Chapter 3

Financial Statements Analysis and Long-Term Planning

财务报表分析与财务模型

Key Concepts and Skills

- Know how to standardize financial statements for comparison purposes
- Know how to compute and interpret important financial ratios
- Be able to develop a financial plan using the percentage of sales approach
- Understand how capital structure and dividend policies affect a firm's ability to grow

Chapter Outline

3.1 Financial Statements Analysis

3.2 Ratio Analysis

3.3 The Du Pont Identity

3.4 Financial Models

3.5 External Financing and Growth

Budweiser vs. Sam Adams
(December 2010)

Ticker: BUD

- Sales: $36.3 billion
- Net income: $5.8 billion
- Assets: $114.3 billion
- Mkt. cap: $96.0 billion

Ticker: SAM

- Sales: $0.5 billion
- Net income: $0.05 billion
- Assets: $0.25 billion
- Mkt. cap: $1.3 billion

How do we compare these two companies?

3.1 Financial Statements Analysis

- Common-Size Balance Sheets （共同比资产负债表）
  - Compute all accounts as a percent of total assets
- Common-Size Income Statements （共同比利润表）
  - Compute all line items as a percent of sales
- Standardized statements make it easier to compare financial information, particularly as the company grows.
- They are also useful for comparing companies of different sizes, particularly within the same industry.

Prufrock Corporation
Balance Sheets

	2011	2012
Assets		
Current assets		
Cash	$ 84	$ 98
Accounts receivable	165	188
Inventory	393	422
Total	$ 642	$ 708
Fixed assets		
Net plant and equipment	$2,731	$2,880
Total assets	$3,373	$3,588
Liabilities and Owners' Equity		
Current liabilities		
Accounts payable	$ 312	$ 344
Notes payable	231	196
Total	$ 543	$ 540
Long-term debt	$ 531	$ 457
Owners' equity		
Common stock and paid-in surplus	$ 500	$ 550
Retained earnings	1,799	2,041
Total	$2,299	$2,591
Total liabilities and owners' equity	$3,373	$3,588

Prufrock Corporation
Common-Size Balance Sheets

	2011	2012	Change
Assets			
Current assets			
Cash	2.5%	2.7%	+ .2%
Accounts receivable	4.9	5.2	+ .3
Inventory	11.7	11.8	+ .1
Total	19.1	19.7	+ .6
Fixed assets			
Net plant and equipment	80.9	80.3	− .6
Total assets	100.0%	100.0%	.0%
Liabilities and Owners' Equity			
Current liabilities			
Accounts payable	9.2%	9.6%	+ .4%
Notes payable	6.8	5.5	− 1.3
Total	16.0	15.1	− .9
Long-term debt	15.7	12.7	− 3.0
Owners' equity			
Common stock and paid-in surplus	14.8	15.3	+ .5
Retained earnings	53.3	56.9	+ 3.6
Total	68.1	72.2	+ 4.1
Total liabilities and owners' equity	100.0%	100.0%	.0%

84 / 3,373 = 2.5%

2.7% - 2.5% = 0.2%

PRUFROCK CORPORATION
2012 Income Statement

Sales		$2,311
Cost of goods sold		1,344
Depreciation		276
Earnings before interest and taxes		$ 691
Interest paid		141
Taxable income		$ 550
Taxes (34%)		187
Net income		$ 363
Dividends	$121	
Addition to retained earnings	242	

PRUFROCK CORPORATION

Common-Size Income Statement 2012

Sales		100.0%
Cost of goods sold		58.2
Depreciation		11.9
Earnings before interest and taxes		29.9
Interest paid		6.1
Taxable income		23.8
Taxes (34%)		8.1
Net income		15.7%
Dividends	5.2%	
Addition to retained earnings	10.5	

1,344 / 2311 = 58.2%

Tells us what happened to each dollar of sales

Practice Problems Ch. 3

1. Russell's Hardware has inventory of $218,000, equity of $421,800, total assets of $647,700, and sales of $587,200. What is the common-size percentage for the inventory account?

