

Discounted Cash Flow: Forecasting Free Cash Flows

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Last Time

Discounted Cash Flow (DCF)

- Forecast drivers

This Time Discounted Cash Flow (DCF)

- Forecasting free cash flows

Forecasting Free Cash Flows

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

Translate forecast drivers into \$ forecasts

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

Project Assumptions

Revenue Forecasts

Market Forecasts

Initial Market Size (Units, million)

Market Growth Rate

Market Size (Units, million)

(Actual Market Size, Units Mil)

Dell's Market Share

Initial Market Share

Market Share Annual Growth Rate

Market Share

Pricing Strategy

Initial Unit Price (\$/unit)

Bi-Annual Price Increases (\$/unit)

Unit Price (\$/unit)

| | | Year | | | | | |
|--|--|-----------|---|---|---|---|---|
| | | 0 (F2008) | 1 | 2 | 3 | 4 | 5 |

| | | | | |
|------|----------|--------|-------|-------|
| 1.00 | 2500.00% | 128.0% | 9.4% | 3.5% |
| 1.0 | 26.0 | 59.3 | 64.9 | 67.1 |
| 1.0 | 60.0 | 116.3 | 195.4 | 229.0 |

| | | | | |
|--------|-------|-------|-------|-------|
| 25.00% | 5.00% | 5% | 5% | 5% |
| 25.0% | 26.3% | 27.6% | 28.9% | 30.4% |

| | | | | |
|--------|--------|--------|--------|--------|
| 200.00 | - | 49.99 | - | 49.99 |
| 200.00 | 200.00 | 249.99 | 249.99 | 299.98 |

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

Project Assumptions

Revenue Forecasts

Market Forecasts

Initial Market Size (Units, million)

Market Growth Rate

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(Actual Market Size, Units Mil)

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|--------|-------|-------|-------|-------|
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| | | | | |
|--------|--------|--------|--------|--------|
| 200.00 | - | 49.99 | - | 49.99 |
| 200.00 | 200.00 | 249.99 | 249.99 | 299.98 |

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

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

Project Assumptions

Revenue Forecasts

Market Forecasts

Initial Market Size (Units, million)

Market Growth Rate

Market Size (Units, million)

(Actual Market Size, Units Mil)

Dell's Market Share

Initial Market Share

Market Share Annual Growth Rate

Market Share

Pricing Strategy

Initial Unit Price (\$/unit)

Bi-Annual Price Increases (\$/unit)

Unit Price (\$/unit)

| | | Year | | | | | |
|--|--|-----------|---|---|---|---|---|
| | | 0 (F2008) | 1 | 2 | 3 | 4 | 5 |

| | | | | |
|------|----------|--------|-------|-------|
| 1.00 | 2500.00% | 128.0% | 9.4% | 3.5% |
| 1.0 | 26.0 | 59.3 | 64.9 | 67.1 |
| 1.0 | 60.0 | 116.3 | 195.4 | 229.0 |

| | | | | |
|--------|-------|-------|-------|-------|
| 25.00% | 5.00% | 5% | 5% | 5% |
| 25.0% | 26.3% | 27.6% | 28.9% | 30.4% |

| | | | | |
|--------|--------|--------|--------|--------|
| 200.00 | - | 49.99 | - | 49.99 |
| 200.00 | 200.00 | 249.99 | 249.99 | 299.98 |

$$\text{Revenue 1} = 1.0 \times 0.25 \times 200 = 50$$

$$\begin{aligned} FCF = & (\text{Revenue} - \text{Costs} - \text{Depreciation}) \times (1 - t_C) \\ & + \text{Depreciation} - \text{Capital Expenditures} \\ & - \text{Change in Net Working Capital} \end{aligned}$$
Incremental Earnings Forecasts

Sales

| Year | | | | | |
|------|------|---------|---------|---------|---------|
| 0 | 1 | 2 | 3 | 4 | 5 |
| | 50.0 | 1,365.0 | 4,084.6 | 4,692.0 | 6,116.9 |

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

Project Assumptions

Operating Expenses

COGS

COGS / Sales (% Sales)

| | | Year | | | | | |
|--|--|-----------|---|---|---|---|---|
| | | 0 (F2008) | 1 | 2 | 3 | 4 | 5 |

| | | | | | |
|--------|--------|--------|--------|--------|--------|
| 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 |
|-------|-------|-------|-------|-------|

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

Project Assumptions

Operating Expenses

COGS

COGS / Sales (% Sales)

SG&A

1% of 2008 Company SG&A (\$mil)

SG&A Expense Growth Rate

R&D

R&D Upfront (\$mil)

R&D for Versioning (\$mil)

| | | Year | | | | | |
|--|--|-----------|---|---|---|---|---|
| | | 0 (F2008) | 1 | 2 | 3 | 4 | 5 |



69.59



200.00



Incremental Earnings Forecasts

Sales

| | | Year | | | | | |
|--|--|------|---------|---------|---------|---------|---|
| | | 0 | 1 | 2 | 3 | 4 | 5 |
| | | 50.0 | 1,365.0 | 4,084.6 | 4,692.0 | 6,116.9 | |

$$\begin{aligned}
 \text{COGS} &= (\text{COGS} / \text{Sales}) \times \text{Sales} \\
 \text{Year 1: } 0.8066 \times 50.0 &= 40.33
 \end{aligned}$$

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

Project Assumptions

Operating Expenses

COGS

COGS / Sales (% Sales)

SG&A

1% of 2008 Company SG&A (\$mil)

