
1.2. Asymmetric information and barriers to efficiency

Asymmetric information and barriers to efficiency

The Efficiency Principle:

“If agents are able to bargain together effectively and if they can effectively implement and enforce their decisions, then the outcome of economic activity will tend to be efficient (at least for the parties to the bargain)”

Asymmetric information and barriers to efficiency

- **Barriers to Efficiency**

- Identifying and bringing together relevant parties
- Information acquisition and processing: which alternatives?
- Information acquisition and processing: value of alternatives?
- Bargaining: will it really lead to efficient outcome?
- Limits to distribution of value
- Costs of writing and monitoring contracts
- Limited enforcement:
 - Can parties commit to do what they agreed upon?
 - Measurement problems: did they follow the contract?

Asymmetric information and barriers to efficiency

- We are going to deal with some of these barriers
- First, we'll focus on **information asymmetries**
- Why?
 - One of the main barriers for:
 - **Effective bargaining**
 - **Implementation** and **enforcement** of agreements
- How to deal with problems of asymmetric information: one of the most important tasks in coordination/motivation

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Microsoft-Yahoo

- Did asymmetries of information play any role in the failure of the merger?

Asymmetric information and barriers to efficiency

- “More and more small and medium sized firms are having difficulties obtaining financing and these difficulties are also becoming greater”
(Miguel Sebastián, Spanish Industry Minister, El País, 23-02-09)

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Financing

- María is an entrepreneur with an idea
- María goes to the bank to request a loan
- Problem 1:
 - María may know whether her idea is good
 - ... but the bank doesn't
 - asymmetric information about the quality of María's project
- Problem 2:
 - The idea may be good, but, if María gets the loan, she may use the money to pay her friends large salaries rather than investing in project
 - asymmetric information about María's decisions/actions as manager

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- “Even though banks have reported billions of dollars of losses from bad loans, these critics say, the major institutions still carry trillions of dollars in additional toxic assets and are too damaged to resume normal lending.”

(The New York Times, 22-02-09)

Asymmetric information and barriers to efficiency

Current financial crisis.

- One big problem: banks had (and still have) “toxic assets”
 - Complex financial assets, hard to value
 - Some close to worthless, others significant value
 - Problem: banks need to sell some of these assets, but markets not working
 - Banks cannot sell even “good” assets (or only at “firesale” prices)
 - Why are the markets not working?
 - Asymmetric information: potential buyers think that sellers will try to sell them the most toxic assets.

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- Potential solution: the govt. buys the assets
... (there are others)
- Problem: how to organize the sale in a way that the govt. (or other buyers) pays a reasonable amount?

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- Large pharmaceutical firm of country A considers outsourcing production of a drug to young producer in country B
 - Producer in country B promises to establish strict quality control
 - Problem: the large pharmaceutical firm cannot observe how strict the controls are in practice
- Asymmetric information about quality controls (decision/action of producer in country B) may prevent the agreement

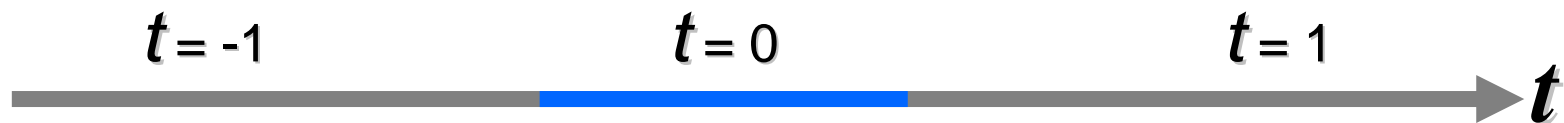
Asymmetric information and barriers to efficiency

Some jargon:

- **Perfect information:** all the parties have all the relevant information
- **Symmetric information:** all the parties have the same relevant information, but they may not have all the relevant information
- **Asymmetric information:** different parties have different relevant information (parties have private information)
- **Public information:** information known by all
- **Contract:** agreement that governs a transaction (need not be written, explicit)