$218,000/ $647,700 = 33.66%

3.2 Ratio Analysis （比率分析）

- Ratios also allow for better comparison through time or between companies.
- As we look at each ratio, ask yourself:
  - How is the ratio computed?
  - What is the ratio trying to measure and why?
  - What does the value indicate?
  - How can we improve the company’s ratio?

Categories of Financial Ratios

- Short-term solvency or liquidity ratios （短期流动能力和偿债指标）
- Long-term solvency or financial leverage ratios （长期偿债能力指标）
- Asset management or turnover ratios （资产管理或资金周转指标）
- Profitability ratios （盈利性指标）
- Market value ratios （市场价值指标）

Liquidity Ratios

PRUFROCK Balance Sheet -2012							
ASSETS				**Liabilities & Owners Equity**			
Current Assets				**Current Liabilities**			
Cash	**$**	**98**		**Accounts Payable**	**$**	**344**
Accounts Receivable	**$**	**188**		**Notes Payable**	**$**	**196**
Inventory	**$**	**422**		**Total**	**$**	**540**
Total	**$**	**708**		**Long term debt**	**$**	**457**
				Owners' Equity		
				Common Stock and paid in surplus	**$**	**550**
Fixed Assets				**Retained Earnings**	**$**	**2,041**
Net Plant & Equipment	**$**	**2,880**		**Total**	**$**	**2,591**
Total Asets	**$**	**3,588**		**Total Liabilties & Owners' Equity**	**$**	**3,588**

The firm’s ability to pay its bills over the short run without undue stress

- **Current Ratio**（流动比率） = CA / CL
  - 708 / 540 = 1.31 times
- **Quick Ratio**（速动比率）= (CA – Inventory) / CL
  - Acid Test Ratio
  - (708-422) / 540 = 0.53 times
- **Cash Ratio**（现金比率） = Cash / CL
  - 98/ 540 = .18 times

Financial Leverage Ratios

	PRUFROCK **Balance Sheet -2012**			
ASSETS			**Liabilities & Owners Equity**	
Current Assets			**Current Liabilities**	
Cash	**$ 98**		**Accounts Payable**	**$ 344**
Accounts Receivable	**$ 188**		**Notes Payable**	**$ 196**
Inventory	**$ 422**		**Total**	**$ 540**
Total	**$ 708**		**Long term debt**	**$ 457**
			Owners' Equity	
			Common Stock and paid in surplus	**$ 550**
Fixed Assets			**Retained Earnings**	**$ 2,041**
Net Plant & Equipment	**$ 2,880**		**Total**	**$ 2,591**
Total Asets	**$ 3,588**		**Total Liabilties & Owners' Equity**	**$ 3,588**

Indicative of the firm's debt capacity; a measure of how much assets a company holds relative to its equity

- **Total Debt Ratio （负债比率）** = (TA – TE) / TA
  - (3588-2,591) / 3588 = 0.28 times
- **Debt/Equity （负债权益比）** = TD / TE
  - (0.28/0.72) = 0.39 times
- **Equity Multiplier （权益乘数）** = TA/TE = 1 + D/E
  - ($1 /0.72) = 1.39

Financial Leverage Ratios

PRUFROCK Income Statement - 2012		
Sales	$	2,311
COGS	$	1,344
Depreciation	$	276
EBIT	$	691
Interest	$	141
Taxable Income	$	550
Taxes	$	187
Net Income	$	363
Dividends	$	121
Addition to RE	$	242

- **Times Interest Earned** （利息倍数）= EBIT / Interest
  - 691/141 = 4.9 times
  - how well a company has its interest obligations covered
- **Cash Coverage** （现金对利息的保障倍数） = (EBIT + Deprec) / Interest
  - (691 + 276) / 141 = 6.9 times
  - EBIT is not really a measure of cash available to pay interest

Financial Leverage (source: wind)

