# Firm Valuation Models … Focus on FCF Approach

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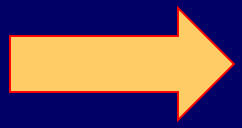

# FCFE Model

- FCFE = Current EPS – ((Capital Spending – Depreciation) X (1 – Debt ratio) – (Δ Working Capital) X (1 – Debt ratio)
- The Constant Growth FCFE Model
- To be used for: stable firms (say, NBFCs)

# FCFE Model

- If there is no change in number of equity shares, then
- FCFE = Current EPS – ((Capital Spending – Depreciation) X (1 – Debt ratio) – (Δ Working Capital) X (1 – Debt ratio)
- **Constant Growth FCFE Model**
- Used for: stable firms say, DFL
- Modifications made:
- We reject the computed beta of less than 0.67 for the firm
- We took a beta of 1.33 (average of comparable non-banking finance firms)
- Cost of Equity 12.15%

# Constant Growth FCFE Model

- FCFE = Net Income – ((Capital Spending – Depreciation) X (1 – Debt ratio) – (Δ Working Capital) X (1 – Debt ratio)

| Dhandapani Finance Limited | 2006 | 2005 | 2004 |
|---|---|---|---|
| Net Income | 5 | 5 | 5 |
| Capital Spending - Depreciation | 0.2 | (0.5) | (0.6) |
| Change in Working Capital | 20.9 | 23.5 | 28.1 |
| Debt Ratio | 80% | 79% | 79% |
| FCFE | 1.0 | 0.8 | (0.6) |
| Past Growth (based on Sales CAGR from 2003) | 2.58% | | |
| Past Growth (based on Total Assets CAGR from 2003) | 16.97% | | |
| Estimated Future Growth Rate | 7.50% | | |
| Cost of Equity | 12.15% | | |
| Value of Stock Using FCFE | 24.0 | | |

# Dhandapani Finance ... any cues ...

- Can we use this on 2007 figures (taking beta of peer firms of about 0.74)

| Dhandapani Finance Limited (Scenario 1) | 2007 | 2006 | 2005 | 2004 | |
|---|---|---|---|---|---|
| Estimated Sales (in a scenario replicating industry) | 34 | | | | First Leasing Company |
| Estimated Net Margin (replicating industry scenario) | 19% | | | | First Leasing Company |
| Net Income | 6.4 | 5.2 | 5.4 | 5.0 | |
| Capital Spending - Depreciation | 0.4 | (0.6) | 0.2 | (0.7) | Removing Reval FA |
| Change in Working Capital | 26.2 | 22.0 | 22.5 | 28.0 | |
| Debt Ratio | 81% | 80% | 80% | 79% | |
| FCFE | 1.4 | 0.9 | 0.7 | (0.7) | |
| Past Growth (based on Sales CAGR from 2003) | 8.22% | | | | |
| Past Growth (based on Total Assets CAGR from 2003) | 13.72% | | | | Removing Reval FA |
| Estimated Future Growth Rate (fundamental) | 7.50% | risk free | market premia | | |
| Cost of Equity | 12.07% | 8.00% | 5.50% | 0.74 | |
| Value of Stock Using FCFE | 34.0 | | | | |
| Value of Stock Using Liquidation (on Book Figures) | 49.5 | | | | |

# Dhandapani Finance ...

| Dhandapani Finance Limited (Scenario 2) | 2007 | 2006 | 2005 | 2004 |
|---|---|---|---|---|
| Estimated Sales (in a scenario replicating leaders) | 44 | | | |
| Estimated Net Margin (replicating industry scenario) | 16% | | | |
| Net Income | 7.1 | 5.2 | 5.4 | 5.0 |
| Capital Spending - Depreciation | 0.4 | (0.6) | 0.2 | (0.7) |
| Change in Working Capital | 26.2 | 22.0 | 22.5 | 28.0 |
| Debt Ratio | 81% | 80% | 80% | 79% |
| FCFE | 2.1 | 0.9 | 0.7 | (0.7) |
| Projected Extraordinary Growth Rate and Period | 15.00% | 5 years | | |
| Estimated Future Growth Rate (fundamental) | 7.50% | risk free | market premia | |
| Cost of Equity | 12.07% | 8.00% | 5.50% | 0.74 |
| Value of Stock Using FCFE | 48.8 | | | |
| Value of Stock Using Liquidation (on Book Figures) | 49.5 | | | |
| Value of Stock Using 5 yr Extraordinary Growth | 62.6 | | | |