Asymmetric information and barriers to efficiency

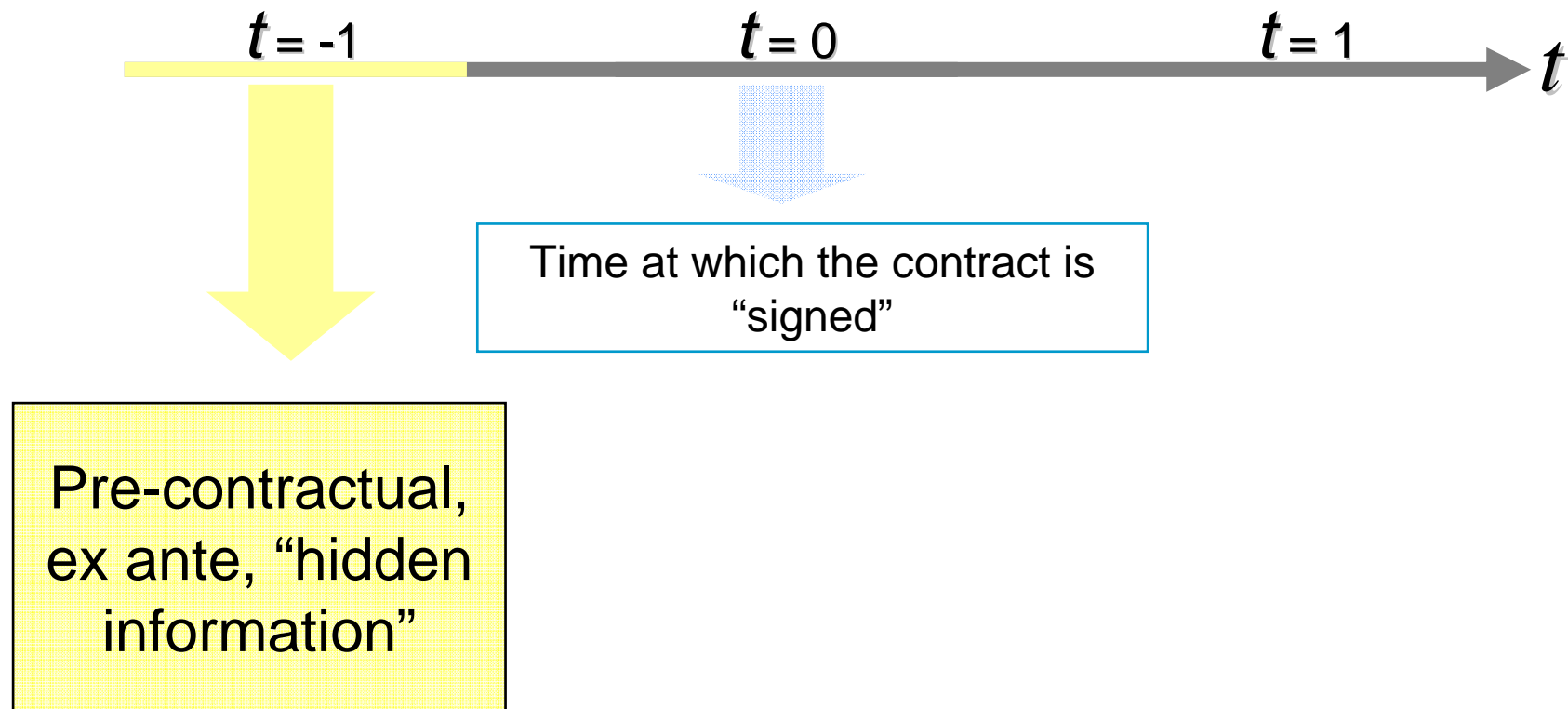
- Timing of information asymmetries



Time at which the contract is “signed”

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- Timing of information asymmetries



