Equity Analysis and Valuation

11

CHAPTER

McGraw-Hill/Irwin

Earnings Persistence

Recasting and Adjusting

- Earnings persistence is a key to effective equity analysis and valuation
- Analyzing earnings persistence is a main analysis objective
- Attributes of earnings persistence include:

Stability
Predictability
Variability
Trend
Earnings management
Accounting methods

Analyze

Earnings Persistence

Recasting and Adjusting

Two common methods to help assess earnings persistence:

- ❖ **Recasting of income statement**
- ❖ **Adjusting of income statement**

Earnings Persistence

Recasting and Adjusting

Information for Recasting and Adjusting

- Income statement, including its subdivisions:
  - Income from continuing operations
  - Income from discontinued operations
  - Extraordinary gains and losses
  - Cumulative effect of changes in accounting principles
- Other financial statements and notes
- Management commentary in financial statements
- Management's Discussion and Analysis
- Other: product-mix changes, technological innovations, work stoppages, and raw material constraints

Earnings Persistence

Recasting and Adjusting

Objectives of Recasting

1. Recast earnings and earnings components so that stable, normal and continuing elements comprising earnings are distinguished and separately analyzed from random, erratic, unusual and nonrecurring elements

2. Recast elements included in current earnings that should more properly be included in the operating results of one or more prior periods

Recasting and adjusting earnings also aids in determining earning power

Earnings Persistence

Recasting and Adjusting

General Recasting Procedures

❶ Income statements of several years (typically at least five) are recast

❷ Recast earnings components to yield meaningful classifications and a relevant format for analysis

❸ Components can be rearranged, subdivided, and tax effected

❹ Total recasted components must reconcile to reported net income

Earnings Persistence

Recasting and Adjusting

Specific Recasting Procedures

- Discretionary expenses are segregated
- Distinct components are segregated (such as equity in income of unconsolidated subsidiaries) and often reported net of tax
- When components of continuing income are separately reclassified, their pre-tax amounts along with their tax effects must be removed
- Income tax disclosures enable one to separate factors that either reduce or increase taxes such as:
  - Deductions—tax credits, capital gains rates, tax-free income, lower foreign tax rates
  - Additions—additional foreign taxes, non-tax-deductible expenses, and state and local taxes (net of federal tax benefit)

Earning Persistence

Recasting and Adjusting -- Illustration

Campbell Soup Company
Recast Income Statements ($ mil.)

Item		*Year 11*	*Year 10*	*Year 9*	*Year 8*	*Year 7*	*Year 6*
13	Net sales	$ 6,204.1	$ 6,205.8	$ 5,672.1	$ 4,868.9	$ 4,490.4	$ 4,286.8
19	Interest income	26.0	17.6	38.3	33.2	29.5	27.4
	Total revenue	$ 6,230.1	$ 6,223.4	$ 5,710.4	$ 4,902.1	$ 4,519.9	$ 4,314.2
	Costs and expenses:						
	Cost of products sold (see Note 1 below)	$ 3,727.1	$ 3,893.5	$ 3,651.8	$ 3,077.8	$ 2,897.8	$ 2,820.5
	Marketing and selling expenses (see Note 2 below)	760.8	760.1	605.9	514.2	422.7	363.0
145	Advertising (see Note 2 below)	195.4	220.4	212.9	219.1	203.5	181.4
144	Repairs and maintenance (see Note 1 below)	173.9	180.6	173.9	155.6	148.8	144.0
16	Administrative expenses	306.7	290.7	252.1	232.6	213.9	195.9
17	Research and development expenses	56.3	53.7	47.7	46.9	44.8	42.2
102	Stock price‑related incentive programs (see Note 3 below)	15.4	(0.1)	17.4	(2.7)	—	8.5
20	Foreign exchange adjustment	0.8	3.3	19.3	16.6	4.8	0.7
104	Other, net (see Note 3 below)	(3.3)	(2.0)	(1.4)	(4.7)	(0.4)	(9.0)
162A	Depreciation (see Note 1 below)	194.5	184.1	175.9	162.0	139.0	120.8
103	Amortization of intangible and other assets (see Note 3 below)	14.1	16.8	16.4	8.9	5.6	6.0
18	Interest expense	116.2	111.6	94.1	53.9	51.7	56.0
	Total costs and expenses	$ 5,557.9	$ 5,712.7	$ 5,266.0	$ 4,480.2	$ 4,132.2	$ 3,930.0
23	Earnings before equity in earnings of affiliates & min. interests	$ 672.2	$ 510.7	$ 444.4	$ 421.9	$ 387.7	$ 384.2
24	Equity in earnings of affiliates	2.4	13.5	10.4	6.3	15.1	4.3
25	Minority interests	(7.2)	(5.7)	(5.3)	(6.3)	(4.7)	(3.9)
26	Income before taxes	$ 667.4	$ 518.5	$ 449.5	$ 421.9	$ 398.1	$ 384.6
	Income taxes at statutory rate*	(226.9)	(176.3)	(152.8)	(143.5)	(179.1)	(176.9)
	Income from continuing operations	$ 440.5	$ 342.2	$ 296.7	$ 278.4	$ 219.0	$ 207.7
135	State taxes (net of federal tax benefit)	(20.0)	(6.6)	(3.8)	(11.8)	(8.6)	(8.0)
	Investment tax credit	—	—	—	—	4.4	11.6
137	Nondeductible amortization of intangibles	(4.0)	(1.6)	(1.2)	(2.6)	(1.4)	—
138	Foreign earnings not taxed or taxed at other than statutory rate	2.0	(2.2)	(0.2)	3.2	11.1	15.2
139	Other: Tax effects	(17.0)	(2.2)	(0.1)	(3.7)	7.5	(4.7)
	Alaska Native Corporation transaction	—	—	—	—	4.5	—
22	Divestitures, restructuring and unusual charges	—	(339.1)	(343.0)	(40.6)	—	—
	Tax effect of divest., restructuring & unusual charges (Note 4)	—	13.9	64.7	13.9	—	—

