Corporate Finance

CORPORATE FINANCE DECISIONS

INVESTMENT
- PORTFOLIO
- CAPITAL
- M&A

FINANCING
- DEBT
- EQUITY

RISK MGT
- MEASUREMENT
- TOOLS
The CFO Questions

- How fast can we grow? How do we need to invest to grow? Acquisitions?
- How should we finance the growth stage? What kind of equity? What’s our exit plan? Private or public?
- How much debt should we have?
- What kind of debt should we have? Maturity? Fixed/floating? Currency? Asset-backed? Hybrids, such as convertibles?
- How should we manage our financial risks?

Financing X Inc

<table>
<thead>
<tr>
<th></th>
<th>12-94</th>
<th>12-95</th>
<th>12-96</th>
<th>12-97</th>
<th>12-98/final</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operating Results</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revenues (in $mil)</td>
<td>5,732.4</td>
<td>8,942.9</td>
<td>8,620.310</td>
<td>2,658,14,807.6</td>
<td></td>
</tr>
<tr>
<td>Net Income (in $mil)</td>
<td>748.3</td>
<td>505.9</td>
<td>715.3</td>
<td>1,221.3</td>
<td>1,945.2</td>
</tr>
<tr>
<td>Net margin (in %)</td>
<td>13.05</td>
<td>6.06</td>
<td>8.20</td>
<td>11.10</td>
<td>13.14</td>
</tr>
<tr>
<td>Book Value/share ($)</td>
<td>3.65</td>
<td>10.23</td>
<td>5.48</td>
<td>6.35</td>
<td>10.23</td>
</tr>
<tr>
<td>Earnings/share ($)</td>
<td>1.04</td>
<td>1.64</td>
<td>1.18</td>
<td>2.12</td>
<td>3.31</td>
</tr>
<tr>
<td><strong>Dividend Policy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dividend/share ($)</td>
<td>0.24</td>
<td>0.34</td>
<td>0.38</td>
<td>0.73</td>
<td>1.07</td>
</tr>
<tr>
<td>Payout ratio (%)</td>
<td>22.7</td>
<td>30.9</td>
<td>37.6</td>
<td>34.5</td>
<td>32.4</td>
</tr>
<tr>
<td><strong>Profitability</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROE (%)</td>
<td>28.56</td>
<td>15.95</td>
<td>20.71</td>
<td>30.92</td>
<td>32.40</td>
</tr>
<tr>
<td>ROA (%)</td>
<td>12.74</td>
<td>4.70</td>
<td>9.91</td>
<td>15.99</td>
<td>16.50</td>
</tr>
</tbody>
</table>
**Is There an Optimal Capital Structure?**

Assets’ value is the present value of the cash flows from the real business of the firm

Value of the firm = PV(Cash Flows)

Debt + Equity = Value of the firm

---

**Financing X Inc**

<table>
<thead>
<tr>
<th>Assets ($ mil)</th>
<th>$2,247.2</th>
<th>$3,396.8</th>
<th>$29.34</th>
<th>$28.81</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inventories</td>
<td>1,342.0</td>
<td>1,518.6</td>
<td>17.52</td>
<td>12.88</td>
</tr>
<tr>
<td>Other</td>
<td>2,336.1</td>
<td>4,266.4</td>
<td>30.50</td>
<td>36.19</td>
</tr>
<tr>
<td>Current assets</td>
<td>5,925.3</td>
<td>9,181.8</td>
<td>77.37</td>
<td>77.87</td>
</tr>
<tr>
<td>Non-current assets</td>
<td>1,733.0</td>
<td>2,408.7</td>
<td>22.63</td>
<td>22.13</td>
</tr>
<tr>
<td>Total assets</td>
<td>7,658.3</td>
<td>11,790.5</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Liabilities &amp; Shareholders’ Equity ($ mil)</th>
<th>$3,779.7</th>
<th>$5,232.4</th>
<th>44.03</th>
<th>44.38</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current liabilities</td>
<td>247.3</td>
<td>302.4</td>
<td>3.23</td>
<td>2.56</td>
</tr>
<tr>
<td>Other liabilities</td>
<td>89.9</td>
<td>252.0</td>
<td>1.17</td>
<td>1.14</td>
</tr>
<tr>
<td>Total liabilities</td>
<td>3,769.0</td>
<td>5,786.8</td>
<td>48.43</td>
<td>49.08</td>
</tr>
<tr>
<td>Shareholders’ equity</td>
<td>3,949.4</td>
<td>6,003.8</td>
<td>51.57</td>
<td>50.92</td>
</tr>
<tr>
<td>Total shareholders’ equity</td>
<td>7,658.3</td>
<td>11,790.5</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

