

# Wrap-up of Financing

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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:  $\text{Assets} = \text{Liabilities} + \text{Net Worth}$ ?
  - If yes, stop
  - If not, adjust Bank Plug
- Recall: All we want are rough approximations

# General Dynamics

- **Sustainable Growth Rate:  $g^* = (1-d) * ROE$**
- 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 (NI/Sales) increases
  - Asset turnover (Sales/Assets) increases
  - Leverage (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 ( $g \ll g^*$ ) or Finance junkies ( $g \gg g^*$ )
- **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:

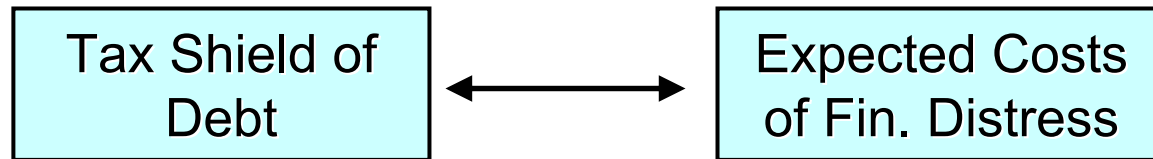
- Ask yourself: Why is financing argument wrong under MM?
  - Avoid fallacies such as mechanical effects on accounting measures (e.g., WACC, EPS, Win-win)
  
- Ask yourself, what frictions does the argument rely on?
  - Taxes, Costs of financial distress, Information asymmetry, Agency problems
  
- If 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



**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.

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

- Order of magnitude for PV tax shield
  - Constant debt level :  $t \cdot D$
  - $t$  = 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

=

(Probability of Distress) \* (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

	<b>1988</b>	<b>1989</b>	<b>1990</b>	<b>1991</b>	<b>1992</b>
<b>Sales</b>	2,471.7	2,685.1	3,062.6	3,406.3	3,798.5
<b>Net income</b>	277.9	306.2	348.4	396.0	445.9
<b>EPS</b>	1.75	1.94	2.21	2.51	2.84
<b>DPS</b>	1.00	1.15	1.33	1.50	1.70
<b>Cash</b>	358.8	322.9	436.6	493.8	593.3
<b>Total assets</b>	1,510.9	1,611.3	1,862.2	2,090.7	2,370.3
<b>A/P and other non-interest bearing liabilities</b>	511.60	565.70	670.50	758.40	883.60
<b>Long-term + short-term debt</b>	7.8	10.3	13.7	10.3	13.9
<b>Net worth</b>	991.5	1,035.3	1,178.0	1,322.0	1,472.8

**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:

	<b>1988</b>	<b>1989</b>	<b>1990</b>	<b>1991</b>	<b>1992</b>
<b>Cash</b>	358.8	322.9	436.6	493.8	593.3
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<b>Net worth</b>	991.5	1,035.3	1,178.0	1,322.0	1,472.8
<b>D/(D+NW)</b>	1%	1%	1%	1%	1%
<b>D/(Total Assets)</b>	1%	1%	1%	0%	1%
<b>(D-Cash)/(Total Assets)</b>	-23%	-19%	-23%	-23%	-24%

## What are likely factors that led to this capital structure?

	1988	1989	1990	1991	1992
<b>Net income</b>	277.9	306.2	348.4	396.0	445.9
<b>EPS</b>	1.75	1.94	2.21	2.51	2.84
<b>DPS</b>	1.00	1.15	1.33	1.50	1.70
<b>Total assets</b>	1,510.9	1,611.3	1,862.2	2,090.7	2,370.3
<b>Growth in assets</b>		0.07	0.16	0.12	0.13
<b>Net worth</b>	991.5	1,035.3	1,178.0	1,322.0	1,472.8
<b>ROE</b>		0.31	0.34	0.34	0.34
<b>Dividend payout ratio</b>		0.59	0.60	0.60	0.60
<b>Plowback ratio</b>		0.41	0.40	0.40	0.40
<b>Sustainable growth rate</b>		0.13	0.13	0.14	0.14

## 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 attempt to voluntarily increase leverage



## What explains the high sustainable rate? (Focus on year 1992)

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

$$g^* = 0.4 * 0.34 =$$

$$0.4 * 0.21 * 1.58$$

# What explains the high sustainable rate? (Focus on year 1992)

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

$$g^* = 0.4 * 0.34 =$$

$$0.4 * 0.21 * 1.58$$

$$ROA = \frac{NI}{Assets} = \underbrace{\frac{NI}{Sales}}_{\text{Profit Margin}} \times \underbrace{\frac{Sales}{Assets}}_{\text{Asset Turnover}}$$

$$ROA = 0.12 * 1.82$$

# 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%.

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

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.