



经济管理学院

The college of Economics and Management

Lecture 4

Long-Term Financial Planning and Growth

Corporate Finance – Fall 2019

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Prelude

- A lack of effective long-range planning is a commonly cited reason for financial distress and failure.
 - "Planning is the process that at best helps the firm avoid stumbling into the future backward"
- Financial planning establishes guidelines for change and growth in a firm.
 - Normally focus on the big picture (major elements of a firm's financial and investment policies) without examining the individual components in detail.

- The primary goals in this chapter are to
 - Discuss financial planning
 - Refers to long-term planning
 - Illustrate the interrelatedness of the various investment and financial decisions a firm makes
 - These decisions cannot be considered in isolation from one another
 - Plans on purchasing must be considered along with plans on raising capital
 - We develop and describe a long-range planning technique named *the percentage of sales approach*

- The key assumptions in percentage of sales approach are about growth rate.
 - Growth is usually espoused as a goal by corporation
 - Almost all firms use an explicit, companywide growth rate as a major component of their long-term financial policy.
- Establish basic elements of a firm's policy to develop a financial plan
 - Investment in new assets (capital budgeting decisions)
 - Degree of financial leverage (capital structure decisions)
 - Cash paid to shareholders (dividend policy decisions)
 - Liquidity requirements (net working capital decisions)
- There are direct connections between the growth a company can achieve and its financial policy, which, will be discussed in this chapter.

Learning Objectives

- LO1: How to apply the percentage of sales method
- LO2: How to compute the external financing needed to fund a firm's growth
- LO3: The determinants of a firm's growth
- LO4: Some of the problems in planning for growth

Chapter Outline

4.1 What Is Financial Planning?

4.2 Financial Planning Models: A First Look

4.3 The Percentage of Sales Approach

4.4 External Financing and Growth

4.5 Some Caveats Regarding Financial Planning Models

4.1 What is financial planning

- Financial planning formulates the way in which financial goals are to be achieved.
 - Decisions must be made far in advance of their implementation

4.1.1 Growth as a financial management goal

- Growth, by itself, is not an appropriate goal for the financial manager
 - Textbook examples of J. Peterman and Amazon.com
- The reason we discuss growth is that growth rates are so commonly used in the planning process
 - Growth is a convenient means of summarizing various aspects of a firm's financial and investment policies – more convenient than EPS or price per share
- The appropriate goal is increasing the market value of equity
 - Growth may be a desirable consequence

4.1.2 Dimensions of financial planning

- The first dimension: Planning horizon
 - Short-run decisions (usually next 12 months)
 - Long-run decisions (usually 2 – 5 years)
- The second dimension: Aggregation
 - Combines capital budgeting decisions into one large project
- The third dimension: Assumptions and Scenarios
 - Make realistic assumptions about important variables
 - Run several scenarios where you vary the assumptions by reasonable amounts
 - Determine, at a minimum, worst case, normal case, and best case scenarios for each division of the company

- A worst case makes relatively pessimistic assumptions about the company's products and the state of the economy
 - Emphasize a division's ability to withstand significant economic adversity
 - Require details concerning cost cutting and even divestiture and liquidation
- A normal case makes the most likely assumptions about the company and the economy
- A best case is based on optimistic assumptions
 - It could involve new products and expansion and detail the financing needed to fund the expansion
- Scenario analysis is particularly important for cyclical businesses

4.1.3 What can planning accomplish?

- Examine interactions
 - Help management see the interactions between decisions
 - Especially for investment and financing decisions
- Explore options
 - Give management a systematic framework for exploring its investment and financing options and their impacts on the firm's shareholders

4.1.3 What can planning accomplish?

- Avoid surprises
 - Help management identify possible outcomes and plan accordingly
 - In particular, it should address what actions the firm will take if assumptions made today about the future are seriously in error
- Ensure feasibility and internal consistency
 - help management determine if goals can be accomplished and if the various stated (and unstated) goals of the firm are consistent with one another
 - To get a coherent plan, goals and objectives will often have to be modified, and priorities will have to be established.