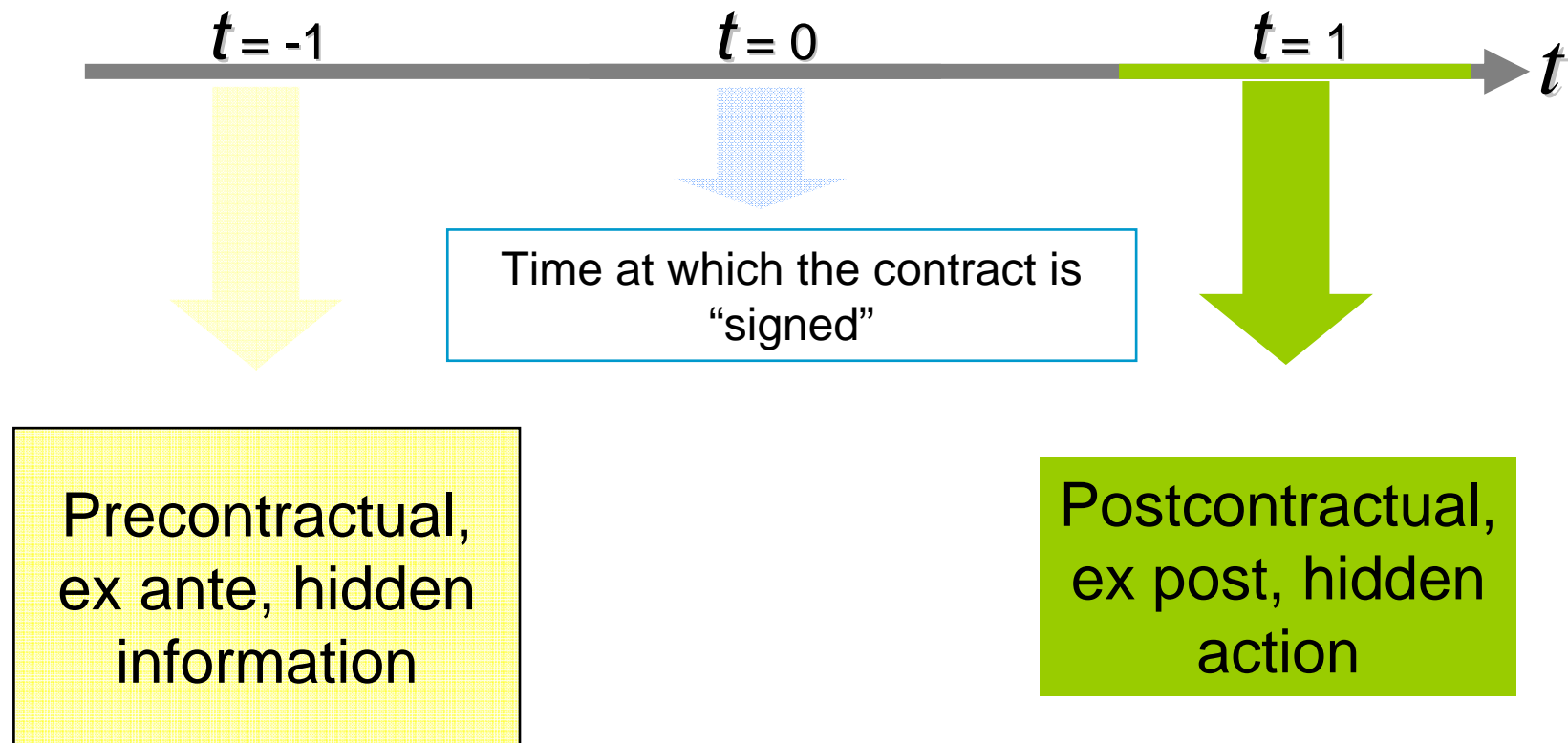
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Precontractual or *ex ante* asymmetric information (hidden information problems)

- The parties have private information prior to signing the contract:
 - Job candidate and employer
 - Entrepreneur and bank
 - Buyer of insurance and insurance company
 - Target and acquirer in an acquisition
 - Buyer and seller of a used car
 - Managers *vis à vis* shareholders, debtholders

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- Timing of information asymmetries



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Postcontractual or *ex post* asymmetric information (*hidden action* problems)

- *After* signing the contract, a party (or several) can take *actions* that *cannot be observed* by the other parties
 - Employee and employer
 - Managers and investors
 - Buyer of an insurance policy and insurance company

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- Later in the course, we will focus on consequences of asymmetric information for:
 - Employee selection
 - Motivation
 - Vertical integration
- Now, focus on **precontractual asymmetric information as barrier to efficiency** (limit to **EP** and **Coase Theorem**)

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Bargaining with asymmetric information

Example 1: bargaining over a company acquisition

- Firm M initiates contacts to acquire firm Y
- Firm Y may be in one of two possible situations:
 - Y_L . If it stays alone, no good investment projects: value 0
 - Y_H . If it stays alone, profitable investment projects: value 2
 - Probability of Y_L : 80%; probability of Y_H : 20%.

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- Firm M can be in two different situations:
 - M_H . Knowledge of its employees complementary to assets of Y → extra value if acquisition: 3
 - M_L . Knowledge of its employees not well adapted to assets of Y → extra value if acquisition: 1
 - Probability of M_H : 80% ; probability of M_L : 20%

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- Is the acquisition efficient?

