8. Using Information Strategically

(See McM Ch.6)

Uncertainty, not perfect knowledge, is the norm: valuations, alternative opportunities, costs of delay, commitment possibilities.

Negotiators go to great lengths to learn their opponents' aims and to conceal their own. (Robert Maxwell bugged his guests' cabins in his yacht.) Information and misinformation are released during negotiations. Tricks — exaggerated impatience, feigned anger, excessive friendliness, personal abuse — used to obtain opponents' true aims; countered with feigned ignorance, excessive demands.

Questions about information

The full complexities of information transmission and concealment in negotiation are rich:

- Why do some tactics work?
- What are the limits of what negotiators can achieve?
- Uneven distribution of information may result in no agreement. How to mitigate an informational disadvantage.
- Credible strategies for communicating information. Signals.

8.1 Informational Handicap

Suppose Sally doesn't know Burt's valuation of the car.

- Sally has many cars for sale, all of which cost her $1000.
- Sally knows that there are two kinds of buyer:
  - one values this type of car at $1040,
  - the other values it at $1100.
- Equal numbers of both types of buyer;
  no distinguishing marks.

Knowledge is a source of bargaining power.

Sally makes a take-it-or-leave-it offer.

- ➢ If Sally knew how much Tom, Dick, or Harry would pay, then she could extract all the gains from trade.
- ➢ If Sally isn't sure of any buyer's willingness to pay, she can't.
- ➢ She risks:
  - — asking too high a price and losing a sale (with low valuers) or
  - — forgoing some profits (with high valuers).

  The best price balances these risks.

The best price

Q: What price?

A: The same price (why?).

- Either $1040
  (and making $40 from every customer: all are buyers);
- Or $1100
  (and making $100 from every sale but losing half the customers, on average a return of $50 per potential buyer).
- Sally should ask $1100 to maximise her expected profit, at the cost of forgone sales.

Inefficiency from private information

Even the low-valuation customers could yield a $40-per-sale gain, but in ignorance Sally excludes them with a high price:

private information results in some of the potential gains from trade not being realised: inefficient.

As in the PD, bargaining with private information can result in *inefficiencies* (non-Pareto-optimal outcome: the low-value buyers would like to buy up to $1040 and Sally would like to sell above $1000, but no sales in this region):

each bargainer's attempt to grab a larger share of the gains from trade when he or she doesn't know the other's limit results in inefficiencies, and ignorance → a significant probability of negotiation breakdown.

Are inefficiencies inevitable?

Inefficiencies need not occur, gains from trade need not be lost:

What if the buyers' valuations were closer (say, $1060 and $1100)?

Then there would always be a sale:

- since Sally'd make $60 per potential buyer if she asked for $1060 in this case, and
- all would buy, some of the buyers making a windfall profit of $40 per purchase, however.

Two lessons

Two lessons from these simple models of exchange with differential information:

1. private information can lead to inefficient outcomes, with no trading, although potential gains from trade exist;
2. in other cases, *private information can be a source of bargaining power*, with extra gains accruing to the holders of information.

Sally's in a powerful bargaining position by virtue of her ability (we have assumed) of being able to make commitments;

the buyers, however, have some countervailing power from Sally's lack of knowledge, which precludes her from extracting all the gains from trade.

8.2 Screening: Overcoming an Informational Disadvantage

- Can Sally mitigate her informational disadvantage when she's asking $1060, but losing $40 per sale to the high valuers?
- Can Sally structure the negotiations to induce the sellers to reveal their private valuations?
- Can Sally *screen* the potential buyers?

Remember: *costs of delay are a source of bargaining power*.

Who's less impatient?

- Suppose buyers incur costs if agreement is delayed:

  suppose that settlement can be reached when buyers enter Sally's yard or a week later,

  but also suppose that buyers value costs and benefits a week hence at only 80% of their current value;

- Sally, however, faces no costs of delay. (She's relatively less impatient.)

