Contracts as Reference Points

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Plan

1. Hart, Oliver and John Moore (2008) "Contracts as Reference Points" QJE

2. Halonen-Akatwijuka, Maija and Oliver Hart (2016) "Continuing Contracts"

Introduction

- Initial contract provides a reference point for what the parties feel entitled to

- Parties do not feel entitled to outcomes *outside* the contract but may feel entitled to different outcomes *within* the contract

- If parties do not receive their entitlement, they get aggrieved and engage is counterproductive ex post behaviour (quality shading)

Introduction

- A rigid contract limits the number of outcomes and aligns reference points

- But rigid contract cannot adjust and may lead to ex-post inefficiency

- Tradeoff between contractual rigidity and flexibility

The model

- Buyer, B, and seller, S, in long-term relationship
- Perfectly competitive market for Bs and Ss at date 0
- At date 1 bilateral monopoly (Williamson's "fundamental transformation")

The model

- Buyer, B, and seller, S, meet at date 0
- One unit of trade at date 1
- At date 0 uncertainty about B's value, v, and S's cost, c
- Uncertainty resolved at date 1
- Symmetric information: v and c observable to B and S but not verifiable
- n states of the world (v_i, c_i)
- π_i = probability of state i
- Voluntary trade

The model

- Parties risk neutral
- No wealth constraints

New assumptions

- Ex post trade is partially contractible: perfunctory performance (within the letter of the contract) is enforceable by court but not consummate performance (within the spirit of the contract)

- Same cost to provider

New assumptions

- Agent is willing to provide consummate performance if and only if he is "well treated"

- Agent is "well treated" if and only if he receives what he is entitled to in the contract

- Date 0 contract provides a reference point for entitlements

New assumptions

- If date 0 contract specifies only one outcome (*rigid contract*), each party feels well treated when outcome determined by date 0 contract occurs

- If date 0 contract specifies more than one outcome (*flexible contract*), it is assumed that each party feels entitled to the best outcome (for himself) allowed by the contract (self-serving bias) subject to the other agent breaking even

New assumptions

- When agent does not get what he feels entitled to, he gets aggrieved
- Aggrievement leads to shading (providing less than consummate performance)

Simple example

- B requires one unit of standard good from S at date 1
- Assume no uncertainty: B's value is 100 and S's cost is 0
- What is optimal contract?

Simple example

- Standard literature (no noncontractible investments): no ex ante contract necessary

- At date 1 negotiate contract: Nash bargaining leads to $p = 50$

- If competitive conditions at date 0 do not support 50:50 split, add lump sum payment at date 0

Simple example

- When contract forms reference point, "no contract" means that trade can occur at any price between 0 and 100

- There is much to argue about at date 1

- Best outcome for B is $p = 0$

- Best outcome for S is $p = 100$

Simple example

- Suppose B and S agree on p between 0 and 100

- B is aggrieved by p and shades by θp

- S is aggrieved by $(100 - p)$ and shades by $\theta(100 - p)$

$$U_B = 100 - p - \theta(100 - p) = (1 - \theta)(100 - p)$$
$$U_S = p - \theta p = (1 - \theta)p$$

- Total surplus $= (1 - \theta)100$, independent of p

Simple example

- Ex post renegotiation cannot eliminate shading as it is not contractible

- Writing a rigid contract (fixing price at date 0) solves the shading problem

- There is nothing to argue about and therefore no shading

Simple example

- Why does fixing price in date 0 contract avoid aggrievement when date 1 contract does not?

- Because date 0 market is more competitive than date 1 market

- In this simple example first best is obtained by rigid contract.

- Consider uncertainty about (i) value and cost and (ii) the nature of the good

Uncertain v and c

- Symmetric information

- v and c not verifiable

- Trade at date 1 is voluntary: it occurs if and only if both parties are willing to trade

- Contract: $p_0 = $ no trade price, $p_1 = $ trade price

Uncertain v and c

- Trade occurs ($q = 1$) if and only if $v - p_1 \geq -p_0$ and $p_1 - c \geq p_0$
- $q = 1$ if and only if $v \geq p_1 - p_0 \geq c$
- First best trading rule: $q = 1$ if and only if $v \geq c$
- Trading less often than first best
- Only the difference $p_1 - p_0$ matters. Set $p_0 = 0$ and drop subscript from p_1

