Discounted Cash Flow: Forecast Drivers

Michael R. Roberts

William H. Lawrence Professor of Finance

The Wharton School, University of Pennsylvania

Last Time
Discounted Cash Flow (DCF)
- Free Cash Flow

This Time
Discounted Cash Flow (DCF)

- Forecast Drivers

Forecast Drivers

$$FCF = (\text{Revenue} - \text{Costs} - \text{Depreciation}) \times (1 - t_C)$$
$$+ \text{Depreciation} - \text{Capital Expenditures}$$
$$- \text{Change in Net Working Capital}$$

FCF = (Revenue – Costs – Depreciation) x $(1 - t_C)$
$\quad$ + Depreciation – Capital Expenditures
$\quad$ – Change in Net Working Capital

Revenue = Market Size x Market Share x Price

$$FCF = (\textcolor{red}{Revenue} - Costs - Depreciation) \times (1 - t_C)$$
$$+ \; Depreciation - Capital \; Expenditures$$
$$- \; Change \; in \; Net \; Working \; Capital$$

$$\textcolor{red}{Revenue} = \textcolor{orange}{Market \; Size} \times Market \; Share \times Price$$

	Year				
Project Assumptions	0 (F2008)	1	2	3	4	5
Revenue Forecasts						
Market Forecasts						
Initial Market Size (Units, million)		1.00				
Market Growth Rate			2500.00%	128.0%	9.4%	3.5%
Market Size (Units, million)		1.0	26.0	59.3	64.9	67.1

$$\text{FCF} = (\textcolor{red}{\text{Revenue}} - \text{Costs} - \text{Depreciation}) \times (1 - t_C)$$
$$+ \text{Depreciation} - \text{Capital Expenditures}$$
$$- \text{Change in Net Working Capital}$$

$\textcolor{red}{\text{Revenue}} = \textcolor{orange}{\text{Market Size}} \times \text{Market Share} \times \text{Price}$

Project Assumptions
Revenue Forecasts
Market Forecasts

	Year				
	0 (F2008)	1	2	3	4	5

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Initial Market Size (Units, million)	1.00					
Market Growth Rate		2500.00%	128.0%	9.4%	3.5%	
Market Size (Units, million)	1.0	26.0	59.3	64.9	67.1	
(Actual Market Size, Units Mil)	1.0	60.0	116.3	195.4	229.0	

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(Actual Market Size, Units Mil)		1.0	60.0	116.3	195.4	229.0
Corp Market Share						
Initial Market Share	25.00%					
Market Share Annual Growth Rate		5.00%	5%	5%	5%	5%
Market Share		25.0%	26.3%	27.6%	28.9%	30.4%
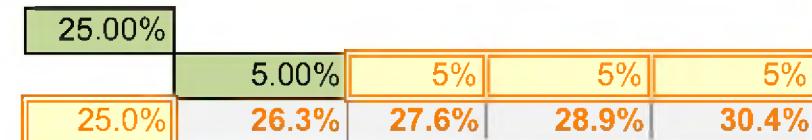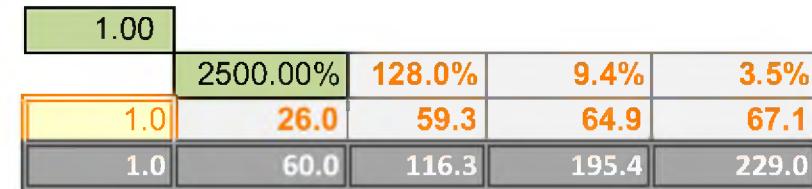
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$$\textcolor{red}{\text{Revenue}} = \text{Market Size} \times \text{Market Share} \times \textcolor{orange}{\text{Price}}$$

	Year				
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Initial Market Share	25.00%					
Market Share Annual Growth Rate		5.00%	5%	5%	5%	
Market Share		25.0%	26.3%	27.6%	28.9%	30.4%
Pricing Strategy						
Initial Unit Price ($/unit)	200.00					
Bi-Annual Price Increases ($/unit)		-	49.99	-	49.99	
Unit Price ($/unit)		200.00	200.00	249.99	249.99	299.98

