The Breakdown of Morale

Nick Vikander

SMYE 2009, Istanbul

April 25, 2009

Erasmus University Rotterdam and Tinbergen Institute

vikander@tinbergen.nl, www.tinbergen.nl/∼vikander

Morale is Important

Managers are preoccupied with morale (Bewley 1999)

- Morale linked to productivity
- Turnover, unfairness can cause morale to break down
- Low morale can be contagious

Explore a mechanism based on these ideas, by which morale may break down

Consider self-managed teams, where morale may be particularly important. (Osterman 2000, Barker 1993)

The Setting

- High morale, cooperate (work productively) rather than defect (opportunism)
- Altruists and egoists
- Infinite horizon, high morale - private information

The Mechanism

- Players unexpectedly learn a shock (lay-offs) will occur at a fixed future date
- Causes egoist morale to break down before the shock
- Low morale may then spread to altruists, since they suspect their cooperation will not be reciprocated

The Setting

- High morale, cooperate (work productively) rather than defect (opportunism)
- Altruists and egoists
- Infinite horizon, high morale - private information

The Mechanism

- Players unexpectedly learn a shock (lay-offs) will occur at a fixed future date
- Causes egoist morale to break down before the shock
- Low morale may then spread to altruists, since they suspect their cooperation will not be reciprocated

The Setting

- High morale, cooperate (work productively) rather than defect (opportunism)
- Altruists and egoists
- Infinite horizon, high morale - private information

The Mechanism

- Players unexpectedly learn a shock (lay-offs) will occur at a fixed future date
- Causes egoist morale to break down before the shock
- Low morale may then spread to altruists, since they suspect their cooperation will not be reciprocated

The Model

- Countably infinite number of players
- Type $\theta \in \Theta \equiv \{0, \theta_0\}$. A fraction λ are altruists with $\theta = \theta_0 > 0$
- Infinitely repeated game with discount factor δ, where players pair up into a team in each period and play a stage game
- Players learn before period 1 that an exogenous shock will occur after T_0 periods. A randomly selected fraction $1 - \delta_0$ will then leave the game
- Players whose partner has left the game match up with each other and play continues

The Model

- Countably infinite number of players
- Type $\theta \in \Theta \equiv \{0, \theta_0\}$. A fraction λ are altruists with $\theta = \theta_0 > 0$
- Infinitely repeated game with discount factor δ, where players pair up into a team in each period and play a stage game
- Players learn before period 1 that an exogenous shock will occur after T_0 periods. A randomly selected fraction $1 - \delta_0$ will then leave the game
- Players whose partner has left the game match up with each other and play continues

The Model

- Countably infinite number of players
- Type $\theta \in \Theta \equiv \{0, \theta_0\}$. A fraction λ are altruists with $\theta = \theta_0 > 0$
- Infinitely repeated game with discount factor δ, where players pair up into a team in each period and play a stage game
- Players learn before period 1 that an exogenous shock will occur after T_0 periods. A randomly selected fraction $1 - \delta_0$ will then leave the game
- Players whose partner has left the game match up with each other and play continues

The Model

- Countably infinite number of players
- Type $\theta \in \Theta \equiv \{0, \theta_0\}$. A fraction λ are altruists with $\theta = \theta_0 > 0$
- Infinitely repeated game with discount factor δ, where players pair up into a team in each period and play a stage game
- Players learn before period 1 that an exogenous shock will occur after T_0 periods. A randomly selected fraction $1 - \delta_0$ will then leave the game
- Players whose partner has left the game match up with each other and play continues

The Model

- Countably infinite number of players
- Type $\theta \in \Theta \equiv \{0, \theta_0\}$. A fraction λ are altruists with $\theta = \theta_0 > 0$
- Infinitely repeated game with discount factor δ, where players pair up into a team in each period and play a stage game
- Players learn before period 1 that an exogenous shock will occur after T_0 periods. A randomly selected fraction $1 - \delta_0$ will then leave the game
- Players whose partner has left the game match up with each other and play continues

The Model

- The stage game:

	C	D
C	$a+\theta_i, a+\theta_j$	c, b
D	b, c	d, d

- Matching: random in first period, by some exogenous mechanism in later periods

Look at a subset of Perfect Bayesian equilibria

Parameter assumptions:

$$\delta > \frac{b-a}{b-d} \quad (1)$$

$$\delta_0 \leq \frac{1-\delta}{\delta}\frac{b-a}{a-d} \quad (2)$$

The Model

- The stage game:

	C	D
C	$a + \theta_i, a + \theta_j$	c, b
D	b, c	d, d

- Matching: random in first period, by some exogenous mechanism in later periods

Look at a subset of Perfect Bayesian equilibria

Parameter assumptions:

$$\delta > \frac{b-a}{b-d} \tag{1}$$

$$\delta_0 \leq \frac{1-\delta}{\delta}\frac{b-a}{a-d} \tag{2}$$

The Model

- The stage game:

	C	D
C	$a+\theta_i, a+\theta_j$	c, b
D	b, c	d, d

- Matching: random in first period, by some exogenous mechanism in later periods

Look at a subset of Perfect Bayesian equilibria

Parameter assumptions:

$$\delta > \frac{b-a}{b-d} \tag{1}$$

$$\delta_0 \leq \frac{1-\delta}{\delta}\frac{b-a}{a-d} \tag{2}$$

The Model

- The stage game:

	C	D
C	$a+\theta_i, a+\theta_j$	c, b
D	b, c	d, d

- Matching: random in first period, by some exogenous mechanism in later periods

Look at a subset of Perfect Bayesian equilibria

Parameter assumptions:

$$\delta > \frac{b-a}{b-d} \tag{1}$$

$$\delta_0 \leq \frac{1-\delta}{\delta}\frac{b-a}{a-d} \tag{2}$$

Equilibria

Three types of equilibrium outcomes which can be Pareto ranked

More favourable equilibria only exist for a subset of parameter values

- An equilibrium always exists where players defect in all periods before the shock
- That is the unique equilibrium unless there is a period where players sort: altruists cooperate and egoists defect
- Sorting reveals players' types: altruists will cooperate with each other egoists will defect until the shock
- The condition for sorting is that there exist integer $T \leq T_0$ such that $T_a \leq T \leq T_e$.

