

Incentives and Organizations

Solution Sketch

Question 1:

It is often argued that compensation schemes do not only affect workers' performance incentives, but that they can also have "selection effects" (or affect "worker sorting").

- a) Explain the difference between the two effects. Discuss when and how individual risk preferences influence the importance of the two effects. Do worker's risk preferences affect the overall firm performance? Why / why not? *Base the discussion on the standard principal-agent model and empirical examples discussed in the lecture.*
- *Incentive effect: workers' performance depends on the compensation scheme*
 - *Selection effect: workers' with different abilities or preferences feel attracted by different compensation schemes*
 - *In standard P-A model: for given linear compensation scheme (commission rate b ; baseline salary s), risk-preferences do not affect the effort provision (FOC is the same with and without risk-aversion) \rightarrow incentive effect is unaffected*
 - *When production entails noise, risk-averse workers do prefer incentive scheme with lower incentives \rightarrow selection effect is affected*
 - *Dohmen and Falk (2011) show empirically that risk-averse workers choose variable payment schemes less often*
 - *Leads to situation where overall incentives are lower since different contracts are offered and therefore the effort provision is lower when workers are risk-averse.*
- b) Explain how firms should optimally respond to the presence of risk averse workers when offering work contracts. What could be an alternative way to increase firm performance when workers are risk averse?
- *Firms should offer compensation schemes that involve lower performance incentives (lower commission rate) when production technology (or measurement of output) entails noise.*
 - *Moreover, firms should invest in production technology/monitoring schemes to reduce noise.*

c) Consider the study “Performance Pay and Productivity” by Lazear (AER 2000). Explain how he disentangles the incentive and the selection effect of performance pay. Discuss the underlying identification assumptions and potential violations that would threaten the internal validity of the results.

- *Fixed effect estimation yields pure incentive effect for workers who are employed under old and new compensation scheme*
- *OLS estimation without worker fixed effects yields total effect (incentive + selection effect)*
- *Difference between the two estimates is interpreted as evidence for selection (about half of the total effect can be explained by selection)*
- *Fixed effect estimation assumes absence of trends that are correlated with introduction of performance pay*
- *Performance pay might be not randomly introduced, i.e. more/less productive workers spend more/less time under new compensation scheme*
- *Less productive workers are more likely to leave firm. Since the incentive effect might be lower for workers with lower productivity the incentive effect might be overestimated (upper bound)*

d) The findings by Lazear indicate that pay-for-performance increases the firm productivity by about 44% relative to a fixed hourly wage. Many firms, however, still use fixed wage schemes. Why could such a strategy nonetheless be optimal from a firms’ perspective? Briefly outline three reasons that we discussed throughout the course and explain the underlying mechanisms.

- *We discussed various reasons during the course, e.g.:*
 - *Monitoring costs are too high, respectively output is too difficult (too costly) to measure*
 - *Fairness concerns: high fixed wage might create reciprocal response, which increases worker performance*
 - *Arousal under choking: incentives might have dysfunctional effects reducing performance*
 - ...

Question 2:

a) A “self-enforcing relational contract” is an informal agreement, which ensures that the contracting parties do have incentives to stick to the agreement even when outcomes are

non-verifiable. Discuss at least three factors that contribute to the feasibility of relational contracts and explain why they are important.

- See lecture notes, Section 5:
 - o Short-run gains from defection are relatively low
 - o Mutual gains from cooperation are relatively high
 - o Players' outside options are relatively bad
 - o Players are relatively patient
 - o Probability that game is terminated due to exogenous shocks is relatively low (r small)

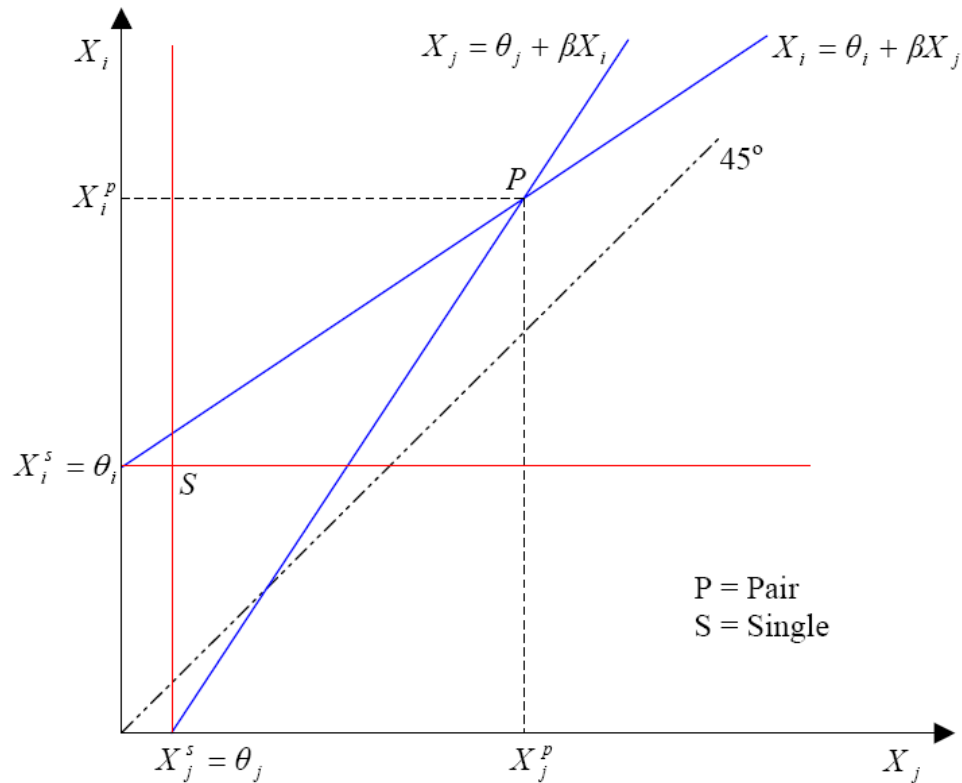
- b) Explain why infinite settings facilitate the emergence of relational contracts. When are relational contracts also feasible in finite settings? Explain the key differences based on an empirical example that we discussed during the course.
 - In infinite settings expected value of maintaining cooperation is generally larger
 - Finite settings require either fair-minded agents or uncertainty about the termination probability, this is not necessary in infinite settings
 - Nevertheless, relational contracts can emerge in both settings

