LECTURE 6.0

WHAT IS A FIRM?

THE FIRM

The price mechanism is effective in market transactions:

- It uses information efficiently
- It provides strong incentives

A firm uses administrative fiat rather than the price mechanism to allocate resources. Why?

- Exchange or transactions in markets incur contracting costs: search and information costs, bargaining and decision costs, drafting and enforcement costs.

Why do we have firms?

- Why do some transactions take place in markets, and others within firms?

THE FIRM

Our model of firms to this point is clearly oversimplified. We had a single actor making profit maximizing decisions.

The remainder of this week's content will examine different ways we can view the firm.

OUTLINE

6.0 What is a firm?

6.1 The neoclassical model

6.2 Transaction cost economics

6.3 Principal-agent theory

6.4 The firm as a nexus of contracts

6.5 Property rights approach

6.6 Incentive conflicts and contracts

6.7 Information problems

READING

Hart (1989) "An Economist's Perspective on the Theory of the Firm", Columbia Law Review, 89(7), 1757-74

Chapter 10, “Incentive Conflicts and Contracts” in Brickley, Smith and Zimmerman (2016) Managerial Economics and Organizational Architecture (6th ed)

Lecture Note 2: Relational Contracts (Links to an external site.) in Robert Gibbons, MBA Course (15.903: Organizational Economics and Corporate Strategy)

Links to readings or downloads are available in Canvas.

LECTURE 6.1

THE NEOCLASSICAL MODEL

THE NEOCLASSICAL MODEL

Think of the firm as a set of production plans.

Strengths:

- Nice from math perspective, rigourous but rudimentary.
- Tractable: allows modelling how exogenous changes (shocks) affect firm behaviour, such as a change in wages or introduction of a tax
- Useful for thinking about strategic behaviours under imperfect competition

THE NEOCLASSICAL MODEL

Think of the firm as a set of production plans.

Weaknesses:

- Says little or nothing about internal workings of firm, how decisions made etc
- Ignores conflicts within the firm. Many of those decision makers do not have a primary objective of maximising the value of the firm. They are, after all, individual economic agents with their own preferences. They can have different interests.
- No insight into what are the boundaries of the firm: no insight into mergers, splitting of firms into smaller firms, structure. Why do firms employ workers for some services, and contract for or purchase other services?

LECTURE 6.2

PRINCIPAL-AGENT THEORY

PRINCIPAL-AGENT THEORY

Principal-agent theory:

- builds on neoclassical theory and emphasises incentives
- considers separate role for workers, managers within a firm
- highlights conflicts defined by asymmetric information

Owners cannot contract manager to maximise profit, but must use incentive schemes to align interests.

PRINCIPAL-AGENT THEORY

Strengths:

- Enriches neoclassical model by recognising relationships in firm
- Acknowledges challenges of resolving conflicts within firm

Weaknesses:

- Provides limited insight into boundaries of the firm.

We are going to examine principal-agent theory in more detail later this semester when we cover incentives.

LECTURE 6.3

TRANSACTION COST ECONOMICS

TRANSACTION COST ECONOMICS

Transaction costs are faced by agents whenever they interact: costs of thinking, planning, contracting

- Transaction costs may be lower when internalised within a firm, because the firm has decision-making authority
- Authority is what defines the firm
- The cost of authority is the risk of errors and decision-making rigidity, leading to an inefficient allocation of resources.

Rather than having to specify every detail into a myriad of contracts, people can become employees with more scope to vary in their actions and duties as required.

TRANSACTION COST ECONOMICS

Strengths:

- Provides insight into where the boundaries of the firm – where the costs and benefits of internalising versus externalising transactions are equalised.

Weaknesses:

- Transaction costs remain somewhat ambiguous.
- The source of authority is not clear. How is a refusal to do what is asked (by an employee for example) resolved?

