance sheet for CSV Corp. is provided below. Calculate the current and quick ratios.

Assume CSV borrowed $15,000 using long-term debt. Recalculate the company's current and quick ratios.

CSV Corp. balance sheet (amounts in thousands):

	2017
Cash	$ 1,400
Accounts receivable	3,600
Inventory	5,800
Total current assets	10,800
Property, plant and equipment	10,200
Total assets	$ 21,000
Accounts payable	$ 4,200
Accrued expenses payable	6,400
Total current liabilities	10,600
Long-term debt	4,400
Shareholders' equity	6,000
Total liabilities and shareholders' equity	$ 21,000

Calculated current ratio: _____

Calculated quick ratio: _____

Assume $15,000 borrowed using long-term debt:

Revised current ratio: _____

Revised quick ratio: _____

Selected *leverage* ratios:

- Total assets to equity = total assets / shareholders' equity

  Measures the number of dollars of total assets held for every $1 of shareholders' equity. The higher the ratio the higher the level of liabilities financing.

  A ratio of 1 indicates no debt financing. A ratio of 2 indicates equal amounts of debt and equity financing.

  For BGS Technologies: $850,000 / $615,000 = 1.38

- Total liabilities to equity = total liabilities / shareholders' equity

Measures the number of dollars of total liabilities owed for every $1 of shareholders' equity. The higher the ratio the higher the level of liabilities financing.

For BGS Technologies: $235,000 / $615,000 = .38

- Debt to equity = Debt financing (current and noncurrent portion of LT debt plus notes payable) / shareholders' equity

For BGS Technologies: ($20,000 + $150,000) / $615,000 = .28

Measures the number of dollars of debt financing for every $1 of shareholders' equity. The higher the ratio the higher the level of debt financing.

Average total assets to shareholders' equity for selected technology-related industries:

Aerospace and Defense	3.0
Computers and Peripherals	2.0
Drugs	2.0
Software	2.1
Semiconductors	1.7
Telecommunications Equipment	1.6
Telecommunications Services	3.9

In contrast, financial institutions tend to have high leverage ratios. For example, commercial banks have a total assets to shareholders' equity ratio of 12.9.

Selected *leverage* ratios (cont'd):

Income Statement Measures of Leverage

Times interest earned = EBITDA / Interest expense

EBITDA: Earnings before interest expense, income taxes, depreciation and amortization. Earnings before interest expense and income taxes are earnings available to pay interest and taxes. By adding back such non-cash expenses as depreciation and amortization, EBITDA becomes a measure of cash flow, but one that ignores changes in working capital accounts. It measures the number of times that cash flow available for interest covers interest. In effect, a measure of how far earnings can fall before debt service of interest becomes a significant problem.

Before calculating EBITDA, known nonrecurring items of income and expense should be removed.

For BGS Technologies:

EBITDA =

Sustainable net income	$168,750
Interest expense	+ 25,000
Income tax expense	+ 56,250
Depreciation expense	+ 32,000
EBITDA	$282,000

Times interest earned = $282,000 / $25,000 = 11.3.

Selected *leverage* ratios (cont'd):

Altman's Z bankruptcy predictor:

3.3(Earnings before taxes / Total assets) + 1.2(Working capital / Total assets) +.6(Market value of equity / book value of debt) + 1.4(Retained earnings / Total assets) + 1(Revenue / Total assets).

$Z \leq 1.8$ indicates high bankruptcy risk within 1 year

$Z \geq 3.0$ indicates low bankruptcy risk within 1 year

Z between these two scores is not a clear indicator.

Z was development for larger, public companies. Private companies and smaller companies will tend to give signs of increased bankruptcy risk.

For BGS Technologies:

Altman's Z bankruptcy predictor =

3.3(75+125+25) / 850) + 1.2((305-85)/850) + .6(615/235) + 1.4(315/850) + 1(1,000 / 850) =

.8735 + .3106 + 1.57 + .5188 + 1.1765 =

4.45

Selected *leverage* ratios (cont'd):

- Book value per share = common shareholders' equity / number of shares of common stock outstanding.

  Measures the amount that each shareholder would receive if the company's assets were to be sold and liabilities liquidated at book value.