(Continued on next page)

Earning Persistence

Recasting and Adjusting -- Illustration

Campbell Soup Company
Recast Income Statements ($ mil.)

Item		Year 11	Year 10	Year 9	Year 8	Year 7	Year 6	
	Gain on sale of businesses in (Yr 8) and sub. in Yr 7	—	—	—	3.1	9.7	—	
	Loss on sale of exercise equipment subsidiary, net of tax	—	—	—	—	(1.7)	—	
	LIFO liquidation gain (see Note 1 below)	—	—	—	1.7	2.8	1.4	
	Income before cumulative effect of accounting change	$ 401.5	$ 4.4	$ 13.1	$ 241.6	$ 247.3	$ 223.2	
153A	Cumulative effect of accounting change for income taxes	—	—	—	32.5	—	—	
28	Net income as reported	$ 401.5	$ 4.4	$ 13.1	$ 274.1	$ 247.3	$ 223.2	
14	(Note 1) Cost of products sold	$ 4,095.5	$ 4,258.2	$ 4,001.6	$ 3,392.8	$ 3,180.5	$ 3,082.8	
144	Less: Repair and maintenance expenses	(173.9)	(180.6)	(173.9)	(155.6)	(148.8)	(144.0)	
162A	Less: Depreciation[a]	(194.5)	(184.1)	(175.9)	(162.0)	(139.0)	(120.0)	
153A	Plus: LIFO liquidation gain[b]	—	—	—	2.6	5.1	2.6	
		$ 3,727.1	$ 3,893.5	$ 3,651.8	$ 3,077.8	$ 2,897.8	$ 2,821.4	
15	(Note 2) Marketing and selling expenses	$ 956.2	$ 980.5	$ 818.8	$ 733.3	$ 626.2	$ 544.4	
145	Less: Advertising	(195.4)	(20.4)	(212.9)	(219.1)	(203.5)	(181.4)	
		$ 760.8	$ 960.1	$ 605.9	$ 514.2	$ 422.7	$ 363.0	
21	(Note 3) Other expenses (income)	$ 26.2	$ 14.7	$ 32.4	$ (3.2)	$ (9.5)	$ 5.5	
102	Less: Stock price–related incentive programs	(15.4)	0.1	(17.4)	2.7	—	(8.5)	
103	Less: Amortization of intangible and other assets	(14.1)	(16.8)	(16.4)	(8.9)	(5.6)	(6.0)	
	Less: Gain on sale of businesses (Yr 8) and sub. (Yr 7)	—	—	—	4.7	14.7	—	
104 (9.0)		Other, net	$ (3.3)	$ (2.0)	$ (1.4)	$ (4.7)	$ (0.4)	$
	(Note 4) Tax effect of divest, restruc., & unusual charges	—	$ 115.3[c]	$ 116.6[d]	$ 13.9	—	—	
136	Nondeductible divestitures, restructuring, and unusual charges	—	(101.4)[e]	(51.9)[f]	—	—	—	
		—	$ 13.9	$ 64.7	$ 13.9	—	—	

*Statutory federal tax rate is 34% in Year 8 through Year 11, 45% in Year 7, and 46% in Year 6.