Conclusion of 4.1

- Financial planning forces managers to think about goals and establish priorities
- "Financial plan don't work, but financial planning does"
- We can establish the direction and make some educated guesses

4.2 Financial planning models: A first look

- Financial planning models require assumptions about the future
- Based on the assumptions, a model generates predicted values for many other variables
- Models can be simple or complex, but almost all have the elements we discuss in the following subsection.

4.2.1 A financial planning model: The ingredients

- Sales Forecast
 - Almost all financial plans require an externally supplied sales forecast
 - Many cash flows depend directly on the level of sales
 - Often estimated using sales growth rate
 - Our goal is to examine the interplay between investment and financing needs at different possible levels, not to pinpoint what we expect to happen
- Pro Forma Statements
 - A forecast balance sheet, income statement, and statement of cash flows
 - These forecast statements are based on projections of at least key items such as sales
 - Setting up the plan using projected financial statements allows for consistency and ease of interpretation

➤ Asset Requirements

- The additional assets that will be required to meet sales projections
- To support higher sales levels, a firm must invest in net working capital and fixed assets

➤ Financial Requirements

- The amount of financing needed to pay for the required assets
- Discuss dividend policy and debt policy

- Plug Variable
 - Since projected total assets will exceed projected total liabilities and equity, the balance sheet will no longer be balanced
 - Plug variable is determined by management deciding what type of financing (both positive and negative) will be used to make the balance sheet balance
 - The decisions should be in line with dividend policy and debt policy
- Economic Assumptions
 - Explicit assumptions about the economic environment over the life of the plan
 - At a minimum, make assumptions about interest rates and the firm's tax rate

4.2.2 A simple financial planning model

- See the textbook example of Computerfield Corp.
- An example of Gourmet Coffee Inc.
 - given that:

Gourmet Coffee Inc. Balance Sheet December 31, 2015			
Assets	1000	Debt	400
		Equity	600
Total	<u>1000</u>	Total	<u>1000</u>

Gourmet Coffee Inc. Income Statement For Year Ended December 31, 2015	
Revenues	2000
Less: costs	(1600)
Net Income	<u>400</u>

- Initial assumptions
 - Revenues will grow at 15% ($2,000 \times 1.15$)
 - All items are tied directly to sales, and the current relationships are optimal
 - Consequently, all other items will also grow at 15%
- Pro forma income statement

**Pro Forma Income Statement
For Year Ended 2016**

Revenues	2,300
Less: costs	(1,840)
Net Income	460

- Pro forma balance sheet
Case I: Debt increases at 15% (400 → 460). Dividends is the plug variable.

- Dividends = 460 (NI) – 90 (increase in equity) = 370

Case II: No dividends are paid. Debt is the plug variable.

- Debt = TA - TE = 1,150 – (600+460) = 90

- Repay 400 – 90 = 310 in debt

Case III: ...

Case IV: ...

Gourmet Coffee Inc.

Pro Forma Balance Sheet

Case 1

Assets	1,150	Debt	460
		Equity	690
Total	<u>1,150</u>	Total	<u>1,150</u>

Gourmet Coffee Inc.

Pro Forma Balance Sheet

Case 2

Assets	1,150	Debt	90
		Equity	1,060
Total	<u>1,150</u>	Total	<u>1,150</u>

- Comments of the example
 - The assumptions (and the following examples) might be unrealistic, but our point here is to notice the interaction between sales growth and financial policy
 - The firm must invest in net working capital and fixed assets to support higher sales level
 - The growth in assets requires that the firm decide on how to finance that growth, which depends on the firm's financial policy and its dividend policy
 - The firm needed no outside funds in the example, it won't usually be the case. We will explore a more detailed situation in the next section

4.3 The percentage of sales approach

- It is a simple and practical way of generating pro forma statements
 - An extension of the previous simple model
- Separate items that vary directly with sales and others do not
 - e.g. long-term borrowing is set by management

4.3.1 The income statement

- See the textbook example (Table 4.1 and Table 4.2)
- Costs vary directly with sales -> profit margin is constant
 - Be aware of the assumption
 - If depreciation and interest expense do not vary directly with sales, profit margin is not constant
- Dividends are a management decision and generally do not vary directly with sales -> this influences additions to retained earnings

