Corporate Finance Theory

Lecture 1
Introduction, Broad Review, and Financing under moral hazard (i)

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Intended outcomes for the day:

1. Know a number of practical issues regarding the lectures

2. Consider how to get the most out of different aspects of the course

3. Become familiar with some broad ideas from Corporate Finance, and develop a model where moral hazard can lead to credit rationing.

Lectures

Lectures

-20 lectures + 1 drop-in session, starting today

-See the entry in the university course calendar

Attendance

-All lectures will take place physically on campus.

-You are expected to attend (as much as possible).

-I will not stream or record lectures

Getting the most out of **Absalon**

Regularly check the Absalon course homepage

All relevant material will be posted there

In the module for each lecture, you will find the materials related to that lecture.

This will include the lecture slides, and often **activities to complete** (such as short videos to see, a text to read, a short quiz, etc.) **before the start of that lecture.**

For example, in the module for Lecture 1, you can find a short video with tips for reading research articles.

YOU ARE EXPECTED TO COMPLETE THE ACTIVITIES BEFORE THE START OF THE RELEVANT LECTURE.

Getting the most out of **Lectures**

Attend – whenever possible

Prepare

- By completing the activities associated with a given lecture, before you attend
- By looking through the lecture slides
- By looking through the associated research article

Participate

- There will be a variety of things to take part in during lectures
- For example: multiple choice questions, group discussions.

Getting the most out of **Office hours**

As a rule, the weekly office hour will be:

Wednesdays from 11.00 – 12.00
26.1.17 (my office)

You are welcome to drop me a mail before coming to the office hour: nick.vikander@econ.ku.dk

But it is also just fine to stop by unannounced.

Any changes to the timing of the office hour will be posted on Absalon.

You can also ask questions during the break of any lecture or directly afterwards

Email: only for short, practical questions

Course Intended Learning Outcomes

To pass the final exam (and to show satisfactory performance on the obligatory assignment), you must show that you have met the course Intended Learning Outcomes in **all three** of the following areas:

1. Intuition

2. Formal modeling

3. Application to cases

Please see the entry in the University Course Calendar for more details on the Intended Learning Outcomes.

Please see both the University Course Calendar and the folder "Information on Assessment" on Absalon, for more information about the obligatory assignment and final exam.

Short Review of Corporate Finance

Distinction between real activities and financial activities

Real activities

Suppose you must decide whether to undertake a particular project

Say a costly investment, followed by positive cash flow

Calculate the project's net present value (NPV), taking into account risk and opportunity cost

Undertake the project if the net present value is positive

Distinction between real activities and financial activities

Financial activities

Now suppose you want to raise funds to finance the investment

Issuing new debt (bonds)

Issuing new equity (shares)

Using retained earning (cash reserves)

Debt and Equity

Debt carries a promise to pay back predetermined amounts at fixed dates

→ inability;

Maturity; default; bankruptcy; seniority; covenants

↳ legal proceedings.

