



Advanced Corporate Finance I

M.Sc. Course B400

Winter term 2015/2016

Prof. Dr. Christian Koziol

Department of Finance

www.uni-tuebingen.de/wiwi/finance



People

- Lecture: Prof. Dr. Christian Koziol
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- Exercise session: Tilo Treuter, M.Sc.
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- Office: Department of Finance
Nauklerstr. 47 (first floor)
<http://www.uni-tuebingen.de/wiwi/finance>
- Course Materials: Available on ILIAS (password: ACF1@WS1516)
- Questions: Please use the discussion forum on ILIAS



Logistics and grading

- Language: English, exam may be answered in German
- Time
 - Lecture: Wednesday, 12:15 PM – 13:45 PM, room E03
 - Exercise session: Tuesday, 8:30 AM – 10:00 AM, room E03 (not weekly)
 - Detailed schedule will be available soon (on ILIAS)
- Grading
 - Written exam (60 minutes, 60 points, 75%)
 - Group project (20 points, 25%)
 - Exchange students may choose oral exam, but have to complete group project
 - 9 ECTS credits



Materials

- Course materials available on ILIAS
 - Slides (with fill-in parts)
 - Excel sheets
 - Problem sets

- Readings
 - Main textbook:
 - › Grinblatt and Titman (GT): Financial Markets & Corporate Strategy
 - Original papers (also provided on ILIAS):
 - › Modigliani and Miller (1958)
 - › Merton (1974)
 - › Leland (1994)



What is corporate finance?

- Simple description of a firm:
- Goal of a firm: Optimal investment and financing decisions
- Focus in this lecture: Optimal capital structure



Example: Apple

- Apple balance sheet (USD billion, year end 2012):

Assets		Liabilities and shareholder's equity	
Cash & short-term investments	39.8	Payables, accruals	30.3
Long-term financial investments	97.3	Current and other liabilities	22.8
Receivables, inventory	32.5	Deferred income tax	15.7
Property, plants, equipment	15.4	Long-term debt	0.0
Other assets, goodwill	11.0	Equity	127.3
Total	196.1	Total	196.1

- Market capitalization of Apple at end of 2012: USD 482.6 billion
- Question: What is striking about Apple's capital structure



Why is it important?

Financing decisions (raising capital) usually exhibit the following properties:

- High amount of capital involved
- Prerequisite for successful investment (What if no capital can be raised?)
- Good decisions can add value to the firm (or reduce costly problems)
- Implications for further decisions of the firm (management motivation, corporate strategy, information conveyed, etc.)



Difference between M.Sc. and B.Sc. approach

■ B.Sc. approach:

- Get major problems
- Understand standard solutions or at least know where to look up standard solutions
- Focus: Problem solving (repetition of others arguments)

■ M.Sc. approach:

- Get advanced methods to deal with financing problems
- Solve (almost) arbitrary problems using these sophisticated methods
- Focus: Dealing with methods (in order to derive own arguments)



Example: credit crunch (1/3)

- Firm raises capital from two equal banks in $t=0$
- Loan can be terminated in $t=1$ or expires in $t=2$
- Banks have the right to terminate

	$t=1$	$t=2$
Total repayment (per bank)	100 (50)	110 (55)
Value of firm assets	60	120

- Simplifying assumption of zero interest rate $r=0\%$
- Efficient decision: let loan expire in $t=2$



Example: credit crunch (2/3)

Analysis of termination decision of bank

- Identical decision of both banks
 - Termination in $t=1$: firm defaults and both banks get 30 (half of firm assets)
 - Expiry in $t=2$: firm survives and both banks get 55
- Different decisions (bank A terminates in $t=1$, bank B waits until $t=2$)

	$t=1$	$t=2$
Bank A	50	-
Bank B	-	$(60 - 50) \cdot \frac{120}{60} = 20$



Example: credit crunch (3/3)

- What is the optimal termination behavior?