Uncertain v and c

- *Rigid contract*: p fixed

- *Flexible contract*: p between $\underline{p}$ and $\overline{p}$

- Under flexible contract S feels entitled to $p = min(\overline{p}, v)$ and B feels entitled to $p = max\left(\underline{p}, c\right)$

- Aggregate aggrievement $= [min(\overline{p}, v) - p] + \left[p - \right.$

Uncertain v and c

- Optimal contract chooses $\left[\underline{p}, \overline{p}\right]$ to max

$$\int_{v \geq c, v \geq \underline{p}, c \leq \overline{p}} \left[v - c - \theta \left\{min(\overline{p}, v) - max\left(\underline{p}, c\right)\right\}\right] dF(v, c)$$

- Tradeoff: with large interval $\left[\underline{p}, \overline{p}\right]$ it is more likely that trade occurs if $v \geq c$ but also expected shading costs are high

Uncertain v and c

- Tradeoff between contractual rigidity and flexibility
- Rigid contract
  - No shading
  - Cannot adjust to the state of nature
- Flexible contract
  - Scope for aggrievement and shading
  - Can adjust to the state of nature

Uncertain v and c

- A rigid contract achieves first best if
  - only v varies
  - only c varies
  - the smallest element of support of v is at least as great as the largest element of the support of c

Uncertain v and c

- Example 1

	s1	s2
v	9	20
c	0	10

Uncertain v and c

- Example 2

	s1	s2	s3
v	9	20	20
c	0	10	0

Uncertain v and c

	s1	s2	s3
v	9	20	20
c	0	10	0

Flexible contract: $\underline{p} = 9$ and $\overline{p} = 10$

- Trade in every state

- But shading in s3

- Total surplus $= 9\pi_1 + 10\pi_2 + (20 - \theta)\pi_3$

Uncertain v and c

	s1	s2	s3
v	9	20	20
c	0	10	0

Rigid contract $p = 9$

- No trade is s2

- No shading

- Total surplus = $9\pi_1 + 20\pi_3$

Uncertain v and c

	s1	s2	s3
v	9	20	20
c	0	10	0

Rigid contract $p = 10$

- No trade in s1

- No shading

- Total surplus $= 10\pi_1 + 20\pi_3$

Uncertain v and c

- Flexible contract is optimal if and only if
  $$9\pi_1 + 10\pi_2 + (20 - \theta)\pi_3 > max(9\pi_1 + 20\pi_3, 10\pi_2 + 10\pi_3)$$
- if θ and/or π_3 are small

Uncertain nature of good

- Bach or Shostakovich for a musical evening
- Methods cannot be specified in date 0 contract, choice becomes clear at date 1

	Method 1	Method 2
Value	20	14
Cost	10	8
Surplus	10	6

- B and S fix the price at date 0, say $p = 10$
- S has the right to choose method (S is independent contractor)
- S chooses inefficient method 2 as it minimises his cost
- B is aggrieved by 6
- Total surplus $= 6 - 6\theta$

	Method 1	Method 2
Value	20	14
Cost	10	8
Surplus	10	6

- B has the right to choose method (employment)
- B chooses efficient method 1 as it maximises his value
- B is aggrieved by 2
- Total surplus $= 10 - 2\theta > 6 - 6\theta$
- Employment is optimal because method matters more to B

	Method 1	Method 2
Value	20	14
Cost	10	**2**
Surplus	10	12

- If S has the right to choose method, total surplus $= 12 - 6\theta$
- If B has the right to choose method, total surplus $= 10 - 8\theta$
- It is optimal to have independent contractor because production method matters more to S than B

Experimental evidence

- Fehr, Hart and Zehnder (2011) AER
  1. Buyer chooses rigid or flexible contract
  2. Auction between sellers determines fixed price or lowerbound for price range
  3. State of nature determined
  4. Buyer chooses price consistent with the contract
  5. Seller chooses quality
- Shading in 6% of rigid contracts
- Shading in 25% of flexible contracts (in the good state) although price above lowerbound and fixed price of rigid contract
- Strong negative correlation between price and shading with flexible contracts
- When ex ante competition is eliminated, shading increases in rigid contracts

Continuing contracts

Halonen-Akatwijuka and Hart (2016)

- Large literature in economics and law on long-term contracts.

- Leading explanation: LT contracts support specific investments

- Much empirical support for this.