LECTURE 6.4

THE FIRM AS A NEXUS OF CONTRACTS

NEXUS OF CONTRACTS

The firm is defined by a set of contractual relationships

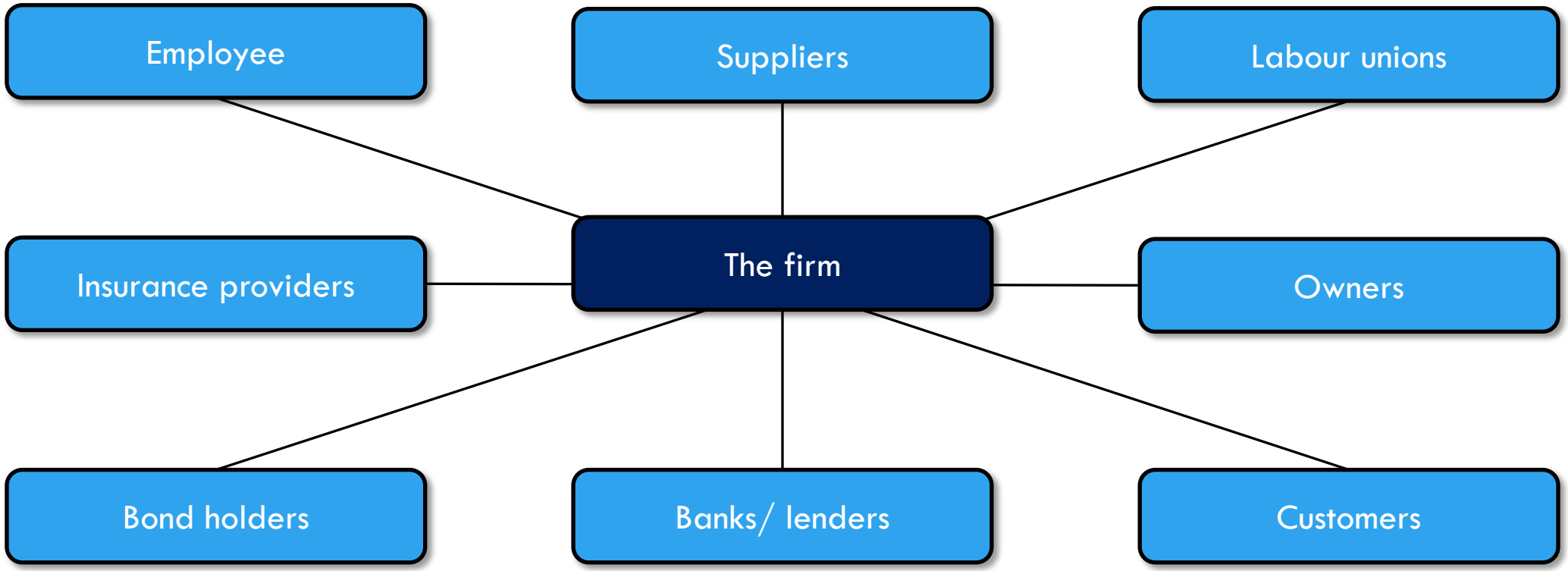
- with employees, suppliers, customers, creditors
- formal legal contracts
- informal/implicit contracts, expectations, and relationships

Think of the firm as a nexus of contracts where the firm is always one of the parties to the contract.

The contracts include both enforceable legal contracts and informal/implicit contracts, expectations and relationships.

- Contracts from an economist's perspective don't need to be '*enforceable legal agreement*' (lawyer's definition).
- Rather think of them as relationships characterised by reciprocal expectations and behaviour. Contracts can be implicit or explicit.

NEXUS OF CONTRACTS



NEXUS OF CONTRACTS

Strengths:

- Makes clear that there is a series of relationships that make up the firm

Weaknesses:

- Doesn’t necessarily help us understand the scope of the firm or why firms take particular forms.

LECTURE 6.5

PROPERTY RIGHTS APPROACH

PROPERTY RIGHTS APPROACH

Control over non-human assets defines the firm:

- Emphasises the contingent nature of relationships: it is not possible to write comprehensive contracts that cover all contingencies
- Property rights determine incentives when contracts leave gaps
- *Hold up* leads to inefficient decision making before and after contracts

PROPERTY RIGHTS APPROACH

Example of hold up: A and B have a profit opportunity.

1. A decides whether to invest $6m in the project.
2. If A invested, A and B can earn combined profits of $10m.

Suppose A and B negotiate a contract before A invests. What might the contract look like?

Suppose A and B negotiate a contract after A invests. What might the contract look like?

Understanding the property rights are critical for identifying the incentives of agents when comprehensive long-term contracts cannot be written. That is, the residual rights of control over assets will have implications for asset usage and division of surplus in a relationship.

PROPERTY RIGHTS APPROACH

Strengths:

- Helps explain boundaries of the firm – complementary assets should be located within a firm to avoid hold up problems and reduce potential incentive problems.

Weaknesses:

- Doesn't really incorporate information about separation of ownership and control.

LECTURE 6.6

INCENTIVE CONFLICTS AND CONTRACTS

INCENTIVE CONFLICTS

A fundamental story of economics is utility maximising economic agents. Managers are no different. The actions that maximise a manager's utility won't in general be actions that maximise the utility of shareholders or owners.

More generally, parties that contract with a firm are unlikely to have interests that are aligned. Managers, employees, suppliers have different goals to owners

What types of conflicts arise in firms? Conflicts between an owner and manager include:

- Effort choice
- Perks (company car, nice office, travel)
- Risk exposure – managers have a portfolio (both financial and human capital) different from firm's owners
- Different time horizons
- Overinvestment and empire building

INCENTIVE PROBLEMS AND CONTRACTS

How can these conflicts be resolved?

- Implicit and explicit contracts can be used to align interests

Contracts define an organization's architecture:

- who makes what decisions
- the rewards and penalties which flow from them.

INCENTIVE PROBLEMS AND CONTRACTS: EXAMPLE

Assume we want to prevent a CEO from taking too many perks: the CEO likes perks, the owner wants to limit spending on perks.

Suppose the CEO has a utility function:

$$U = f(C, P)$$

Where:

C is their direct compensation

P is the perks they receive

Suppose the CEO must be 'paid' at least S: $U(C,P) \geq U(S,0)$. Otherwise, she will find a job at another firm.