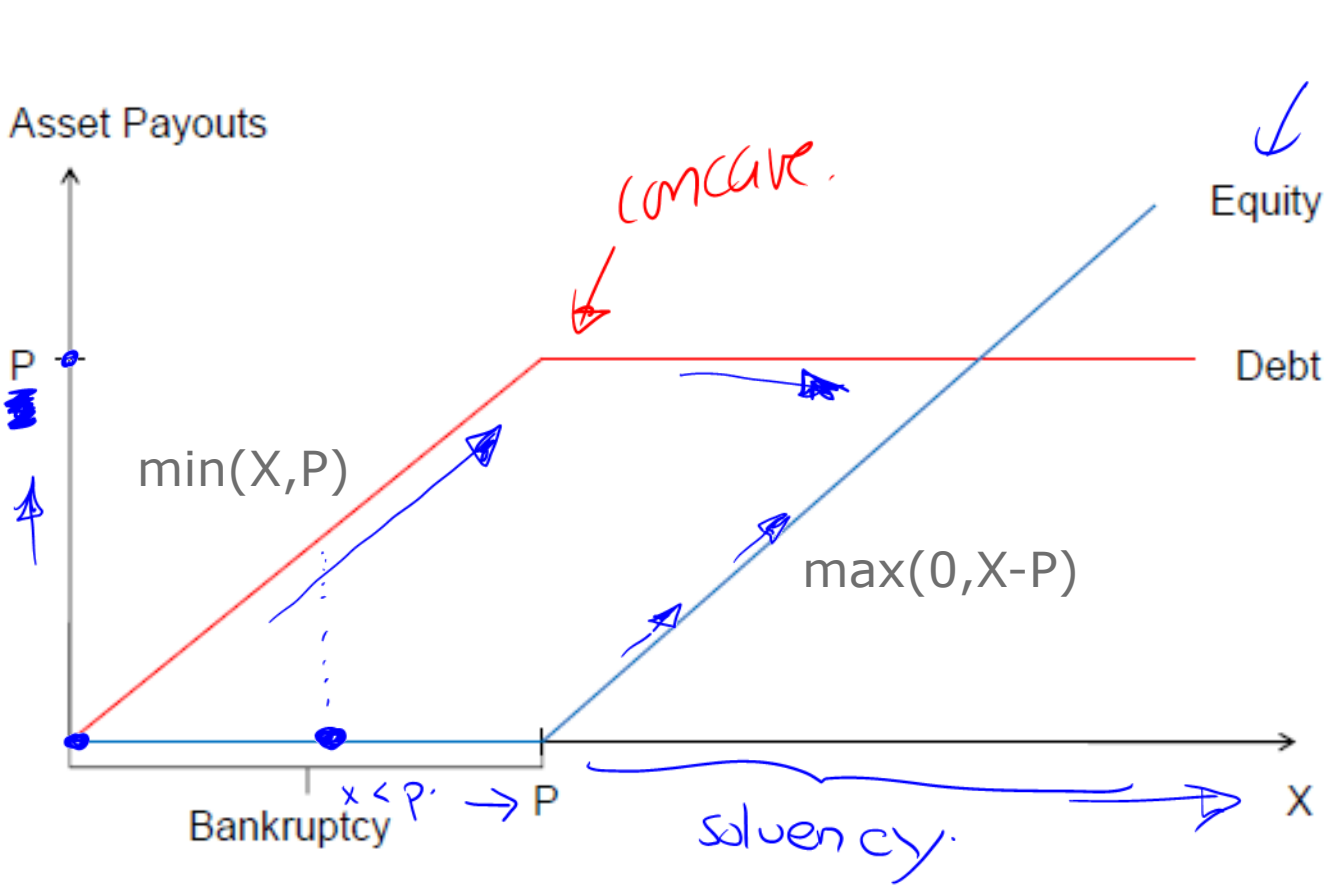
Equity gives a right to the residual cash flow; discretionary dividends

Equity confers a right to control, but subordinate to debt

Debt and Equity

Points to potential conflict associated with risk

Suppose the firm has debt D=P, and receives income X.
-How much will creditors receive?
-How much will shareholders receive?



Modigliani-Miller Theory

Modigliani-Miller: with perfect capital markets, the financing decision is irrelevant.

The total value of the firm is independent of the firm's financial structure (debt, equity, …)

The total value is also independent of the firm's payout policy (dividends, share repurchases, …)

It is equal to the market value of the total cash flows generated by the firm's assets. See the previous graph!

Absalon: Myers article on capital structure:
↳ WACC is constant
(does not depend on debt level/ratio)

Modigliani-Miller Theory

In practice, markets are often imperfect.

Projects with positive NPV not undertaken due to market imperfections

Projects have negative NPV due to market imperfections

Firm's decision to undertake a project may depend on its financing decision

What is the relevant departure from the benchmark? What is the key market friction?

Trade-Off Theory

Taxation rules often favor debt

Interest payments on debt can be deducted from corporate tax base: interest Tax Shield

(Personal taxes may offset some of benefits)

Weigh tax benefits of taking on debt against potential costs of financial distress.

→ legal costs

Costs related to default / bankruptcy.