- The two-stage FCFE Model
- One needs to adjust the capital spending and depreciation for the stable period
- To be used for: companies having temporary edge over others (say, Pioneer Distilleries Limited)

- There can be a strong argument for using two-stage model for Hindustan Unilever instead of constant growth model
- The two-stage FCFE Model
- One needs to adjust the capital spending and depreciation for the stable period
- To be used for: companies having temporary edge over others
- Say, Ethanol Manufacturers (for example, Pioneer Distilleries)

| Financials Rs (in Crores) | Pioneer Distilleries | | | |
|---|---|---|---|---|
| For the year | 703 | 603 | 503 | 403 |
| Operating Income | 48.4 | 40.4 | 41.1 | 25.1 |
| Net Profit | 5.3 | 1.4 | 0.9 | -5.3 |
| Net Worth | 13.6 | 8.7 | 7.7 | 5.8 |
| No. of Shares (in crore) | 1.1 | 1.0 | 1.0 | 0.8 |
| Adjusted EPS (Rs) | 4.6 | 1.4 | 0.9 | -6.2 |
| Book value per Share (Rs) | 13.7 | 9.6 | 8.5 | 7.0 |
| Dvdnd per Share (Rs) | 1.0 | 0.0 | 0.0 | 0.0 |
| Lt Debt Equity | 3.0 | 3.7 | 3.7 | 4.7 |
| Return on Equity (%) | 39.9% | 15.1% | 12.1% | |
| Dividend Payout Ratio | 21.6% | 0.0% | 0.0% | |
| Computed Retention Ratio | 78.4% | 100.0% | 100.0% | |

| More data taken from Cash Flow Statement | | | | | |
|---|---|---|---|---|---|
| **For the year** | **703** | **603** | **503** | **403** | |
| **Capex** | **16.8** | **9.8** | **6.4** | **0.5** | |
| **Depreciation** | **2.5** | **2.1** | **1.8** | **2.7** | |
| **Change in Working Capital** | **-1.5** | **0.1** | **6.0** | **1.0** | |
| **FCFE** | **31.5** | **22.6** | **29.7** | **-9.9** | |
| **Pioneer Distilleries** | **Current** | **1** | **2** | **3** | **4** |
| **Reinvestment rate (assumed)** | | 78.4% | 78.4% | 78.4% | 78.4% |
| **Return on Equity (%) (assumed)** | 39.9% | 39.9% | 39.9% | 39.9% | 39.9% |
| **Expected Growth Rate** | | 31.3% | 31.3% | 31.3% | 31.3% |
| **Free Cash Flow to Equity (FCFE)** | 31.5 | 41.3 | 54.2 | 71.2 | 93.4 |
| **Cost of Equity (taking Beta = 2)** | | 19.0% | | | |
| **Pioneer Distilleries (Stable Growth Phase)** | 5 | | | | |
| **Cost of Equity (taking Beta = 1.1)** | 14.1% | **Stable Period Growth (assume** | | | 7.0% |
| **Stable Period ROE (assumed)** | 14.1% | **Expected Net Income Year 5** | | | 18.4 |
| **Stable Period Equity Reinvestment rate** | 49.8% | | | | |
| **Expected FCFE in Year 5** | 9.2 | | | | |
| **Terminal Value of Equity in Year 4** | 130.9 | | | | |
| **Pioneer Distilleries** | **1** | **2** | **3** | **4** | |
| **Free Cash Flow to Equity (FCFE)** | 41.3 | 54.2 | 71.2 | 224.3 | |
| **Value of Equity** | 227.1 | No. of Equity Shares | | 1.3 | |
| **Value of Equity per Share** | 178.8 | | | | |

*the computations will change significantly, if we change the debt-equity ratio (and such scenarios)*

| Pioneer Distilleries | 2007ttm | | | | |
|---|---|---|---|---|---|
| BV of Equity | 19.2 | | | | |
| BV of Debt | 58.4 | | | | |
| Net Income | 8.2 | | | | |
| Dividend payout ratio | 20.0% | | | | |
| D/E Ratio | 3.0 | | | | |
| Interest Coverage Ratio (estimated) | 2.8 | Rating should be BB / B+ | | | |
| Interest Expense (approx) | 11.8% | | | | |
| Tax Rate | 20.0% | | | | |
| Return on Capital Employed | 15.5% | | | | |
| D/E Scenarios ==> | 0.5 | 1.5 | 2.5 | 3.0 | 3.5 |
| Estimated Growth Rate (using ROCE) | 14.9% | 19.8% | 24.7% | 27.1% | 29.6% |