- Sally chooses, and commits herself to, not simply a single price, but a *price schedule* or *menus*:

  a current price and a price for next week.

- What's her best schedule or menu?

A game tree

Consider an extensive-form tree:

Sally:

1. asks a high price in the first period and
2. drops her price in the second period if the car hasn't sold then.

Assume that Burt is one of two types with equal probability:

("H"): Burt values the car at $1100 ("H"), or

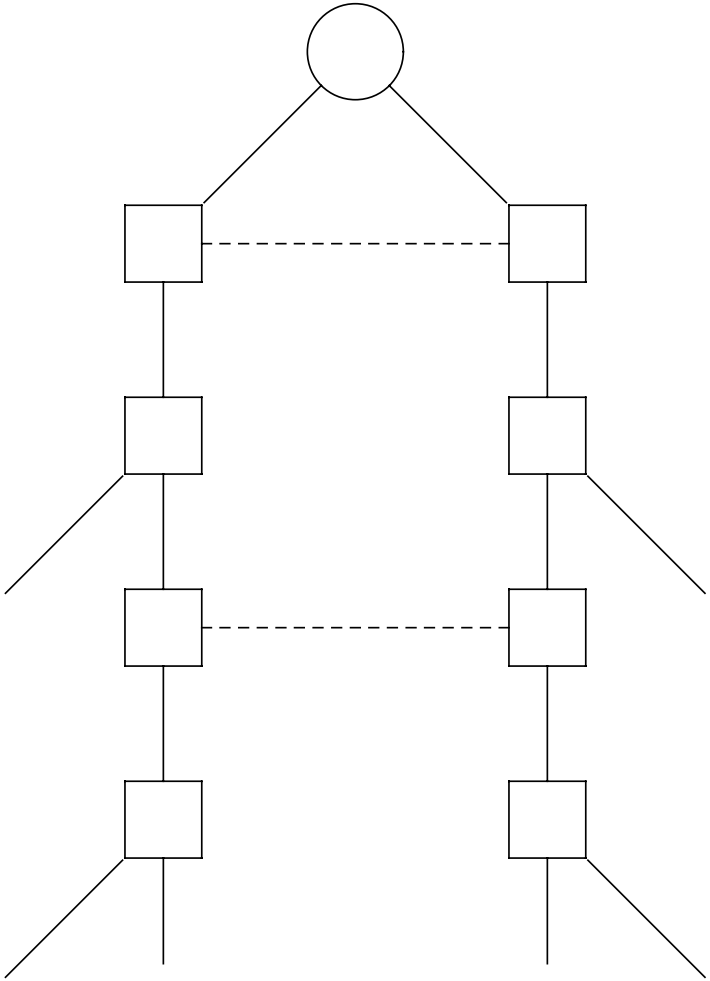
("L"): Burt values the car at $1060 ("L").

But Sally doesn't know which type Burt is,

as indicated by the dashed lines (the information set) between the two pairs of possible positions Sally can be in.[1]