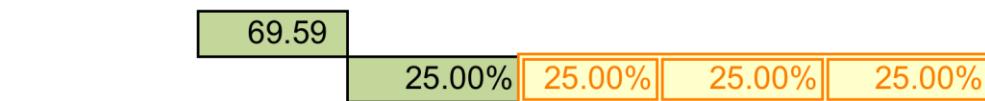
SG&A Expense Growth Rate

R&D

R&D Upfront (\$mil)

R&D for Versioning (\$mil)

| | Year | | | | |
|-----------|------|---|---|---|---|
| 0 (F2008) | 1 | 2 | 3 | 4 | 5 |



Incremental Earnings Forecasts

Sales

| | Year | | | | |
|---|------|---------|---------|---------|---------|
| 0 | 1 | 2 | 3 | 4 | 5 |
| | 50.0 | 1,365.0 | 4,084.6 | 4,692.0 | 6,116.9 |

Incremental Earnings Forecasts

COGS

| | Year | | | | |
|---|------|---------|---------|---------|---------|
| 0 | 1 | 2 | 3 | 4 | 5 |
| | 40.3 | 1,101.0 | 3,294.6 | 3,784.6 | 4,933.9 |

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

Project Assumptions

Operating Expenses

COGS

COGS / Sales (% Sales)

SG&A

1% of 2008 Company SG&A (\$mil)

SG&A Expense Growth Rate

R&D

R&D Upfront (\$mil)

R&D for Versioning (\$mil)

| | Year | | | | | |
|---------------------------------|-----------|--------|--------|--------|--------|--------|
| | 0 (F2008) | 1 | 2 | 3 | 4 | 5 |
| 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% | 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 |

$$\begin{aligned}
 \text{Year 1: SG\&A} &= 1\% \text{ of '08 SG\&A} \\
 &= 0.01 \times \$6,959 = \$69.6 \\
 \text{Year 2 - 5: SG\&A} &= 25\% \text{ Annual Growth Rate} \\
 &= \$69.59 \times (1+0.25) = \$87.0
 \end{aligned}$$

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

Project Assumptions

Operating Expenses

COGS

COGS / Sales (% Sales)

SG&A

1% of 2008 Company SG&A (\$mil)

SG&A Expense Growth Rate

R&D

R&D Upfront (\$mil)

R&D for Versioning (\$mil)

| | Year | | | | |
|-----------|------|---|---|---|---|
| 0 (F2008) | 1 | 2 | 3 | 4 | 5 |



Incremental Earnings Forecasts

SG&A

| | Year | | | | |
|---|------|------|-------|-------|-------|
| 0 | 1 | 2 | 3 | 4 | 5 |
| | 69.6 | 87.0 | 108.7 | 135.9 | 169.9 |

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

Project Assumptions

Operating Expenses

COGS

COGS / Sales (% Sales)

| | | Year | | | | | |
|--|--|-----------|---|---|---|---|---|
| | | 0 (F2008) | 1 | 2 | 3 | 4 | 5 |

SG&A

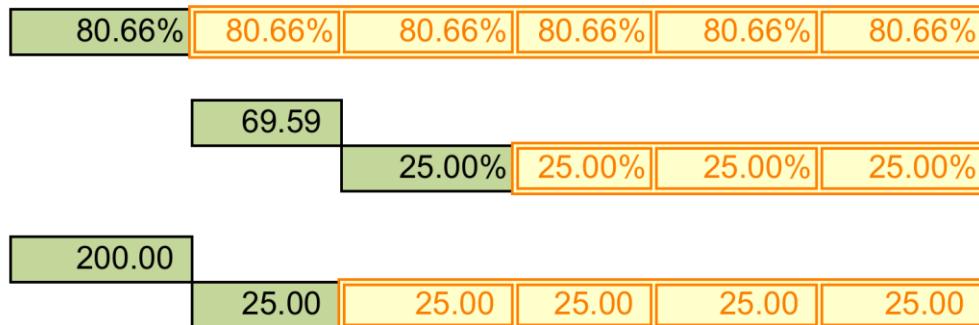
1% of 2008 Company SG&A (\$mil)

SG&A Expense Growth Rate

R&D

R&D Upfront (\$mil)

R&D for Versioning (\$mil)



Incremental Earnings Forecasts

R&D



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

| Incremental Earnings Forecasts | Year | | | | | |
|------------------------------------|--------|-------|---------|---------|---------|---------|
| | 0 | 1 | 2 | 3 | 4 | 5 |
| Sales | | 50.0 | 1,365.0 | 4,084.6 | 4,692.0 | 6,116.9 |
| COGS | | 40.3 | 1,101.0 | 3,294.6 | 3,784.6 | 4,933.9 |
| <i>Gross Profit = (28) - (29)</i> | 0.0 | 9.7 | 264.0 | 790.0 | 907.4 | 1,183.0 |
| SG&A | | 69.6 | 87.0 | 108.7 | 135.9 | 169.9 |
| R&D | 200.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 |
| <i>EBITDA = (30) - (31) - (32)</i> | -200.0 | -84.9 | 152.0 | 656.2 | 746.5 | 988.1 |

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

Project Assumptions

Capital Expenditures & PP&E Information

- Initial Investment (Fixed Cost, \$mil)
- Future Investment (% of initial Investment)
- Future Investment (Annual Growth)

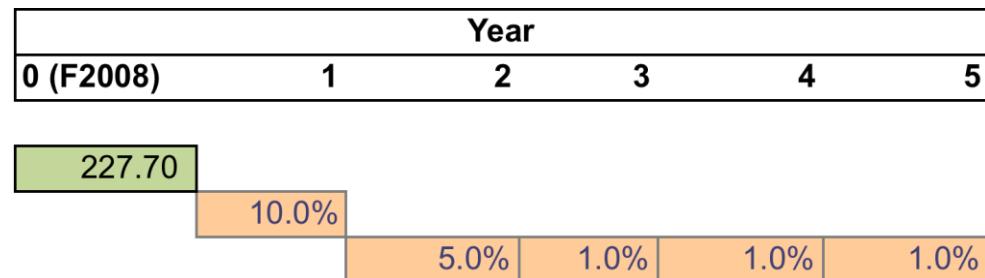
| | Year | | | | |
|-----------|------|-------|------|------|------|
| 0 (F2008) | 1 | 2 | 3 | 4 | 5 |
| 227.70 | | 10.0% | | | |
| | | 5.0% | 1.0% | 1.0% | 1.0% |
| | | | | | |