*A large portion of the Private Equity and LBO game depends on this one ...*

- The E Model – A three stage FCFE Model
- A high growth phase, a transition phase, and a stable growth phase
- Caution – (a) capital spending vis-à-vis depreciation (b) risk
- To be used for: firms with very high current growth rates
- Let us try it on Hexaware Technologies
- High growth phase 40% (5 year); transition phase declining (6 year); stable growth phase rate 6%
- Current EPS = 38
- Current Capital Spending per share = 12
- Current Depreciation per share = 9
- Current Change in Working Capital per share = 26
- Debt ratio = 1%
- Current beta = ? Future beta = ?
- Assume capex = depreciation in the terminal year

# Value of a Firm

- While, one can use the 'DCF' method to get the value of Operating Assets
- We also need to add the value of non-operating assets
  - Add back the value of non-operating assets in cash and marketable securities
  - Add back the value of long-term investments and minority holdings in other companies
  - Any other idle and unutilized assets
- Consider non-equity claims against the company (say, Jet Airways OR Shaw Wallace)
  - Unfunded obligations
  - Expected litigation payouts

# Hindustan Unilever Limited

- FCFE = Current EPS – ((Capital Spending – Depreciation) X (1 – Debt ratio) – (Δ Working Capital) X (1 – Debt ratio)

| Financial Rs (in Crores) | Hindustan Unilever Limited | | | | | |
|---|---|---|---|---|---|---|
| For the year | 612 | 512 | 412 | 312 | | |
| No. of Shares (in crore) | 220.7 | 220.1 | 220.1 | 220.1 | | |
| Adjusted EPS (Rs) | 6.8 | 5.8 | 5.3 | 7.8 | | |
| Book value per Share (Rs) | 12.3 | 10.5 | 9.5 | 9.7 | 87.7% | Ploughl |
| Dvdnd per Share (Rs) | 6.0 | 5.0 | 5.0 | 5.5 | 12.0% | Ke |
| Lt Debt Equity | 0.0 | 0.0 | 0.6 | 0.6 | 7.4% | G |
| Return on Equity (%) | 60.0% | 58.5% | 54.7% | | 138.1 | IV |

# FCFE Vs DDM

*A few points to be noted*

- For small investors – prefer using DDM
- Prefer FCFE over DDM when
  - The cash dividends are very high or very low (i.e., unrealistic)
  - Firms with a predicted change in corporate control
  - When there are large non-cash dividend benefits from owning the firm (say, salary, network, etc.)
- Firm's having operating losses could avoid using DDM and FCFE

# Kilburn Chemicals Ltd., for individual investor

| Year | 2007 | 2006 |
|---|---|---|
| DPS | 2.00 | 2.00 |
| EPS | 9.10 | 10.00 |
| BV/Share | 44.60 | 37.00 |
| ROE | 22.30% | 27.03% |
| Payout Ratio | 21.98% | 20.00% |
| **High Growth Rate** | **17.40%** | |
| **Stable Growth Rate** | **7%** | |
| **Dividends** | **2** | |
| **Cost of Equity (High Growth, beta 1.15)** | **14.33%** | 0.08 0.14 |
| **Cost of Equity (Stable Growth, beta 1.05)** | **13.78%** | |
| **ROE in Stable Period** | **13.78%** | |
| **Estimated Retention Ratio in Stable Phase** | **50.82%** | |
| **Estimated EPS in 2013** | 22.04 | |
| **Estimated Dividend in 2013** | 10.84 | |

| Kilburn Chemicals Limited | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|
| Estimated Dividend | 2.35 | 2.76 | 3.24 | 3.80 | 4.46 | 10.84 |
| Estimated Terminal Value | | | | | 160.01 | |
| Estimated DDM | 2.35 | 2.76 | 3.24 | 3.80 | 164.47 | |
| Share Price (Intrinsic) | $92.76 | | | | | |