	Total Debt Ratio		Liquidity Ratio		Quick Ratio	
	2016	2015	2016	2015	2016	2015
Energy	47.08	48.02	0.83	0.81	0.61	0.59
Material	59.13	59.92	0.90	0.82	0.63	0.57
Industrial	67.38	66.70	1.21	1.24	0.84	0.82
Household consumption	44.07	43.84	1.55	1.49	1.10	1.03
Healthcare	34.86	36.42	2.03	1.80	1.61	1.37
Finance	92.05	91.99	1.17	0.90	1.17	0.90
Information Tech	46.75	45.45	1.77	1.74	1.48	1.42
Communication Service	62.52	61.91	0.25	0.19	0.24	0.18
Public Utility	63.59	63.99	0.55	0.54	0.48	0.46
Real estate	76.53	76.07	1.64	1.62	0.55	0.46

Asset Management: Inventory Ratios

PRUFROCK Balance Sheet -2012				
ASSETS			Liabilities & Owners Equity	
Current Assets			Current Liabilities	
Cash	$ 98		Accounts Payable	$ 344
Accounts Receivable	$ 188		Notes Payable	$ 196
Inventory	$ 422		Total	$ 540
Total	$ 708		Long term debt	$ 457
			Owners' Equity	
			Common Stock and paid in surplus	$ 550
Fixed Assets			Retained Earnings	$ 2,041
Net Plant & Equipment	$ 2,880		Total	$ 2,591
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How efficiently a firm uses its assets to generate sales?

- **Inventory Turnover** （库存周转率） = COGS / Inventory
  - 1344/422 = 3.2 times
  - we sold off the entire inventory 3.2 times during the year
- **Days' Sales in Inventory** （库存周转天数）
  - 365 / Inventory Turnover = 365 / 3.2= 114 days
  - it will take about 114 days to work off our current inventory

Asset Management: Receivables Ratios

PRUFROCK Balance Sheet -2012			
ASSETS		Liabilities & Owners Equity	
Current Assets		Current Liabilities	
Cash	$ 98	Accounts Payable	$ 344
Accounts Receivable	$ 188	Notes Payable	$ 196
Inventory	$ 422	Total	$ 540
Total	$ 708	Long term debt	$ 457
		Owners' Equity	
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How fast we collect on sales?

•**Receivables Turnover （应收账款周转率）** = Sales / Accounts Receivable = 2311/188 = 12.3 times

•A high ratio implies either that a company operates on a cash basis or that its extension of credit and collection of accounts receivable is efficient

•**Days' Sales in Receivables （应收账款周转天数）**

- 365 / Receivables Turnover = 365 / 12.3 = 30 days
- we collect on our credit sales in 30 days

Asset Management: Asset Turnover Ratios

PRUFROCK Balance Sheet -2012			
ASSETS		**Liabilities & Owners Equity**	
Current Assets		**Current Liabilities**	
Cash	$ 98	Accounts Payable	$ 344
Accounts Receivable	$ 188	Notes Payable	$ 196
Inventory	$ 422	Total	$ 540
Total	$ 708	Long term debt	$ 457
		Owners' Equity	
		Common Stock and paid in surplus	$ 550
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- **Total Asset Turnover** （总资产周转率）

  = Sales / Total Assets = 2311/3588 = 0.64 times
- Asset turnover measures a firm's efficiency at using its assets in generating sales or revenue
- It also indicates pricing strategy: companies with low profit margins tend to have high asset turnover, while those with high profit margins have low asset turnover

Asset Management (source: wind)

	Inventory Turnover		Receivables Turnover		Total Asset Turnover	
	2016	2015	2016	2015	2016	2015
Energy	5.15	4.14	10.74	7.48	0.44	0.33
Material	2.72	2.34	6.91	6.00	0.38	0.31
Industrial	1.30	1.16	2.27	2.04	0.31	0.28
Household consumption	2.22	2.17	5.36	5.78	0.50	0.51
Healthcare	1.22	1.23	2.53	2.62	0.26	0.27
Finance	6.14	3.02	736.73	694.04	0.02	0.02
Information Tech	2.23	2.11	1.94	1.89	0.29	0.30
Communication Service	47.97	28.57	7.15	7.31	0.23	0.23
Public Utility	5.22	4.10	3.72	3.62	0.13	0.12
Real estate	0.12	0.13	7.18	8.65	0.09	0.11

Practice Problems Ch. 3

2. The Global Network has sales of $418,700, cost of goods sold of $264,900, and inventory of $61,900. What is the Days' Sales in Inventory ?