  For BGS Technologies: $615,000 / 100,000 = $6.15 / share

If the market price of BGS Technologies were less than $6.15 per share, BGS would be worth more in liquidation than as a going concern. Such low valuations occur when companies are having financial difficulties and losses are expected to recur in the future.

- Price to book value:
  Market price per share / book value per share.

  For BGS Technologies, assuming a $20 share price,
  $20 / $6.15 = 3.25.

  The company would be selling at 3.25 times book value.

The shares of technology firms tend to trade at prices well in excess of book value, in fact, at multiples of book value.

Recent market price to book value multiples for selected technology-related industries:

Aerospace and Defense	3.1
Computers and Peripherals	4.2
Drugs	7.5
Software	7.7
Semiconductors	3.4
Telecommunications Equipment	6.0
Telecommunications Services	4.9

Reasons for these high valuations relative to book value vary, including the immediate expensing of research and development expenditures and the high growth prospects of these firms generally.

Other industries which sell at a high multiple to book value are those where high spending on marketing costs are the norm. Like research and development, marketing costs are expensed immediately.

Softdrinks	9.4
Household products (brands)	5.1

Selected *activity* ratios:

- Receivables turnover = Revenue / accounts receivable

  Measures the number of times during the year that total accounts receivable were created with new sales and then collected.

  For BGS Technologies: $1,000,000 / $80,000 = 12.5 times.

  More intuitive is Receivables in days:

  Receivables in days = 365 / Receivables turnover

Measures the average number of days it will take to collect the ending balance in accounts receivable. Measures management's success in collecting outstanding receivables.

For BGS Technologies: 365 / 12.5 = 29.2 days

- Inventory turnover = revenue / inventory

  Measures the number of times during the year, in terms of revenue, that total inventory is purchased and then resold.

  For BGS Technologies: $1,000,000 / $150,000 = 6.67 times.

  More intuitive is inventory in days:

  Inventory in days = 365 / Inventory turnover

  Measures the average number of days it will take to sell the ending balance in inventory. Measures management's success in controlling inventory.

  For BGS Technologies: 365 / 6.67 = 54.7 days

- Payables turnover = revenue / accounts payable

  Measures the number of times during the year, in terms of revenue, that total accounts payable is borrowed and then repaid.

  For BGS Technologies: $1,000,000 / $55,000 = 18.2 times.

  More intuitive is Payables in days:

  Payables in days = 365 / Payables turnover.

  Measures the average number of days management will delay payment of the ending balance in accounts payable. Measures management's use of financing from vendors.

  For BGS Technologies: 365 / 18.2 = 20.1 days

- Cash cycle =

  Inventory in days - Payables in days + Receivables in days.

  Measures how many days it takes for a company to go through a complete cash cycle.

A cash cycle is the length of time inventory is carried, (Inventory in days) less the portion of that period financed by vendors, (Payables in days), plus once inventory is sold, the length of time required to convert resulting accounts receivable back to cash, (Receivables in days).

Companies with shorter cash cycles are more efficient in their management of current assets and better able to generate cash flow.

For BGS Technologies: 54.7 – 20.1 + 29.2 = 63.8 days.

- Fixed assets turnover = revenue / property, plant & equipment

  Measures the number of times during the year that fixed assets (PP&E, net) are recovered through Sales.

  For BGS Technologies: $1,000,000 / $545,000 = 1.83 times

  More intuitive is Fixed assets in days:

  Total assets in days = 365 / Fixed assets turnover.

  Measures the average number of days required to recover fixed assets through sales. This ratio measures efficiency in the management of investments in fixed assets.

  For BGS Technologies: 365 / 1.83 = 199.5 days.

- Total assets turnover = revenue / total assets

  Measures the number of times during the year that total assets are recovered through Sales.

  For BGS Technologies: $1,000,000 / $850,000 = 1.18 times

  More intuitive is Total assets in days:

  Total assets in days = 365 / Total assets turnover.

  Measures the average number of days required to recover total assets through sales. This ratio measures efficiency in the management of investments in Total assets.

  For BGS Technologies: 365 / 1.18 = 309.3 days.

Exercise in Calculating Activity Ratios

United Instruments, Inc.

