Wrap-up of Financing

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Finance Theory II
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Overview of Financing

Financial forecasting
- Short-run forecasting
- General dynamics: Sustainable growth.

Capital structure
- Describing a firm’s capital structure
- Benchmark: MM irrelevance
- Theory 1: Static Trade-Off Theory
- Theory 2: Pecking Order Theory
- An integrated approach

Note: Throughout we take “operations” as given.
Forecasting a Firm’s Funding Needs

- **Question**: Given our operations (and the forecast thereof), will we need funding, and how much?

- Short-run forecasting

- General dynamics:
  - The concept of sustainable growth
  - Cash Cows and Finance junkies
Financial Forecasting: General Approach

- Need (a model of) the firm’s production function
  - Use available data
  - Common sense
  - Specific knowledge of firm and industry

- Given this model forecast all items in the balance sheet except “funding needs”

- Infer the funding need from identity of Assets and Liabilities + Net Worth
Forecasting: Our approach

- Forecast Assets
- Forecast non-bank liabilities, excluding Net Worth
- Forecast Net Income
  - Assume some starting value for Bank Loan = “Bank Plug”
  - Forecast interest using Bank Plug
- Forecast Net Worth
- Consistency check: Assets = Liabilities + Net Worth?
  - If yes, stop
  - If not, adjust Bank Plug
- Recall: All we want are rough approximations
General Dynamics

- **Sustainable Growth Rate**: \( g^* = (1-d) \times \text{ROE} \)

- Gives a (very rough) measure of how fast you can grow Assets without increasing your leverage ratio or issuing equity

- Sustainable growth rate increases when
  - Dividends \((d)\) decreases
  - Profit margins \((\text{NI/Sales})\) increases
  - Asset turnover \((\text{Sales/Assets})\) increases
  - Leverage \((\text{Assets/NW})\) increases
Key Points

- **Key Point 0:** The concept of sustainable growth does not tell you whether growing is good or not.

- **Key Point 1:** Sustainable growth is relevant only if you cannot or will not raise equity, and you cannot let D/E ratio increase.

- **Key Point 2:** Sustainable growth gives a quick idea of general dynamics: Cash cows ($g << g^*$) or Finance junkies ($g >> g^*$).

- **Key Point 3:** Financial and business strategies cannot be set independently.
Capital Structure

- Describing a firm’s capital structure
- MM theorem
- Theory 1: Static Trade-off Theory
  - Tax shield vs. Expected distress costs
- Theory 2: Pecking Order Theory
  - Implications for investment
  - Implications for capital structure
- Pulling it all together
MM Theorem

- **MM:** In frictionless markets, financial policy is irrelevant.
  - Finance Theory 1: Financial transactions are NPV=0. QED

- **Corollary:** All the following are irrelevant:
  - Capital structure
  - Long- vs. short-term debt
  - Dividend policy
  - Risk management
  - Etc.
Evaluate the following statements

- Issuing equity dilutes earnings-per-share and thus hurts current shareholders.

- Equity in a levered firm is riskier than equity in an unlevered (but otherwise identical) firm.

- Currently, interest rates are high, so it is better to issue equity than debt.

- Currently, short-term interest rates are lower than long-term interest rates, so it is better to issue long-term than short-term debt.
Using MM Sensibly

When evaluating an argument in favor of a financial move:

- Ask yourself: Why is financing argument wrong under MM?
  - Avoid fallacies such as mechanical effects on accounting measures (e.g., WACC, EPS, Win-win)

- Ask yourself, what frictions does the argument rely on?
  - Taxes, Costs of financial distress, Information asymmetry, Agency problems

- If none, dubious argument. If some, evaluate magnitude.
Financing Choices

Debt vs. Equity
Theory 1: Static Trade-Off Theory

- Talks about costs and benefits of Debt relative to Equity
- The optimal target capital structure is determined by balancing

Tax Shield of Debt \[\rightarrow\] Expected Costs of Fin. Distress

**Note:** The theory does not give you a precise target but rather a range, an order of magnitude.
Tax Shield of Debt

- Debt increases firm value by reducing corporate tax bill.
  - This is because interest payments are tax deductible.
  - Personal taxes tend to reduce but not offset this effect.

\[ V(\text{w/ debt}) = V(\text{all equity}) + \text{PV(tax shield)} \]

- Order of magnitude for PV tax shield
  - Constant debt level: \( t \times D \)
  - \( t \) = marginal tax rate depends on country, tax credits, etc.