   Inventory Turnover = COGS / Inventory = $264,900/ $61,900

   = 4.58

   Days' Sales in Inventory = 365 / Inventory Turnover = 365/4.58

   = 80.35 days

3. A firm has $42,900 in receivables and $211,800 in total assets. The total asset turnover rate is 1.45 and the profit margin is 4.2 percent. How long on average does it take the firm to collect its receivables?

   Receivables Turnover = Sales / Accounts Receivable = Sales / $42,900

   Asset Turnover = Sales /Asset => Sales = $211,800 * 1.45 = $307,110

   Receivables Turnover = $307,110 / $42,900 = 7.16

   Days' Sales in Receivables = 365 / 7.16 = 50.98 days

Profitability Measures 盈利性指标

PRUFROCK Balance Sheet -2012						
ASSETS			Liabilities & Owners Equity			
Current Assets			Current Liabilities			
Cash	$	98	Accounts Payable	$	344	
Accounts Receivable	$	188	Notes Payable	$	196	
Inventory	$	422	Total	$	540	
Total	$	708	Long term debt	$	457	
			Owners' Equity			
			Common Stock and paid in surplus	$	550	
Fixed Assets			Retained Earnings	$	2,041	
Net Plant & Equipment	$	2,880	Total	$	2,591	
Total Asets	$	3,588	Total Liabilties & Owners' Equity	$	3,588	

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- **Profit Margin** （销售利率率） = NI / Sales
  - 363/2311 = 15.7%
- **Return on Assets (ROA)** 资产收益率 = NI / TA
  - 363/3588 = 10.12%
- **Return on Equity (ROE)** 权益收益率 = NI / TE
  - 363 / 2591 = 14.01%
- **EBITDA Margin** 息税、折旧及摊销前利润率 = EBITDA / Sales
  - 967 / 2311 = 41.8%

ROE (source: wind)

Industry	ROE(%)	
	2016	2015
Energy 能源	2.50	2.78
Material 材料	4.52	-0.79
Household consumption 日常消费	12.30	11.35
Healthcare 医疗	10.56	11.32
Finance 金融	12.70	14.84
Information Tech 信息技术	7.04	7.49
Communication Service 电信服务	0.77	4.86
Public Utility 公用事业	9.11	11.46
Real estate 房地产	11.66	10.23

报告期选择 2019 中报

	ROE(%)		
行业名称	本期	上年同期	差值
能源	4.00	4.34	-0.35
材料	4.86	6.59	-1.73
工业	4.18	4.13	0.06
可选消费	4.48	5.76	-1.28
日常消费	8.36	7.17	1.19
医疗保健	5.97	6.52	-0.55
金融	6.98	6.78	0.20
信息技术	2.58	3.29	-0.71
电信服务	2.10	1.96	0.14
公用事业	4.10	3.72	0.39
房地产	6.36	6.22	0.13

Practice Problems Ch. 3

4. Freedom Health Centers has total equity of $861,300, sales of $1.48 million, and a profit margin of 5.2 percent. What is the return on equity?

ROE = NI / TE = ($1.48 million * 0.052)/ $861,300 = 8.94%

5. Eastern Hardwood Sales has total equity of $89,000, a profit margin of 4.8 percent, an equity multiplier of 1.5, and a total asset turnover of 1.3. What is the amount of the firm's sales?

