



LONG-TERM FINANCIAL PLANNING AND GROWTH

FIN 360: PRINCIPLES OF FINANCIAL MANAGEMENT
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WHAT IS FINANCIAL PLANNING?

Financial planning, also known as *strategic planning*, formulates the way in which a firm's longer-term financial goals are to be achieved. It establishes guidelines for change and growth in the firm. Major elements of a financial plan include:

1. The firm's needed investment in new assets. *Why are new assets needed at all?*
2. The degree of financial leverage the firm chooses to employ. *What's the benefit of leverage in the first place? Why have leverage at all?*
3. The amount of cash the firm thinks is necessary and appropriate to pay shareholders (**dividend policy**). *Why and when would a firm pay the shareholders?*
4. The amount of liquidity and working capital the firm needs on an ongoing basis. *Why don't firms just maximize liquidity and working capital?*

The firm's decisions regarding these four areas will affect its future profitability, need for external financing, and opportunities for growth. Growth should not be a goal unto itself: it is important that it generate increasing value of a share for existing shareholders.

FINANCIAL PLANNING MODEL: PERCENTAGE OF SALES APPROACH

The **percentage of sales approach** to developing a financial planning model begins with a firm's sales forecast, and then observing how this "flows through" other accounts and items on the financial statements.

PRACTICE: A firm has projected a 7% increase in sales. With this assumption, we generate what is known as a **pro forma** income statement, or a statement that presents forecasts based on our assumptions. Management for the firm has chosen a 45% **dividend payout ratio**, whereby it pays 45% of each period's net income to shareholders as a dividend. This implies a $1 - 45\% = 55\%$ **retention or plowback ratio** that flows into the firm's retained earnings.



	<u>Last Period</u>	% of Sales	<u>Pro Forma</u>	
Net Sales	\$18,746.1		\$	← Step 1: Compute Sales
Cost of Goods Sold	15,286.0			
Gross Profit	3,460.1		3,702.3	
SG&A	1,422.5			
Depreciation	569			
EBIT	1,468.6		1,571.4	
Interest Expense	372.6			← Step 3: Complete the Pro Forma Statement using forecast sales and expenses.
Earnings Before Taxes	1,096.0			
Income Tax Expense	241.1		258.0	
Net Income	<u>\$854.9</u>		<u>\$914.7</u>	

Step 2: Determine items' % of past sales (revenue)

Step 4: Determine the forecast dividend payouts (45%) and retention (55%) amounts:

Dividend payout: \$ _____ Plowback amount: \$ _____

Step 5: Determine balance sheet items by the percentage of sales method. Recall Sales in the last period was **\$18,746.1** as listed on the income statement above. The pro forma values will be based on the pro forma sales of **\$20,058.3**



Note that certain financing items, particularly **Notes payable**, **Long term debt**, and **Common stock** do not necessarily vary with sales. The firm still “owes” the items or maintains their levels regardless of how much it sells. **Retained earnings** will be adjusted later based on the **plowback ratio**.

We put “n/a” or “not applicable” for these items for the % of Sales column. We assume no change in the pro formas except for Retained Earnings which reflects the retention ratio.

	<u>Last Period</u>	% of Sales	<u>Pro Forma</u>
ASSETS			
Current assets			
Cash and cash equivalents	\$290.9		
Accounts receivable	2,786.0		
Inventories	2,582.7		
Total current assets	<u>5,659.6</u>		<u>6,055.8</u>
Fixed assets			
Gross property and equip.	\$31,300.3		
Accumulated depreciation	(7,705.6)		
Net plant and equipment	<u>23,594.7</u>		<u>25,246.3</u>
Total Assets	<u>29,254.3</u>		<u>\$31,302.1</u>
LIABILITIES AND EQUITY			
Current liabilities			
Accts payable, other accr.	\$2,783.6		
Notes payable	359.5		
Taxes payable	501.0		
Total current liabilities	<u>3,644.1</u>		<u>3,874.0</u>
Long term debt	<u>\$13,918.5</u>		
Total liabilities	<u>\$17,562.6</u>		<u>\$17,792.5</u>
Owners' Equity			
Com. stock paid-in-sur.	\$6,491.6		
Retained earnings	5,200.1		
Total equity	<u>\$11,691.7</u>		<u>\$12,194.8</u>
Total liabilities and equity	<u>\$29,254.3</u>		<u>\$29,987.3</u>

Step 6: Retained Earnings must increase by the \$503.11 plowback amount.