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

Project Assumptions

Capital Expenditures & PP&E Information

- Initial Investment (Fixed Cost, \$mil)
- Future Investment (% of initial Investment)
- Future Investment (Annual Growth)



Year 0: Initial investment = 227.7

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

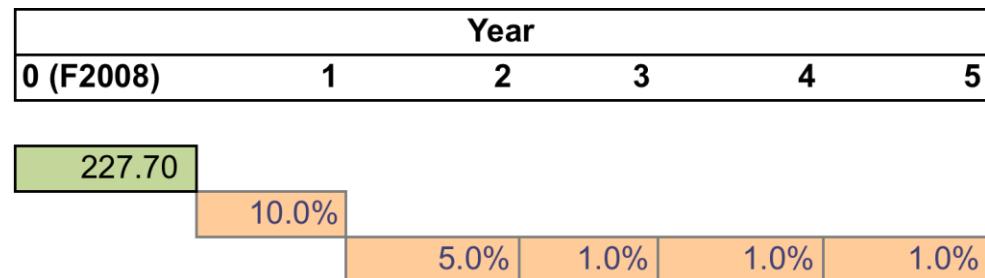
Project Assumptions

Capital Expenditures & PP&E Information

Initial Investment (Fixed Cost, \$mil)

Future Investment (% of initial Investment)

Future Investment (Annual Growth)



Year 0: Initial investment = 227.7

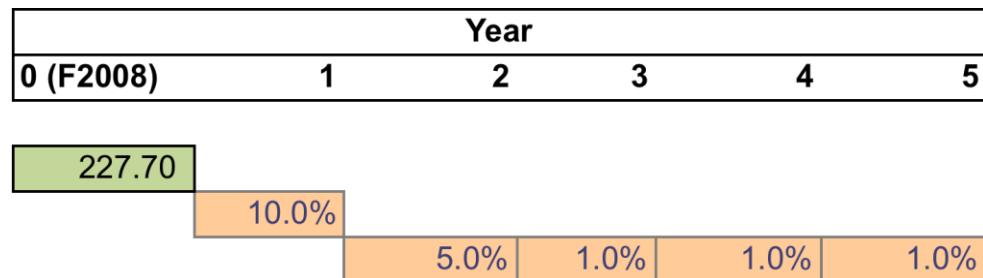
Year 1: 10% of initial investment = $0.10 \times \$227.7 = \22.77

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

Project Assumptions

Capital Expenditures & PP&E Information

- Initial Investment (Fixed Cost, \$mil)
- Future Investment (% of initial Investment)
- Future Investment (Annual Growth)



Year 0: Initial investment = 227.7

Year 1: 10% of initial investment = $0.10 \times \$227.7 = \22.77

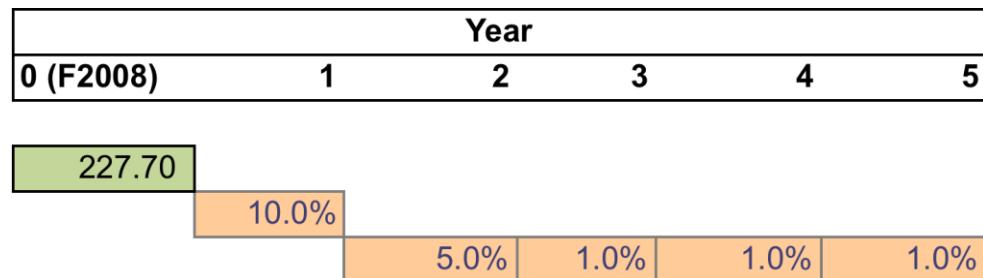
Year 2: 5% annual growth = $\$22.77 \times (1+0.05) = \23.9

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

Project Assumptions

Capital Expenditures & PP&E Information

- Initial Investment (Fixed Cost, \$mil)
- Future Investment (% of initial Investment)
- Future Investment (Annual Growth)



Year 0: Initial investment = 227.7

Year 1: 10% of initial investment = $0.10 \times \$227.7 = \22.77

Year 2: 5% annual growth = $\$22.77 \times (1+0.05) = \23.9

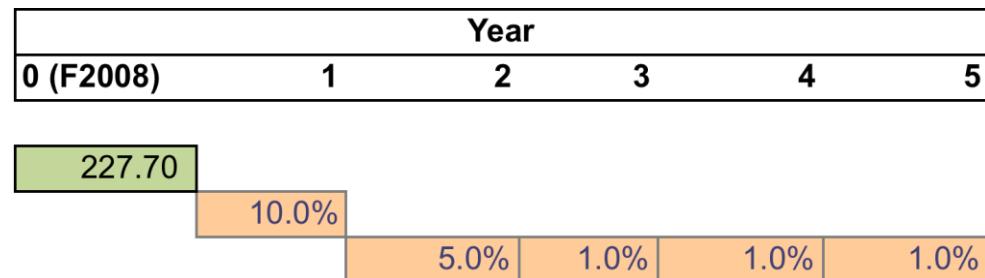
Year 3-5: 1% annual growth = $\$23.9 \times (1+0.01) = \24.1