Asset = 1.5 * $ 89,000 = $ 133,500

Sales = Asset * 1.3 = $ 133,500 * 1.3 = $ 173,550

Market Value Measures 市场价值的度量指标

- **Market Price** = $88 per share = PPS
- **Shares outstanding** = 33 million

  Shares outstanding are all the shares of a corporation that have been authorized, issued and purchased by investors and are held by them
- **Earnings per Share** = EPS = 363/33 = $11
- **PE Ratio (price-earnings ratio, 市盈率)** = PPS / EPS
  - $88 / $11 = 8 times
  - the PE ratio measures how much investors are willing to pay per dollar of current earnings, higher PEs are often taken to mean that the firm has significant prospects for future growth
- **Price/Sales Ratio** = PPS/Sales per share
  - $88/($2,311/33) = 1.26
- **Market-to-book ratio (市值账面比，市净率）**

  = PPS / Book value per share
  - Book value per share = Total Equity/shares outstanding

    = $2,591/33 = $78.52
  - Market-to-Book = $88/78.52 = 1.12 times

3.3 The DuPont Identity 杜邦恒等式

- **ROE = NI / TE** = Basic Formula

  权益收益率 = 净利润/总权益
- **ROE = PM * TAT * EM** = Dupont Identity
  - PM = Net Income / Sales
  - TAT = Sales / Total Assets
  - EM = Total Assets / Total Equity

$$\text{ROE} = \left(\frac{\text{NI}}{\text{Sales}}\right) \times \left(\frac{\text{Sales}}{\text{TA}}\right) \times \left(\frac{\text{TA}}{\text{TE}}\right) = \frac{\text{NI}}{\text{TE}}$$

ROE = Profit Margin * Total Asset Turnover * Equity Multiplier

权益收益率 = 销售利润率*总资产周转率*权益乘数

Using the Du Pont Identity

- **ROE = PM * TAT * EM**
  - **Profit margin**
    - Measures firm's operating efficiency
    - How well does it control costs
  - **Total asset turnover**
    - Measures the firm's asset use efficiency
    - How well does it manage its assets
  - **Equity multiplier**
    - Measures the firm's financial leverage
    - EM = TA/TE = 1+D/E ratio

Prufrock's DuPont Identity

PRUFROCK RECAP			
Liquidity Ratios		**Financial Leverage Ratios**	
Current Ratio	1.31	Total Debt Ratio	0.28
Quick Ratio	0.53	Debt to Equity	0.39
Cash Ratio	0.18	Equity Multiplier	1.39
Asset Management Ratios		Times Interest Earned	4.9
Inventory Turnover	3.20	Cash Coverage	6.9
Days' Sales in Inventory	114	**Profitability Measures**	
Receivables Turnover	12.30	Profit Margin	15.70%
Days' Sales in Receivables	30	ROA	10.12%
Total Asset Turnover	0.64	ROE	14.00%
Capital Intensity Ratio			
Market Value Measures			
Market Price	$88.00		
Shares Outstanding	33 m		
EPS	$11.00	Price/Sales Ratio	1.26
PE Ratio	8.0	Book value per share	$78.52
Market to Book	1.12		

- **ROE = PM * TAT * EM**
  - PM = 15.7%
  - TAT = .64
  - EM = 1.39
- ROE = .157 x .64 x 1.39

  = .139667 = 14%

DuPont Identity of BUD and SAM

BUD:	ROE =	Profit margin	*	Total asset turnover	*	Equity multiplier
2010	16.3%	15.9%		0.32		3.24
2009	19.4%	16.0%		0.33		3.71
SAM:	ROE =	Profit margin	*	Total asset turnover	*	Equity multiplier
2010	30.3%	10.8%		1.79		1.56
2009	18.0%	7.5%		1.58		1.52

Why Evaluate Financial Statements?