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$$\text{Costs} = \text{Cost Margin} \times \text{Revenue}$$

Project Assumptions	Year					
	0 (F2008)	1	2	3	4	5
Operating Expenses						
COGS						
COGS / Sales (% Sales)	80.66%	80.66%	80.66%	80.66%	80.66%	80.66%
SG&A						
1% of 2008 Company SG&A ($mil)		69.59				
SG&A Expense Growth Rate			25.00%	25.00%	25.00%	25.00%

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Costs = R&D Expenditures

Project Assumptions	Year					
	0 (F2008)	1	2	3	4	5
Operating Expenses						
COGS						
COGS / Sales (% Sales)	80.66%	80.66%	80.66%	80.66%	80.66%	80.66%
SG&A						
1% of 2008 Company SG&A ($mil)		69.59				
SG&A Expense Growth Rate			25.00%	25.00%	25.00%	25.00%
R&D						
R&D Upfront ($mil)	200.00					
R&D for Versioning ($mil)		25.00	25.00	25.00	25.00	25.00
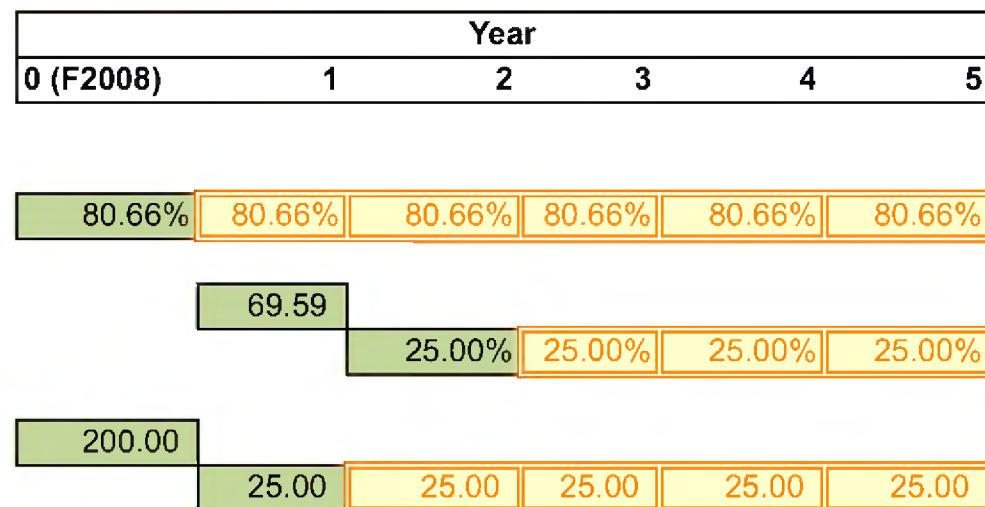
$$FCF = (Revenue - Costs - Depreciation) \times (1 - t_C)$$
$$+ Depreciation - \text{\textcolor{red}{Capital Expenditures}}$$
$$- \text{Change in Net Working Capital}$$

Capital Expenditures

	Year				
0 (F2008)	**1**	**2**	**3**	**4**	**5**

Project Assumptions
Capital Expenditures & PP&E Information
  Initial Investment (Fixed Cost, $mil)
  Future Investment (% of initial Investment)
  Future Investment (Annual Growth)

	Year				
227.70					
	10.0%				
		5.0%	1.0%	1.0%	1.0%

$$FCF = (\text{Revenue} - \text{Costs} - \text{Depreciation}) \times (1 - t_C)$$
$$+ \text{Depreciation} - \textcolor{red}{\text{Capital Expenditures}}$$
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Capital Expenditures

Project Assumptions	Year					
Capital Expenditures & PP&E Information	0 (F2008)	1	2	3	4	5
Initial Investment (Fixed Cost, $mil)	227.70					
Future Investment (% of initial Investment)		10.0%				
Future Investment (Annual Growth)			5.0%	1.0%	1.0%	1.0%
PP&E Liquidation Value	50.00%	50.0%	50.0%	50.0%	50.0%	50.0%

$$FCF = (\text{Revenue} - \text{Costs} - \text{Depreciation}) \times (1 - t_C)$$
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$$- \text{Change in Net Working Capital}$$