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

Project Assumptions

Capital Expenditures & PP&E Information

- Initial Investment (Fixed Cost, \$mil)
- Future Investment (% of initial Investment)
- Future Investment (Annual Growth)



Capital Expenditure Forecasts

Project CapEx



$$\text{FCF} = (\text{Revenue} - \text{Costs} - \text{Depreciation}) \times (1 - t_C)$$

+ Depreciation – Capital Expenditures
– Change in Net Working Capital

Capital Expenditure Forecasts

Project CapEx

| | Year | | | | | |
|---------------|-------|------|------|------|------|------|
| | 0 | 1 | 2 | 3 | 4 | 5 |
| Project CapEx | 227.7 | 22.8 | 23.9 | 24.1 | 24.4 | 24.6 |

+

Straight line depreciation over 5 years

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

Capital Expenditure Forecasts

Project CapEx

Accumulated CapEx

Depreciation

| | Year | | | | | |
|-------------------|-------|-------|-------|-------|-------|-------|
| | 0 | 1 | 2 | 3 | 4 | 5 |
| Project CapEx | 227.7 | 22.8 | 23.9 | 24.1 | 24.4 | 24.6 |
| Accumulated CapEx | 227.7 | 250.5 | 274.4 | 298.5 | 322.9 | 347.5 |
| Depreciation | | 45.5 | 50.1 | 54.9 | 59.7 | 64.6 |

Year 1: \$227.7 / 5 = \$45.5

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

Capital Expenditure Forecasts

Project CapEx

Accumulated CapEx

Depreciation

| | Year | | | | | |
|-------------------|-------|-------|-------|-------|-------|-------|
| | 0 | 1 | 2 | 3 | 4 | 5 |
| Project CapEx | 227.7 | 22.8 | 23.9 | 24.1 | 24.4 | 24.6 |
| Accumulated CapEx | 227.7 | 250.5 | 274.4 | 298.5 | 322.9 | 347.5 |
| Depreciation | | 45.5 | 50.1 | 54.9 | 59.7 | 64.6 |

$$\text{Year 1: } 227.7 / 5 = 45.5$$

$$\text{Year 2: } 250.5 / 5 = 50.1$$

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

Capital Expenditure Forecasts

Project CapEx

Accumulated CapEx

Depreciation

| | Year | | | | | |
|-------------------|-------|-------|-------|-------|-------|-------|
| | 0 | 1 | 2 | 3 | 4 | 5 |
| Project CapEx | 227.7 | 22.8 | 23.9 | 24.1 | 24.4 | 24.6 |
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What happens to all of that physical capital?

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

Capital Expenditure Forecasts

Project CapEx

Accumulated CapEx

Depreciation

Book Value of CapEx

Liquidation Value (LV)

After tax proceeds from asset sale

| | Year | | | | | |
|------------------------------------|-------|-------|-------|-------|-------|-------|
| | 0 | 1 | 2 | 3 | 4 | 5 |
| Project CapEx | 227.7 | 22.8 | 23.9 | 24.1 | 24.4 | 24.6 |
| Accumulated CapEx | 227.7 | 250.5 | 274.4 | 298.5 | 322.9 | 347.5 |
| Depreciation | | 45.5 | 50.1 | 54.9 | 59.7 | 64.6 |
| Book Value of CapEx | | | | | | 72.8 |
| Liquidation Value (LV) | | | | | | 36.4 |
| After tax proceeds from asset sale | | | | | | 45.6 |

$$\begin{aligned}
 \text{Book Value} &= \text{Accum CapEx} - \text{Accum Depreciation} \\
 &= 347.5 - 274.8 \\
 &= 72.8
 \end{aligned}$$

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

Capital Expenditure Forecasts

Project CapEx

Accumulated CapEx

Depreciation

Book Value of CapEx

Liquidation Value (LV)

After tax proceeds from asset sale

| | Year | | | | | |
|------------------------------------|-------|-------|-------|-------|-------|-------|
| | 0 | 1 | 2 | 3 | 4 | 5 |
| Project CapEx | 227.7 | 22.8 | 23.9 | 24.1 | 24.4 | 24.6 |
| Accumulated CapEx | 227.7 | 250.5 | 274.4 | 298.5 | 322.9 | 347.5 |
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| Book Value of CapEx | | | | | | 72.8 |
| Liquidation Value (LV) | | | | | | 36.4 |
| After tax proceeds from asset sale | | | | | | 45.6 |

$$\begin{aligned}
 LV &= \text{Book Value} \times \text{Recovery Rate} \\
 &= 72.8 \times 0.50 \\
 &= 36.4
 \end{aligned}$$

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

Capital Expenditure Forecasts

Project CapEx

Accumulated CapEx

Depreciation

Book Value of CapEx

Liquidation Value (LV)

After tax proceeds from asset sale

| | Year | | | | | |
|------------------------------------|-------|-------|-------|-------|-------|-------|
| | 0 | 1 | 2 | 3 | 4 | 5 |
| Project CapEx | 227.7 | 22.8 | 23.9 | 24.1 | 24.4 | 24.6 |
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| Depreciation | | 45.5 | 50.1 | 54.9 | 59.7 | 64.6 |
| Book Value of CapEx | | | | | | 72.8 |
| Liquidation Value (LV) | | | | | | 36.4 |
| After tax proceeds from asset sale | | | | | | 45.6 |

$$\begin{aligned}
 \text{After-tax proceeds} &= LV - (LV - \text{Book Value}) \times \text{Tax Rate} \\
 &= 36.4 - (36.4 - 72.8) \times 0.255 \\
 &= 45.6
 \end{aligned}$$