4.3.2 The balance sheet

- We assume all items grow at exactly the same rate as sales. Now we assume some items do and others do not (Table 4.3)
 - All asset items vary directly with sales
 - CAPITAL INTENSITY RATIO: the ratio of total assets to sales
 - higher ratio -> more capital-intensive firm
 - Accounts payable also normally varies directly with sales
 - It varies with the number of orders with suppliers
 - Notes payable, long-term debt and equity generally do not vary directly with sales
 - They depend on management decisions
 - The change in the retained earnings portion of equity will come from the dividend decision, not from sales

- After the assumptions, we construct a partial pro forma balance sheet. (Table 4.4)
 - We calculate the projected amounts of items varying with sales.
 - For the items that don't vary directly with sales, we initially assume no change and simply write in the original amounts
 - The change in retained earnings is equal to the additional to retained earnings we calculated earlier.
- In this pro forma balance sheet, we notice that assets are projected to increase by \$750, but liabilities and equity will increase by only \$185 (without additional financing), leaving a shortfall of \$565.
 - We label this amount external financing needed (EFN)

4.3.3 A particular scenario

- The 25% increase in sales is not going to happen unless the company can raise \$565 in new financing
 - This example illustrates how the planning process can point out problems and potential conflicts
- The company has three possible financing sources: short-term borrowing, long-term borrowing, and new equity
 - The choice of combination is up to management, and there are so many possibilities
- A particular choice is that the company borrow $\$300 - 75 = \225 in short-term notes payable and leave total net working capital unchanged (Table 4.5)
 - The remaining $\$565 - 225 = \340 comes from long-term debt

An example of Tasha's Toy Emporium

- Assume that sales grow at 10% and dividend payout rate is 50%

Income Statement, 2015			Pro Forma Income Statement, 2016	
		% of Sales		
Sales	5,000		Sales	5,500
Less: costs	(3,000)	60%	Less: costs	(3,300)
EBT	2,000	40%	EBT	2,200
Less: taxes (40% of EBT)	(800)	16%	Less: taxes	(880)
Net Income	1,200	24%	Net Income	1,320
Dividends	600		Dividends	660
Add. To RE	600		Add. To RE	660

Tasha's Toy Emporium – Balance Sheet

	Current	% of Sales	Pro Forma		Current	% of Sales	Pro Forma
Assets				Liabilities & Owners' Equity			
Current Assets				Current Liabilities			
Cash	\$500	10%	\$550	A/P	\$900	18%	\$990
A/R	2,000	40	2,200	N/P	2,500	n/a	2,500
Inventory	3,000	60	3,300	Total	3,400	n/a	3,490
Total	5,500	110	6,050	LT Debt	2,000	n/a	2,000
Fixed Assets				Owners' Equity			
Net PP&E	4,000	80	4,400	CS & APIC	2,000	n/a	2,000
Total Assets	9,500	190	10,450	RE	2,100	n/a	2,760
				Total	4,100	n/a	4,760
				Total L & OE	9,500		10,250

- External Financing Needed (EFN): The firm needs to come up with an additional \$200 in debt or equity to make the balance sheet balance
 - $TA - (TL + OE) = 10,450 - 10,250 = 200$
- Choose plug variable(s) for \$200 EFN
 - Borrow more short-term (Notes Payable)
 - Borrow more long-term (Long-Term Debt)
 - Sell more common stock (Common Stock & Additional Paid in Capital)
 - Decrease dividend payout, which increases the Additions To Retained Earnings

4.3.4 An alternative scenario

- This scenario considers operating at less than full capacity
- Suppose that the company is currently operating at 80% capacity
 - Full Capacity sales = $5000 / .8 = 6,250$
 - Estimated sales = \$5,500, so we would still only be operating at 88%
 - Therefore, no additional fixed assets would be required.
 - Pro forma Total Assets = $6,050 + 4,000 = 10,050$
 - Total Liabilities and Owners' Equity = 10,250
- Choose plug variable(s) for \$200 EXCESS financing
 - Repay some short-term debt (decrease Notes Payable)
 - Repay some long-term debt (decrease LT Debt)
 - Buy back stock (decrease CS & APIC)
 - Pay more in dividends (reduce Additions To Retained Earnings)