- Internal uses
  - Performance evaluation – compensation and comparison between divisions
  - Planning for the future – guide in estimating future cash flows
- External uses
  - **Creditors** use Financial Statements to decide whether to grant a loan or credit to a business.
  - **Suppliers** need Financial Statements to assess the credit worthiness of a business and ascertain whether to supply goods on credit.
  - **Customers** use Financial Statements to assess whether a supplier has the resources to ensure the steady supply of goods in the future. This is especially vital where a customer is dependant on a supplier for a specialized component
  - **Stockholders** use Financial Statements to assess the risk and return of their investment in the company and take investment decisions based on their analysis

Benchmarking

- Ratios need to be compared to something
- Time-Trend Analysis
  - How the firm’s performance is changing through time
  - Internal and external uses
- Peer Group Analysis
  - Compare to similar companies or within industries
  - SIC (Standard Industrial Classification) and NAICS (North American Industry Classification System) codes

Potential Problems

- There is no underlying theory, so there is no way to know which ratios are most relevant.
- Benchmarking is difficult for diversified firms.
- Globalization and international competition makes comparison more difficult because of differences in accounting regulations.
- Firms use varying accounting procedures.
- Firms have different fiscal years.
- Extraordinary, or one-time, events

3.4 Financial Models 财务模型

- Investment in new assets – determined by capital budgeting decisions
- Degree of financial leverage – determined by capital structure decisions
- Cash paid to shareholders – determined by dividend policy decisions
- Liquidity requirements – determined by net working capital decisions

Financial Planning Ingredients

- Sales Forecast – how many cash flows depend directly on the level of sales (often estimate sales growth rate)
- Pro Forma Statements – setting up the plan as projected (pro forma) financial statements allows for consistency and ease of interpretation
- Asset Requirements – the additional assets that will be required to meet sales projections
- Financial Requirements – the amount of financing needed to pay for the required assets
- Plug Variable – determined by management decisions about what type of financing will be used (makes the balance sheet balance)

Percent of Sales Approach （销售百分比法）

- Some items vary directly with sales, others do not.
- Income Statement
  - Costs may vary directly with sales - if this is the case, then the profit margin is constant
  - Depreciation and interest expense may not vary directly with sales – if this is the case, then the profit margin is not constant
  - Dividends are a management decision and generally do not vary directly with sales – this affects additions to retained earnings

Percent of Sales Approach

- Balance Sheet
  - Initially assume all assets, including fixed, vary directly with sales.
  - Accounts payable also normally vary directly with sales.
  - Notes payable, long-term debt, and equity generally do not vary with sales because they depend on management decisions about capital structure.
  - The change in the retained earnings portion of equity will come from the dividend decision.
- External Financing Needed (EFN)
  - The difference between the forecasted increase in assets and the forecasted increase in liabilities and equity.

Project a 25% increase in sales

ROSENGARTEN CORPORATION Income Statement		
Sales		$1,000
Costs		800
Taxable income		$ 200
Taxes (34%)		68
Net income		$ 132
Dividends	$44	
Addition to retained earnings	88	

ROSENGARTEN CORPORATION Pro Forma Income Statement	
Sales (projected)	$1,250
Costs (80% of sales)	1,000
Taxable income	$ 250
Taxes (34%)	85
Net income	$ 165

- Dividend payout ratio 股利支付率 = Dividends / NI = 44/132 = 1/3
- Retention ratio 留存比率 = Addition to retained earnings / NI = 88/132 = 2/3

- Projected dividends paid to shareholders = 165 * 1/3 = 55
- Projected addition to retained earnings = 165 * 2/3 = 110

ROSENGARTEN CORPORATION
Balance Sheet

Assets	$	Percentage of Sales	Liabilities and Owners' Equity	$	Percentage of Sales
Current assets			Current liabilities		
Cash	$ 160	16%	Accounts payable	$ 300	30%
Accounts receivable	440	44	Notes payable	100	n/a
Inventory	600	60	Total	$ 400	n/a
Total	$1,200	120	Long-term debt	$ 800	n/a
Fixed assets			Owners' equity		
Net plant and equipment	$1,800	180	Common stock and paid-in surplus	$ 800	n/a
			Retained earnings	1,000	n/a
			Total	$1,800	n/a
Total assets	$3,000	300%	Total liabilities and owners' equity	$3,000	n/a

