

# Quality Uncertainty in Vertical Relations

Comments by  
Jacques Crémer

**Background:** rise in product failures that involve substantial safety and health issues.

**Background:** rise in product failures that involve substantial safety and health issues.

**Issue:** "consumers attribute quality defects mainly to the labels of final products".

**Background:** rise in product failures that involve substantial safety and health issues.

**Issue:** "consumers attribute quality defects mainly to the labels of final products".

**Model:** a model to see how downstream firm can control quality of upstream supplier

U



D

U



U

- Variable costs = 0.

# U

- Variable costs = 0.
- Two types:  $\underline{\theta}$  and  $\bar{\theta}$ .



U

- Variable costs = 0.
- Two types:  $\theta$  and  $\bar{\theta}$ .

Exogenous

Endogenous

# U

- Variable costs = 0.
- Two types:  $\underline{\theta}$  and  $\bar{\theta}$ .
- Probability of  $\bar{\theta}$ :  $\rho(e, \bar{\theta})$ .

# U

- Variable costs = 0.
- Two types:  $\underline{\theta}$  and  $\bar{\theta}$ .
- Probability of  $\bar{\theta}$ :  $\rho(e, \bar{\theta})$ .
- Cost of effort,  $c(e)$ .

# U

- Variable costs = 0.
- Two types:  $\underline{\theta}$  and  $\bar{\theta}$ .
- Probability of  $\bar{\theta}$ :  $\rho(e, \bar{\theta})$ .
- Cost of effort,  $c(e)$ .

Why this choice of modelisation?  
What are the consequences

# D

- Distributes both products and coordinates prices
- Demand functions:  $X(\text{prices}; \theta)$  and  $Y(\text{prices}; \theta)$

Externalities  
between  
products

The diagram consists of a blue rectangular box at the bottom containing the text 'Externalities between products'. Two blue lines originate from the box and point upwards and outwards towards the demand functions  $X(\text{prices}; \theta)$  and  $Y(\text{prices}; \theta)$  in the list above, indicating that these functions are influenced by or interact with externalities between products.

# D

- Distributes both products and coordinates prices
- Demand functions:  $X(\text{prices}; \theta)$  and  $Y(\text{prices}; \theta)$

Externalities  
between  
products

Why this specification  
rather than normal vertical  
integration?

# Game

Repeated game where in each period:

D chooses  $\bar{\theta}$ .

# Game

Repeated game where in each period:

- D chooses  $\bar{\theta}$ .
- Negotiation (Nash bargaining solution)



# Game

Repeated game where in each period:

- D chooses  $\bar{\theta}$ .
- Negotiation (Nash bargaining solution)

Restrictions on contracts:

payment to U is  $w(\theta)X + F(\theta)$ .

# Game

Repeated game where in each period:

- D chooses  $\bar{\theta}$ .
- Negotiation (Nash bargaining solution)
- U chooses  $e$ .
- U observes  $\theta$  and announces it to U.

# Game

Repeated game where in each period:

- D chooses  $\bar{\theta}$ .
- Negotiation (Nash bargaining solution)
- U chooses  $e$ .
- U observes  $\theta$  and announces it to U.
- D sets prices and consumers purchase.

# Game

Repeated game where in each period:

- D chooses  $\bar{\theta}$ .
- Negotiation (Nash bargaining solution)
- U chooses  $e$ .
- U observes  $\theta$  and announces it to U.
- D sets prices and consumers purchase.

D maximizes

$$(p - w)X(p, q, \theta) + qY(p, q, \theta).$$

# Game

Repeated game where in each period:

- D chooses  $\bar{\theta}$ .
- Negotiation (Nash bargaining solution)
- U chooses  $e$ .
- U observes  $\theta$  and announces it to U.
- D sets prices and consumers purchase.
- If U has lied game stops and does not go to next period.

# Game

Repeated game where in each period:

- D chooses  $\bar{\theta}$ .
- Negotiation (Nash bargaining solution)
- U chooses  $e$ .
- U observes  $\theta$  and announces it to U.
- D sets prices and consumers purchase.
- If U has lied game stops and does not go to next period.

Why isn't the choice of  $\bar{\theta}$  part of the negotiation ?

# Results

$$IC : \underline{w}X(\underline{\text{prices}}, \underline{\theta}) + \underline{F} \geq \underline{w}X(\overline{\text{prices}}, \overline{\theta}) + \overline{F} + \text{benefits continuation}$$

# Results

$$IC : \underline{w}X(\underline{\text{prices}}, \underline{\theta}) + \underline{F} \geq \underline{w}X(\overline{\text{prices}}, \overline{\theta}) + \overline{F} + \text{benefits continuation}$$

If IC not binding efficiency.

If IC binding,  $\bar{w} > 0$  implies inefficiency.



# Results

$$IC : \underline{w}X(\underline{\text{prices}}, \underline{\theta}) + \underline{F} \geq \underline{w}X(\overline{\text{prices}}, \overline{\theta}) + \overline{F} + \text{benefits continuation}$$

If IC not binding efficiency.

If IC binding,  $\bar{w} > 0$  implies inefficiency.

Authors present some results about target quality ( $\bar{\theta}$ ), but I do not understand the interpretation: at the minimum inefficiency should be thought of in terms of expected quality  $((1 - \rho)\underline{\theta} + \rho\bar{\theta})$ .

## Conclusions

- Why use a repeated game framework?
- If repeated aspect is important, why not use a Levin (relational contract) type framework?
- Link between introduction, model and conclusions.