

# INEQUITY AVERSION AND TEAM INCENTIVES



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## Research Question:

**We show how a Manager can use Inequity Aversion to provide incentives to Employees to work hard.**

**Inequity Aversion:** An Employee feels bad because another co-worker earns more or less than he does.

The Manager can offer **lower but more equal wages when employees work hard, and threaten them with very unequal wages when one of them shirks.**

The Manager now has **two Instruments: Wages and Equality.**

So the Manager can threaten the Employees with Inequality if they do not Work Hard...



If you do Not Work hard, it is not only that I am not going to pay you but I am going to pay the other employee a lot.

## 1. Standard Vs. Inequity Averse Employees

### a. Standard Employees:

Their Utility ( $U_i$ ) depends on their Wage ( $w_i$ ) and the Cost of Working Hard ( $c_i$ ).

$$U_i = w_i - c_i$$

### b. Inequity Averse Employees:

Their Total Utility ( $U_i^A$ ) depends on their Utility ( $U_i$ ) which depends on own Wage ( $w_i$ ) and the Cost of Working Hard ( $c_i$ ), but also depends on the Utility of their co-worker ( $U_j^A$ ), and thus on their Wages ( $w_j$ ) and cost of effort ( $c_j$ ).

We use Inequity Averse Preferences as modelled by Fehr & Schmidt (1999):

$$U_i^A = U_i - \alpha \max[U_j - U_i, 0] - \beta \max[U_i - U_j, 0]$$

“Envy”
“Guilt”

Assuming that  $\alpha$  and  $\beta > 0$ ...

We deal with **Two types of Aversion to Inequity:**



**Envy:** You feel bad because your co-worker is better off than you are

**Guilt:** You feel bad because your co-worker is worse off than you are



We compare the Design of the Optimal Wages when Employees are Standard Vs. when they have a Preference for Equality.

## 2. The Model

1 Principal (Manager), 2 Agents (Employees 1 and 2)

No Informational Problems (Production Deterministic).

Production is Positive and Increasing with Employees working Hard

		Employee 2	
		Work Hard	Not Work
Employee 1	Work Hard	1	$q_1$
	Not Work	$q_2$	0

Assuming  $q_1$  and  $q_2 < 1$  and cost of Not Work is zero

The Manager is Budget Constrained: wages are paid from Production.

Limited Liability: Wages cannot be negative.

Manager decides wages to each Employee when they Work Hard and when they do Not Work.

The Manager maximizes Production minus wages paid.

## 3. Solution Under Standard Preferences

If Employees have standard preferences, the Manager just needs to compensate for the cost of working hard.

		Employee 2	
		Work Hard	Not Work
Employee 1	Work Hard	$w_1, w_2$	$X, 0$
	Not Work	$0, Y$	$0, 0$

Thus:

- Pay 0 to an Employee when he does not work hard
- Pay a wage that exactly compensates cost of effort ( $w_1 = c_1$  and  $w_2 = c_2$ ) when working hard.
- All other wages ( $X$  and  $Y$ ) do not need to be specified to make (Work Hard, Work Hard) a Nash Equilibrium.

**But if employees have a preference for equality, the Manager can do better by creating inequality when only one employee works hard!!!**

**How? By “Completing the Contract” and thus, specifying what the Manager pays to the Employee who works hard alone ( $X$  and  $Y$ )**

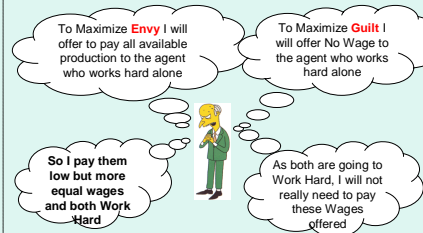
## 4. Solution Under Inequity Aversion

The Utility of each Employee now depends on the wage paid to their co-worker.

By offering extreme rewards to co-workers, the effects of Inequity Aversion are maximized.

**Extreme Rewards:** Either you pay All Production Available or Nothing

The Manager takes the decision of what effect to exploit: **Envy or Guilt (knowing if agents care more for Envy or Guilt)**



Only one of the effects (**Envy or Guilt**) can be used by the Manager on each Employee

Whether **Envy or Guilt** is used depends:

**Envy:** An Employee will Work Hard if he knows that when Not Working his co-worker gets a high wage. This will be used if the employee suffers a lot from Envy ( $\alpha$  High)

$$\begin{aligned}
 \rightarrow Y = q_2 &\rightarrow U_1^A = -\alpha(q_2 - c_2) \\
 \rightarrow X = q_1 &\rightarrow U_2^A = -\alpha(q_1 - c_1)
 \end{aligned}$$

**Guilt:** An Employee will Work Hard if he knows that when Not Working his co-worker gets a high wage. This will be used if the employee suffers a lot from Envy ( $\beta$  High)

$$\begin{aligned}
 \rightarrow Y = 0 &\rightarrow U_1^A = -\beta c_2 \\
 \rightarrow X = 0 &\rightarrow U_2^A = -\beta c_1
 \end{aligned}$$

**But also depends on: Cost of Effort**



If it is very costly for a Employee 2 to Work Hard, then the Manager tends to exploit **Guilt** (of Employee 1) by not paying Employee 2. Then an employee will feel even more guilty for shirking

**Notice:** Whether the Manager wants both Employees to Work Hard or only one Employee to Work hard, depends on the interplay between **Productivities** ( $q_1$  and  $q_2$ ), **Cost of effort** ( $c_1$  and  $c_2$ ) and **Degrees of Inequity Aversion** ( $\alpha$  and  $\beta$ ).

## 5. Results

- Same Production Levels can be Implemented at a Lower Total Cost for the Manager when Employees are Inequity Averse
- Optimal level of Production can change
- It is always good for the Manager to take into account Inequity Aversion:
  - If not, possible changes of production levels not desired
  - If not, possible higher wage cost.

## 6. The Paper Discusses

- Uniqueness of Equilibria
- Robustness to Collusion
- Wage design if agents feel Spite (similar and stronger results)

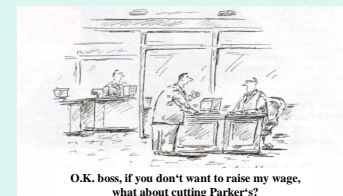


**Spite:** An Employee feels good for being better off than his co-workers!

## 7. Conclusions

- Human Resources and Experimental Literature tells us that Employees compare among themselves. We do a theoretical exercise
- An optimal wage policy can make use of it by creating Inequity out of equilibrium
- Firm design can help to make these comparisons stronger:
  - Salaries publicly known
  - Effort levels more observable (Open Vs. Private Offices?)
  - Firm meetings to enhance relationships among co-workers.

## 8. In Summary



O.K. boss, if you don't want to raise my wage, what about cutting Parker's?