INCENTIVE PROBLEMS AND CONTRACTS: EXAMPLE

Next, assume the owners of the firm know the maximum profit (π_M) that could be attained:

$$\pi_R = \pi_M - P$$

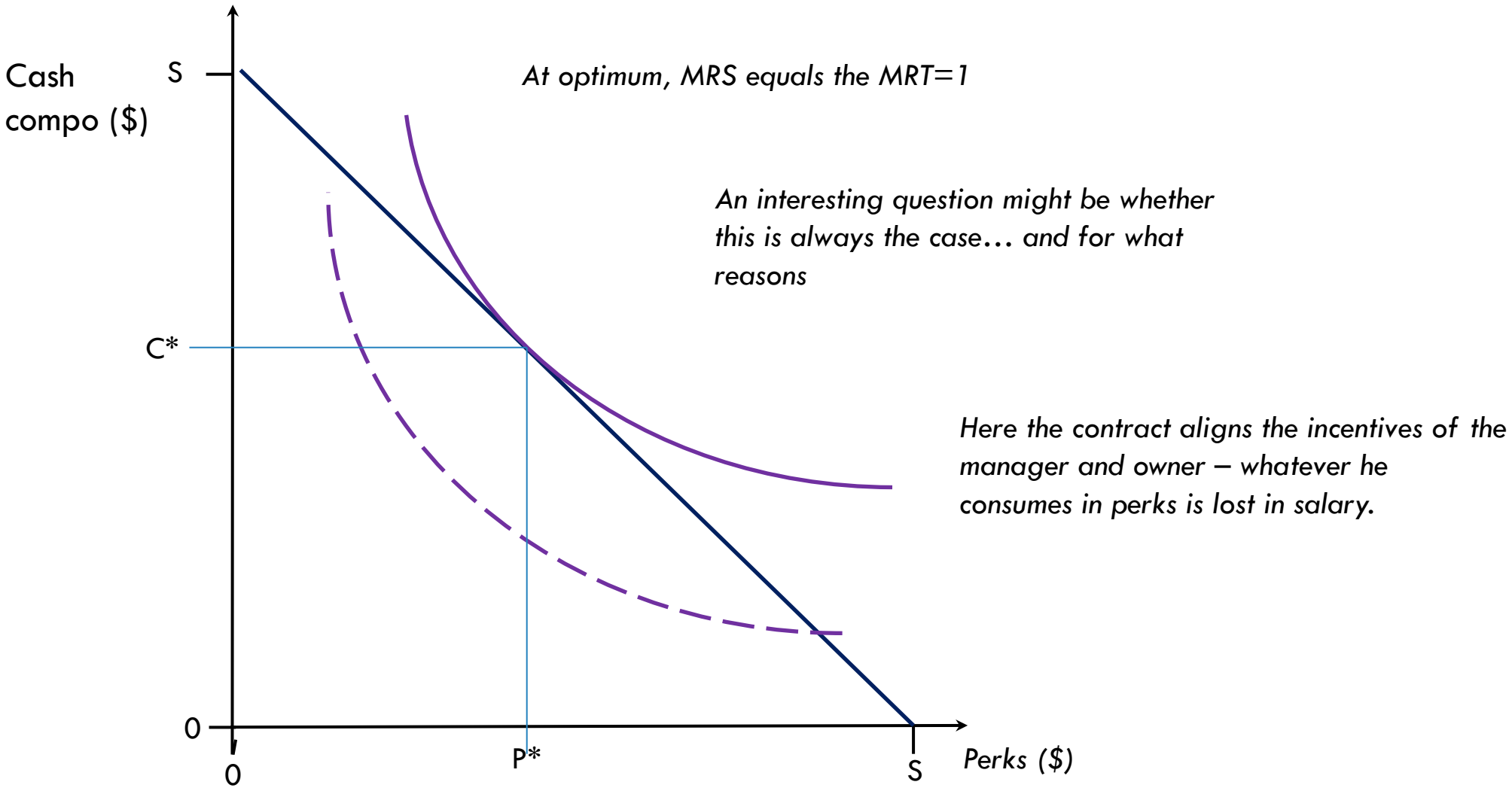
Where π_R is realized profits

If π_R is contractable, the optimal contract is:

$$C = S - (\pi_M - \pi_R)$$

This contract directly charges the CEO for any perks she consumes (i.e. $C = S - P$)

Whatever the CEO consumes in perks is lost in salary. This forces the CEO to internalise the costs of her perks



At optimum, MRS equals the MRT=1

An interesting question might be whether this is always the case… and for what reasons

Here the contract aligns the incentives of the manager and owner – whatever he consumes in perks is lost in salary.

INCENTIVE PROBLEMS AND CONTRACTS

Complications:

- Contracts are not costless to negotiate, write and enforce.
- Information is asymmetric. what is the most obvious aspects of asymmetry in the relationship above? Hint: think about π.
- Information asymmetries might occur before the contract is negotiated, and after.

LECTURE 6.7

INFORMATION PROBLEMS

POST-CONTRACTUAL INFORMATION PROBLEMS

Principal-agent relationships:

- A principal engages an agent to perform a service on the principal's behalf (or a task that the principal cares about).