ROSENGARTEN CORPORATION
Partial Pro Forma Balance Sheet

Assets	Next Year	Change from Current Year	Liabilities and Owners' Equity	Next Year	Change from Current Year
Current assets			Current liabilities		
Cash	$ 200	$ 40	Accounts payable	$ 375	$ 75
Accounts receivable	550	110	Notes payable	100	0
Inventory	750	150	Total	$ 475	$ 75
Total	$1,500	$300	Long-term debt	$ 800	$ 0
Fixed assets			Owners' equity		
Net plant and equipment	$2,250	$450	Common stock and paid-in surplus	$ 800	$ 0
			Retained earnings	1,110	110
			Total	$1,910	$110
Total assets	$3,750	$750	Total liabilities and owners' equity	$3,185	$185
			External financing needed	$ 565	$565

External Financing Needed (EFN)
外部融资需求量

$$\left(\frac{\text{Assets}}{\text{Sales}}\right) \times \Delta\text{Sales} - \frac{\text{Spon Liab}}{\text{Sales}} \times \Delta\text{Sales} - (PM \times \text{Projected Sales}) \times (1 - d)$$

$$= (3 \times 250) - (0.3 \times 250) - (0.13 \times 1250 \times 0.667)$$

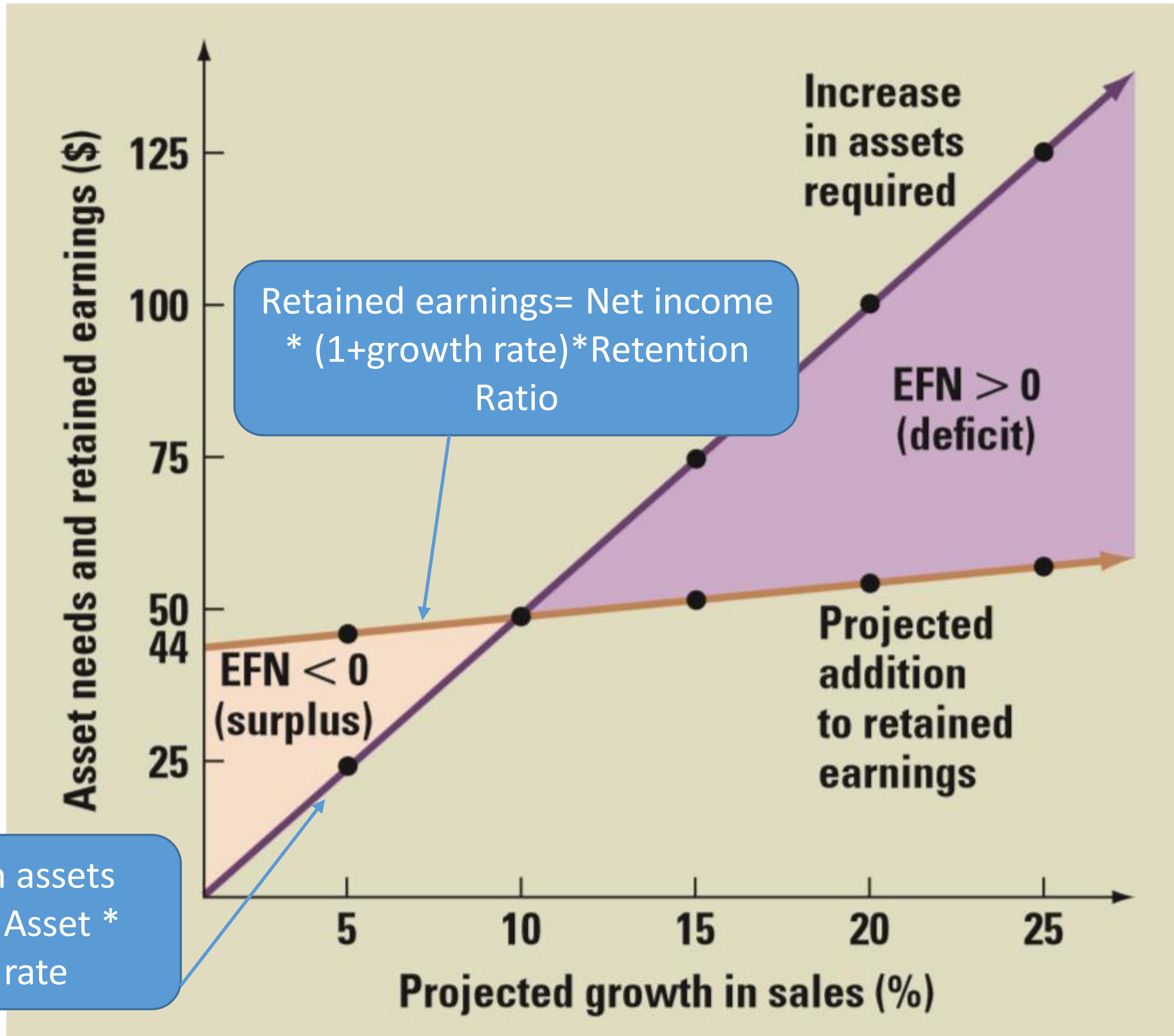
$$= \$565$$

- **Spontaneous liability** （自发增长的负债）: liabilities that naturally move up and down with sales
- **d (股利支付率）**: dividend payout ratio
- **PM （销售利润率）**: profit margin

3.4 External Financing and Growth

- At low growth levels, internal financing (retained earnings) may exceed the required investment in assets.
- As the growth rate increases, the internal financing will not be enough, and the firm will have to go to the capital markets for financing.
- Examining the relationship between growth and external financing required is a useful tool in financial planning.

External Financing and Growth



Retained earnings= Net income * (1+growth rate)*Retention Ratio

Increase in assets required = Asset * growth rate

The Internal Growth Rate 内部增长率

- The internal growth rate tells us how much the firm can grow assets using **retained earnings** as the **only source** of financing （在没有外部融资的情况下可能实现的最大增长率）