†This amount is not disclosed for Year 6.

[a]We assume most depreciation is included in cost of products sold.

[b]LIFO liquidation gain before tax. For example, for Year 8 this is $2.58 million, computed as $1.7/(1 □ 0.34).

[c]$339.1 22 □ 0.34 = $115.3.

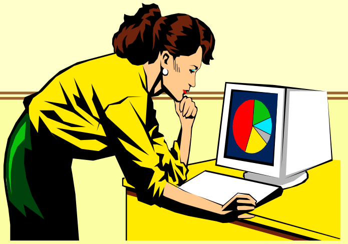
[d]$343.0 22 □ 0.34 = $116.6

[e]$179.4 26 □ 0.565 136 = $101.4.

[f]$106.5 26 □ 0.487 136 = $51.9.

Earnings Persistence

Recasting and Adjusting -- Illustration



Objective of Adjusting

Assign earnings components to periods where they most properly belong

Note: Uses data from recast income statements and any other relevant information

Earnings Persistence

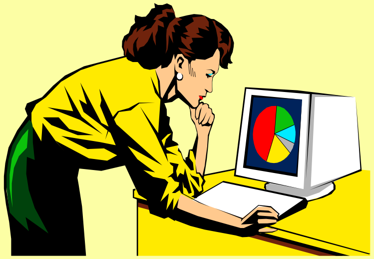
Recasting and Adjusting

General Adjusting Procedures

All earnings components must be considered
When a component is excluded from the period when reported, then

1. **Shift it (net of tax) to the operating results of one or more prior periods, or**
2. **Spread (average) it over earnings for the period under analysis**

Note: Only spread items over prior earnings when they cannot be identified with specific periods

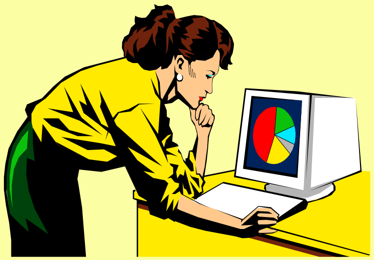


Earnings Persistence

Recasting and Adjusting

Specific (Typical) Adjusting Procedures

- Assign extraordinary and unusual items (net of tax) to applicable years
- Tax benefit of carryforwards normally moved to the loss year
- Costs or benefits from lawsuit settlements moved to relevant prior years
- Gains and losses from disposals of discontinued operations usually relate to operating results of several prior years
- Changes in accounting principles or estimates yield adjustments to all years under analysis to a comparable basis—redistribute “cumulative effect” to the relevant prior years
- Normally include items that increase or decrease equity



Earnings Persistence

Recasting and Adjusting

Campbell Soup Company
Adjusted Income Statements ($ mil.)

	Year 11	*Year 10*	*Year 9*	*Year 8*	*Year 7*	*Year 6*	*Total*
Net income as reported	$401.5	$ 4.4	$ 13.1	$ 274.1	$ 247.3	$223.2	$ 1,163.6
Divestitures, restructuring & unusual charges		339.1	343.0	40.6			
Tax effect of divestitures, restructuring, etc.		(13.9)	(64.7)	(13.9)			
Gain on sale of businesses (Yr 8) and sale of subsidiary (Yr 7), net of tax				(3.1)	(9.7)		
Loss on sale of exercise equipment subsidiary					1.7		
ANC transaction					(4.5)		
LIFO liquidation gain				(1.7)	(2.8)	(1.4)	
Cumulative effect of change in acctg for taxes				(32.5)			
Adjusted net income	$ 401.5	$329.6	$291.4	$ 263.5	$ 232.0	$221.8	
Total net income for the period							$ 1,739.8
Average earnings for the period							$ 289.97