- What if that the company is currently operating at 95% capacity?
 - Full Capacity sales = $5000 / .95 = 5263$
 - Estimated sales = \$5,500, so we need additional fixed assets
 - Fixed assets/Full-capacity sales = $4000 / 5263 = 0.76$
 - Tasha needs \$0.76 in fixed assets for every \$1 in sales once it reaches full capacity
 - This assumes fixed assets can be divided into very small amounts
 - Projected fixed assets = $5500 * 0.76 = 4180$
 - Pro forma total assets = $6,050 + 4,180 = 10,230$
 - Total Liabilities and Owners' Equity = 10,250
 - EFN = -20 (i.e. \$20 excess financing)

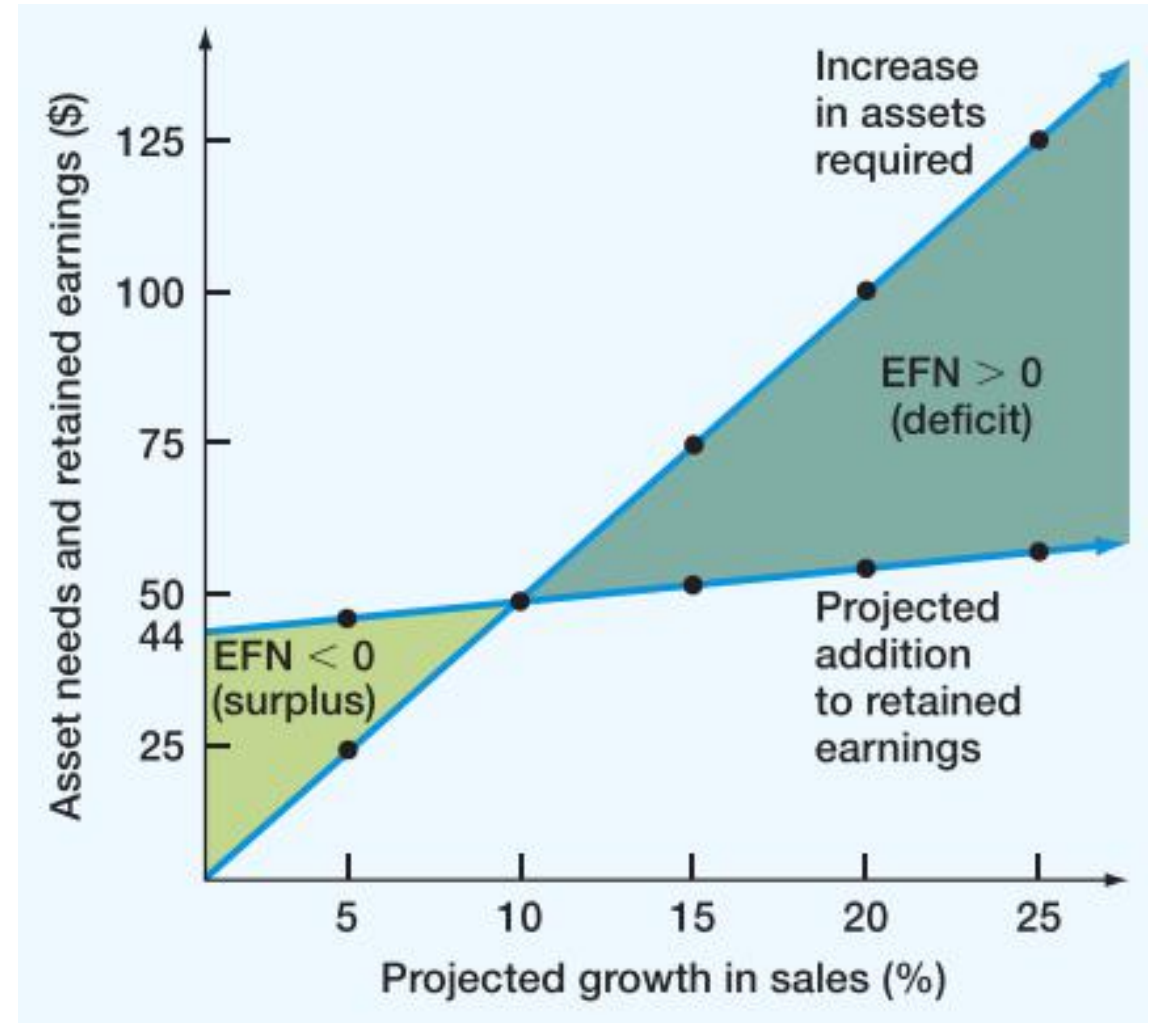
- Ending comments
 - The reversal of EFN illustrates that it is inappropriate to blindly manipulate financial statement information in planning process
 - The results depend critically on the assumptions made about the relationships between sales and asset needs
 - The relationships should be based on business activities
- Projected growth rates is also important to outside analysts and potential investors
 - Estimates of on [Yahoo! Finance](#)
 - Estimates of on [Eastmoney](#)