→ losing customers, suppliers, ... etc.

Costs related to agency theory

Agency Theory

Often the issue may be agency problems – moral hazard (hidden actions) and adverse selection (hidden information).

Separation of ownership and control: management's decisions affect firm value

But management's incentives may differ from shareholders', both may differ from creditors'

Think of creditors or shareholders as the principal, management as the agent

- CEO may exert insufficient effort, choose inefficient projects, engage in empire building, misreport cash flows, etc.

Incentive contracts, monitoring, but also capital structure, may help/hurt to align incentives.

Conflicts between firm "insiders" and "outsiders" affects whether/ how firms can obtain financing.

Questions and comments so far?

A MODEL OF CREDIT RATIONING

Lenders / investors /outsiders

Entrepreneur / borrower / insider

Project costs I.
Has cash $A < I$.

Borrow: $I - A$.

Key question: Can lenders recoup their investment?

Risk neutral entrepreneur has one project, needs outside financing.

Project costs I.
Entrepreneur has equity $A < I$; borrows $I - A$;
is protected by LL.

limited liability
⇒ entrepreneur cannot get a negative payoff.

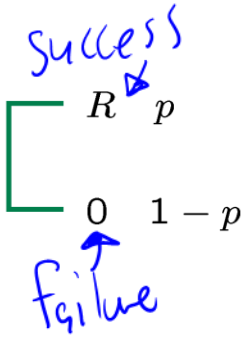
Moral hazard

	Pr (success)	Private benefit
Behaves	p_H	0
Misbehaves	p_L	B

$\Pr(\text{failure}) = 1 - p_H = 1 - p_L$.

$B > 0$.

Verifiable outcome



Want to induce **good behavior**:

$$NPV = p_H R - I > 0,$$

and

$$[p_L R - I] + B < 0.$$

expected cash with good behavior. cost

Lender: really cares about incentives to behave well (i.e. the borrower)

Contract: Specify how to split the cash flow in case of project success

Success: $R_b + R_l = R$.

borrower lender.

Failure: 0 each

Borrower incentive constraint:

$$p_H R_b \geq p_L R_b + B.$$

$$(p_H - p_L) R_b \geq B$$

$$\Delta p \, R_b \geq B.$$

Incentive compatibility constraint for the borrow:

$$(p_H - p_L)\, R_b \geq B$$

; $\Delta p R_b \geq B$.

Question for you: **(i)** What is the highest value of R_l (repayment to the lender) that the parties can agree on? **(ii)** If lenders are willing to break even on average, under what condition will the project get financed?

A. (i) $R - \frac{B}{p_H - p_L}$ (ii) $p_L\left(R - \frac{B}{p_H - p_L}\right) > I - A$

B. (i) $R - \frac{p_H - p_L}{B}$ (ii) $p_L\left(R - \frac{p_H - p_L}{B}\right) > I - A$

C. (i) $R - \frac{B}{p_H - p_L}$ (ii) $p_H\left(R - \frac{B}{p_H - p_L}\right) > I - A$

D. (i) $R - \frac{p_H - p_L}{B}$ (ii) $p_H\left(R - \frac{p_H - p_L}{B}\right) > I - A$

$R_b + R_l = R$

→ must pay up!

correct

Discuss in pairs. Then go to socrative.com, Room 897458, and vote for the best answer

Borrower IC: $\Delta p \cdot R_b \geq B$

$\Rightarrow R_b \geq \frac{B}{\Delta p}$ } Borrower is required "skin in the game" or "minimum required stake"

$R_B + R_L = R$

$\Rightarrow R_L = R - R_b$

$R_L \leq R - \left(\frac{B}{\Delta p}\right)$

Lender's payoff: $R_L = R - \left(\frac{B}{\Delta p}\right)$

$\hookrightarrow \boxed{p_H\left(R - \frac{B}{\Delta p}\right) - (I - A) \geq 0}$

max. expected repayment. initial outlay

$$p_H\left(R - \frac{B}{\Delta p}\right) \geq I - A$$

or

PLEDGEABLE INCOME ≥ INVESTORS' OUTLAY

Minimum equity: $p_H\left(R - \frac{B}{\Delta p}\right) = I - \bar{A}$

$\bar{A}$ → minimum cash needed to get the project financed.

