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 **threat 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^{IA}) 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^{IA}), and thus on their Wages (w_j) and cost of effort (c_j)

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

$$U_i^{IA} = U_i - \underbrace{\alpha \max\left[U_j - U_i, 0\right]}_{\text{"Envy"}} - \underbrace{\beta \max\left[U_i - U_j, 0\right]}_{\text{"Guilt"}}$$

Assuming that α 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

Production Function

Employee 1 \ Employee 2	Work Hard	Not Work
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 1 \ Employee 2	Work Hard	Not Work
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)

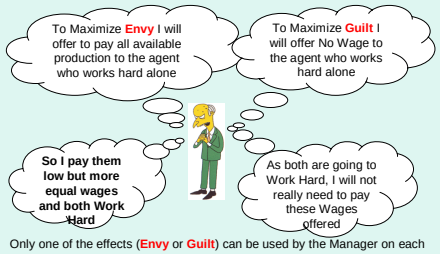
4. Solution Under Inequity Aversion

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 (**α High**)

$Y = q_2 \Rightarrow U_1^{IA} = -\alpha(q_2 - c_2)$
$X = q_1 \Rightarrow U_2^{IA} = -\alpha(q_1 - c_1)$

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 (**β High**)

$Y = 0 \Rightarrow U_1^{IA} = -\beta c_2$
$X = 0 \Rightarrow U_2^{IA} = -\beta c_1$

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** (α and β).

5. Results

- **Same Production Levels can be Implemenetd 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 acoount 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

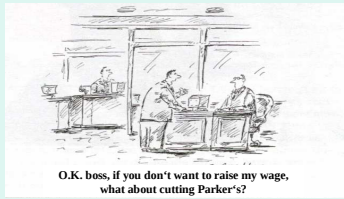
•Human Resources and Experimental Literature tells us that Employees compare among themselves. We do a theoretical exercise

•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?