4.4 External financial and growth

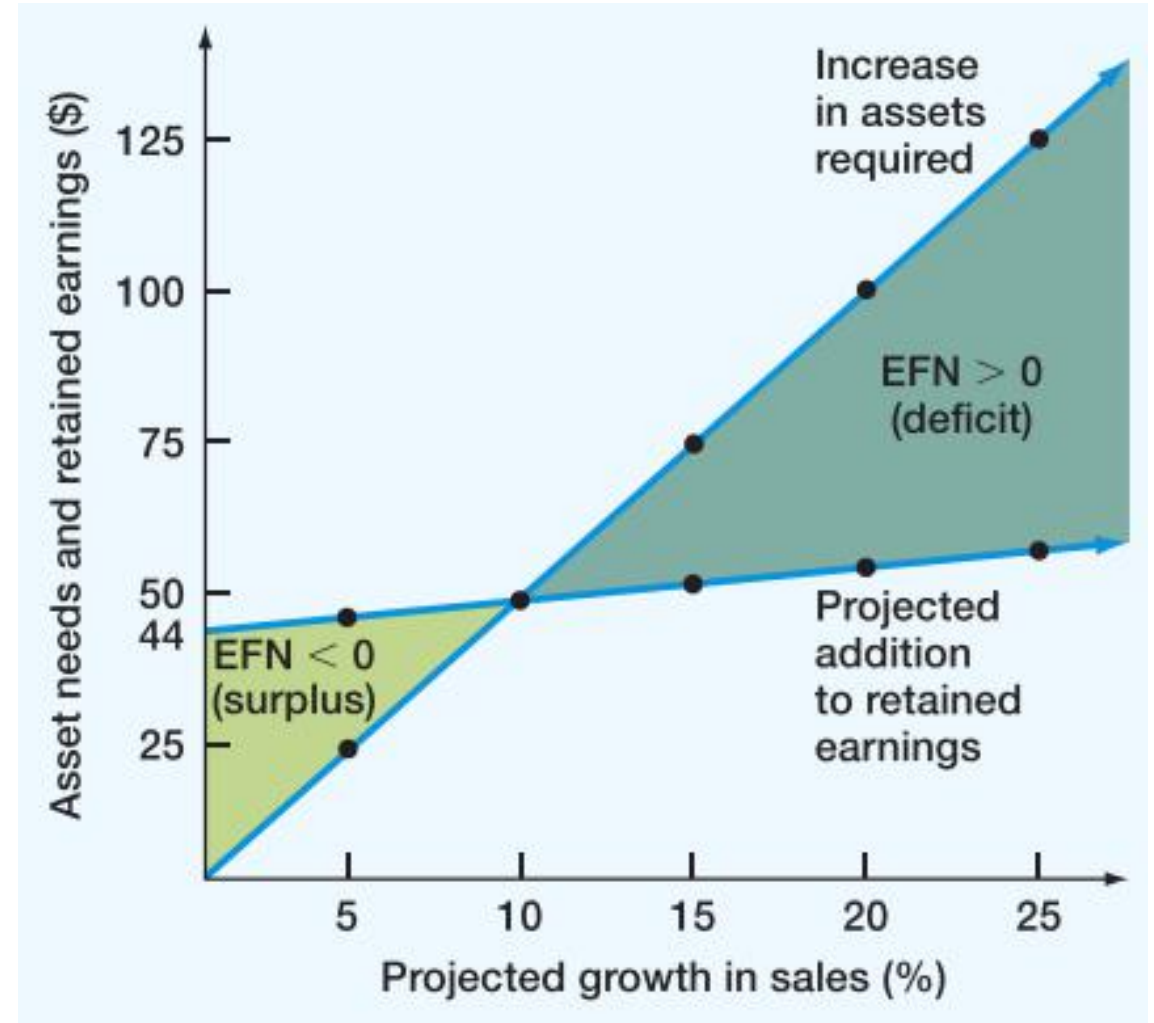
- In Section 4.3, we took a growth rate as given, and then we determined the amount of EFN to support that growth
- In this section, we will take the firm's financial policy as given and then examine the relationship between that financial policy and the firm's ability to finance new investments and thereby grow
 - Again, we focus on growth because it is a convenient means of examining the interactions between investment and financing decisions rather than an appropriate goal