RE = 5,200.1 + 503.11

Step 7: *This pro forma balance sheet doesn't balance!* We define the **External Financing Needed (EFN)** as the amount in additional financing required to *make the balance sheet balance*.

$$EFN = Total\ Assets - Total\ Liabilities\ and\ Equity$$

$$EFN = \$ \underline{\hspace{2cm}} - \$ \underline{\hspace{2cm}} = \$ \underline{\hspace{2cm}}$$

Note that this projected amount of EFN is under the assumption that our notes payable, long term debt, and common stock are unchanged.

INTERPRETATION: The firm needs to raise the computed EFN for the 7% level of growth to occur. This may be done through some mix of short term borrowing, long term borrowing, or issuing additional equity (though as we will see later, issuing new equity is often costly and may not be preferable to borrowing).



Can EFN be negative? If so, when? What does that imply about the growth rate?

Thus, EFN is the *required increase in assets* minus the *spontaneous increase in liabilities* minus the *increase in retained earnings*:

$$EFN = \frac{A^*}{S_0} \Delta S - \frac{L^*}{S_0} \Delta S - (MS_1 \times b)$$

Where

A^* = Assets (existing) tied to sales

S_0 = Sales (at time zero)

ΔS = Dollar change in sales based on forecast

L^* = Liabilities that change spontaneously (tied to sales)

M = Profit margin

S_1 = Sales (forecast)

b = Retention ratio or *plowback ratio*

Additionally, we know

$$\text{Net Income}_1 = MS_1$$

$$b = 1 - \text{dividend payout ratio}$$

$$\Delta \text{Retained Earnings} = MS_1 \times b$$

Revisiting our previous example:


$$EFN = \frac{A^*}{S_0} \Delta S - \frac{L^*}{S_0} \Delta S - (MS_1 \times b)$$

becomes

$$EFN = \frac{290.9 + 2786 + 2582.7 + 31300.3 - 7705.6}{18746.1} (20058.3 - 18746.1) - \frac{2783.6 + 501}{18746.1} (20058.3 - 18746.1) - (914.7 \times 0.55)$$

Which yields the same EFN as we found by building pro forma statements:

$EFN =$

 Work additional examples in the Excel File [Financial Forecasting](http://www.josephfarizo.com/fin360) at www.josephfarizo.com/fin360. Be sure that you can find the same EFN by either building pro forma statements or using the formula.

GROWTH RATES

We've seen how the firm can determine the financing needed to achieve projected growth. But how might the firm determine appropriate growth rates? We consider two measures.

THE INTERNAL GROWTH RATE

The firm's **internal growth rate** is the maximum growth rate achievable without requiring additional financing, *of any kind*.

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

where ROA is the return on assets (existing net income over existing assets) and b is the plowback ratio.



What does a projected growth rate above the internal growth rate imply about what the firm will need to do if it wants to achieve that projected rate?

THE SUSTAINABLE GROWTH RATE

The firm's **sustainable growth rate** is the maximum growth rate a firm can achieve without external financing while *maintaining its existing debt to equity ratio*.

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

where ROE is the return on equity (existing net income over existing equity) and b is the plowback ratio.



What does a projected growth rate above the sustainable growth rate imply about what the firm will need to do? How might this present issues for the firm?

Note that when we compute these growth rates, we need to first make the assumption that *no liabilities, not even current liabilities, vary spontaneously with sales*. The intention of these formulas is to provide growth rates that allow the firm to then make choices about how to vary liabilities and equity to finance growth.



While *assets and costs* may be proportional to sales when building pro forma statements, we assume no liabilities or equity vary spontaneously with sales when determining internal and sustainable growth rates.

With the *percentage of sales* approach above, however, liabilities may vary spontaneously with sales.