- Williamson (1975), Klein et al. (1978), Goldberg and Erickson (1987), Joskow (1987), Crocker and Masten (1988), Pirrong (1993), Brickley et al. (2006), and Bandiera (2007)

Continuing contracts

- More challenging to explain why parties write contracts that are shorter than the likely term of their relationship

- Our question: Why do parties often write contracts that are neither LT nor ST, but are of indefinite duration?

- Leading examples: rental contracts where the lease usually rolls over, employment contracts

- We call such contracts "continuing"

Continuing contracts

- Parties are likely to apply notions of fairness, fair dealing and good faith when they renegotiate continuing contracts even if they are not legally required to do so.

- For empirical support: see Kahneman et al. (1986), Okun (1981), Rotemberg (2011), Bar-Gill and Ben-Shahar (2003).

- We will take the view that fair dealing implies that the previous contract(s) will be a reference point for renegotiation.

Continuing contracts

Related literature on reference points and fairness

- Okun (1981), Kahneman, Knetsch, and Thaler (1986), Bewley (1999), Schwartz and Scott (2007), Herweg and Schmidt (2014).

Related literature on determinants of contact length

- Gray (1978), Dye (1985), Harris - Holmstrom (1982,1987), Diamond (1991), MacLeod- Malcomson (1993), Che-Hausch (1998), Segal (1999), Guriev & Kvasov (2005).

The model

- Buyer B and seller S in two-period relationship
- Period 1: B's value v_1 and S's cost c_1, $v_1 > c_1$
- Uncertainty about period 2: v_2, c_2 and outside options r_B and r_S (drawn from F)
- Symmetric information
- v_2, c_2, r_B, r_S not verifiable
- Trade efficient in period 2 if and only if $v_2 - c_2 > r_B + r_S$
- Initially assume $r_B = r_S = 0$

The model

Ex ante B and S contract:

- Long-term contract
- Short-term contract
- Continuing contract

- Contract negotiated under competitive conditions: one B and many alternative S's with outside option $\overline{u}$

- New contract can be negotiated in period 2 to follow short-term or continuing contract

- Long-term contract can be renegotiated in period 2

- B has all the bargaining power

The model

- Parties are risk neutral

- No wealth constraints

- No discounting

The model

- Period 2 bargaining under symmetric information but not costless

- Parties feel entitled to the any uncontracted for surplus (self-serving bias)

- If party feels entitled to x but receive y, aggrievement $= (x - y)$. Respond by shading and causing a loss of $\theta(x - y)$ to the other party. $0 < \theta < 1$.

Example

- $(v_1, c_1) = (20,10), (v_2, c_2) = (24,10), \overline{u} = 0$

ST contract

- Contract specifies trade only for period 1 at $p_1 = 10$.
- No commitment, promise or understanding that the parties will be bound by fairness or good faith if they negotiate a future contract. Any period 2 contract negotiated from scratch.
- Each party feels entitled to all the surplus in period 2.
- $p_2 = 10$ but S feels entitled to 24.
- S aggrieved by 14 and shades by 14θ.
- $U_B = 24 - 14\theta, U_S = 0$

Example

- $(v_1, c_1) = (20,10), (v_2, c_2) = (24,10), \overline{u} = 0$

Continuing contract

- Contract specifies trade for period 1 at $p_1 = 10$.

- Fair dealing constrains price changes in period 2.

- Period 1 contract forms a reference point for period 2 negotiations. Each party feels entitled to any *increase* in surplus.

- Then $p_2 = 10$ but S feels entitled to 14.

- S aggrieved by 4 and shades by 4θ.

- $U_B = 24 - 4\theta, U_S = 0$

Example

- $(v_1, c_1) = (20,10), (v_2, c_2) = (24,10), \overline{u} = 0$

Continuing contract dominates ST contract when $r_B = r_S = 0$

- The argument is over the *change* in surplus rather than the whole surplus.

Without outside options, choice between continuing and LT contract

- LT contract is optimal in this example since no uncertainty.
- $p_1 = p_2 = 10.$ No need to renegotiate. No shading.
- $U_B = 24, U_S = 0$

Continuing contract (no outside options)

Continuing contract is optimal if either business is as usual or a big change will occur that makes break up efficient.

- Under continuing contract there is nothing to argue about when business is as usual.

- With continuing contract parties can walk away costlessly when break up efficient.