There are many agency relationships within a firm:

- Shareholders appoint a Boards of Directors.
- Boards delegate decision making authority to senior executives.
- Tasks are assigned to successively lower level of employees.

Agency problems arise because the interests of the principal-agent are not perfectly aligned. Moreover, asymmetric information means that these contracting problems cannot be resolved costlessly. Monitoring costs will be incurred.

Residual loss is the loss in gains from trade that result from the conflicts of interest in the agency relationship.

POST-CONTRACTUAL INFORMATION PROBLEMS

Moral hazard: After a contract is written, the agent may take (hidden) actions to benefit herself. That is, the agent acts in their own interests and inconsistently with the interests of the principal.

- It is costly to monitor the actions of an agent
- It is difficult to include all contingencies in a contract

Insurance is a classic example: after insuring, the insured takes more risks.

POST-CONTRACTUAL INFORMATION PROBLEMS

Consider a building firm that wishes to use a legal firm to provide advice. Let *L* be the number of hours of advice given each week. The marginal benefit of advice to the builder is:

$$MB = 200 - 2L$$

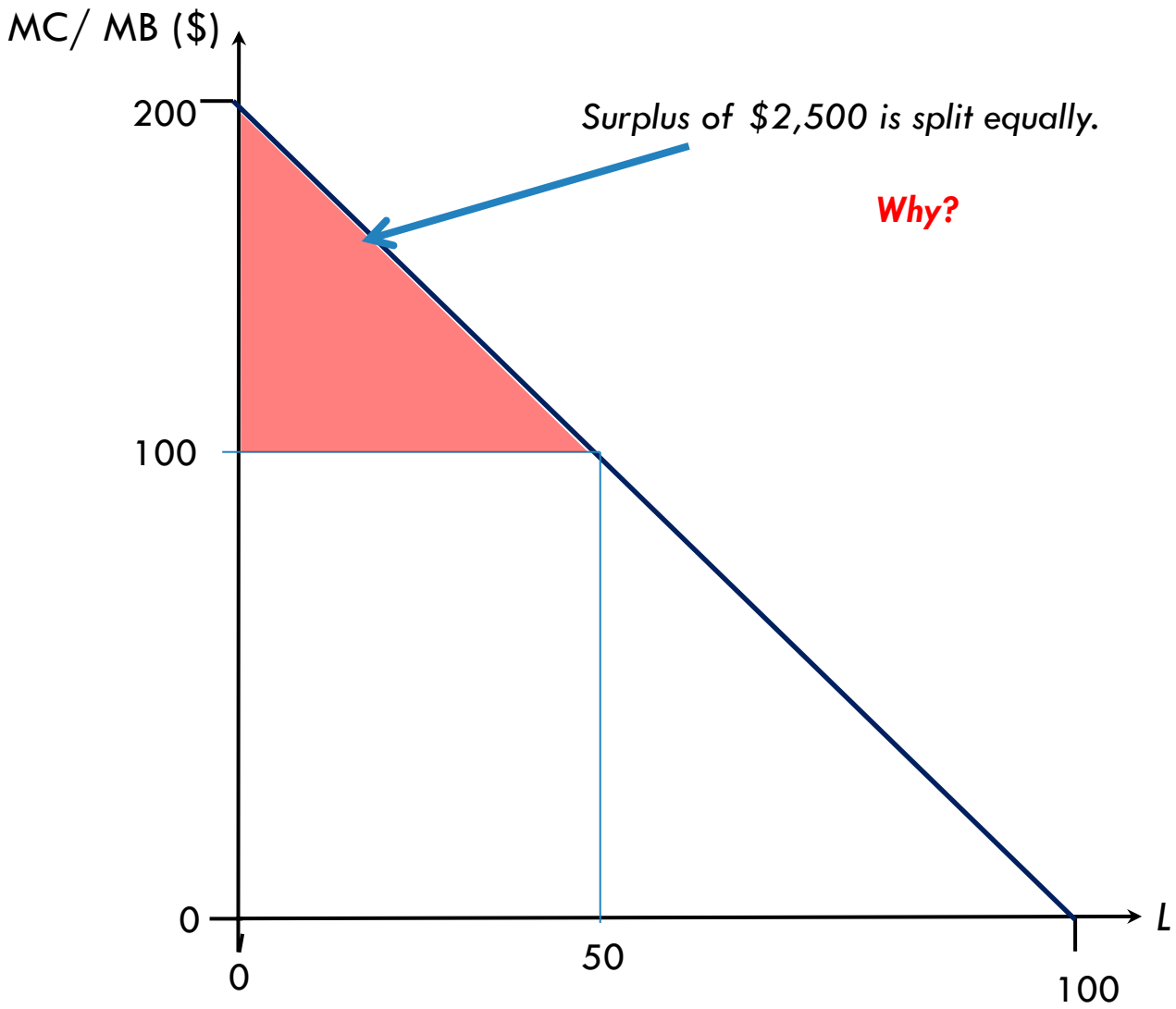
The law firm has constant marginal costs:

$$MC = 100$$

The optimal hours of legal service equates the marginal benefit and marginal cost:

$$MB = MC = 100 \rightarrow \quad L^* = 50$$

For example, a contract that specifies for 50 hours per week at $6250 gives both firms a surplus of $1250.