Selected Financial Statement Statistics as of Dec. 31, 2017 (amounts in millions):

Accounts receivable	$ 544
Inventory	337
PP&E, net	1,526
Total assets	2,707
Accounts payable	272
Sales	2,690

Calculate the following ratios and comment:

Accounts receivable turnover and Days receivables:

Inventory turnover and Days inventory:

Accounts payable turnover and Days payables:

Cash cycle:

Fixed assets turnover and Days fixed assets:

Total assets turnover and Days total assets:

Combining Profitability and Activity Ratios
DuPont Analysis

We know that Return on equity is calculated as:

Net income / Shareholders' equity,

We can expand this ratio as follows:

Return on equity =

$$\frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total assets}} \times \frac{\text{Total assets}}{\text{Shareholders' equity}}$$

which provides us with:

Return on equity =

Net margin X Asset turnover (asset multiplier) X Financial leverage. (debt multiplier)

For BGS Technologies:

Return on equity, 22.7% =

$$\frac{\$139{,}500^*}{\$1{,}000{,}000} \times \frac{\$1{,}000{,}000}{\$850{,}000} \times \frac{\$850{,}000}{\$615{,}000}$$

.14 1.18 1.38

*Sustainable net income calculated earlier.

We can use these three important measures of financial performance and position to help us determine the more important contributors to changes in Return on equity through time and to differences in Return on equity across companies.

Is the company generating its Return on equity through

- High margins?
- Low asset investments and thus high turnover?
- High debt financing?

A Significant Increase in Return on Equity Using DuPont Analysis to Understand Why

Gentrol, Inc.

Selected financial statement data (in thousands):

Quarter ended December 31,	2017	2016
From the income statement:		
Net income (sustainable)	$ 1,373	$ 1,287
Sales	$ 15,389	$ 13,845
From the balance sheet:		
Current assets	$ 4,664	$ 4,269
Property, plant and equipment	931	962
Other assets	360	18
Total assets	$ 5,955	$ 5,249
Current liabilities	$ 3,480	$ 2,049
Long-term debt	1,997	14
Total liabilities	5,477	2,063
Shareholders' equity	478	3,186
Total liabilities and Shareholders' equity	$ 5,955	$ 5,249

Gentrol, Inc. (cont'd)

Calculating return on equity, we have:

2017: $1,373 / $478 = 287.2%

2016: $1,287 / $3,186 = 40.4%

How has the company boosted its return on equity?

Using DuPont Analysis:

Return on equity =

Net margin	X	Asset turnover (asset multiplier)	X	Financial leverage. (debt multiplier)

For 2017, return on equity, 287.2% =

$1,373 / $15,389	X	$15,389 / $5,955	X	$5,955 / $478
.089	X	2.58	X	12.46

For 2016, return on equity, 40.4% =

$1,288 / $13,845	X	$13,845 / $5,249	X	$5,249 / $3,186
.093	X	2.64	X	1.65

Gentrol, Inc. (cont'd)

We can see that the company's net profit margin and asset turnover actually declined in 2017 from 2016.

The significant increase in Return on equity is due to a significant increase in its use of debt financing - the debt multiplier - which adds to the company's risk level.

Using DuPont Analysis to Compare Corporate Performance

Intel Corp. and IBM

In a recent year, Intel Corp. and IBM report remarkably similar measures of return on equity:

Intel Corp. return on equity: 28.8%

IBM return on equity: 28.2%

Using DuPont Analysis we see that,

Return on equity =

Net margin	X	Asset turnover (asset multiplier)	X	Financial leverage. (debt multiplier)

For Intel Corp.:

.215	X	.93	X	1.44

For IBM:

.088	X	.90	X	3.58

Intel Corp. and IBM (cont'd)

From this analysis we better understand the performance of the two companies.

- IBM is much less profitable than Intel Corp.
- The two companies have remarkably similar asset turnover rates.
- IBM uses debt to lever a lower profit margin to a return on equity that is similar to Intel's.

Using DuPont Analysis to Compare Corporate Performance

Exercise Using Data for Thiokol Corp. and Wyman-Gordon, Inc.

Use the data provided below to compare financial performance for the two companies (amounts in millions).