PRACTICE: Given the following information, compute the internal and sustainable growth rates for the firm, assuming a plowback ratio of 65%. Interpret these values.



	<u>Year End</u>		
Net Sales	\$442		
Cost of Goods Sold	349		
Gross Profit	63		
SG&A	40		
Depreciation	10		
EBIT	43		
Interest Expense	10		
Earnings Before Taxes	33		
Income Tax Expense	10		
Net Income	\$23		
			<u>Year End</u>
		Current Assets	\$30
		Fixed Assets	100
		Total	130
		Current Liabilities	15
		Long Term Debt	15
		Equity	100
		Total	\$130

$$\text{Internal Growth Rate} = \frac{ROA \times b}{1 - (ROA \times b)} = 12.99\%$$

$$\text{Sustainable Growth Rate} = \frac{ROE \times b}{1 - (ROE \times b)} = 17.58\%$$

We could also find these growth rates using *only* the following measures:

Total asset turnover: 3.40

Profit margin: 5.2%

Equity multiplier: 1.30

Dividend payout ratio: 35%

$$ROE = PM \times TAT \times EM = 0.052 \times 3.40 \times 1.30 = \mathbf{22.984\%}$$

and

$$ROE = \frac{\text{Net Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}} \times \frac{\text{Assets}}{\text{Equity}} \Rightarrow \frac{\text{Net Income}}{\text{Assets}} \times \frac{\text{Assets}}{\text{Equity}} \Rightarrow ROA \times EM = ROE$$


$$ROE = ROA \times EM \Rightarrow 22.984\% = ROA \times 1.30$$

$$\mathbf{ROA = 17.69\%}$$

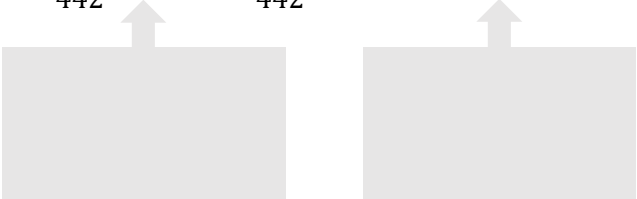
and

$$\mathbf{b = 1 - 0.35 = 0.65}$$

We plug these computed ROA and ROE values into the growth rate formulas. Notice if the firm grows at exactly the internal growth rate (with values we obtain from the pro formas):

$$EFN = \frac{A^*}{S_0} \Delta S - \frac{L^*}{S_0} \Delta S - (MS_1 \times b) = \frac{130}{442} (57.435) - \frac{0}{442} (57.435) - (25.989 \times 0.65) = 0$$


If the firm grows at exactly the sustainable growth rate:

$$EFN = \frac{A^*}{S_0} \Delta S - \frac{L^*}{S_0} \Delta S - (MS_1 \times b) = \frac{130}{442} (77.694) - \frac{0}{442} (77.694) - (27.043 \times 0.65) = 5.273$$


This tells us that if the firm increases its debt by \$5.273, its debt-to-equity ratio would be exactly as it was before, assuming growth at the sustainable rate. You can verify this by building the pro forma statements (see the Excel file linked below).

INTERPRETATION: Growing at the internal growth rate implies that EFN will be zero. Growing at the sustainable growth rate tells the firm if it adds exactly the EFN to the “left side” of its balance sheet equation, its debt-to-equity ratio will be unchanged.



The Excel file [Growth Rates](http://www.josephfarizo.com/fin360) at www.josephfarizo.com/fin360 provides this example and many other useful examples.

CAVEATS OF FINANCIAL PLANNING MODELS

Here, we've largely assumed that firms are **operating at capacity**, or that any new increase in sales requires additional investment in fixed assets. This isn't always the case: on average, **capacity utilization** is about 70-80%, exceeding only 90% during wartime. Thus, we might be overstating the EFN slightly if the firm can simply "turn on the existing machines" rather than purchase new ones.

Financial planning is an *iterative* process that should constantly be revisited and modified as conditions change. It relies on many assumptions, historical ROA and ROE figures, and fixed ratios of accounting items to sales. It is one of *many* tools the firm should use to finance growth.