MC/ MB ($)
200
100
0
0
50
100
L
Surplus of $2,500 is split equally.
Why?

POST-CONTRACTUAL INFORMATION PROBLEMS

What if it is costly to verify the amount of work actually done? If the parties cannot agree on a contract, all surplus will be lost

Suppose instead that the firm can **monitor** the work of the law firm at a cost. The law firm incurs similar **bonding** costs to document its work. Will this resolve the problem of overbilling?

POST-CONTRACTUAL INFORMATION PROBLEMS

Suppose that the builder can pay $400 in monitoring and the law firm $400 in documenting its legal work.

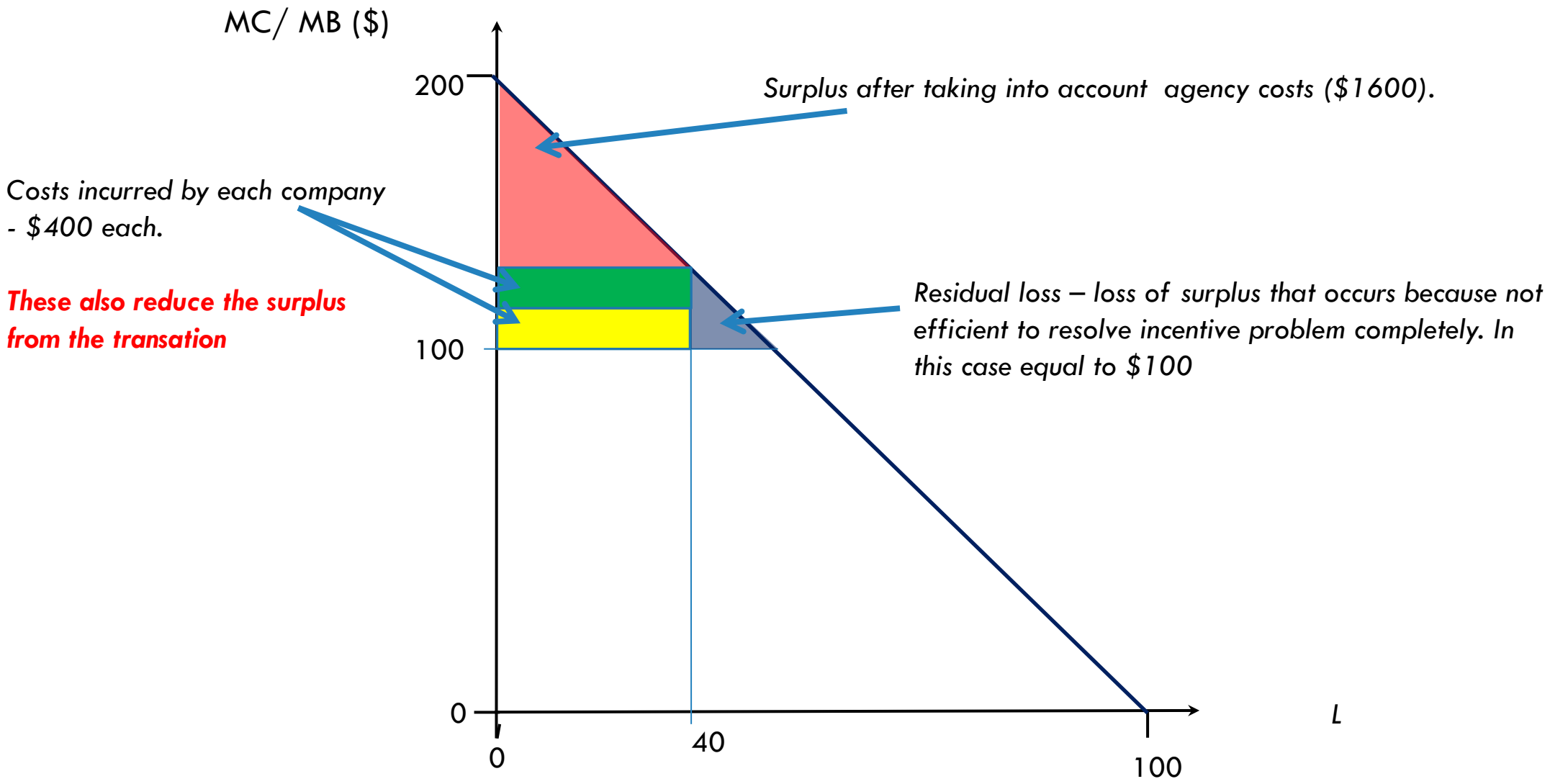
Further suppose that the monitoring can only ensure that at least 40 hours of work is done. As a result, the builder is unwilling to pay for more, so the law firm only provides 40 hours.

Under this framework there is a loss of $100 in surplus through the lower provision of hours, plus $800 in costs between the two forms. That leaves $1600 of surplus.