Remarks

(i) If project gets financed, the borrower receives entire NPV

$$p_H R_b - A = p_H (R - R_\ell) - A = p_H R - I.$$

(ii) Projects with positive NPV may end not being funded. Specifically if A < $\overline{A}$: **credit rationing**

(iii) Credit rationing more likely to apply to firms with little cash on hand (low A) or high agency costs (high B/($p_H - p_L$))

(iv) High agency costs associated with high private benefits from borrower misbehavior; and low sensitivity of project outcome on borrower behavior

(v) Here, lender's claim can be interpreted either as equity or debt (not general)

DEBT OVERHANG

Definition: A new project does not get financed due to presence of a previous claim.

Example:

$p_H\left(R - \frac{B}{\Delta p}\right) > I$

Project with $\overline{A} < 0$

Borrower with no cash (A = 0), previous claim D from some initial investors who have no further cash

$$D \geq \left(-\overline{A}\right)/p_H$$

Can the borrower raise funds from new investors, to fund a project with NPV: $p_H R - I > 0$?

Previous claim is **senior.** → initial investors have priority for repayment

Same analysis as before, but with $A=0$ and R replaced by $R-D$. ; $R_b + R_l = R - D$ paid to initial investors.

Borrower IC: $p_H\left(R - D - \frac{B}{\Delta p}\right) \geq I$ (-A)

$$p_H D \leq p_H\left(R - \frac{B}{\Delta p}\right) - I$$

$$D \leq -\bar{A}/p_H.$$

But we assumed $D > -\bar{A}/p_H$.

➡ cannot raise funds.

DEBT OVERHANG

We have seen that **debt overhang** can leave the borrower unable to finance a new project.

Question: Is there any kind of agreement that the borrower and initial investors might come to, that would leave them both better off? If so, what would such an agreement look like?

Discuss in pairs. Then go to socrative.com, Room 897458, and write a short answer (2-4 sentences)

Your Answers: on Absalon

Debt forgiveness, restructuring or similar.

Resulting debt overhang:

lenders put in I

↳ some proceeds, in case of success go to borrower (R_b)

AND

the previous investors (D)

→ reduces my incentives to lend;

When is debt overhang an issue?

– Situations with many creditors. For example corporate bonds.

Ressources

For those interested in reading more, either now or in the future.

Corporate Finance Theory by Berk and DeMarzo. Section on capital structure

Capital Structure by Myers (2001, Journal of Economic Perspectives). Link to article available on course homepage.

The Theory of Corporate Finance by Tirole. Link to the book's Introduction available on course homepage. You do not need to buy the textbook for the course, but it is a good resource.

Intended outcomes revisited.

1. Know a number of practical issues regarding the lectures: **Number of lectures, attendance**

2. Consider how to get the most out of different aspects of the course: **Absalon, lectures, office hours**

3. Become familiar with a number of important concepts in Corporate Finance Theory, and develop a model where moral hazard can lead to credit rationing: **debt and equity, Modigliani-Miller, market imperfections and agency problems; model of credit rationing + debt overhang.**

Preparation for next time

1. Watch the video in the folder for Lecture 2, to understand how issuing new claims can dilute those of initial investors; even if the new claims are junior to the initial ones.

2. Consider the model of credit rationing seen today (slides 20 – 29) but with one difference: project failure still yields strictly cash flow. That is, failure yields R', with $0 < R' < R$. A contract now must specify the cash flow the borrower and lender receive in case of success, R_b and R_l respectively; and the cash they receive in case of failure, R_b' and R_l'. A) For a given contract, write down the incentive compatibility constraint for the borrower to engage in good behavior. B) If lenders are willing to break even on average, under what condition will the project get financed? **Hint: follow the steps seen in the Lecture slides today.** ***Be ready to share your thoughts next time!***

Note: for Question 2, you can assume

$$p_L R + (1 - p_L) R' + B < I$$