

Corporate Finance: a roadmap

Corporate Finance - MSc in Finance (BGSE)

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In this chapter...

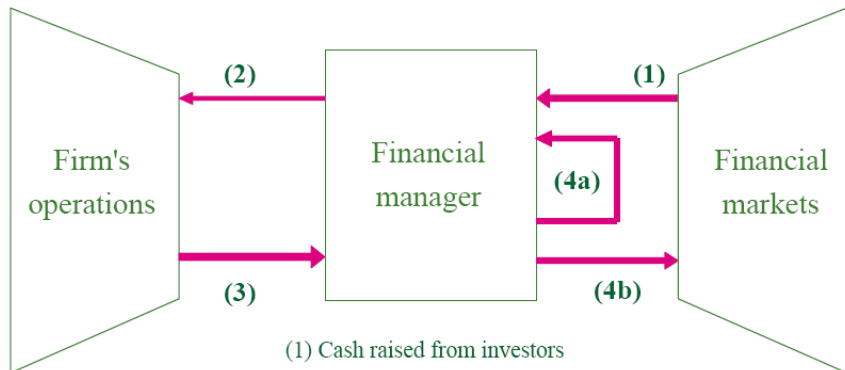
- An introduction to "corporate finance"
- Investment decision and valuation basics
- Financing Decision and a simple example
- Modigliani and Miller propositions and a roadmap

Questions addressed by corporate finance

- How to allocate funds to alternative “projects” (capital budgeting)?
 - Buy a fridge, build a new plant, buy another firm...?
(a brief review will be provided below)
- How to raise the funds to finance them (capital structure)?
 - Use internal funds (cash), debt (borrowing), equity (issuing stock),...?
(this will be the focus of the first part of the course)
- Other less frequent but not less important decisions:
 - Mergers and acquisitions, spin-offs, going public,...
(this will be the focus of the second part of the course)

Corporate finance in practice

The role of the financial manager



(1) Cash raised from investors

(2) Cash invested in firm

(3) Cash generated by operations

(4a) Cash reinvested

(4b) Cash returned to investors

Investment decision

- Projects: Factories, machines, patents,...
- How to decide whether to invest in a project? How to select projects?
 - Techniques: Compute “NPV”, “IRR”, Profitability index,...
- How to adjust to take into account “risk”?
 - Models: CAPM, APT,...
- A brief review of NPV follows
(for more details see Brealey and Myers or Berk and DeMarzo)

Present and future value

- Suppose $t = 0, 1, \dots$ and a (frictionless) market with a constant interest rate r per period:
 - If $r = 10\%$, an investor with \$1 in $t = 0$ can lend & obtain \$1.10 in $t = 1 \rightarrow \$1.10$ is the future value of \$1
 - In general,
 - $(1 + r)x$ is the date-1 value of date-0 x
 - $(1 + r)^t x$ is the date- t value of date-0 x

- Conversely,...

- If $r = 10\%$, an investor with \$1.1 in $t = 1$ can borrow & obtain \$1 in $t = 1 \rightarrow \$1$ is the present value of \$1.1
- In general,
 - x is the date-0 value of date-1 $(1 + r)x$
 - x is the date-0 value of date- t $(1 + r)^t x$
- And by a proportionality rule,
 - $\frac{1}{1+r} x$ is the present value of date-1 x
 - $\frac{1}{(1+r)^t} x$ is the present value of date- t x

- The discount factor is...

$$\frac{1}{(1 + r)^t}$$

and for (potentially non-constant) interest rates, r_1, r_2, \dots, r_t

$$\frac{1}{(1 + r_1)(1 + r_2)\dots(1 + r_t)} = \frac{1}{\prod_{i=1}^t (1 + r_i)}$$

Net present value

- Consider an investment project that
 - requires an investment I_0 at $t = 0$
 - generates a sequence of cash flows $\{y_t\}_{t=1,\dots,T}$
- Under certainty, the project's NPV is given by

$$NPV = -I_0 + \sum_{t=1}^T \frac{y_t}{\prod_{i=1}^t (1 + r_i)}$$

- Under uncertainty, some adjustment for the price of risk is needed

$$NPV = -I_0 + \sum_{t=1}^T \frac{E(y_t)}{\prod_{i=1}^t (1 + \bar{r}_{yi})}$$

where \bar{r}_{yi} is risk-adjusted required rate of return (project's cost of capital)