In splitting this remaining surplus equally, the builder and law firm could settle on a new contract for $5200 per week.

$$\pi_L = 5200 - 40 \times 100 - 400 = \$800$$

$$\pi_B = 6400 - 5200 - 400 = \$800$$


MC/ MB ($)
200
100
0
0
40
100
L
Surplus after taking into account agency costs ($1600).
Costs incurred by each company - $400 each.
These also reduce the surplus from the transation
Residual loss – loss of surplus that occurs because not efficient to resolve incentive problem completely. In this case equal to $100

PRE-CONTRACTUAL INFORMATION PROBLEMS

Bargaining failures: Sometimes because of information asymmetries mutually advantageous trades are simply never made. Think about bargaining between agents where surplus exists but is not generated.

- Example: Suppose a person is willing to accept a job for as little as $2,500 a month and an employer is willing to pay $3,000. As neither side knows the other's reservation price, the potential employee might ask for $3,500 as a first bid. The employer then discontinues negotiations as they believe they can't get the employee for less than $3,000.

Adverse selection: The agent has private information about her "type" or the hidden details of a contract

- the agent will only contract with the principal in circumstances that benefit her
- e.g. health insurance: healthy people are both cheaper to insure and less likely to apply
- e.g. the market for used cars: if I want to sell my car, it may be because it is unreliable

Various ways to overcome adverse selection, but none are perfect. Moreover, they can often be costly.

IMPLICIT CONTRACTS AND REPUTATIONAL CONCERNS

Many contracts that constitute the firm are implicit.

- Implicit contracts are promises and understandings that are not formalised within legal documents.
- Examples include promises of a promotion for a job well done, or an understandings that quality will be maintained.

Implicit contracts are difficult to enforce in court (by definition). They rely on the incentives of individuals to honour their terms

Reputational concerns Can act as a powerful force to motivate contract compliance. Each party's reputation must be valuable enough to ensure the contract is adhered to.

We have already encountered reputational concerns in the case of Anna and Bert. Recall:

IMPLICIT CONTRACTS AND REPUTATIONAL CONCERNS

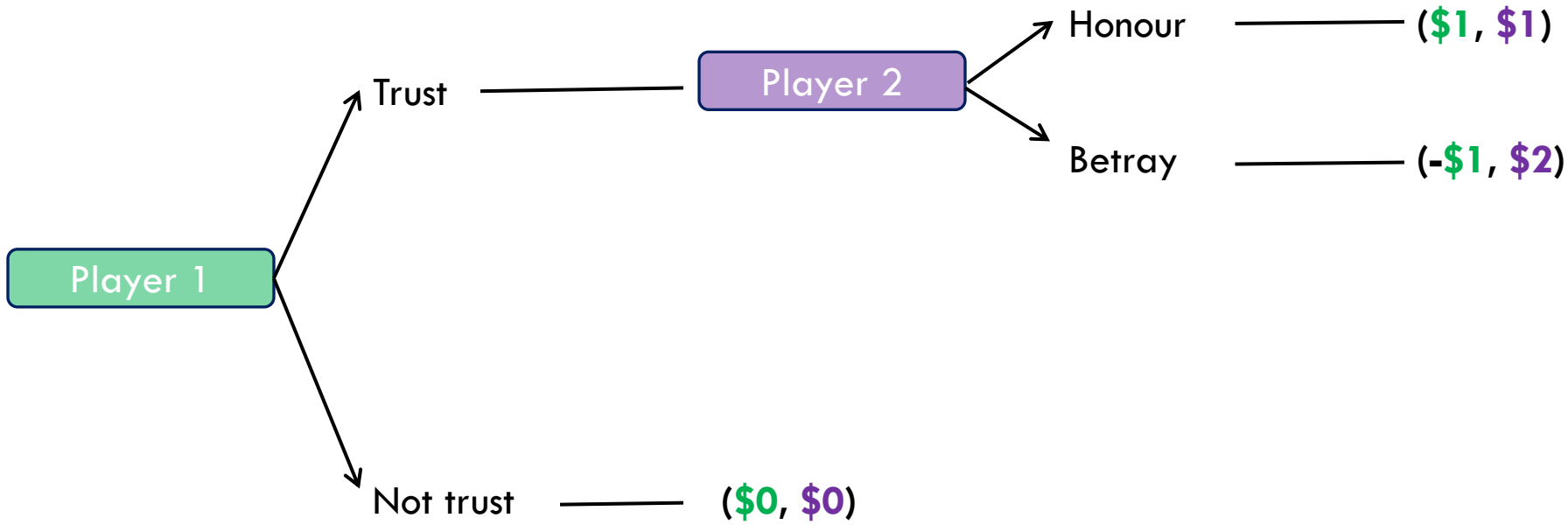
Consider two employees assigned to a team, Anna and Bert. Anna and Bert can work or shirk.

Payoffs reflecting the utility from exerting effort, along with the disutility of effort.

		Bert	
		Shirk	Work
Anna	Shirk	$1000, $1000	$3000, $0
	Work	$0, $3000	$2000, $2000

IMPLICIT CONTRACTS AND REPUTATIONAL CONCERNS

Consider a simple ‘trust game’ in which one party decides whether to trust the other party when they promise that they will be rewarded if they work hard. Could also be used as a model of a bonus based on subjective performance evaluation.