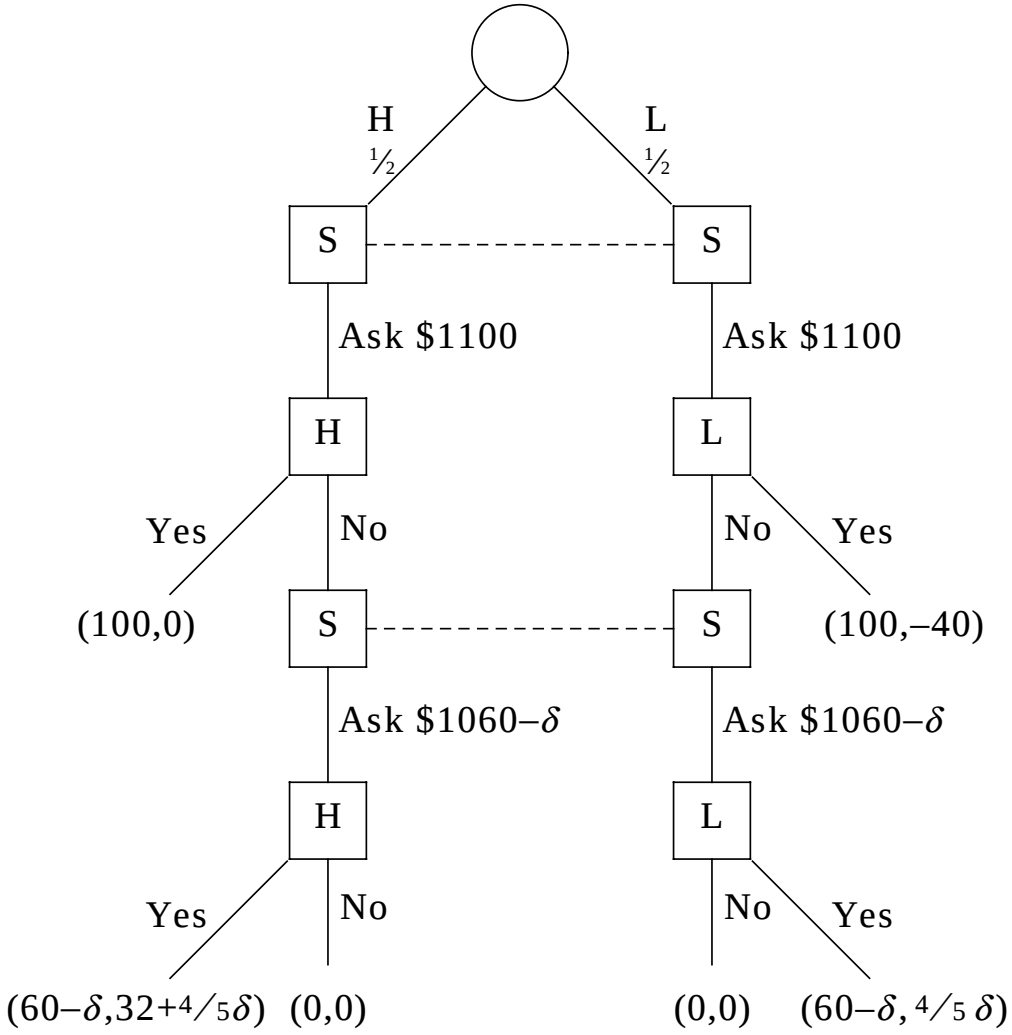
---

1. This game tree represents the Harsanyi transformation. John Harsanyi, who studied at Sydney University and taught at A.N.U., received the 1994 Nobel Prize in Economics.



The game tree

Bargaining Tree: Payoffs (Sally, Burt)



Look forward and reason back

What will the players do? *Look forward and reason back*.

- *First*, if Burt is an H type and finds himself in the second period with an offer of \$1060–δ for the car, then he will buy and make himself a windfall profit of

  $$\$32+{}^{4}\!/_{5}\delta,\ (80\%\text{ of }\$40+\delta = \$1100 - (\$1060-\delta)).$$

  (Remember that Burt's benefits shrink by 20% by the second period.) Otherwise, no deal, and neither gets anything.

- Will Burt get this opportunity?

- If Sally can't sell the car for \$1100 in the first week, then she'll offer it at the lower price a week later.

- Will Burt buy at \$1100 in the first week?

- No: since Burt is an H type, that's his valuation of the car, meaning he gains none of the gains to trade at the high price, and he knows that Sally will offer it a lower price later.

and if Burt is a low valuer?

- *Second*, if Burt is an L type and finds himself in the second period with an offer of \$1060–δ for the car, then he will buy and make himself a (small) windfall profit of

$$4/5\delta, \qquad (80\% \text{ of } \delta = \$1060 - (\$1060 - \delta)).$$

  The alternative is no deal and nothing for either of them.