Depreciation

Project Assumptions
Capital Expenditures & PP&E Information

	Year				
0 (F2008)	1	2	3	4	5
227.70					
	10.0%				
		5.0%	1.0%	1.0%	1.0%
50.00%	50.0%	50.0%	50.0%	50.0%	50.0%
5.00	5	5	5	5	5

Row labels for the table:
- Initial Investment (Fixed Cost, $mil)
- Future Investment (% of initial Investment)
- Future Investment (Annual Growth)
- PP&E Liquidation Value
- PP&E life for depreciation (Years)

*Straight line depreciation

$$\text{FCF} = (\text{Revenue} - \text{Costs} - \text{Depreciation}) \times (1 - t_C)$$
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$$- \text{Change in Net Working Capital}$$

$$\text{Net Working Capital} = \text{Cash} + \text{Inventory} + \text{AR} - \text{AP}$$

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	Year					
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Project Assumptions
Working Capital Assumptions
  Cash Requirements

% of SG&A	50.00%	50%	50%	50%	50%	50%
% R&D Expenditures	100.00%	100%	100%	100%	100%	100%

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$$Net \ Working \ Capital = Cash + Inventory + AR - AP$$

Project Assumptions	Year					
	0 (F2008)	1	2	3	4	5
Working Capital Assumptions						
Cash Requirements						
% of SG&A	50.00%	50%	50%	50%	50%	50%
% R&D Expenditures	100.00%	100%	100%	100%	100%	100%
Inventory						
Inventory Days (365 x Inventory / COGS)	7.58	7.58	7.58	7.58	7.58	7.58
Excess Inventory liquidation value (% of Inventory Cost)						25.00%

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		Year				
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Working Capital Assumptions						
Cash Requirements						
% of SG&A	50.00%	50%	50%	50%	50%	50%
% R&D Expenditures	100.00%	100%	100%	100%	100%	100%
Inventory						
Inventory Days (365 x Inventory / COGS)	7.58	7.58	7.58	7.58	7.58	7.58
Excess Inventory liquidation value (% of Inventory Cost)						25.00%
Accounts Receivable						
Days Receivable (365 x Accounts Receivable / Sales)	38.49	38.49	38.49	38.49	38.49	38.49

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	Year					
Project Assumptions	**0 (F2008)**	**1**	**2**	**3**	**4**	**5**
Working Capital Assumptions						
Cash Requirements						
% of SG&A	50.00%	50%	50%	50%	50%	50%
% R&D Expenditures	100.00%	100%	100%	100%	100%	100%
Inventory						
Inventory Days (365 x Inventory / COGS)	7.58	7.58	7.58	7.58	7.58	7.58
Excess Inventory liquidation value (% of Inventory Cost)						25.00%
Accounts Receivable						
Days Receivable (365 x Accounts Receivable / Sales)	38.49	38.49	38.49	38.49	38.49	38.49
Accounts Payable						
Days Payable (365 x Accounts Payable / COGS)	61.54	61.54	61.54	61.54	61.54	61.54

FCF = (Revenue – Costs – Depreciation) x $(1 - t_C)$
+ Depreciation – Capital Expenditures
– Change in Net Working Capital

Δ Net Working Capital = Net Working Capital (t)
– Net Working Capital (t-1)

where Δ = change over one period

FCF = (Revenue – Costs – Depreciation) x (1 – t_C)
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– Change in Net Working Capital

Taxes

We want the marginal tax rate (MTR)

=

Tax rate on additional $ of earnings
25.5%

This is Nonsense!

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Impossible to make accurate forecasts!

This is Nonsense!

Impossible to make accurate forecasts!

I agree, but that's not the point!!!!

Lesson: Point of DCF is to focus discussion and analysis on relevant issues

Lesson: Successful valuation (i.e., decision making) depends critically on input from non-finance personnel

Summary

Lessons

- Forecast Drivers are the assumptions used to populate our free cash flow forecasts

- Goal is to establish framework for discussion
  - Think about value drivers

Coming up next

- Discounted Cash Flow (DCF)
  - Forecasting free cash flow