4.4.1 EFN and growth

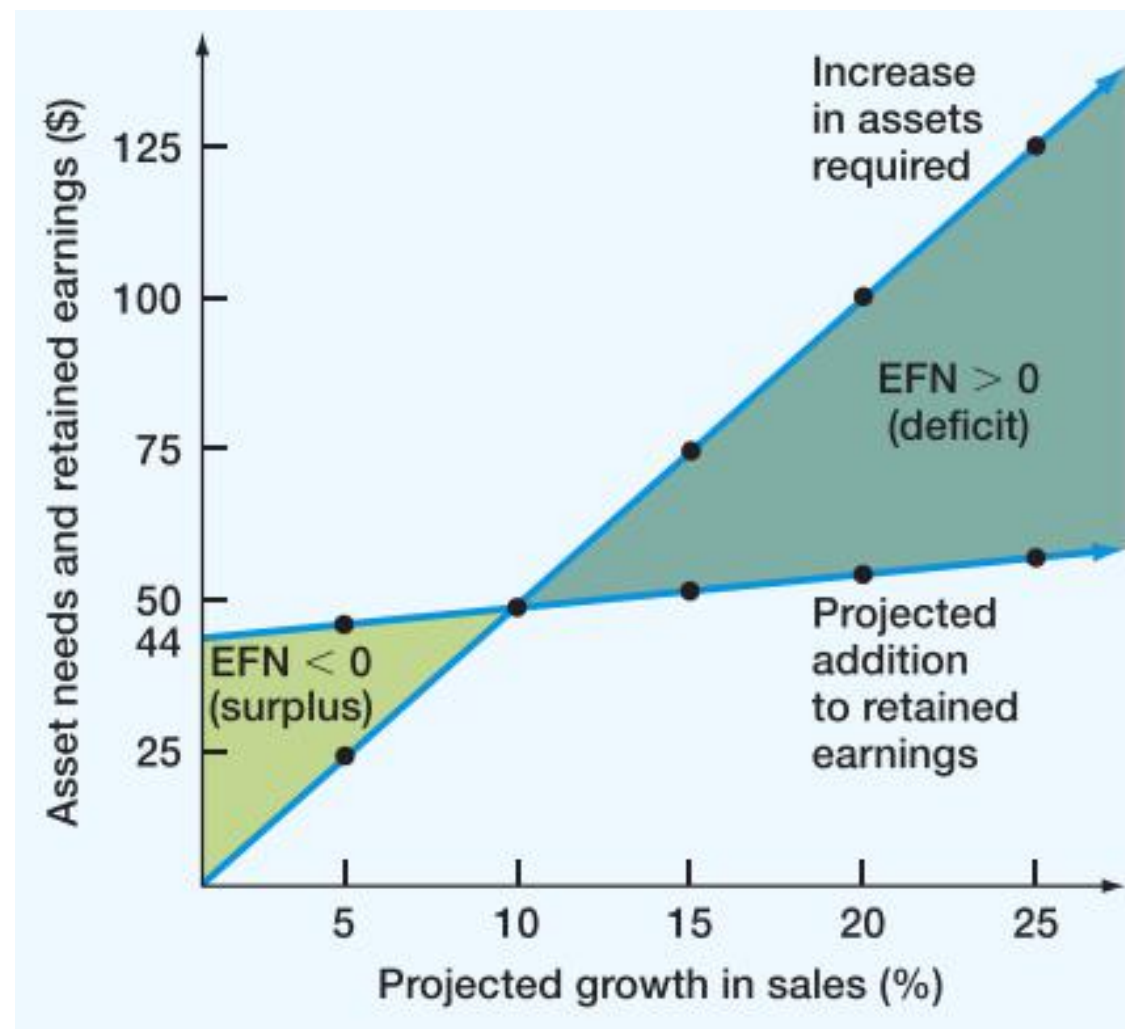
- The textbook example of Hoffman Company
 - Sales growth rate of 20% and no new equity sold
 - See Table 4.6 & Table 4.7
- EFN and growth rates (Fig. 4.1)
 - Eq. 1: $\Delta \text{Assets} = 500 * g$
 - Eq. 2: $\Delta \text{RE} = 500 * (1+g) * (1 - 0.8) * (1 - 0.34) * 2/3$