- Since Burt values the car for less than \$1100 (he's an L), then he won't buy at the higher price in the first period.

So Sally's schedule of (\$1100, \$1060–δ) doesn't screen the sellers.

Can Sally screen the players into the two group?

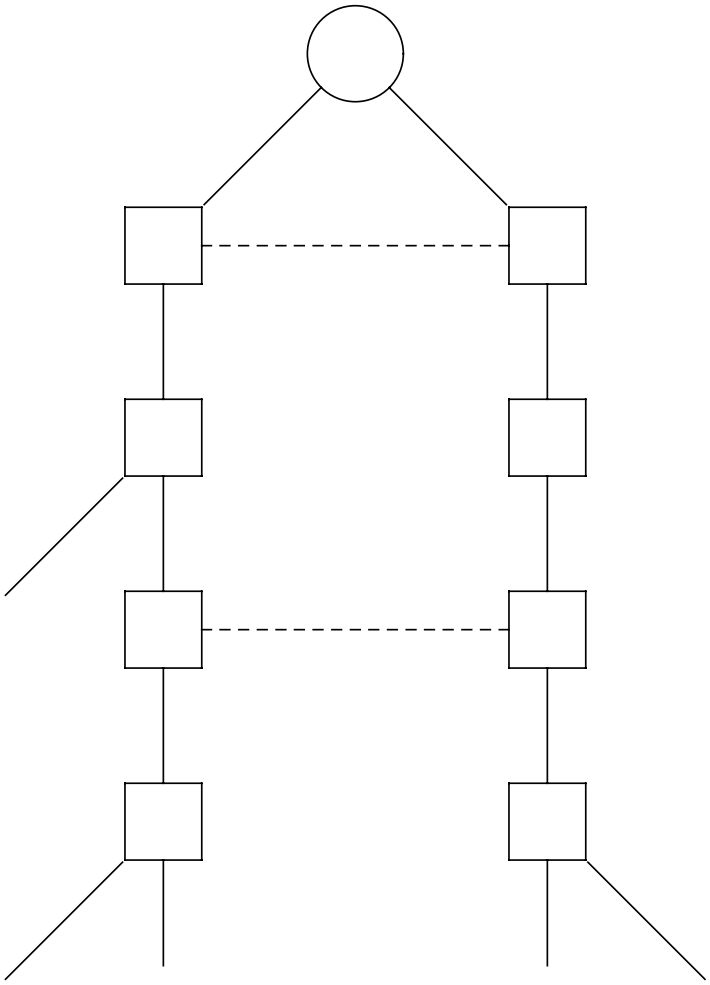
Is there a schedule that does *screen* the sellers into the two types?

If there is such a schedule, then an unsold car in the second period will be offered at $\$1060-\delta$:

even if Burt is a low valuer (as he must be for the car not to have sold in the first period), he will buy at this price.

Call the first-period price P.

The extensive-form tree:



Rollback

- If Burt is H and buys at \$$P$ in the first period, then his return is \$1100–P,
- whereas if he doesn't buy in the first period, then he will buy at \$1060–δ in the second, with a return of \$32+$^4/_5\delta$.
- So long as P is low enough to induce Burt to buy in the first period, then Sally can screen Burt for his type, and make a higher return than the average of \$60 per customer of the previous section.
- If \$1100–P is greater than \$32+$^4/_5\delta$, then Burt (H) will buy in period one; that is, if P is no greater than \$1068–$^4/_5\delta$.
- In the limit, P = \$1068, and Burt (H) will be indifferent between buying sooner or later.