**Balance Sheet Ratios**

| Current ratio | 1.8 | 1.8 |
| Debt/equity ratio | 0.1 | 0.1 |
### Preference Rankings for Long-Term Finance: Results of a Survey

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Source</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Retained Earnings</td>
<td>5.61</td>
</tr>
<tr>
<td>2</td>
<td>Straight Debt</td>
<td>4.88</td>
</tr>
<tr>
<td>3</td>
<td>Convertible Debt</td>
<td>3.02</td>
</tr>
<tr>
<td>4</td>
<td>External Common Equity</td>
<td>2.42</td>
</tr>
<tr>
<td>5</td>
<td>Straight Preferred Stock</td>
<td>2.22</td>
</tr>
<tr>
<td>6</td>
<td>Convertible Preferred</td>
<td>1.72</td>
</tr>
</tbody>
</table>

### Financing X Inc

<table>
<thead>
<tr>
<th>Historical Growth Rates (%)</th>
<th>1-year</th>
<th>3-year annualized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue growth</td>
<td>44.24</td>
<td>21.08</td>
</tr>
<tr>
<td>Net income growth</td>
<td>59.27</td>
<td>56.66</td>
</tr>
<tr>
<td>Earnings/share</td>
<td>56.44</td>
<td>26.77</td>
</tr>
<tr>
<td>Equity</td>
<td>52.02</td>
<td>23.58</td>
</tr>
<tr>
<td>Proj. 5-year EPS growth (%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Proj. 5-year EPS growth (%) = 22.80
**Corporate Financing Life-Cycle**

Leverage

- Growth companies
- Mature companies

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**Financing Growth Companies: The Agenda**

- What determines the optimal mix of debt and equity for a growth company?
- How does altering the mix of debt and equity affect the value of a company?
- What is the right kind of equity for a growth company?
- What is the right kind of debt for a growth company?
- Where do you want to go?
First, Why Equity?

- Benefits of Equity
  - Flexibility: cannot afford to have fixed obligations
  - Strategic partners
  - Interventionist partners

- Disadvantages
  - No tax shield
  - Expensive!

What Kind of Equity?

- Sources of Equity
  - Private investors
  - Strategic investors
  - Interventionist investors
  - Public market

- And Kinds
  - Common stock
  - Stock with restricted voting rights
  - Hybrids, including convertibles
Started in September 1997, .comfax enables users to send faxes and receive faxes over the internet at a low cost.

By June 1998 the company had expanded its services and was signing up subscribers at the rate of 100,000 a day.

Initial funding was “Angel” finance, but now the expansion was exceeding the company’s financial, physical and managerial capacity. On two occasions it had literally run out of money.

What form of equity financing would be appropriate for .comfax?

Pre-IPO Equity Financing

- Friends and family
- Angel
- Venture capital
- Strategic partners
Silipos Inc, 1999

Where do you want to go?