- Growth and External Financing
 - 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 money
 - Examining the relationship between growth and external financing required is a useful tool in long-range planning



- Growth and External Financing
 - For young, high-growth, start-up firms this relationship is imperative, particularly since their access to the capital markets may be limited and internally generated financing has yet to develop
 - In fact, there are many examples of firms “growing themselves out of business.”
 - These situations are the specialty for “angel” investors and venture capitalists



4.4.2 Financial policy and growth

- The internal growth rate and the sustainable growth rate are particularly useful in long-range planning

The internal growth rate

- The maximum growth rate a firm can achieve without external financing of any kind
 - EFN = 0 (the cross point)
 - The required increase in assets = the increase in retained earnings
- Using the information from Tasha's Toy Emporium
 - $ROA = 1200 / 9500 = .1263$, retention ratio = .5
 - **Internal Growth Rate** = $\frac{ROA \times b}{1 - ROA \times b} = \frac{.1263 \times .5}{1 - .1263 \times .5} = .0674 = 6.74\%$

- Derivation of the internal growth rate
 - TA = Total assets, g = internal growth rate, NI = Net income, b = retention ratio
 - The required increase in assets = the increase in retained earnings
 - That means $TA * g = NI * (1+g) * b$
 - Here TA and NI are from most current financial statements
 - Arrange, $TA * g = NI * b + NI * b * g$
 - Since $ROA = NI/TA \rightarrow g = ROA * b + ROA * b * g$
 - Arrange, $g(1-ROA * b) = ROA * b$
 - Finally, $g = ROA * b / (1-ROA * b)$ Q.E.D.
- Be cautious about the implied assumptions when you use this rate

- Discussion of the internal growth rate
 - This firm could grow assets at 6.74% without raising additional external capital
 - Relying solely on internally generated funds will increase equity and assets without an increase in debt
 - Consequently, the firm's leverage will decrease over time
 - If there is an optimal amount of leverage (as we will discuss in later chapters) then the firm may want to borrow to maintain that optimal level of leverage.
 - This idea leads us to the sustainable growth rate.

The sustainable growth rate

- The maximum growth rate a firm can achieve without external equity financing while maintaining a constant debt-equity ratio
 - Unchanged financial leverage
- Rationale of the sustainable growth rate
 - New equity sales can be expensive
 - The current owners may not wish to bring in new owners
 - A firm might view a particular debt-equity ratio as optimal
 - ...
- Using Tasha's Toy Emporium
 - $ROE = 1200 / 4100 = .2927$, $b = .5$
 - **Sustainable Growth Rate** $= \frac{ROE \times b}{1 - ROE \times b} = \frac{.2927 \times .5}{1 - .2927 \times .5} = .1714 = 17.14\%$

- Derivation of the sustainable growth rate
 - TA = Total assets, TE = Total equity, TD = Total debt, g = sustainable growth rate, NI = Net income, b = retention ratio, $\Delta X = X_{t+1} - X_t$
 - a constant debt-equity ratio $\rightarrow TD/TE = (TA-TE)/TE = \Delta TD/\Delta TE$
 - Thus, $\Delta TD/\Delta TE = EFN/[NI*(1+g)*b] = [TA*g - NI*(1+g)*b] / [NI*(1+g)*b]$

$$= TA*g/[NI*(1+g)*b] - 1 = (TA-TE)/TE = TA/TE - 1$$
 - Arrange, $g/[NI*(1+g)*b] = 1/TE$
 - Since $ROE = NI/TE$, we have $g/[(1+g)*b] = ROE$
 - Arrange, $g = ROE*b + ROE*b*g$
 - Finally, $g = ROE*b/(1-ROE*b)$ Q.E.D.
- Be cautious about the implied assumptions when you use this rate