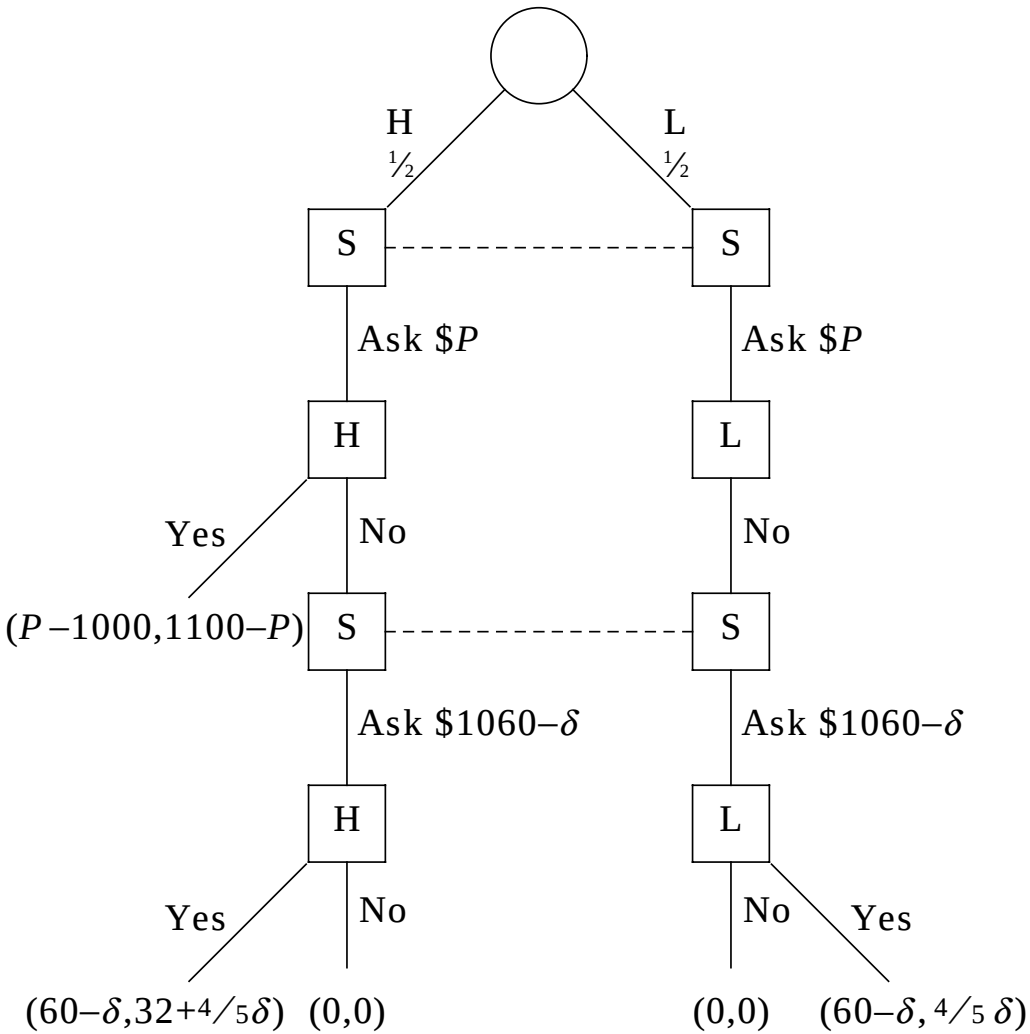
Screening works

Because of Burt's cost of waiting, Sally can screen Burt's type:

if she prices with the schedule ($1068, $1060), then Burt (H) will buy in the first period, while Burt (L) will wait for the second period to buy.

Note that the higher Burt values the car, the greater the loss he suffers by waiting: high-valuation buyers are more impatient to settle than are low-valuation buyers, which enables sellers to screen them.

Sally's average return with screening is $\frac{1}{2} \times \$68 + \frac{1}{2} \times \$60 = \$64$, which is $4 per customer higher than the $60 average with the non-screening strategy above.



Bargaining Tree: Payoffs (Sally, Burt)

8.2.1 Haggling

This model might motivate *haggling*: Sally as the seller quotes a high price and then lowers it.

High-valuation buyers are relatively more impatient to settle, and so may be prepared to pay a higher price, sooner, than may low-valuation buyers, who credibly prove their low valuations by holding out for lower prices.