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Value if acquisition	Value if stand-alone Y	
	0 (prob=0.8)	2 (prob=0.2)
1 (prob=0.2)		
3 (prob=0.8)		

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- **If**
 - M knows whether Y_H or Y_L
 - Y knows whether M_H or M_L
- In which cases do we expect the acquisition to take place?

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Value if acquisition	Value if stand-alone Y	
	0 (prob=0.8)	2 (prob=0.2)
1 (prob=0.2)		
3 (prob=0.8)		

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- As predicted by Efficiency Principle → in each case, parties agree on efficient outcome

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- Now, suppose that when they initiate bargaining
 - M knows value of the acquisition but not Y's stand-alone value
 - Y's knows its stand-alone value but not M's value of the acquisition
 - Both parties know the possible situations that may arise and their corresponding probabilities

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- If you were Y:
 - If your stand-alone value were 2, would you reveal it to the buyer?
 - Benefits of “honesty”: if $M=3$, you will bargain a high price (between 2 and 3)
 - Costs of honesty: ?
- It pays off to be honest

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- If your stand-alone value were 0?
 - Benefits of honesty: you ensure that there is a deal, which is good since your value is 0
 - Costs of honesty: you'll probably get a low price even if $M=3$
- In this case, there is a trade-off between ensuring that a deal takes place and negotiating a high price
- What determines that trade-off?
 - How likely it is that M will give little value to the acquisition (how likely it is that the negotiation will break down)
 - How much the price may increase if M gives a high value to the acquisition (how much the price may increase)

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- If you were M:
 - If the value of the acquisition were 1, would you reveal it to Y?
 - If the value of the acquisition were 3?

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- What if Y convinces M that its stand-alone value is 2 and M convinces Y that the value of the acquisition is 1?
- It is possible that the acquisition does not take place even if it is efficient
- But,... what about the Efficiency Principle?
- **Asymmetric information** precludes “**effective bargaining**”

Asymmetric information and barriers to efficiency

The Efficiency Principle:

“If agents are able to bargain together effectively and can effectively implement and enforce their decisions, then the outcome of economic activity will tend to be efficient (at least for the parties to the bargain)”

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- We could analyze the problem quantitatively if we knew more details about the bargaining process.
- However, we will **not** try to fully solve the problem (would require a bit of Game Theory)
- We will just check **whether the perfect info outcome** (acquisition if and only if it is efficient) **can be expected to hold**.

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- Suppose that:
 - Y submits their minimum acceptable price to an arbitrator (Y_R).
 - M submits their maximum acceptable price to an arbitrator (M_R).
 - If $M_R < Y_R$ there is no sale
 - If $M_R \geq Y_R$ the price is the middle point between M_R and Y_R

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- Suppose that you are Y, $Y=0$ and you expect M to be honest
 - Does it pay to be honest?
 - Expected payoff if honest: $(0.2*0.5) + (0.8*1.5) = 1.3$
 - Expected payoff if dishonest: $(0.2*0) + (0.8*2.5) = 2$
- if M is honest, Y has no incentives to be honest!

Value if acquisition	Value if stand-alone Y	
	0 (prob=0.8)	2 (prob=0.2)
1 (prob=0.2)		
3 (prob=0.8)		

Asymmetric information and barriers to efficiency

- Suppose now that you are M, $M=3$ and you expect Y to be honest
 - Does it pay to be honest?
 - Expected payoff if honest:
 $(0.8*(3 - 1.5)) + (0.2*(3 - 2.5)) = 1.3$
 - Expected payoff if dishonest:
 $(0.8*(3 - 0.5)) + (0.2*0) = 2$
- if Y is honest, M has no incentives to be honest

Value if acquisition	Value if stand-alone Y	
	0 (prob=0.8)	2 (prob=0.2)
1 (prob=0.2)		
3 (prob=0.8)		

Asymmetric information and barriers to efficiency

- For the numbers in the example, we cannot expect both to be honest all the time → with some probability they will lie and the acquisition will not take place when it is efficient!
- What they will actually do?
 - Hard to tell
 - Game theory provides an answer: they will be dishonest “part of the time”
(for those in the know, a Bayesian Nash equilibrium in mixed strategies)