- Discussion of the sustainable growth rate
 - Note that no new equity is issued
 - The sustainable growth rate is substantially higher than the internal growth rate.
 - This is because we are allowing the company to issue debt as well as use internal funds.
- Why managers would wish to avoid issuing equity to meet anticipated financing needs? You can find more answers if you are interested in:
 - Topics in previous chapters: stockholder/bondholder conflicts of interest and agency costs
 - Topics in future chapters: information asymmetry, signaling, flotation costs, high cost of equity, and corporate governance

Determinants of growth

- Sustainable Growth Rate = $\frac{ROE \times b}{1 - ROE \times b}$
- ROE (consider DuPont identity), b (retention ratio) -> Four factors
 - Profit margin (operating efficiency): the ability to generate funds internally
 - Dividend policy: internally generated equity
 - Total asset turnover (asset use efficiency): the firm's needed for new assets as sales grow
 - Financial policy: additional debt financing available

- if sales growth rate $>$ sustainable growth rate, all or some of the following should happen:
 - increase profit margins
 - increase total asset turnover
 - increase financial leverage
 - increase retained earnings (or sell new shares)
- If a firm does not wish to sell new equity, and its profit margin, dividend policy, financial policy, and total asset turnover are all fixed, then there is only one possible growth rate

Robert C. Higgins on sustainable growth

- The sustainable growth equation explicitly states "it takes money to make money", and is often used by bankers and other external analysts to assess a company's credit-worthiness
- It tells a banker what issues will be at the top of management's financial agenda
 - If actual growth rate consistently exceeds sustainable growth rate
-> The problem will be where to get the cash to finance with -> Talk about interest in loan products
 - If sustainable growth rate consistently exceeds actual -> The problem will be what to do with the pilling-up cash -> Talk about investment products

- It can help when explaining to financial inexperienced small business owners and overly optimistic entrepreneurs
 - For the long-run viability, it is necessary to keep growth and profitability in proper balance
- It helps a banker understand why a loan applicant needs money and for how long the need might continue
 - e.g., actual rate >> sustainable growth rate -> the loan could be a down payment on a larger, multiyear commitment

4.5 Some caveats regarding financial planning models

- They are useful for pointing out inconsistencies and financial needs
 - However, they offer little guidance concerning what to do about the problems
- The models do not always ask the right questions
 - They tend to rely on accounting relationships and not financial relationships
 - No meaningful clues about what strategies will increase firm value
 - In particular, cash flow size, risk, and timing tend to get left out
- Divert the user's attentions to the association of D/E ratio and firm growth

- Financial planning is iterative process
 - Plans are created, examined, and modified over and over
 - The final plan will be a result negotiated between all the different parties to the process
 - In fact, long-term financial planning in most corporations relies the Procrustes approach
 - Upper-level managers have a goal in mind, the planning staff rework and ultimately deliver a feasible plan that meets that goal
 - The final plan will therefore implicitly contain different goals in different areas and also satisfy many constraints
 - For this reason, such a plan need not be a dispassionate assessment of what we think the future will bring
 - It may instead be a means of reconciling the planned activities of different groups and a way of setting common goals for the future

Epilogue

- Committing a plan to paper forces managers to think seriously about the future
- We have examined a number of features of the planning process
 - The components of a financial model
 - How a financial planning model is useful in exploring the relationship between growth and financing needs
- Plans all too often are formulated in terms of a growth target with no explicit linkage to value creation, and they frequently are overly concerned with accounting statements
- Nevertheless, the alternative to financial planning is stumbling into the future

CH4 Assignments (Due at 11 a.m. 2019/9/25)

BASIC QUESTIONS 5, 6, and INTERMEDIATE QUESTION 20 (**Compulsory**)

INTERMEDIATE QUESTION 24-26 (Optional)