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

Capital Expenditure Forecasts

Project CapEx
 Accumulated CapEx
 Depreciation
 Book Value of CapEx
 Liquidation Value (LV)
 After tax proceeds from asset sale
 Net Project CapEx

| | Year | | | | | |
|------------------------------------|-------|-------|-------|-------|-------|-------|
| | 0 | 1 | 2 | 3 | 4 | 5 |
| Project CapEx | 227.7 | 22.8 | 23.9 | 24.1 | 24.4 | 24.6 |
| Accumulated CapEx | 227.7 | 250.5 | 274.4 | 298.5 | 322.9 | 347.5 |
| Depreciation | | 45.5 | 50.1 | 54.9 | 59.7 | 64.6 |
| Book Value of CapEx | | | | | | 72.8 |
| Liquidation Value (LV) | | | | | | 36.4 |
| After tax proceeds from asset sale | | | | | | 45.6 |
| Net Project CapEx | 227.7 | 22.8 | 23.9 | 24.1 | 24.4 | -21.0 |

Year 5: $24.6 - 45.6 = -21.0$

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

Net Working Capital = Cash + Inventory + AR – AP

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

Project Assumptions

Working Capital Assumptions

Cash Requirements

% of SG&A

| Year | | | | | |
|-----------|---|---|---|---|---|
| 0 (F2008) | 1 | 2 | 3 | 4 | 5 |

% R&D Expenditures

Inventory

Inventory Days (365 x Inventory / COGS)

| | | | | | |
|---------|------|------|------|------|------|
| 50.00% | 50% | 50% | 50% | 50% | 50% |
| 100.00% | 100% | 100% | 100% | 100% | 100% |

Excess Inventory liquidation value (% of Inventory Cost)

| | | | | | |
|------|------|------|------|------|--------|
| 7.58 | 7.58 | 7.58 | 7.58 | 7.58 | 7.58 |
| | | | | | 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 |
|-------|-------|-------|-------|-------|-------|

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

Project Assumptions

Working Capital Assumptions

Cash Requirements

% of SG&A

% R&D Expenditures

| | | Year | | | | | |
|--|--------------------|-----------|------|------|------|------|------|
| | | 0 (F2008) | 1 | 2 | 3 | 4 | 5 |
| | % of SG&A | 50.00% | 50% | 50% | 50% | 50% | 50% |
| | % R&D Expenditures | 100.00% | 100% | 100% | 100% | 100% | 100% |

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

Project Assumptions

Working Capital Assumptions

Cash Requirements

% of SG&A

% R&D Expenditures

| | | Year | | | | | |
|--|--|-----------|---|---|---|---|---|
| | | 0 (F2008) | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|---------|------|------|------|------|------|------|
| 50.00% | 50% | 50% | 50% | 50% | 50% | 50% |
| 100.00% | 100% | 100% | 100% | 100% | 100% | 100% |

Incremental Earnings Forecasts

SG&A

R&D

| | | Year | | | | | |
|--|--|-------|------|------|-------|-------|-------|
| | | 0 | 1 | 2 | 3 | 4 | 5 |
| | | | 69.6 | 87.0 | 108.7 | 135.9 | 169.9 |
| | | 200.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 |

Cash for SG&A: 50% of SG&A
 Year 1: $0.50 \times \$69.6 = \34.8

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

Project Assumptions

Working Capital Assumptions

Cash Requirements

% of SG&A

% R&D Expenditures

| | | Year | | | | | |
|--|--|-----------|---|---|---|---|---|
| | | 0 (F2008) | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|---------|------|------|------|------|------|------|
| 50.00% | 50% | 50% | 50% | 50% | 50% | 50% |
| 100.00% | 100% | 100% | 100% | 100% | 100% | 100% |

Incremental Earnings Forecasts

SG&A

R&D

| | | Year | | | | | |
|--|--|-------|------|------|-------|-------|-------|
| | | 0 | 1 | 2 | 3 | 4 | 5 |
| | | | 69.6 | 87.0 | 108.7 | 135.9 | 169.9 |
| | | 200.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 |

Cash for SG&A: 50% of SG&A

Year 1: $0.50 \times \$69.6 = \34.8

Cash for R&D: 100% of R&D

Year 1: $1.00 \times \$25.0 = \25.0

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

Project Assumptions

Working Capital Assumptions

Cash Requirements

% of SG&A

% R&D Expenditures

| Year | | | | | |
|-----------|---|---|---|---|---|
| 0 (F2008) | 1 | 2 | 3 | 4 | 5 |

| | | | | | |
|---------|------|------|------|------|------|
| 50.00% | 50% | 50% | 50% | 50% | 50% |
| 100.00% | 100% | 100% | 100% | 100% | 100% |

Incremental Earnings Forecasts

SG&A

R&D

| Year | | | | | |
|------|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 | 5 |

| | | | | | |
|-------|------|------|-------|-------|-------|
| | 69.6 | 87.0 | 108.7 | 135.9 | 169.9 |
| 200.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 |

Working Capital Forecasts

Cash Requirements - SG&A Funding

Cash Requirements - R&D Funding

Cash

| Year | | | | | |
|------|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 | 5 |

| | | | | |
|------|------|------|------|-------|
| 34.8 | 43.5 | 54.4 | 68.0 | 84.9 |
| 25.0 | 25.0 | 25.0 | 25.0 | 25.0 |
| 59.8 | 68.5 | 79.4 | 93.0 | 109.9 |

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

Project Assumptions

Inventory

Inventory Days (365 x Inventory / COGS)

Excess Inventory liquidation value (% of Inventory Cost)

| | | Year | | | | |
|--|--|-----------|------|------|------|--------|
| | | 0 (F2008) | 1 | 2 | 3 | 4 |
| | | 7.58 | 7.58 | 7.58 | 7.58 | 7.58 |
| | | | | | | 25.00% |