Equilibria

Three types of equilibrium outcomes which can be Pareto ranked

More favourable equilibria only exist for a subset of parameter values

- An equilibrium always exists where players defect in all periods before the shock
- That is the unique equilibrium unless there is a period where players sort: altruists cooperate and egoists defect
- Sorting reveals players' types: altruists will cooperate with each other egoists will defect until the shock
- The condition for sorting is that there exist integer $T \leq T_0$ such that $T_a \leq T \leq T_e$.

Equilibria

Three types of equilibrium outcomes which can be Pareto ranked

More favourable equilibria only exist for a subset of parameter values

- An equilibrium always exists where players defect in all periods before the shock
- That is the unique equilibrium unless there is a period where players sort: altruists cooperate and egoists defect
- Sorting reveals players' types: altruists will cooperate with each other egoists will defect until the shock
- The condition for sorting is that there exist integer $T \leq T_0$ such that $T_a \leq T \leq T_e$.

Equilibria

Three types of equilibrium outcomes which can be Pareto ranked

More favourable equilibria only exist for a subset of parameter values

- An equilibrium always exists where players defect in all periods before the shock
- That is the unique equilibrium unless there is a period where players sort: altruists cooperate and egoists defect
- Sorting reveals players' types: altruists will cooperate with each other egoists will defect until the shock
- The condition for sorting is that there exist integer $T \leq T_0$ such that $T_a \leq T \leq T_e$.

Equilibria

Sorting condition for egoists

Compare:

$$\lambda b + (1-\lambda)d + \frac{\delta}{1-\delta}(1-\delta^{T-1})d + \delta_0 \frac{\delta^T}{1-\delta} a$$

$$\lambda a + (1-\lambda)c + \frac{\delta}{1-\delta}(1-\delta^{T-2})a + \delta^{T-1} b + \delta_0 \frac{\delta^T}{1-\delta} d$$

Equilibria

- If there exists integer $T \leq T_0$ such that $T_a \leq T \leq T_e$, then an equilibrium exists in which players sort
- Players can defect until T periods before before the shock and then sort
- If $\lambda \geq \lambda^*$ as well, then a third type of equilibrium exists. Players can cooperate until T periods before the shock and then sort

Interpretation in terms of morale

Equilibria

- If there exists integer $T \leq T_0$ such that $T_a \leq T \leq T_e$, then an equilibrium exists in which players sort
- Players can defect until T periods before before the shock and then sort
- If $\lambda \geq \lambda^*$ as well, then a third type of equilibrium exists. Players can cooperate until T periods before the shock and then sort

Interpretation in terms of morale

Equilibria

- If there exists integer $T \leq T_0$ such that $T_a \leq T \leq T_e$, then an equilibrium exists in which players sort
- Players can defect until T periods before before the shock and then sort
- If $\lambda \geq \lambda^*$ as well, then a third type of equilibrium exists. Players can cooperate until T periods before the shock and then sort

Interpretation in terms of morale

Equilibria

- If there exists integer $T \leq T_0$ such that $T_a \leq T \leq T_e$, then an equilibrium exists in which players sort
- Players can defect until T periods before before the shock and then sort
- If $\lambda \geq \lambda^*$ as well, then a third type of equilibrium exists. Players can cooperate until T periods before the shock and then sort

Interpretation in terms of morale

Robustness

1) Renegotiation-proofness

2) No rematching

3) Uncertainty about the shock

Helping Morale - I

Seemingly reasonable measures to favour morale, such as increasing the returns to succesful cooperation, can be counterproductive

Theorem

Say θ_0 is small. Then pay-off parameters a, b, c and d exist such that there is an equilibrium with some cooperation, but a marginal increase in a leaves all players defecting as the unique equilibrium.

Parallel to intrinsic motivation, crowding out

Helping Morale - II

Flexibility

- Let players choose actions more frequently (shorter periods)
- Can prevent any breakdown at all, or can favour sorting

Informing in Advance

- A necessary condition to avoid a complete breakdown is $T_a \leq T_0$
- So informing employees longer in advance can help. But if morale does collapse, it stays low for longer.

Helping Morale - II

Flexibility

- Let players choose actions more frequently (shorter periods)
- Can prevent any breakdown at all, or can favour sorting

Informing in Advance

- A necessary condition to avoid a complete breakdown is $T_a \leq T_0$
- So informing employees longer in advance can help. But if morale does collapse, it stays low for longer.

Helping Morale - II

Flexibility

- Let players choose actions more frequently (shorter periods)
- Can prevent any breakdown at all, or can favour sorting

Informing in Advance

- A necessary condition to avoid a complete breakdown is $T_a \leq T_0$
- So informing employees longer in advance can help. But if morale does collapse, it stays low for longer.

Helping Morale - III

Efficient, productive teams may have difficulty adjusting to unexpected changes

- Morale was high before learning of the shock
- Cut players off from information. Parallel to Arrow (1974), Burt (2005)
- Make a clear distinction between altruists and egoists while times are still good

Literature

Related papers in the literature:

- Repeated interactions in teams - Che and Yoo (2001), Kvaloy and Olsen (2006)
- Morale in organizations - Levin (2002)
- Repeated prisoners' dilemma - Kreps et al. (1982).

Thanks