Debt?
IPO?
Acquisition?
Sell?
IntraLinks’ Choices

- Issue debt, either by borrowing from one of the big New York banks keen to get more involved in promising Internet businesses, or by means of a private placement of debt notes, possibly with “sweeteners” such as warrants to attract a lender.
- Seek out one or more private equity investors, ones who believed in the company’s product and its management.
- Do an initial public offering (IPO).
- Find another corporation who would be willing to acquire IntraLinks.
Why Venture Capitalists Prefer Preferred

- Senior status in bankruptcy
- Does not put a value on the shares
- Is convertible into common stock before the IPO
- Conversion price is set such that if there is a liquidation all the money goes to the preferred shareholders (equity is worth zero)

How Much Debt?

MindSpring
The CFO Questions

- How fast can we grow? How do we need to invest to grow? Acquisitions?
- How should we finance the growth stage? What kind of equity? What’s our exit plan? Private or public?
- How much debt should we have?
- What kind of debt should we have? Maturity? Fixed/floating? Currency? Asset-backed? Hybrids, such as convertibles?
- How should we manage our financial risks?
How Much Debt?

A $19.95 company...an “ISP”
Profits: Low ~ Risks: High

Why Should Mindspring Have Debt?

- Benefits of Debt
  - Tax Benefits
  - Adds discipline to management

- Costs of Debt
  - Bankruptcy Costs
  - Agency Costs
  - Loss of Future Flexibility
**How Much Debt? Relative Analysis**

The “safest” place for any firm to be is close to the industry average.

- Subjective adjustments can be made to these averages to arrive at the right debt ratio.
  - Higher tax rates -> Higher debt ratios (Tax benefits)
  - Lower insider ownership -> Higher debt ratios (Greater discipline)
  - More stable income -> Higher debt ratios (Lower bankruptcy costs)
  - More intangible assets -> Lower debt ratios (More agency problems)

---

**When Debt and Equity are Not Enough**

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
<th>Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value of future cash flows</td>
<td>Debt</td>
<td>Collateralized</td>
</tr>
<tr>
<td></td>
<td>Contractual int. &amp; principal</td>
<td>Asset-securitized</td>
</tr>
<tr>
<td></td>
<td>No upside</td>
<td>Project financing</td>
</tr>
<tr>
<td></td>
<td>Senior claims</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control via restrictions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Equity</td>
<td>Preferred</td>
</tr>
<tr>
<td></td>
<td>Residual payments</td>
<td>Warrants</td>
</tr>
<tr>
<td></td>
<td>Upside and downside</td>
<td>Convertible</td>
</tr>
<tr>
<td></td>
<td>Residual claims</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Voting control rights</td>
<td></td>
</tr>
</tbody>
</table>

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**Convertibles**

- **Market Value**
- **Market Premium**
- **Conversion Value**
- **Straight Bond Value**

**What About Large-Cap Growth Firms?**

[Graph showing stock and bond values with market data]

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Financing Growth Companies 37
### Applying the Quantitative Approach

<table>
<thead>
<tr>
<th>D/(D+E)</th>
<th>ke</th>
<th>kd</th>
<th>After-tax Cost of Debt</th>
<th>WACC</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>10.50%</td>
<td>8%</td>
<td>4.80%</td>
<td>10.50%</td>
</tr>
<tr>
<td>10%</td>
<td>11%</td>
<td>8.50%</td>
<td>5.10%</td>
<td>10.41%</td>
</tr>
<tr>
<td>20%</td>
<td>11.60%</td>
<td>9.00%</td>
<td>5.40%</td>
<td>10.36%</td>
</tr>
<tr>
<td>30%</td>
<td>12.30%</td>
<td>9.00%</td>
<td>5.40%</td>
<td>10.23%</td>
</tr>
<tr>
<td>40%</td>
<td>13.10%</td>
<td>9.50%</td>
<td>5.70%</td>
<td>10.14%</td>
</tr>
<tr>
<td>50%</td>
<td>14%</td>
<td>10.50%</td>
<td>6.30%</td>
<td>10.15%</td>
</tr>
<tr>
<td>60%</td>
<td>15%</td>
<td>12%</td>
<td>7.20%</td>
<td>10.32%</td>
</tr>
<tr>
<td>70%</td>
<td>16.10%</td>
<td>13.50%</td>
<td>8.10%</td>
<td>10.50%</td>
</tr>
<tr>
<td>80%</td>
<td>17.20%</td>
<td>15%</td>
<td>9.00%</td>
<td>10.64%</td>
</tr>
<tr>
<td>90%</td>
<td>18.40%</td>
<td>17%</td>
<td>10.20%</td>
<td>11.02%</td>
</tr>
<tr>
<td>100%</td>
<td>19.70%</td>
<td>19%</td>
<td>11.40%</td>
<td>11.40%</td>
</tr>
</tbody>
</table>