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

Project Assumptions

Inventory

Inventory Days (365 x Inventory / COGS)

Excess Inventory liquidation value (% of Inventory Cost)

| Year | | | | | |
|-----------|------|------|------|------|----------------|
| 0 (F2008) | 1 | 2 | 3 | 4 | 5 |
| 7.58 | 7.58 | 7.58 | 7.58 | 7.58 | 7.58 25.00% |

Incremental Earnings Forecasts

COGS

| Year | | | | | |
|------|------|---------|---------|---------|---------|
| 0 | 1 | 2 | 3 | 4 | 5 |
| | 40.3 | 1,101.0 | 3,294.6 | 3,784.6 | 4,933.9 |

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

Project Assumptions

Inventory

Inventory Days (365 x Inventory / COGS)

Excess Inventory liquidation value (% of Inventory Cost)

| Year | | | | | |
|-----------|------|------|------|------|------|
| 0 (F2008) | 1 | 2 | 3 | 4 | 5 |
| 7.58 | 7.58 | 7.58 | 7.58 | 7.58 | 7.58 |

25.00%

Incremental Earnings Forecasts

COGS

| Year | | | | | |
|------|---------|---------|---------|---------|---|
| 0 | 1 | 2 | 3 | 4 | 5 |
| 40.3 | 1,101.0 | 3,294.6 | 3,784.6 | 4,933.9 | |

$$\text{Inventory} = \text{Inventory Days} \times \text{COGS} / 365$$

$$\text{Year 1: Inventory} = 7.58 \times \$40.3 / 365 = \$0.837$$

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

Project Assumptions

Inventory

Inventory Days (365 x Inventory / COGS)

Excess Inventory liquidation value (% of Inventory Cost)

| Year | | | | | |
|-----------|------|------|------|------|----------------|
| 0 (F2008) | 1 | 2 | 3 | 4 | 5 |
| 7.58 | 7.58 | 7.58 | 7.58 | 7.58 | 7.58 25.00% |

Incremental Earnings Forecasts

COGS

| Year | | | | | |
|------|------|---------|---------|---------|---------|
| 0 | 1 | 2 | 3 | 4 | 5 |
| | 40.3 | 1,101.0 | 3,294.6 | 3,784.6 | 4,933.9 |

Working Capital Forecasts

Inventory

| Year | | | | | |
|------|-----|------|------|------|-------|
| 0 | 1 | 2 | 3 | 4 | 5 |
| | 0.8 | 22.9 | 68.4 | 78.6 | 102.5 |

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

Days Receivable (365 x Accounts Receivable / Sales)

| Year | | | | | |
|-------|-------|-------|-------|-------|-------|
| 0 | 1 | 2 | 3 | 4 | 5 |
| 38.49 | 38.49 | 38.49 | 38.49 | 38.49 | 38.49 |

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

Working Capital Forecasts

Accounts Receivable

Days Receivable (365 x Accounts Receivable / Sales)

| Year | | | | | |
|-------|-------|-------|-------|-------|-------|
| 0 | 1 | 2 | 3 | 4 | 5 |
| 38.49 | 38.49 | 38.49 | 38.49 | 38.49 | 38.49 |

Incremental Earnings Forecasts

Sales

| Year | | | | | |
|------|---------|---------|---------|---------|---|
| 0 | 1 | 2 | 3 | 4 | 5 |
| 50.0 | 1,365.0 | 4,084.6 | 4,692.0 | 6,116.9 | |

$$AR = AR \text{ Days} \times Sales / 365$$

$$\text{Year 1: } AR = 38.49 \times \$50.0 / 365 = \$5.272$$

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

Working Capital Forecasts

Accounts Receivable

Days Receivable (365 x Accounts Receivable / Sales)

| Year | | | | | |
|-------|-------|-------|-------|-------|-------|
| 0 | 1 | 2 | 3 | 4 | 5 |
| 38.49 | 38.49 | 38.49 | 38.49 | 38.49 | 38.49 |

Incremental Earnings Forecasts

Sales

| Year | | | | | |
|------|---------|---------|---------|---------|---|
| 0 | 1 | 2 | 3 | 4 | 5 |
| 50.0 | 1,365.0 | 4,084.6 | 4,692.0 | 6,116.9 | |

Working Capital Forecasts

Accounts Receivable

| Year | | | | | |
|------|-------|-------|-------|-------|---|
| 0 | 1 | 2 | 3 | 4 | 5 |
| 5.3 | 143.9 | 430.7 | 494.8 | 645.0 | |

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

Days Payable (365 x Accounts Payable / COGS)

| Year | | | | | |
|-------|-------|-------|-------|-------|-------|
| 0 | 1 | 2 | 3 | 4 | 5 |
| 61.54 | 61.54 | 61.54 | 61.54 | 61.54 | 61.54 |

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

Working Capital Forecasts

Accounts Payable

Days Payable (365 x Accounts Payable / COGS)

| Year | | | | | |
|-------|-------|-------|-------|-------|-------|
| 0 | 1 | 2 | 3 | 4 | 5 |
| 61.54 | 61.54 | 61.54 | 61.54 | 61.54 | 61.54 |

Incremental Earnings Forecasts

COGS

| Year | | | | | |
|------|---------|---------|---------|---------|---|
| 0 | 1 | 2 | 3 | 4 | 5 |
| 40.3 | 1,101.0 | 3,294.6 | 3,784.6 | 4,933.9 | |

$$AP = AP \text{ Days} \times COGS / 365$$

$$\text{Year 1: AR} = 61.54 \times \$40.3 / 365 = \$6.794$$

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

Working Capital Forecasts

Accounts Payable

Days Payable (365 x Accounts Payable / COGS)

| Year | | | | | |
|-------|-------|-------|-------|-------|-------|
| 0 | 1 | 2 | 3 | 4 | 5 |
| 61.54 | 61.54 | 61.54 | 61.54 | 61.54 | 61.54 |