- \bar{r}_{yi} = return on investments with similar risk (see valuation models)
- Investment rule: invest if and only if $NPV > 0$

Financing Decision

- How are we going to pay for any investment?
 - Internal capital: retain earnings generated
 - External capital: Debt or equity?
 - Debt holder claims must be paid in full before the claims of equity holders can be paid
 - Equity holders elect the board of directors and thus ultimately control the firm
 - Equity holders receive cash in the form of dividends, which are not tax-deductible, while the interest payments of debt are a tax-deductible expense

Firm's Capital Structure

- The collection of securities a firm issues to raise capital from investors is called the firm's capital structure.
- In short “the firm's mix of debt and equity financing”
- When raising funds from investors a firm must choose. . .
 - what type of security to issue
 - and therefore what capital structure to have

An example of a firm's balance sheet

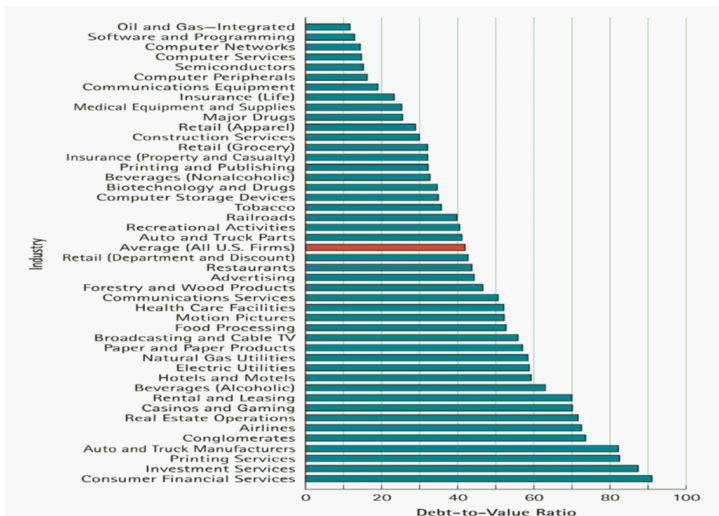
Assets	2005	2004
<u>Current Assets</u>		
Cash	21.2	19.5
Accounts receivable	18.5	13.2
Inventories	15.3	14.3
Other current assets	<u>2.0</u>	<u>1.0</u>
Total current assets	57.0	48.0
<u>Long-Term Assets</u>		
Land	22.2	20.7
Buildings	36.5	30.5
Equipment	39.7	33.2
Less accumulated depreciation	<u>(18.7)</u>	<u>(17.5)</u>
Net property, plant, and equipment	79.7	66.9
Goodwill	20.0	—
Other long-term assets	<u>21.0</u>	<u>14.0</u>
Total long-term assets	120.7	80.9
Total Assets	177.7	128.9

Liabilities and Stockholders' Equity	2005	2004
<u>Current Liabilities</u>		
Accounts payable	29.2	24.5
Notes payable / short-term debt	3.5	3.2
Current maturities of long-term debt	13.3	12.3
Other current liabilities	<u>2.0</u>	<u>4.0</u>
Total current liabilities	48.0	44.0
<u>Long-Term Liabilities</u>		
Long-term debt	99.9	56.3
Capital lease obligations	<u>—</u>	<u>—</u>
Total debt	99.9	56.3
Deferred taxes	7.6	7.4
Other long-term liabilities	<u>—</u>	<u>—</u>
Total long-term liabilities	107.5	63.7
Total Liabilities	155.5	107.7
Stockholders' Equity	22.2	21.2
Total Liabilities and Stockholders' Equity	177.7	128.9