**Note:** A move that increases firm value will increase equity value!
Expected Costs of Distress: Two Terms

Expected costs of financial distress

\[\text{Expected costs of financial distress} = (\text{Probability of Distress}) \times (\text{Costs if actually in distress})\]
Probability of Distress

- Cashflow volatility
  - Is industry risky? Is firm’s strategy risky?
  - Are there uncertainties induced by competition?
  - Is there a risk of technological change?
  - Sensitive to macroeconomic shocks, seasonal fluctuations?
  - Etc.

- Use past data but also knowledge of industry.

- Beware of changes of environment.
Indirect costs of financial distress:

- **Debt overhang**: Inability to raise funds to undertake investments.
  - Pass up valuable projects ➔ **Do I need to invest?**
  - Rivals become aggressive ➔ **Do I have aggressive rivals?**

- **Scare off customers and suppliers** (e.g., implicit warranty or specific investment) ➔ **Do other parties care?**

- **Asset fire sales** ➔ **Are assets easily re-deployable?**
  - Are my assets valuable to other firms? (e.g. R&D)
  - Who are potential buyers? How many? Will they be cash constrained when I want to sell my assets?
Checklist for Target Capital Structure

**Tax Shield:**
- Would the firm benefit from debt tax shield? Is it profitable? Does it have tax credits?

**Expected distress costs:**
- Are cashflows volatile?
- Need for external funds for investment?
- Competitive threat if pinched for cash?
- Customers and suppliers care about distress?
- Are assets easy to re-deploy?

⚠️ **Note:** Hard to renegotiate debt structure increases distress costs (Recall Massey’s complex debt structure).
Theory 2: Pecking Order

- Firms general financing choices:
  - Preferably use retained earnings
  - Then borrow from debt market
  - As a last resort, issue equity

- Theory: Info. asymmetry between firm and market makes:
  - External finance more costly than internal funds
  - Debt less costly than equity (because less info-sensitive)
Implications for Investment

- The value of a project depends on how it is financed.

- Some projects will be undertaken only if funded internally or with relatively safe debt but not if financed with risky debt or equity.

- Companies with less cash and more leverage will be more prone to under-invest.

- Rationale for hoarding cash.
Implications for Capital Structure

- If a firm follows the Pecking Order, its leverage ratio results from a series of incremental decisions, not attempt to reach a target.
  - High cash flow ==> Leverage ratio decreases
  - Low cash flow ==> Leverage ratio increases

- There may be good and bad times to issue equity depending on the degree of information asymmetry.

- Rationale for hybrid instruments.
What Do We Do With Two Theories?

- Sometimes, both theories will give the same recommendation

- But sometimes, they will differ

- Consider Massey Ferguson:
  - Static Trade-off theory ==> Equity issue
  - Pecking Order Theory ==> Debt issue

- Two questions:
  - Is one theory better at describing what firms do?
  - Is one theory better at telling what they should be doing?
But As a Prescriptive Theory?

If firms use Pecking order blindly and ignore static trade-off:

- **Cash cows will end up with too little leverage (UST).**
  - Good news: Never too late to lever-up

- **Finance junkies will end up with too much leverage (Massey)**
  - Bad news: It can be too late to unlever (debt-overhang).
  - ST debt is temporary relief but worsens things in fine.
DON'T TALK TO DEERE & COMPANY ABOUT MARKET SIGNALING (from Higgins)

(Please see “Don’t Talk to Deere & Company About Market Signaling” from the course textbook by Higgins.)
An Integrative Approach

- Each theory makes a statement about what is first order issue:
  - STO: Tax shield and Distress costs
  - PO: Information (Price of claims you issue)

- Both theories need not be incompatible:
  - Use each when you think they emphasize the right issues

- When getting far away from target, STO type issues dominate

- When reasonably close to target, PO type issues dominate
An Integrative Approach (cont.)