Incremental Earnings Forecasts

COGS

| Year | | | | | |
|------|------|---------|---------|---------|---------|
| 0 | 1 | 2 | 3 | 4 | 5 |
| | 40.3 | 1,101.0 | 3,294.6 | 3,784.6 | 4,933.9 |

Incremental Earnings Forecasts

Accounts Payable

| Year | | | | | |
|------|-----|-------|-------|-------|-------|
| 0 | 1 | 2 | 3 | 4 | 5 |
| | 6.8 | 185.6 | 555.5 | 638.1 | 831.9 |

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

Working Capital Forecasts

Cash Requirements - SG&A Funding

Cash Requirements - R&D Funding

Cash

Inventory

Accounts Receivable

Accounts Payable

Net Working Capital

| | Year | | | | | |
|----------------------------------|------|------|-------|-------|-------|-------|
| | 0 | 1 | 2 | 3 | 4 | 5 |
| Cash Requirements - SG&A Funding | | 34.8 | 43.5 | 54.4 | 68.0 | 84.9 |
| Cash Requirements - R&D Funding | | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 |
| <i>Cash</i> | | 59.8 | 68.5 | 79.4 | 93.0 | 109.9 |
| <i>Inventory</i> | | 0.8 | 22.9 | 68.4 | 78.6 | 102.5 |
| <i>Accounts Receivable</i> | | 5.3 | 143.9 | 430.7 | 494.8 | 645.0 |
| <i>Accounts Payable</i> | | 6.8 | 185.6 | 555.5 | 638.1 | 831.9 |
| <i>Net Working Capital</i> | 0 | 59.1 | 49.7 | 23.0 | 28.2 | 25.6 |

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

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

Working Capital Forecasts

Cash Requirements - SG&A Funding

Cash Requirements - R&D Funding

Cash

Inventory

Accounts Receivable

Accounts Payable

Net Working Capital

| | Year | | | | | |
|----------------------------------|------|------|-------|-------|-------|-------|
| | 0 | 1 | 2 | 3 | 4 | 5 |
| Cash Requirements - SG&A Funding | | 34.8 | 43.5 | 54.4 | 68.0 | 84.9 |
| Cash Requirements - R&D Funding | | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 |
| <i>Cash</i> | | 59.8 | 68.5 | 79.4 | 93.0 | 109.9 |
| <i>Inventory</i> | | 0.8 | 22.9 | 68.4 | 78.6 | 102.5 |
| <i>Accounts Receivable</i> | | 5.3 | 143.9 | 430.7 | 494.8 | 645.0 |
| <i>Accounts Payable</i> | | 6.8 | 185.6 | 555.5 | 638.1 | 831.9 |
| <i>Net Working Capital</i> | 0 | 59.1 | 49.7 | 23.0 | 28.2 | 25.6 |

What happens to this working capital?

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

Working Capital Forecasts

Cash Requirements - SG&A Funding

Cash Requirements - R&D Funding

Cash

Inventory

Accounts Receivable

Accounts Payable

Net Working Capital

Recovered NWC at end of Project

| | Year | | | | | |
|----------------------------------|------|------|-------|-------|-------|-------|
| | 0 | 1 | 2 | 3 | 4 | 5 |
| Cash Requirements - SG&A Funding | | 34.8 | 43.5 | 54.4 | 68.0 | 84.9 |
| Cash Requirements - R&D Funding | | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 |
| <i>Cash</i> | | 59.8 | 68.5 | 79.4 | 93.0 | 109.9 |
| <i>Inventory</i> | | 0.8 | 22.9 | 68.4 | 78.6 | 102.5 |
| <i>Accounts Receivable</i> | | 5.3 | 143.9 | 430.7 | 494.8 | 645.0 |
| <i>Accounts Payable</i> | | 6.8 | 185.6 | 555.5 | 638.1 | 831.9 |
| <i>Net Working Capital</i> | 0 | 59.1 | 49.7 | 23.0 | 28.2 | 25.6 |
| Recovered NWC at end of Project | | | | | | 51.3 |

(Most of) it is recovered!

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

Working Capital Forecasts

Cash Requirements - SG&A Funding

Cash Requirements - R&D Funding

Cash

Inventory

Accounts Receivable

Accounts Payable

Net Working Capital

Recovered NWC at end of Project

| | Year | | | | | |
|----------------------------------|------|------|-------|-------|-------|-------|
| | 0 | 1 | 2 | 3 | 4 | 5 |
| Cash Requirements - SG&A Funding | | 34.8 | 43.5 | 54.4 | 68.0 | 84.9 |
| Cash Requirements - R&D Funding | | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 |
| <i>Cash</i> | | 59.8 | 68.5 | 79.4 | 93.0 | 109.9 |
| <i>Inventory</i> | | 0.8 | 22.9 | 68.4 | 78.6 | 102.5 |
| <i>Accounts Receivable</i> | | 5.3 | 143.9 | 430.7 | 494.8 | 645.0 |
| <i>Accounts Payable</i> | | 6.8 | 185.6 | 555.5 | 638.1 | 831.9 |
| <i>Net Working Capital</i> | 0 | 59.1 | 49.7 | 23.0 | 28.2 | 25.6 |
| Recovered NWC at end of Project | | | | | | 51.3 |

(Most of) it is recovered!