	Thiokol	Wyman-Gordon
Sales	$ 889.5	$ 499.6
Net income	$ 51.4	$ 25.2
Total assets	$ 818.3	$ 375.9
Shareholders' equity	$ 447.9	$ 109.9

Using DuPont Analysis we see that,

Thiokol Corp.:

Return on equity = _____

$$\frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total assets}} \times \frac{\text{Total assets}}{\text{Shareholders' equity}}$$

Net margin X Asset turnover (asset multiplier) X Financial leverage. (debt multiplier)

Return on equity =

_____ X _____ X _____

Thiokol Corp. and Wyman-Gordon, Inc. (cont'd)

Wyman-Gordon, Inc.:

Return on equity = _____

$$\frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total assets}} \times \frac{\text{Total assets}}{\text{Shareholders' equity}}$$

Net margin X Asset turnover (asset multiplier) X Financial leverage. (debt multiplier)

Return on equity =

_____ X _____ X _____

Analyzing the Cash Flow Statement

How is BGS Technologies doing on a cash flow basis?

Cash Provided (Used) in Operating Activities:

Is the company generating positive cash flow from operating activities?

- Positive cash flow: management has more discretion in decision making

- Negative cash flow: eventually management must look to third parties for cash, may restrict decision making.
  - Lenders - debt financing
  - Shareholders - new stockholders' equity

BGS Technologies is generating positive cash from operating activities in the amount of $145,500. This is cash that can be used to increase its investments, to reduce debt levels or to pay dividends.

- Net cash margin =
  operating cash flow / Sales

A cash flow counterpart to the Net margin ratio. The percentage of each sales dollar resulting in operating cash flow.
For BGS Technologies:

$145,500 / $1,000,000 = 14.5%

Cash Provided (Used) in Investing Activities:

Is the company investing in new property, plant and equipment or liquidating itself?

BGS Technologies increased its investment in property, plant and equipment in the amount of $315,000.

- More than enough to replace, property, plant and equipment consumed in operations during the year.
    - Depreciation expense - a crude measure of property, plant and equipment consumed in operations, $32,000.

BGS Technologies helped to finance its investment in property, plant and equipment by selling ST and LT investments, $110,000.

- Capital expenditures to depreciation expense - measures extent to which new investments in property, plant and equipment are replacing productive capacity consumed in operations.

For BGS Technologies: $315,000 / $32,000 = 9.84.
BGS Technologies is adding significant amounts to productive capacity.

Cash Provided (Used) in Financing Activities:

Is the company financing itself with debt or equity?

BGS Technologies issued $150,000 in new equity financing during the year, reduced long-term debt in the amount of $50,000 and paid dividends in the amount of $30,000 during the year.

Overall, cash increased by $10,500 during the year.

Analyzing Cash Flows
Central Communications, Inc.

Use the cash flow statement provided below to comment on the company's cash flows provided (used) by operating, investing and financing activities. During 2017, the company reported sales of $ 104,324.

Central Communications, Inc.
The Statement of Cash Flows
(amounts in thousands)

	2017
Cash and equivalents beginning of period	$ 10,633
Cash flows from operations:	
Net income (loss)	1,000
Depreciation and amortization	7,729
Deferred taxes	679
Trade receivables	(9,411)
Inventories	(5,646)
Other assets	(1,392)
Accounts payable	2,786
Other liabilities and accrued expenses	(682)
	(4,937)
Cash flows used for investing:	
Purchase of short-term investments	(68,702)
Proceeds from sale and maturities of short-term investments	84,354
Purchase of property and equipment	(10,615)
Purchase of intangible assets	
Note receivable from officer	(300)
	4,737
Cash flows from financing:	
Proceeds from sale of common stock, net of issuance costs	2,412
Principal payments on capital leases and long-term obligations	(177)
	2,235
Net change in cash and equivalents	2,035
Cash and equivalents, end of period	$ 12,668

Central Communications, Inc. (cont'd)

Comments on cash flow

Operating activities:

Net cash margin:

Investing activities:

Capital expenditures to depreciation:

Financing activities:

Selected *valuation* ratios:

- Earnings per share (EPS):
  Net income / common shares outstanding

  Measures the amount of net income attributable to each share.

  To get a clearer picture of performance, sustainable net income should be used in the calculation.

  For BGS Technologies: $168,750 / 100,000 = $1.69.

- Price / earnings ratio (PE):
  Market price per share / Earnings per share

  Measures the pay back period, or the number of years to recover the market price of the stock through earnings assuming earnings per share do not change.

  For BGS Technologies: Assuming BGS was trading at $20 per share, the PE ratio would be $20 / $1.69 = 11.8.