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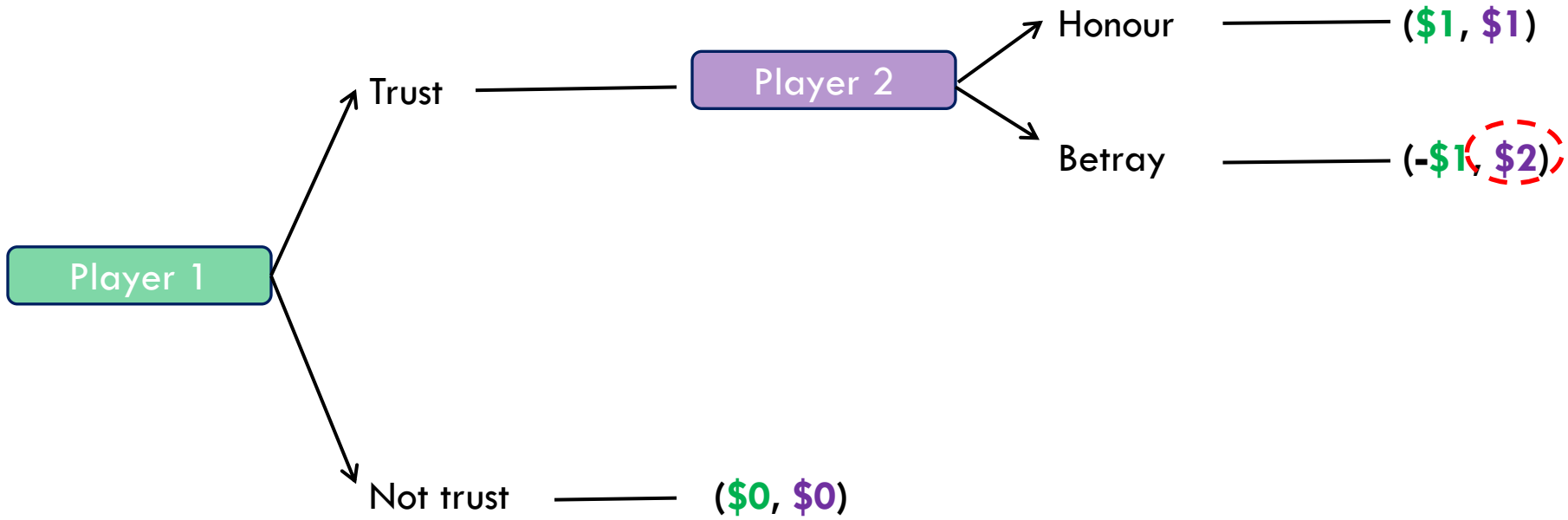

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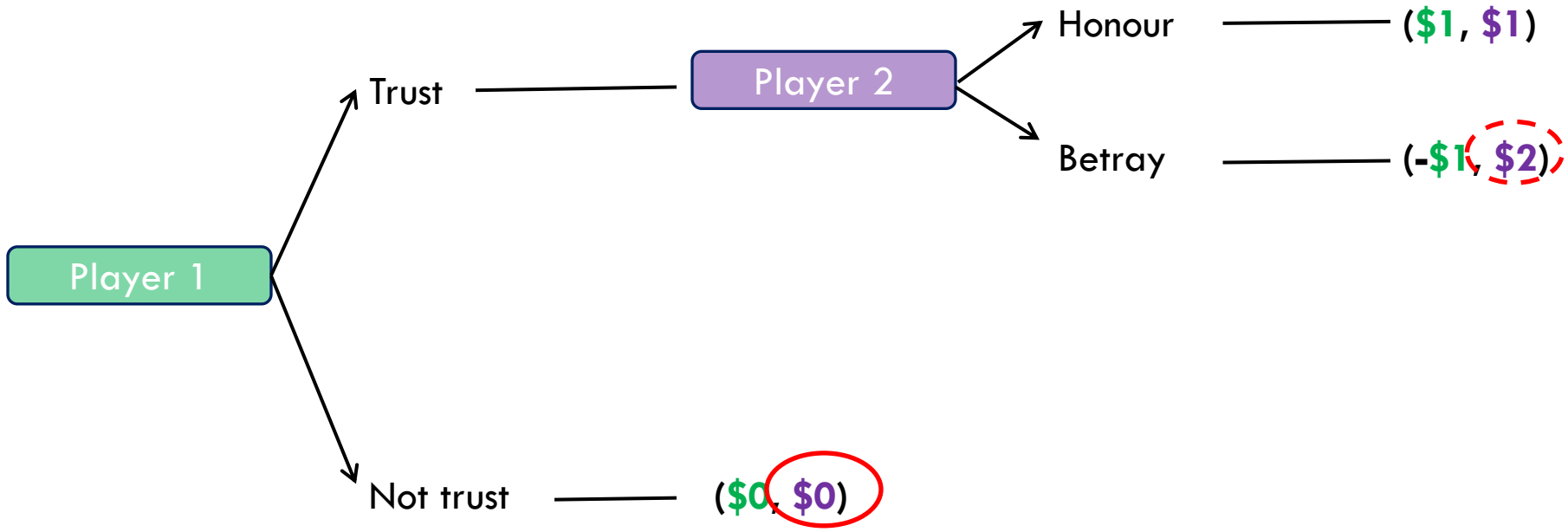