- Establish long-run “target” capital structure

- Evaluate the true economic costs of issuing equity
  - What is real cost of price hit vs. foregone investment or increase in expected cost of distress.

- If still reluctant to issue equity:
  - Are there ways to reduce the cost? (e.g., give information)
  - Will the cost be lower if you issue later?
  - Can you use hybrids and packages to get there? But be careful. (Recall MCI might get stuck with too much debt)
An Integrative Approach (cont.)

- Straying from target may be warranted. But, be as systematic and precise as possible about justification -- Are benefits from straying plausibly large relative to costs?

- Remember: Lion’s share of value is created on LHS. Don’t want to endanger operations. Beware excessive leverage. Ultimately, business strategy should drive financial strategy, not the other way around.

- Avoid rules of thumb like: "Never issue in a down market"; or "Don't knock props out from under stock." These may make sense in some, but certainly not all circumstances.
Conclusion

- The bulk of the value is created on the LHS by making good investment decisions.

- You can destroy much value by mismanaging your RHS: Financial policy should be supporting your business strategy.

- You cannot make sound financial decisions without knowing the implications for the business.

- Finance is too serious to leave it to finance people.
# Apex Drugs and Products

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<thead>
<tr>
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<tbody>
<tr>
<td>Sales</td>
<td>2,471.7</td>
<td>2,685.1</td>
<td>3,062.6</td>
<td>3,406.3</td>
<td>3,798.5</td>
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<tr>
<td>Net income</td>
<td>277.9</td>
<td>306.2</td>
<td>348.4</td>
<td>396.0</td>
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<td>EPS</td>
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<td>1.70</td>
</tr>
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<td>436.6</td>
<td>493.8</td>
<td>593.3</td>
</tr>
<tr>
<td>Total assets</td>
<td>1,510.9</td>
<td>1,611.3</td>
<td>1,862.2</td>
<td>2,090.7</td>
<td>2,370.3</td>
</tr>
<tr>
<td>A/P and other non-interest bearing liabilities</td>
<td>511.60</td>
<td>565.70</td>
<td>670.50</td>
<td>758.40</td>
<td>883.60</td>
</tr>
<tr>
<td>Long-term + short-term debt</td>
<td>7.8</td>
<td>10.3</td>
<td>13.7</td>
<td>10.3</td>
<td>13.9</td>
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Describe Apex’s capital structure.
What are the likely factors that led to this capital structure.

Different measures of leverage should give you a similar picture:

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<tr>
<td>D/(D+NW)</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
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</tr>
<tr>
<td>D/(Total Assets)</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
<td>0%</td>
<td>1%</td>
</tr>
<tr>
<td>(D-Cash)/(Total Assets)</td>
<td>-23%</td>
<td>-19%</td>
<td>-23%</td>
<td>-23%</td>
<td>-24%</td>
</tr>
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What are likely factors that led to this capital structure?

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<td>Growth in assets</td>
<td>0.07</td>
<td>0.16</td>
<td>0.12</td>
<td>0.13</td>
<td></td>
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<tr>
<td>ROE</td>
<td>0.31</td>
<td>0.34</td>
<td>0.34</td>
<td>0.34</td>
<td></td>
</tr>
<tr>
<td>Dividend payout ratio</td>
<td>0.59</td>
<td>0.60</td>
<td>0.60</td>
<td>0.60</td>
<td></td>
</tr>
<tr>
<td>Plowback ratio</td>
<td>0.41</td>
<td>0.40</td>
<td>0.40</td>
<td>0.40</td>
<td></td>
</tr>
<tr>
<td>Sustainable growth rate</td>
<td>0.13</td>
<td>0.13</td>
<td>0.14</td>
<td>0.14</td>
<td></td>
</tr>
</tbody>
</table>
What are likely factors that led to this capital structure?