- Example: $(v_1, c_1) = (20,10)$

  with prob. ½ $(v_2, c_2) = (20,10)$ and with prob. ½ $v_2 < c_2$

Outside options

- $(v_1, c_1) = (20,10), (v_2, c_2) = (24,10), \overline{u} = 0$
- $r_B = 0, r_S > 0$

- How do outside options affect what is regarded as fair-dealing?
- With market based outside options (Case M) can appeal to outside options in bargaining. With idiosyncratic outside options (Case I) they *cannot* be used in bargaining.
- Kahneman et al. (1986) suggests that using changes in value or cost within the relationship to justify a price change is consistent with good faith bargaining whereas using outside options is not.

Idiosyncratic outside options

- $(v_1, c_1) = (20,10), (v_2, c_2) = (24,10), \overline{u} = 0$
- $r_B = 0, 0 < r_S < 14$

- Under continuing contract B is willing to attribute all of the increase in surplus to S but would not go beyond this. The range of acceptable prices for B is $[p_1, p_1 + 4]$.
- S will not quit if and only if $p_2 - c_2 \geq r_S \Leftrightarrow r_S \leq p_1 - 6$.
- If $p_1 - 6 < r_S < 14$ S will quit inefficiently.
- **With idiosyncratic outside options efficient trade can fail to take place.**

Idiosyncratic outside options

With idiosyncratic outside options S's participation constraint may not be binding.

- Low p_1 can lead to inefficient quit in period 2. "Efficiency" wage may be optimal.

- Continuing contract no longer dominates ST contract.

Idiosyncratic outside options

Continuing contract is optimal if either business is as usual or a big change will occur that makes break up efficient.

Additional condition: S's and B's outside options have to be limited conditional on trade being efficient.

- Trade is efficient under continuing contract when limited outside options.

Idiosyncratic outside options

- When outside options can be high (conditional on trade being efficient) p_2 has to be high enough to stop S quitting inefficiently and low enough to stop B quitting inefficiently. Continuing contract does not work well.

- ST contract is optimal if it is unlikely that trade is efficient in period 2.

- LT contract is optimal if it is likely that trade is efficient in period 2.

For-cause contracts

- Introduce for-cause features to make (inefficient) quitting more difficult.

- In employment context an employer can dismiss a worker only for a good reason (e.g. worker misbehaves or firm downsizes).

- In our model downsizing is the only legitimate reason (as model too simple for misbehaviour). Under for-cause contract B can refuse to trade with S if production is unprofitable – but then B cannot trade with anyone else.

- Symmetric for-cause contract.

For-cause contract

- For-cause contract can be renegotiated ex post.
- If trade is inefficient the parties will renegotiate to allow them to trade elsewhere. Renegotiation is costly.
- When trade is efficient outside options are irrelevant since neither party can walk away.

For-cause contract

For-cause contract is optimal if either business is as usual or a big change will occur so that gains from trade vanish both in the relationship and outside.

- Renegotiating for-cause contract is not costly when there is no surplus to share.

- Compared to a continuing contract outside options can be high when trade is efficient – but outside options have to be low when trade is inefficient.

- For-cause contract is optimal when viability is the main issue. At-will continuing contract works well when efficient matching is important.

For-cause contracts

- Even at-will employment contracts have some for-cause elements. Employment comes with an implicit promise of LT relationship and dismissing a worker without a good reason may be bad for the morale of remaining workers (Osterman 1988, Belous 1989, Davis-Blacke and Uzzi 1993).

- If a firm wants the flexibility of a true at-will contract, it should hire an independent contractor or a temporary worker rather than an employee.

- Possible explanation of recent shift to flexible employment arrangments.

Conclusions

- Trade-off between long-term, short-term, and continuing contracts.

- With continuing contracts there is nothing to argue about when no change while under ST contract the whole surplus is up for grabs in (re)negotiation.

- With continuing contract the parties are free to walk away when trade is inefficient while LT contract has to be renegotiated to allow parties to separate.

- Traditional (non-behavioral) models can not explain continuing contracts.

Contracts as reference points

Hart and Moore (2008) "Contracts as Reference Points", Quarterly Journal of Economics

Hart (2008) "Reference Points and the Theory of the Firm", Economica (Coase Lecture)

Hart (2009) "Hold-up, Asset Ownership, and Reference Points", Quarterly Journal of Economics

Hart and Holmstrom (2010) "A Theory of Firm Scope", Quarterly Journal of Economics

Fehr, Hart and Zehnder (2011) "Contracts as Reference Points - Experimental Evidence", American Economic Review

Halonen-Akatwijuka and Hart (2016) "Continuing Contracts"

Work to be done

- Experiments
- Applications
- Theory