$$\text{Internal Growth Rate} = \frac{\text{ROA} \times b}{1 - \text{ROA} \times b}$$

  - b = retention ratio

- Increase in assets = $A \times g$
- Addition to retained earnings = $(NI \times b)(1 + g)$
- $(NI \times b)(1 + g) = A \times g$

  $g = ROA \times b/(1-ROA \times b)$

The Sustainable Growth Rate 可持续增长率

- The sustainable growth rate tells us how much the firm can grow **by using internally generated funds and issuing debt to maintain a constant debt ratio**
- 在没有外部股权融资且保持负债率不变的情况下能实现的最高增长率

- Increase in Equity = Addition to retained earnings = $(NI \times b)(1 + g)$
- To maintain a constant debt ratio

  => Increase in Debt = $(D/E)[NI \times b \times (1 + g)]$

  $EFN = A \times g - (NI \times b)(1 + g)$

  => $(D/E)[NI \times b \times (1 + g)] = A \times g - (NI \times b)(1 + g)$

  $g = ROE \times b/(1 - ROE \times b)$

Determinants of Growth

$$\text{Sustainable Growth Rate} = \frac{\text{ROE} \times b}{1 - \text{ROE} \times b}$$

- Profit margin – operating efficiency
- Total asset turnover – asset use efficiency
- Financial leverage – choice of optimal debt ratio
- Dividend policy – choice of how much to pay to shareholders versus reinvesting in the firm

Quick Quiz

- How do you standardize balance sheets and income statements?
- Why is standardization useful?
- What are the major categories of financial ratios?
- How do you compute the ratios within each category?
- What are some of the problems associated with financial statement analysis?

Quick Quiz

- What is the purpose of financial planning?
- What are the major decision areas involved in developing a plan?
- What is the percentage of sales approach?
- What is the internal growth rate?
- What is the sustainable growth rate?
- What are the major determinants of growth?