		Bank B	
		terminate in $t=1$	wait until $t=2$
Bank A	terminate in $t=1$	(30, 30)	(50, 20)
	wait until $t=2$	(20, 50)	(55, 55)



Objectives of the course

- Dealing with advanced models for financing decisions (e.g. structural models)
- Deriving recommendations in (almost arbitrary) sophisticated financing decisions about
 - Capital structure/Choice of financing instrument
 - Optimal design of financing instrument (e.g. conversion feature in corporate bond)
- Learning to handle formal research models

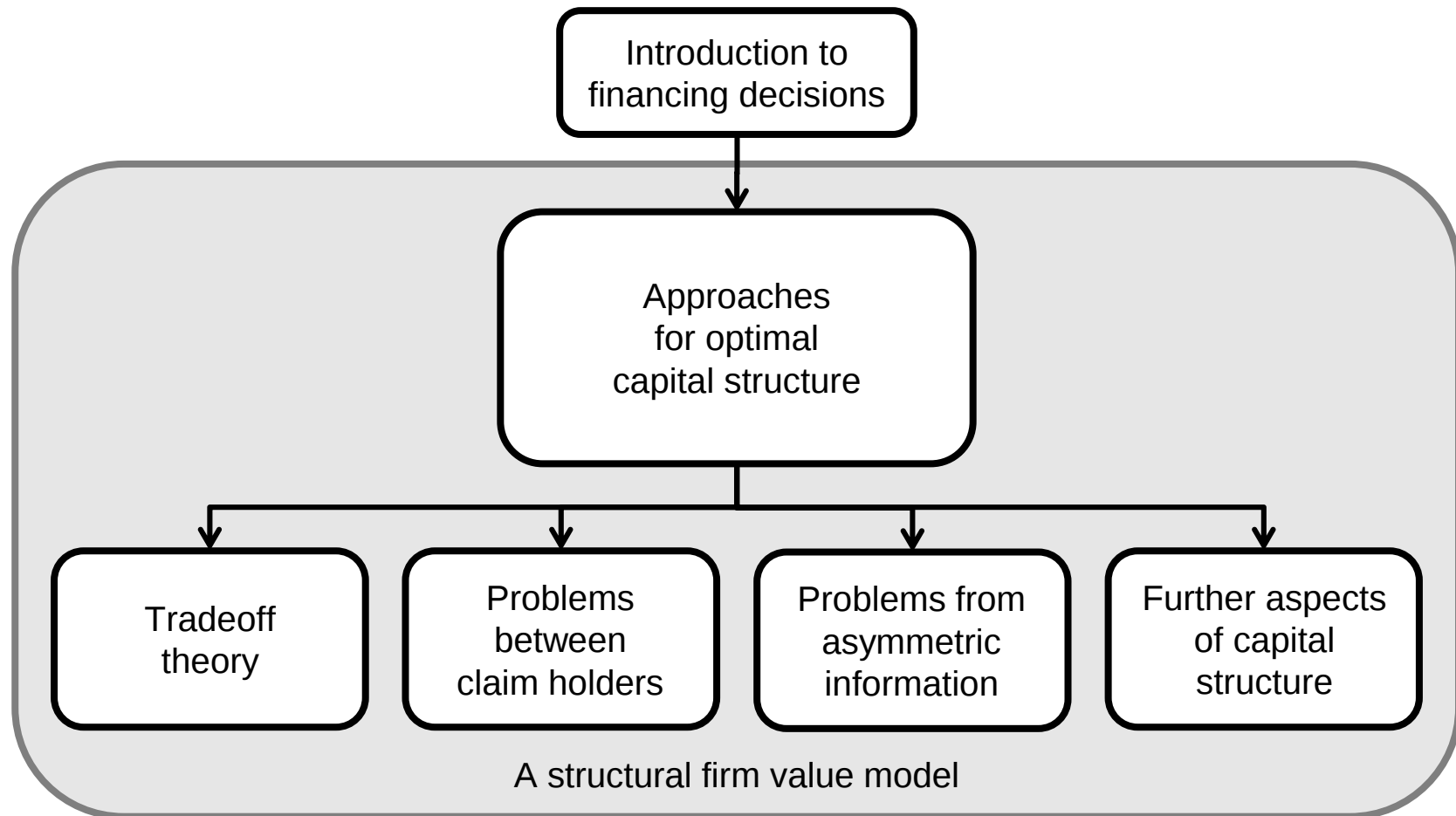


Objectives of the course

- Remarks:
 - Focus: The way to get a result rather than the result itself
 - Methods matter: 'An argument convinces others, if person who argues has either high seniority or solid framework behind arguments (that others do not fully master).'
- Practical (personal) issues:
 - Preparation for position in financing department of firms, credit division of banks or consulting business
 - Introduction to research in corporate finance (Ph.D. thesis)



Syllabus





Syllabus

1. Introduction to financing decisions (GT chapter 1-3)
 - Standard financing instruments
 - Empirical observations