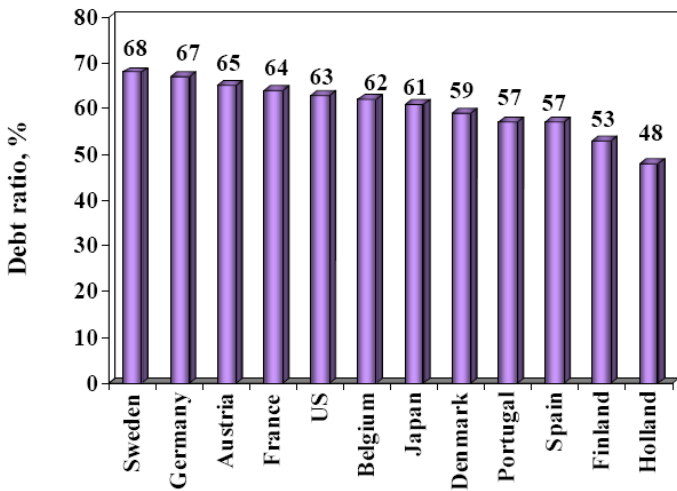
A leverage measure: Debt-to-equity $(3.5+13.3+99.9)/22.2=5.3$

Others: Debt-to-market value of equity, debt-to-entreprise value,...

Discussion: what determines leverage's average industry levels?



Leverage around the world



A "toy" example

Case 1: financing with equity only (unlevered)

- I got a revolutionary idea! Should I undertake it? How should I pay for it?
- After some work, the project estimates are:
 - Cash flows: \$1400m (success) or \$900m (failure) at the end of year
 - Each scenario (success, failure) is equally likely
 - Investment required today: \$800m
 - Due to project risk, investors ask for an additional 10% over the 5% risk-free rate interest rate
 - NPV=? Should I go ahead?
- If project financed only with equity, what is/are...
 - Market value of the firm's (unlevered) equity today?
 - How much money would I get if I sell all the equity?
 - Investors' equity returns in each scenario? Expected returns?

A "toy" example

Case 2: financing with debt and equity (levered)

- Suppose firm also borrows \$500m initially,
 - What should the interest rate be?
 - How much would the firm owe at the end of the year?
- What should now be the...
 - Market value of equity today? How much would I get in total?
 - For this equity value, equity returns in each scenario? Expected?
- In sum...
 - What is the total value of the firm in each case (levered, unlevered)?
 - What is the return on equity and debt in each case?
 - What is the firm's "average cost of capital" in each case?

The Relevance of Capital Structure

- Should we care about firms' financial structure? People do pay attention in practice to capital structure, but is that attention warranted?
- *Objective*: taking as given a firm's assets and investment strategy, can we find a *capital structure that maximises its value*?
- Modigliani and Miller (1958) and (1961): under some particular conditions, financial structure is irrelevant for the value of the firm.
 - Debt/equity ratio, split of debt into different seniorities, etc... do not affect the value of the firm
 - They might affect how the pie is shared, but not the size of the pie.
 - Conclusion: managers should devote their time to thinking about other things (capital budgeting,...).

Conditions Under Which Financial Structure is Irrelevant

- Assumption 1 - Total cash flows available for distribution to all debt and equity holders do not depend on the capital structure (no differential taxation of debt and equity, no bankruptcy costs).
- Assumption 2 - Capital markets are “perfect” (no transaction costs for buying and selling, firms and investors can borrow and lend freely at the same rate, perfect competition and therefore firms and investors are price takers)
- Assumption 3 - All agents have the same information (managerial incentives can be aligned, firm financial policy reveals no information,...)
- Assumption 4 - Arbitrage opportunities are absent (not possible to perform a set of a zero-investment trades that yield a risk-free profit “free money”)

Roadmap for the first part of the Course

Departures from MM conditions

- Violation of condition 1 (chapter 1):
 - Non-neutral taxes: "Debt Tax Shield"
 - Bankruptcy Costs: "Static Trade-Off Theory"
- Violation of condition 3 (chapters 2, 3, 4 and 5):
 - (A). Hidden actions and moral hazard (investors cannot perfectly control managers' actions)
 - (B). Hidden information about outcomes (managers may lie to investors about the performance of the firm)
 - (C). Asymmetric Information and adverse selection (managers may know more about the firm and the projects it operates than investors)
 - (D) Previous (A, B, and C) may also mean that the firm's access to external finance is limited

Why Bother with the Perfect Markets Case?

- World is full of “imperfections”, so why bother studying the case of perfect capital markets?

⇒ It is important to understand under which conditions capital structure does not matter, in order to understand when and how capital structure matters. These conditions tell us where to look for imperfections that may help us determine an optimal capital structure.

Miller (1988): “Showing what doesn’t matter can also show, by implication, what does.”