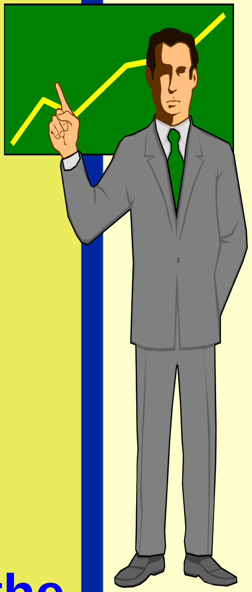
Earnings Persistence

Determinants of Persistence

Earnings persistence determined by many factors including:

- **Earnings variability**
- **Earnings trend**
- **Earnings stability**
- **Earnings predictability**
- **Earnings Management**
- **Management Incentives**

Note: Assess earnings persistence over both the business cycle and the long term

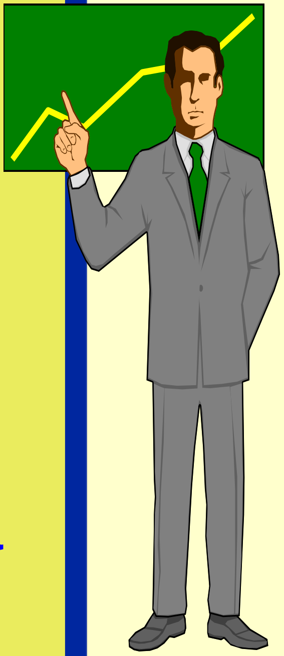


Earnings Persistence

Measuring Persistence

Earnings variability can be measured:

1. **Standard variability measures**
2. **Average earnings--typically using 5 to 10 years of data**
3. **Minimum earnings--typically selected from the most recent business cycle, reflecting a worst-case scenario**



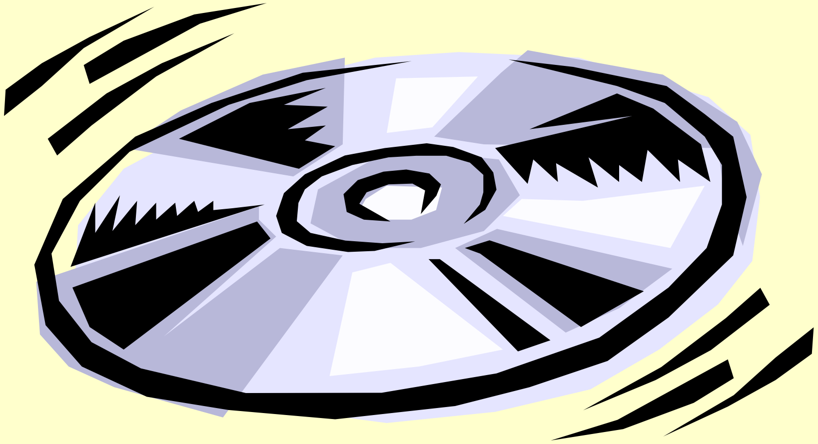
Earnings Persistence

Measuring Persistence

Earnings Trend can be measured:

1. Statistical methods

2. Trend statements (such as Index numbers)



Earnings Persistence

Measuring Persistence

Earnings Management is reflected as follows:

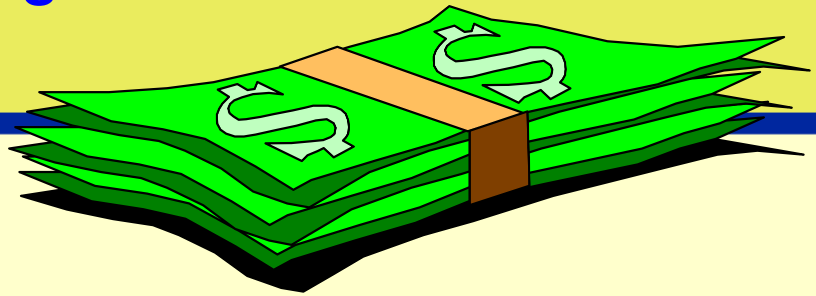
- Changes in accounting methods or assumptions
- Offsetting extraordinary /unusual gains and losses
- Big baths
- Write-downs
- Timing revenue and expense recognition
- Aggressive accounting applications

Earnings Persistence

Measuring Persistence

Management Incentives affecting persistence include:

- Personal objectives and interests
- Companies in distress
- Prosperous companies—preserving hard-earned reputations
- Compensation plans
- Accounting-based incentives and constraints
- Analysts targets