 - The security issuance process
2. A structural firm value model (Merton (1974), Modigliani/Miller (1958))
 - Setup and assumptions of the Merton model
 - Duplicating portfolios
 - Risk-neutral probabilities
 - Black-Scholes world
 - Calibration to real-world data
 - Application: ratings
 - Economic implications and the Modigliani-Miller theorem
3. Tradeoff theory (GT Chapters 14-16, Leland (1994))
 - Impact of taxes
 - Bankruptcy cost
 - Leland model



Syllabus

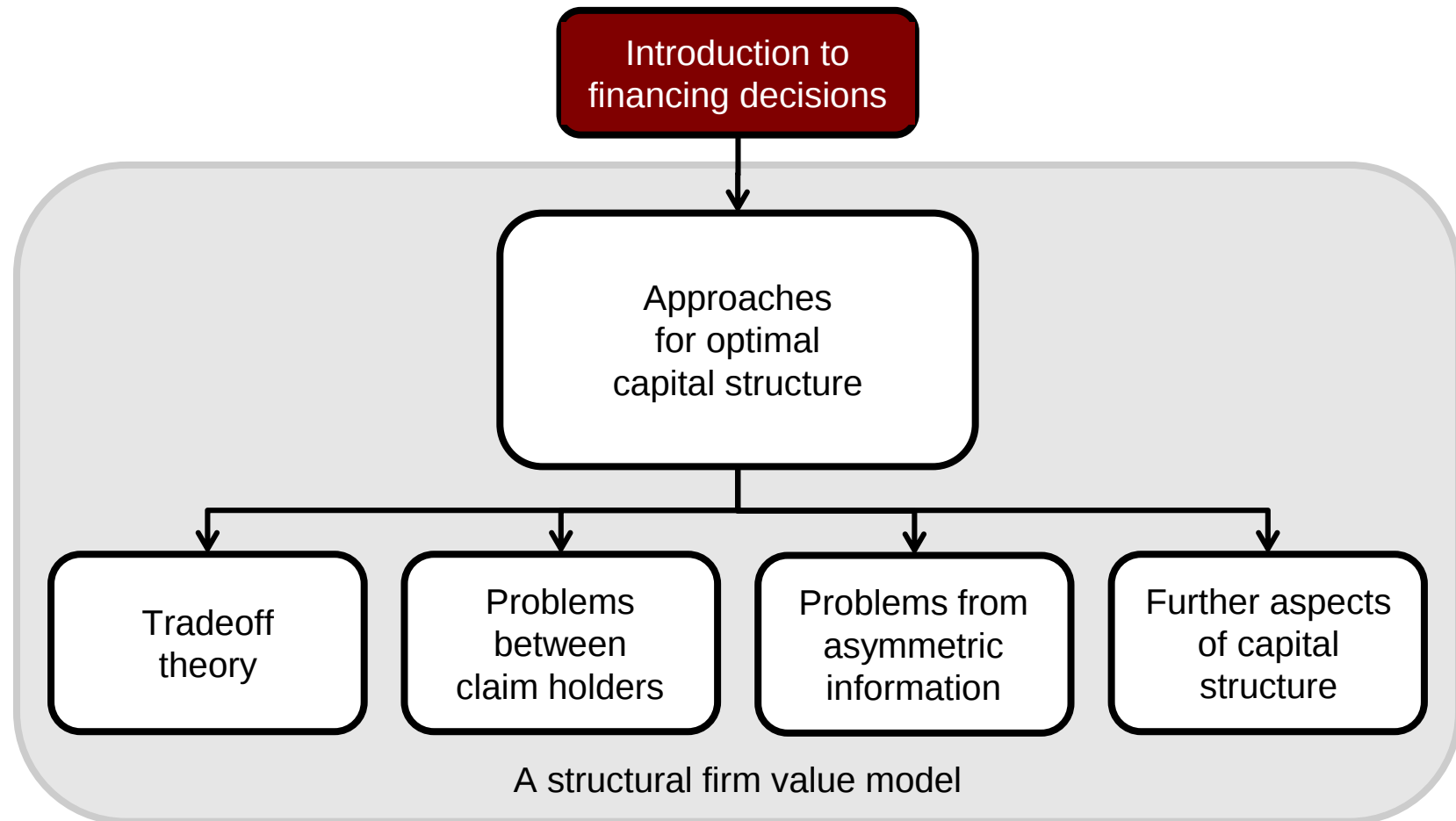
4. Problems between claim holders (GT chapter 16)
 - Overview of incentive problems
 - Asset substitution (overinvestment)
 - Debt overhang (underinvestment)
 - Reluctance to liquidate
 - Shortsighted investment
 - Mitigation of incentive problems
5. Problems from asymmetric information (GT chapter 19)
 - General aspects of asymmetric information
 - Effect on capital structure (Ross model)
 - Effect on investment decisions (Myers/Majluf model)
 - Payout policy (Miller/Rock model)
 - IPO underpricing (Rock model)
 - Pecking order hypothesis
6. Further aspects of capital structure (GT chapters 17+18)
 - Management incentives
 - Competitive strategy
 - Ownership structure