– Cash – Inventory x Recovery Rate – AR + AP

$$\text{Year 5: } - 109.90 - 102.5 \times 0.25 - 645 + 831.9 = 51.375$$

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

Working Capital Forecasts

Cash Requirements - SG&A Funding

Cash Requirements - R&D Funding

Cash

Inventory

Accounts Receivable

Accounts Payable

Net Working Capital

Recovered NWC at end of Project

Change in NWC

| | Year | | | | | |
|----------------------------------|------|------|-------|-------|-------|-------|
| | 0 | 1 | 2 | 3 | 4 | 5 |
| Cash Requirements - SG&A Funding | | 34.8 | 43.5 | 54.4 | 68.0 | 84.9 |
| Cash Requirements - R&D Funding | | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 |
| <i>Cash</i> | | 59.8 | 68.5 | 79.4 | 93.0 | 109.9 |
| <i>Inventory</i> | | 0.8 | 22.9 | 68.4 | 78.6 | 102.5 |
| <i>Accounts Receivable</i> | | 5.3 | 143.9 | 430.7 | 494.8 | 645.0 |
| <i>Accounts Payable</i> | | 6.8 | 185.6 | 555.5 | 638.1 | 831.9 |
| <i>Net Working Capital</i> | 0 | 59.1 | 49.7 | 23.0 | 28.2 | 25.6 |
| Recovered NWC at end of Project | | | | | | 51.3 |
| <i>Change in NWC</i> | 59.1 | -9.4 | -26.6 | 5.2 | 48.6 | |

$$\text{Change in NWC} = \Delta \text{NWC} = \text{NWC}(t) - \text{NWC}(t-1)$$

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

We have all the pieces. Organize into a useful (and familiar) format

(Quasi-) Income Statement

Incremental Earnings Forecasts

| | Year | | | | | |
|---|--------|--------|---------|---------|---------|---------|
| | 0 | 1 | 2 | 3 | 4 | 5 |
| Sales | | 50.0 | 1,365.0 | 4,084.6 | 4,692.0 | 6,116.9 |
| COGS | | 40.3 | 1,101.0 | 3,294.6 | 3,784.6 | 4,933.9 |
| <i>Gross Profit = (28) - (29)</i> | 0.0 | 9.7 | 264.0 | 790.0 | 907.4 | 1,183.0 |
| SG&A | | 69.6 | 87.0 | 108.7 | 135.9 | 169.9 |
| R&D | 200.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 |
| <i>EBITDA = (30) - (31) - (32)</i> | -200.0 | -84.9 | 152.0 | 656.2 | 746.5 | 988.1 |
| Depreciation | | 45.5 | 50.1 | 54.9 | 59.7 | 64.6 |
| <i>EBIT = (33) - (34)</i> | -200.0 | -130.5 | 101.9 | 601.4 | 686.8 | 923.5 |
| Taxes | -50.9 | -33.2 | 25.9 | 153.0 | 174.8 | 235.0 |
| <i>NOPAT (35) - (36) (a.k.a. EBIAT, Unlevered Net Income)</i> | -149.1 | -97.3 | 76.0 | 448.3 | 512.0 | 688.5 |

(Quasi-) Income Statement

| Incremental Earnings Forecasts | Year | | | | | |
|---|--------|--------|---------|---------|---------|---------|
| | 0 | 1 | 2 | 3 | 4 | 5 |
| Sales | | 50.0 | 1,365.0 | 4,084.6 | 4,692.0 | 6,116.9 |
| COGS | | 40.3 | 1,101.0 | 3,294.6 | 3,784.6 | 4,933.9 |
| <i>Gross Profit = (28) - (29)</i> | 0.0 | 9.7 | 264.0 | 790.0 | 907.4 | 1,183.0 |
| SG&A | | 69.6 | 87.0 | 108.7 | 135.9 | 169.9 |
| R&D | 200.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 |
| <i>EBITDA = (30) - (31) - (32)</i> | -200.0 | -84.9 | 152.0 | 656.2 | 746.5 | 988.1 |
| Depreciation | | 45.5 | 50.1 | 54.9 | 59.7 | 64.6 |
| <i>EBIT = (33) - (34)</i> | -200.0 | -130.5 | 101.9 | 601.4 | 686.8 | 923.5 |
| Taxes | -50.9 | -33.2 | 25.9 | 153.0 | 174.8 | 235.0 |
| <i>NOPAT (35) - (36) (a.k.a. EBIAT, Unlevered Net Income)</i> | -149.1 | -97.3 | 76.0 | 448.3 | 512.0 | 688.5 |

NOPAT

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

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

| Free Cash Flow Forecasts | Year | | | | | |
|--|--------|--------|-------|-------|-------|-------|
| | 0 | 1 | 2 | 3 | 4 | 5 |
| NOPAT (Unlevered Net Income, EBITA) | -149.1 | -97.3 | 76.0 | 448.3 | 512.0 | 688.5 |
| Depreciation | | 45.5 | 50.1 | 54.9 | 59.7 | 64.6 |
| Capital Expenditures | 227.7 | 22.8 | 23.9 | 24.1 | 24.4 | -21.0 |
| Changes in NWC | | 59.1 | -9.4 | -26.6 | 5.2 | 48.6 |
| Free Cash Flows = (38) +(39) - (40) - (41) | -376.8 | -133.6 | 111.6 | 505.7 | 542.1 | 725.5 |

Other Free Cash Flow Considerations

- Opportunity Costs (Alternative uses of resources)
- Project Externalities (Cannibalization, spillovers,)
- Sunk Costs (Ignore)
- Other non-cash items (E.g., amortization)
- Salvage values (Assets do not disappear)
- Execution Risk (Idiosyncratic)
- Cash flow frequency (Project dependent)

Summary

Lessons

- Forecasting free cash flows is a matter of converting our forecast drivers into dollar forecasts
- One of the two basic inputs into a DCF

Coming up next

- Discounted Cash Flow (DCF)
 - Decision Criteria