### WACC and Debt Ratios

- **Weighted Average Cost of Capital and Debt Ratios**

  - **WACC** increases as the **Debt Ratio** increases.
  - The graph shows a clear upward trend from 9.40% WACC at 0% Debt Ratio to 11.40% WACC at 100% Debt Ratio.

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### Case Study: SAP

You have the opportunity to visit SAP AG, the business software company. SAP, based in Walldorf, Germany, offers software development and implementation in application areas such as accounting, logistics and human-resource management to large businesses in Europe, North America and around the world. In 1997 the company had sales of over US$3.5 billion equivalent.

In recent months the company’s stock price has been depressed, and management is concerned about a leveraged buyout or a hostile takeover. Hence you have been asked to evaluate whether the company has an appropriate amount of debt. You have collected the following information about SAP’s current position:

- Current share price: 772.2 DEM
- Shares outstanding: 107 million
- Beta of the stock based on the German DAX: 1.15
- Debt outstanding: 2,000 DEM million
- Debt rating: AAA
- Market rate on bonds with rating AAA: 4.40%
- Government bond rate: 4.00%
- DAX long-run expected return: 9.50%
- Company’s marginal tax rate: 44%

Based on the company’s business, its interest coverage and other factors, you have prepared a table showing what an increase in debt would do to the company’s ratings and its cost of borrowing:

<table>
<thead>
<tr>
<th>Additional debt</th>
<th>New Rating</th>
<th>Interest Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>10000</td>
<td>AA</td>
<td>4.850%</td>
</tr>
<tr>
<td>15000</td>
<td>A</td>
<td>5.100%</td>
</tr>
<tr>
<td>20000</td>
<td>BBB</td>
<td>8.500%</td>
</tr>
<tr>
<td>30000</td>
<td>BB</td>
<td>12%</td>
</tr>
</tbody>
</table>

1. How much additional debt should the company take on?
2. What is the weighted average cost of capital before and after the additional debt?
3. What will be the effect on the share price after the company takes on new debt?
4. Should new debt taken on perhaps be accordion? Subordinated, high-yield debt? Hybrid debt such as convertibles? Or just straight debt?
Case Study: SAP

SAP AG

Solution:

In order to get the company’s beta at different levels of debt, we have to first calculate the unlevered beta.  

Current levered beta: 1.15

Current debt/equity (D/E) ratio = debt/share price*shares outstanding: 2.42%

Current debt/capital (D/C) ratio = debt/(debt + share price*shares outstanding): 2.36%

The levered beta is found from: Betalev=Betaunlev*(1+(1-tax rate)(D/E))

The current unlevered beta is Betaunlev=Betalev/(1+(1-tax rate)(D/E)) = 1.13

Now we can calculate, for different debt levels, the cost of equity, the cost of debt, and the WACC:

<table>
<thead>
<tr>
<th>Additional Debt (millions)</th>
<th>Value of Equity Remaining (millions)</th>
<th>New Rating</th>
<th>Interest Rate</th>
<th>Leveled Beta</th>
<th>Cost of Equity</th>
<th>Cost of Debt</th>
<th>Cost of Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>82,659</td>
<td>AAA</td>
<td>4.40%</td>
<td>1.15</td>
<td>10.33%</td>
<td>2.44%</td>
<td>10.14%</td>
</tr>
<tr>
<td>10000</td>
<td>72,659</td>
<td>AA</td>
<td>4.85%</td>
<td>1.24</td>
<td>10.81%</td>
<td>2.69%</td>
<td>9.66%</td>
</tr>
<tr>
<td>15000</td>
<td>67,659</td>
<td>A</td>
<td>5.10%</td>
<td>1.29</td>
<td>11.11%</td>
<td>2.83%</td>
<td>9.45%</td>
</tr>
<tr>
<td>20000</td>
<td>62,659</td>
<td>BBB</td>
<td>8.50%</td>
<td>1.36</td>
<td>11.46%</td>
<td>4.72%</td>
<td>7.11%</td>
</tr>
<tr>
<td>30000</td>
<td>52,659</td>
<td>BB</td>
<td>12.00%</td>
<td>1.52</td>
<td>12.35%</td>
<td>6.66%</td>
<td>10.20%</td>
</tr>
</tbody>
</table>

Optimal Cost of Capital: 9.45%

Change in firm value is a perpetuity = CF1 = cost savings/discount rate = old firm value(old cost of capital-New cost of capital)  
Annual cost savings = old firm value(old cost of capital-New cost of capital) 584 DEM million  
Permanent increase in firm value = Annual cost savings/cost of capital = 6,180 DEM million  
Increase in stock price = increase in firm value/shares outstanding = 70.54 DEM or 9.1%

A Framework for Getting to the Optimal

Is the actual debt ratio greater than or lesser than the optimal debt ratio?

Actual > Optimal

Is the firm under bankruptcy threat?

Yes

Reduce Debt quickly

1. Equity for Debt swap
2. Sell Assets; use cash to pay off debt
3. Renegotiate with lenders

Does the firm have good projects?

ROE > Cost of Equity

Increase leverage quickly

1. Debt/Equity swap
2. Borrow money & buy shares

Does the firm have good projects?

ROE > Cost of Capital

Yes

Take good projects with new equity or with retained earnings.

1. Pay off debt with retained earnings.
2. Reduce or eliminate dividends
3. Issue new equity and pay off debt

Do your stockholders like dividends?

Yes

Pay Dividends

No

Buy back stock

No

Underlevered

Actual < Optimal

Is the firm a takeover target?

Yes

Reduce Debt quickly

1. Equity for Debt swap
2. Sell Assets; use cash to pay off debt
3. Renegotiate with lenders

Does the firm have good projects?

ROE > Cost of Equity

Do your stockholders like dividends?

Yes

Pay Dividends

No

Increase leverage quickly

1. Debt/Equity swap
2. Borrow money & buy shares

Does the firm have good projects?

ROE > Cost of Capital
What Kind of Debt? 
Some Considerations

- Fixed/floating:
  - How certain are the cash flows? Are operating profits linked to interest rates or inflation?

- Currency:
  - Consider currency of the assets: currency of denomination vs. currency of location vs. currency of determination.

- Maturity or availability:
  - Are the assets short term or long term? Should the firm assume ease of refinancing, or buy an option on access to financing?

Designing Debt

Start with the Cash Flows of Assets/Projects

Define Debt Characteristcs

Overlay tax preferences

Consider rating agency & analyst concerns

Factor in agency conflicts between stock and bond holders

Consider Information Asymmetries

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Conclusion: Back to First Principles

- Invest in projects that yield a return greater than the minimum acceptable hurdle rate.
  - The hurdle rate should be higher for riskier projects and reflect the financing mix used - owners' funds (equity) or borrowed money (debt).
  - Returns on projects should be measured based on cash flows generated and the timing of these cash flows; they should also consider both positive and negative side effects of these projects.
- Choose a financing mix that minimizes the hurdle rate and matches the assets being financed.
- If there are not enough investments that earn the hurdle rate, return the cash to stockholders.
  - The form of returns - dividends and stock buybacks - will depend upon the stockholders' characteristics.
- Manage financial risks with debt and derivatives.

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