1. Introduction to financing decisions



Syllabus and course illustration





Learning objectives

- To be familiar with the standard financing instruments and major differences between their characteristics
- To find plausible institutional details and empirical observations to get a first idea about optimal financing behavior
 - Observed capital structures
 - Importance of internal funds
 - Differences from the securities issuing process



Standard instruments at a glance

Types of financing instruments:

- Debt
 - Bank loans
 - Bonds
- Equity
 - Common
 - Preferred
 - Warrants
- Hybrid instruments
 - Convertible bonds
 - Hybrid debt



Standard instruments at a glance

Types of capital sources:

- Public source, i.e. financing instruments are publicly traded at secondary market
 - Broader investor basis
 - More liquid securities

- Private source, i.e. individual financing deals
 - Customized for individual investors
 - No costly registration
 - Less information needs to be revealed
 - Easier to renegotiate



Standard instruments at a glance

Question:

- Are convertible bonds the “best” financing instruments?

Example:

- Firm has 10m stocks at a price of EUR 50 and needs funds equal to EUR 10m
- Three possibilities exist to raise the required EUR 10m:
 - Issuance of 200.000 new stocks
 - Issuance of 10-year straight bond at par with annual coupon equal to 5%
 - Issuance of 10-year convertible bond at par with annual coupon equal to 3% which allows for conversion into 100.000 stocks



Standard instruments at a glance

Question:

- Are convertible bonds the “best” financing instruments?
- Investment bankers often stress the advantages of convertible bonds as follows:
 - In the case of conversion: Convertible bond issue is better (for initial equity holders) than issuance of equity at time $t=0$
 - In the case of no conversion: Convertible bond issue is cheaper than straight debt issuance at time $t=0$

What is wrong with this argument? Find a scenario for which a convertible bond issue is not the best choice for the initial equity holders!