Haggling can be seen in this light as revealing information about the other's limit.

But haggling doesn't always work.

A lower valuation

If Burt's low valuation were $1040, instead of $1060 as above, then Sally could still screen with a schedule of ($1046, $1040), but her average return would be $43, less than $50, the average return of charging $1100 and only selling to high-valuation buyers.

In this case, Sally is better off demanding the (high) fixed price and not trying to screen the buyers, since their valuations are too widely spread for screening to be profitable.

This is inefficient: some gains from trade are left unappropriated, and no sales are made to low-valuation customers, even though they will pay more than Sally's valuation of the cars.

Other screening devices.[2]

- A range of deductibles when you buy insurance: you're a better judge of your risk than is the insurance company.
- Whether to buy a service warantee for a longer period than the standard (for cars for computers).
- Others?

All reveal private information, and enable a more efficient trade to take place — both buyers and sellers are happier than if no trade took place.

2. Joe Stiglitz, my old Stanford supervisor, won the Nobel prize in economics for this work in 2001.

Inefficiencies

Even when screening works, there are some dead-weight losses, caused by *asymmetric information*: with screening (and high-valuation buyers paying more), low-valuation buyers must wait, at some loss, so not all gains to trade realised, with some inefficiency.

Haggling survives for large consumer items, such as cars. Between suppliers and processors or between manufacturers and distributors prices usually determined by negotiation. Haggling is attractive to seller when the gains from discriminating among customers may be large, when prices are high.

But what are the cost to haggling for the seller?

Delay is only one device for screening to reduce an informational handicap: other methods too may result in opponents' revealing their valuations.

Sales methods.

Employment contracts.

8.3 Information and Bargaining Breakdown

Lessons:

- the bargaining process depends on the bargainers' information sets: *what they know* (and know they know) and vice versa
- *private knowledge* can be a source of bargaining power
- asymmetric information can result in *inefficiencies* (DD in the PD): no trade, or delay
- *screening* by delay may be an effective strategy in the face of an opponent's informational advantage
- if *delay* — a temporary breakdown — is costly for any bargainer, then there are dead-weight losses (inefficiencies).

Rational breakdowns

When information is private, *breakdown can be rational*. Pushing too hard, with breakdown, can be a sensible bargaining technique when you don't know your opponent's limit.

Rational for Sally to claim a "rock-bottom selling price" (RBSP), below which she could still profitably go; to mislead about her limit price.

- The cost of this: if Burt's resistance point (unknown to Sally) is lower than Sally's RBSP, then no agreement at a dead-weight loss, an inefficiency. (But see Settlement Escrow below.)
- The benefit: if Burt's resistance point is higher than Sally's RBSP and agreement occurs, then Sally has gained more than otherwise.

Similarly for Burt and other buyers.

Failures

Apparent inefficiencies and irrationalities may be caused by both parties trying to squeeze as much advantage as possible from the secrecy of their own limits, under the handicap of ignorance about their opponent's limit.

Spectacular efficiency losses: e.g. the common-pool problem, a PD. Solution: single extractor or "unitization", would result in between two and five times more oil being extracted.

Why so seldom?

Private estimates of values of the leases. In unitization, each firm assigned a revenue share based on its lease's value, so has an incentive to exaggerate the value. Sufficient to cause breakdown.

Lessons:

- bargainers should try to learn their rivals' valuations of the item under negotiation
- bargainers will conceal their own valuations, to try to bluff their rivals into overestimating the minimum (or underestimating the maximum) they'd settle for, even if breakdown
- long-term consequences to reputation of deception?

8.4 Ethics

Strategic uses of information.

Bluffing involves deception ("strategic misrepresentation").

Nice distinction between deception and lying.

Is honesty the best policy?

Is playing one's card close to one's chest innocuous?

How valuable is a reputation for honesty?

"Would you buy a used car from this man?"