- In most years, assets grew slower than the sustainable rate
  - Retained earnings more than covered the investment needs
  - Apex never had to raise outside funds
  - A classic “cash cow”

- What explains the high sustainable rate?
  - High profit margins and asset turnover offset the mechanical effect of low leverage and the high payout ratios

- Apex management has not attempted to voluntarily increase leverage
What explains the high sustainable rate?
(Focus on year 1992)

\[ g^* = (1 - d) \times \text{ROE} = (1 - d) \times \frac{\text{NI}}{\text{NW}} = \frac{(1 - d) \times \frac{\text{NI}}{\text{Assets}}}{\text{NW}} \]

\[ g^* = 0.4 \times 0.34 = 0.4 \times 0.21 \times 1.58 \]
What explains the high sustainable rate?  
(Focus on year 1992)

\[ g^* = (1 - d) \times \text{ROE} = (1 - d) \times \frac{\text{NI}}{\text{NW}} = (1 - d) \times \frac{\text{NI}}{\text{Assets}} \times \frac{\text{Assets}}{\text{NW}} \]

\[ g^* = 0.4 \times 0.34 = 0.4 \times 0.21 \times 1.58 \]

\[ \text{ROA} = \frac{\text{NI}}{\text{Assets}} = \frac{\text{NI}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}} \]

\[ \text{ROA} = 0.12 \times 1.82 \]
Is this capital structure optimal?
USE THE CHECKLIST!

**Tax shield:**
- Would APEX benefit from tax shields?
  - Is APEX profitable? Yes
  - Does it have tax deductions? Not likely

**Expected distress costs:**
- Are cashflows volatile? No
- Need for external funds for investment? Not much
- Competitive threat if pinched for cash? Yes
- Customers and suppliers care about distress? Not much
- Are assets hard to re-deploy? Not really
## Apex’s capital structure in 1993?

Sales will grow at 11%. Profit margin will fall to 7%.

<table>
<thead>
<tr>
<th></th>
<th>1992</th>
<th>1993</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sales</strong></td>
<td>3,799</td>
<td>4,216</td>
</tr>
<tr>
<td><strong>Net income</strong></td>
<td>446</td>
<td>295</td>
</tr>
<tr>
<td><strong>Profit margin</strong></td>
<td>0</td>
<td>0.07</td>
</tr>
<tr>
<td><strong>Retained earnings</strong></td>
<td>178</td>
<td>118</td>
</tr>
<tr>
<td><strong>NW (NW 1993 + Retained earnings 1994)</strong></td>
<td>1,473</td>
<td>1,591</td>
</tr>
<tr>
<td><strong>Cash (remains constant)</strong></td>
<td>593</td>
<td>593</td>
</tr>
<tr>
<td><strong>Total assets (all other assets grow at 11%)</strong></td>
<td>2,370</td>
<td>2,566</td>
</tr>
<tr>
<td><strong>A/P and other non-interest bearing liabilities (grow at 11%)</strong></td>
<td>884</td>
<td>981</td>
</tr>
<tr>
<td><strong>Bank plug (Total assets - NW - A/P)</strong></td>
<td>14</td>
<td>(6)</td>
</tr>
</tbody>
</table>

External funding needs = -6 – 14 = -20

=> Apex has **excess internal funds of 20**.
Apex’s target capital structure in the long run?

- **More uncertainty**
  - Potential regulation
  - Technological change

- **More competitive pressure**
  - Regulation may favor competition in generic drugs

- **Apex needs to invest more**
  - Advances in biotechnology => more R&D required

- **Less internally generated funds**
  - Patents expire

- **Bottom line:** Lower target leverage.