Empirical observations

- How to get a first idea about corporate financing decisions:

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Empirical observations

Debt ratios (book value and market value) of German DAX companies:

- See file **DAX30_debt_ratios.xls** on ILIAS

Findings:

- Firms from same industry have similar capital structure
- Strong differences between firms from different industries
- Evidence for existence of (industry-specific) capital structure



Empirical observations

Capital structure is affected by three aspects:

- Issuance of financial claims such as debt or equity – positive cash effect
- Market value changes of outstanding instruments (e.g. stock market crash) – no cash effect
- Debt retirements according to repayment schedule – negative cash effect

Consequences:

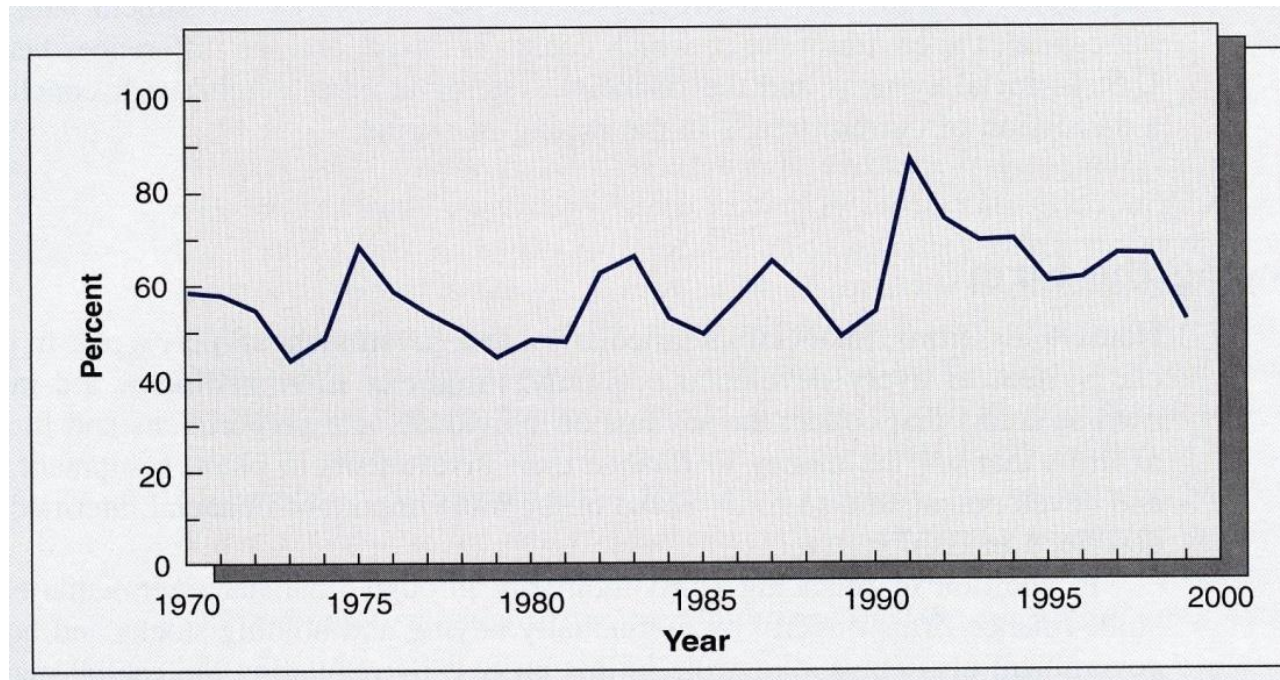
- Capital structure of a firm can heavily change even though the firm is not active (not raising external funds)
- Firm has frequent financing demand, e.g. to satisfy scheduled debt retirements
- How do firms finance their capital demands?



Empirical observations

- Internal funds are major source of corporate financing

Aggregate percent of investment funds raised internally



- Observation suggests
 - Cheap internal funds are relatively attractive financing form