# FCFF

- FCFE and FCFF primarily defer due to the existence of financial leverage (and changes in financial leverage)
- FCFF Models
- Stable growth firm (use WACC instead of $K_e$)
  - Best use: firms with high leverage or changing leverage
- Please note that the debt has to be fairly valued
- Two stage growth model
  - Let us try this on Wockhardt

# Wockhardt Limited

| Wockhardt Limited | 2006 | 2005 | 2004 | 2003 |
|---|---|---|---|---|
| Operating Income (1- tax rate) | 223 | 255 | 222 | 143 |
| Capex | 109 | 202 | 159 | 69 |
| Depreciation | 35 | 24 | 18 | 16 |
| Change in Non Cash Working Capital | 124 | (62) | 147 | 1 |
| FCFF | 25 | 140 | (66) | 89 |

Expected Growth rate = (Reinvestment rate) X (Return on Capital Employed) = 18.9%

Cost of Equity = $R_f + B (R_m - R_f)$ = 11.96% (taking 8%, 13.5%, .72)

# Wockhardt Limited

- Given a synthetic bond rating of AAA and a default spread of 35-50 bps.
- We take the pretax cost of debt for Wockhardt for the next five years is 8.5%
- MVE is Rs 4344 crores and MVD is 700 gives a market-based debt ratio of 0.163

| Wockhardt Limited | Rf | Rm-Rf | Beta | Ke | |
|---|---|---|---|---|---|
| Cost of Equity (now) | 8.0% | 5.5% | 0.72 | 11.96% | |
| | tax rate | mve | mvd | Kd | Kc |
| Cost of Capital (now) | 20.0% | 4,344 | 700 | 6.80% | 10.41% |
| After five year | Beta | Rm-Rf | Beta | Ke | |
| Cost of Equity (stable phase)) | 8.0% | 5.5% | 0.85 | 12.68% | |
| | tax rate | mve | mvd | Kd | Kc |
| Cost of Capital (stable phase) | 30.0% | 4,344 | 700 | 5.95% | 11.02% |
| Stable Phase Growth Predicted | 7.00% | | | | |
| Stable Phase ROCE Predicted | 11.52% | | | | |
| Reinvestment rate in stable growth | 60.76% | | | | |

| 2006 | 2005 | 2004 | 2003 | |
|---|---|---|---|---|
| Non-cash CA | | | | |
| 682 | 516 | 541 | 338 | 310 |
| CL | | | | |
| 316 | 274 | 237 | 181 | 154 |
| non-cash NWC | | | | |
| 365 | 242 | 304 | 157 | 156 |
| non cash NWC-to-Sales Ratio | | | | |
| 34% | 26% | 34% | 20% | 19% |
| non cash NWC-to-Assets Ratio | | | | |
| 18% | 12% | 18% | 16% | 26% |

| Year | Current | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Reinvestment rate | | 100.9% | 100.9% | 100.9% | 100.9% | 100.9% |
| EBIT X (1 - Tax rate) | 223 | 265 | 315 | 374 | 445 | 529 |
| Less (Capex - Depreciation) | 74 | 88 | 104 | 124 | 148 | 175 |
| Less Change in Working Capital (use % rev) | 124 | 57 | 67 | 80 | 95 | 113 |
| FCFF | 25 | 120 | 143 | 170 | 202 | 240 |

| Year | Current | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Reinvestment rate | | 100.9% | 100.9% | 100.9% | 100.9% | 100.9% |
| EBIT X (1 - Tax rate) | 223 | 265 | 315 | 374 | 445 | 529 |
| Less (Capex - Depreciation) | 74 | 88 | 104 | 124 | 148 | 175 |
| Less Change in Working Capital (use % rev) | 124 | 57 | 67 | 80 | 95 | 113 |
| FCFF | 25 | 120 | 143 | 170 | 202 | 240 |

| | |
|---|---|
| Cost of Capital | 10.41% |
| Present Value for first phase | 635 |
| Stable Phase computations | EBIT (1-t) 458 (1-RR) 39.24% |
| Cash flow one year after terminal year | 180 |
| Terminal Value (at the end of year 5) | 4,468 |

| Year | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| FCFF (clubbing both phases) | 120 | 143 | 170 | 202 | 4,709 |

| | |
|---|---|
| Present Value of Operating Assets | 3,358 |
| Add Cash and Marketable Securities | 839 |
| Less Debt and nonoperating assets | 700 |
| Value of Equity of the Firm | 3,497 |
| Value of Equity Per Share | 320 |

What are the possible sources of gap?