Earnings Persistence

Measuring Persistence

Earnings persistence of components depends on key attributes

Recurring vs Non-recurring
Operating vs Non-operating

Key application of these attributes is the reporting of

Extraordinary vs Non-extraordinary

Earnings Persistence

Measuring Persistence

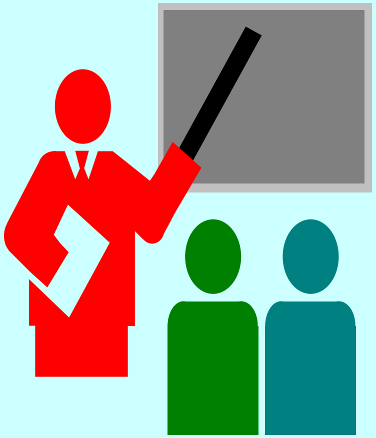
Analyzing and Interpreting Extraordinary Items

1. Determine whether an item is extraordinary (less persistent) or not
2. Assessing whether an item is unusual, non-operating, or non-recurring
3. Determine adjustments necessary given assessment of persistence

Earning Persistence

Measuring Persistence

Three broad categories:



1. **Nonrecurring operating gains and losses**
   -Usually include in current operating income

2. **Recurring non-operating gains and losses**
   -Consider inclusion in current operating earnings

3. **Nonrecurring non-operating gains and losses**
   -Omitted from operating earnings of a single year

Earning-Based Valuation

Stock Prices and Accounting Data

$$V_t = BV_t + \frac{E(RI_{t+1})}{(1+k)^1} + \frac{E(RI_{t+2})}{(1+k)^2} + \frac{E(RI_{t+3})}{(1+k)^3} + \cdots$$

Equity value (*V_t*)
Book value (*BV_t*)
Residual Income (RI_t = *Net income$_t$ – k * BV_{t-1}*)
Cost of equity capital (*k*)

Earning-Based Valuation

Valuation Multiples

Price-to-Book (PB)

$$\frac{\text{Market value of equity}}{\text{Book value of equity}}$$

Ratio Analysis

Earning-Based Valuation

Valuation Multiples

Price-to-Book (PB) expressed in accounting data

$$\frac{V_t}{BV_t} = 1 + \left[\frac{(ROCE_{t+1} - k)}{(1+k)}\right] + \left[\frac{(ROCE_{t+2} - k)}{(1+k)^2} \times \frac{BV_{t+1}}{BV_t}\right] + \left[\frac{(ROCE_{t+3} - k)}{(1+k)^3} \times \frac{BV_{t+2}}{BV_t}\right] + \ldots$$

Note

- ROCE and growth in book value increase → PB increases
- Cost (risk) of equity capital increases → PB decreases
- Present value of future abnormal earnings is positive (negative) → PB is greater (less) than 1.0

Ratio Analysis

Earning-Based Valuation

Valuation Multiples

Price-to-Earnings (PE)

$$\frac{\text{Market value of equity}}{\text{Net income}}$$

Ratio Analysis

Earning-Based Valuation

Valuation Multiples

Price-to-Earnings (PE) expressed in accounting data

$$\frac{P_t}{eps_t} = \frac{1}{k} + \frac{STG - LTG}{k - LTG}$$

Where k is the cost of equity capital, STG (LTG) is the expected short-term (long-term) % change in eps relative to expected "normal" growth (STG>LTG and LTG>k)

- **The PE is inversely related to k**
- **The PE is positively related to the expected growth in eps relative to normal growth.**

Earning-Based Valuation

Valuation Multiples- PEG Ratio

If LTG=0 (long-term growth in eps relative to "normal" growth is expected to remain constant)

$$\frac{P_t}{eps_t} = \frac{STG}{k^2}$$

This yields the popular PEG ratio.

Example: If PE=20 and k=10%, proponents of this screening device recommend stock purchase (sale) if the expected eps growth is greater (less) than 20%.

Earning-Based Valuation

Earnings-Based Valuation--Illustration

Christy Co. book value of equity at January 1, Year 1, is $50,000
Christy has a 15% cost of equity capital (*k*)
Forecasts of Christy's accounting data follow:

	Year 1	Year 2	Year 3	Year 4	Year 5
Sales	$ 100,000	$ 113,000	$127,690	$144,290	$144,290
Operating expenses	77,500	90,000	103,500	118,000	119,040
Depreciation	10,000	11,300	12,770	14,430	14,430
Net income	$ 12,500	$ 11,700	$ 11,420	$ 11,860	$ 10,820
Dividends	6,000	4,355	3,120	11,860	10,820