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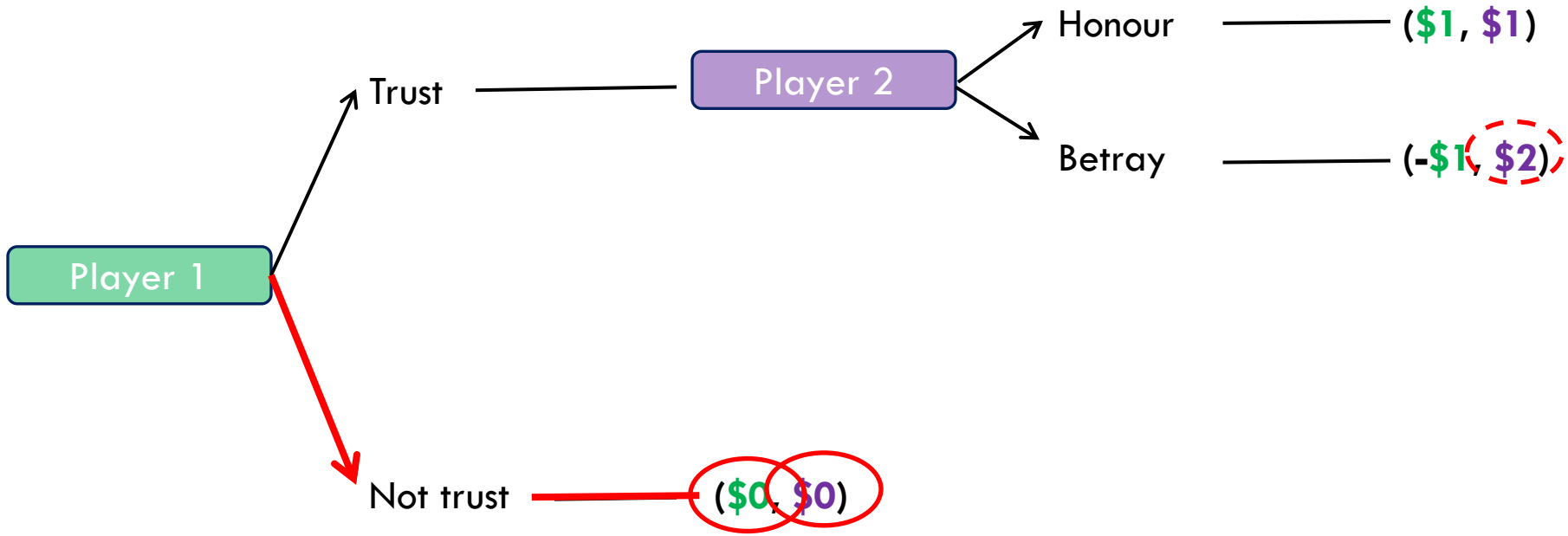

IMPLICIT CONTRACTS AND REPUTATIONAL CONCERNS

What happens if we play the game repeatedly?

- Suppose each player has a discount factor of δ.
- Is there an equilibrium (SPNE) in which Player 1 plays Trust?

Assume players play a 'trigger strategy':

- Player 1: play 'Trust' in first period. Thereafter if all moves in all previous periods have been 'Trust and Honour', play 'Trust'. Otherwise play 'Not Trust'.
- Player 2: If Player 1 plays 'Trust' this period, play 'Honour' if all moves in all previous periods have been 'Trust and Honour', otherwise play 'Betray'.

What happens?

- Trigger strategies are a Nash Equilibrium of the infinitely repeated game as long as player 2 is patient enough (or the discount rate is sufficiently close to one).

IMPLICIT CONTRACTS AND REPUTATIONAL CONCERNS

Think about the payoffs for Player 2 as follows..

- C =1 is the payoff from cooperation (Honour)
- D =2 is the payoff from defection (Betray).
- P =0 is the payoff from punishment (i.e. an endless stream at lower payoff)

IMPLICIT CONTRACTS AND REPUTATIONAL CONCERNS

Player 2 prefers to cooperate if:

$$VC = C(1 + \delta + \delta^2 + \cdots) \geq VD = D + P(\delta + \delta^2 + \cdots)$$

$$C/(1 - \delta) \geq D + \delta P/(1 - \delta)$$

$$\delta \geq \frac{D - C}{D - P} = \frac{2 - 1}{2 - 0} = \frac{1}{2}$$

IMPLICIT CONTRACTS AND REPUTATIONAL CONCERNS

Implications

- If Player 2 is sufficiently patient then it is optimal to cooperate.
- Cooperation is more likely if that value of the relationship (*C*-*P*) is greater. A cooperative outcome is more likely if the parties do better together than apart.