Year 6 and beyond = Both accounting data and dividends approximate Year 5 levels

Earning-Based Valuation

Earnings-Based Valuation--Illustration

Christy's forecasted book value at January 1, Year 1 is $58,594—computed as:

$$\$58,594 = 50,000 + \frac{(0.25-0.15)\times 50,000}{1.15} + \frac{(0.2071-0.15)\times 56,500}{1.15^2} + \frac{(0.1789-0.15)\times 63,845}{1.15^3}$$

$$+\frac{(0.1644-0.15)\times 72,145}{1.15^4} + \frac{(0.15-0.15)\times 72,145}{1.15^5} + 0 + \ldots$$

This implies Christy stock should sell at a PB ratio of 1.17 ($58,594/$50,000) at January 1, Year 1

Earning-Based Valuation

Earnings-Based Valuation--Illustration

Two additional observations are important.

1. Expected ROCE equals 15% (Christy's cost of capital) for Year 5 and beyond. Since ROCE equals the cost of capital for Year 5 and beyond, these years' results do not change the value of Christy (that is, abnormal earnings equal zero for those years). The anticipated effects of competition are implicit in estimates of future profitability.

2. Valuation estimates assume dividend payments occur at the end of each year. A more realistic assumption is that, on average, these cash outflows occur midway through the year. To adjust valuation estimates for mid-year discounting, multiply the present value of future abnormal earnings by (1 *k*/2). For Christine Company the adjusted valuation estimate equals $59,239. This is computed as $50,000 plus (1 1 [.15/2]) 3 $8,594.

Earning Power and Forecasting

Earning Power

Earning power is the earnings level expected to persist into the foreseeable future

- Accounting-based valuation models capitalize earning power

- Many financial analyses directed at determining earning power

Earning Power and Forecasting

Earning Power

Measurement of Earning Power reflects:

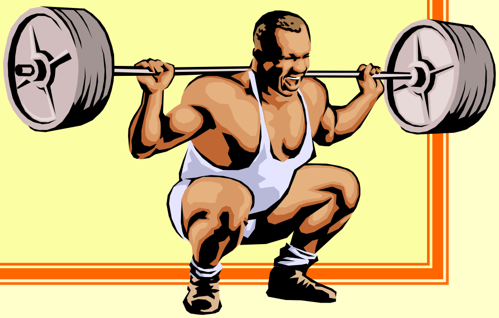
- **Earnings and all its components**
- **Stability and persistence of earnings and its components**
- **Sustainable trends in earnings and its components**

Earning Power and Forecasting

Earning Power

Factors in selecting a time horizon for measuring earning power

- One-year period is often too short to reliably measure earning power
- Many investing and financing activities are long term
- Better to measure earning power by using average (or cumulative) earnings over several years
- An extended period is less subject to distortions, irregularities, and other transitory effects
- Preferred time horizon in measuring earning power is typically 4 to 7 years



Earning Power and Forecasting

Earning Forecasting

- Mechanics of Earnings Forecasting
- Quantitative Methods—time-series and regression models
- Judgmental Methods
- Combinations of Quantitative and Judgmental Methods

Earning Power and Forecasting

Earning Forecasting

Factors Impacting Earnings Forecasts

- **Current and past evidence**
- **Continuity and momentum of company performance**
- **Industry prospects**
- **Management**

Management quality—resourcefulness
Asset management—operating skills

- **Economic and competitive factors**
- **Key Indicators such as**
  - **capital expenditures**
  - **order backlogs**
  - **demand trends**

Earning Power and Forecasting

Monitoring and Revising Earnings Forecasts

Available Interim Reports

- ❖Quarterly reports (Form 10-Q)
- ❖ Reports on current developments (Form 8-K)
- ❖ Disclosure of separate fourth-quarter results
- ❖ Details of year-end adjustments
- ❖ Interim reports filed with the SEC such as:
  - ▪Comparative interim and year-to-date income statement
  - ▪Comparative balance sheets
  - ▪Year-to-date statement of cash flows
  - ▪Pro forma information on business combinations
  - ▪Disclosure of accounting changes
  - ▪Management's narrative analysis of operating results
  - ▪Reports of a change in auditor

Earning Power and Forecasting

Monitoring and Revising Earnings Forecasts

Limitations with Interim Reports

- **Period-End Accounting Adjustments**
- **Seasonality in Business Activities**
- **Integral Reporting Method**