- c) Discuss the following statement: "Unemployment as a disciplining device is a necessary pre-condition for relational contracting". Do you agree with the statement? Why / why not?
 - Presence of unemployment helps to discipline worker
 - Threat of being unemployed reduces value of defection
 - Nevertheless, rational contracting can also take place without unemployment since cooperation can involve future rents for other reasons
 - o Earning a higher salary in the future
 - o Being promoted to a better paid job
 - o Fairness and reciprocity...

Question 3:

- a) Consider the following figure from the study "Clean Evidence on Peer Effects" by Falk, A. and A. Ichino (JOLE 2006) and explain based on the graphical example how peer effects could affect workers' performance. How does the presence of a peer effect influence the output difference between the two players?
 - Figure illustrates example with positive peer effects, i.e. $\beta > 0$
 - Performance of player i has positive effect on performance of player j (and vice versa)

- In equilibrium with peer interactions (P), both players have higher performance than without peer interaction (S).
- Output difference decreases
- Absolute peer effect is stronger for lower performing player
- Player with higher performance creates larger spillover



- b) The paper "Inequality at work: the effect of peer salaries on job satisfaction" by Card, D., A. Mas, E. Moretti, and E. Saez (AER 2012) reports the results from a field experiment conducted at the University of California.
- Briefly summarize their basic setup and
 - Explain the empirical strategy.
- *Randomized controlled trial*
 - *Disclosing information on peers' salaries*
 - *Treatment group is informed about website with information on salaries of workers in public sector*
 - *Survey measures on job satisfaction and administrative data on actual earnings*
 - *Estimate separate treatment effect for those below/above median earnings*
 - *Different specifications (dummy, rank, levels)*

- c) The information treatment increases the use of the *Sacramento Bee Website* by about 28 percentage points. Why is this information important for the interpretation of the further results?
- *Only 28% of the individuals in the treatment group change their behavior due to the information treatment*
 - *Regressing treatment indicator on outcomes might underestimate the true effect of actually receiving information on peer salaries*
 - *Scaling by 1/0.28 provides treatment effect on treated*
 - *This might reflect an upper bound since those who use the website are likely to be more affected by their peers' salary*
- d) In the paper, the authors propose two alternative models that could impose a relationship between the information treatment and the job satisfaction of workers.
- o Explain the intuition behind the two competing models and
 - o Discuss to what extent the empirical results support one or the other.
 - o Is there an empirical test that would allow further disentangling the relevance of the two models? What additional information (or variable) would be required?
- *Relative income model: workers' utility increases in difference between own income relative to reference group → higher job satisfaction if income is above income of others and vice versa*
 - *Rational updating: workers future income expectations depend income of reference group → higher job satisfaction if income is below income of others as they expect pay rise and vice versa*
 - *Empirical findings show reduced job satisfaction and larger intention to change job due to information treatment for those below median income*
 - *Interpreted as evidence for relative income model*
 - *Results are not fully conclusive since the authors do not observe expected utility*
 - *Exploiting information about expected future salaries would allow further empirical test*

Question 4:

- a) Some psychological theories have argued that extrinsic rewards crowd out intrinsic motivation. Why is it difficult to identify the crowding-out effect? Describe *at least three* factors that complicate the empirical identification.
- *No clear-cut definition of intrinsic motivation, crowding-out, etc.*
 - *Measurement of intrinsic motivation is difficult*

- *Exogenous change in extrinsic rewards required*
 - *Performance under financial incentives is affected by incentives itself → makes it difficult to disentangle the two effects*
 - *Crowding-out of intrinsic motivation might be observational equivalent to other phenomena, e.g. perceptions about social norms, reciprocity etc.*
- b) We have discussed a number of studies that analyzed the crowding-out effect of extrinsic incentives. Consider two of these studies and describe how the authors of the studies have tried to tackle the challenges you mentioned in part a). To do so, describe the empirical strategies of the papers and explain how the authors use their approach to analyze crowding-out effects. Do the studies differ in the degree to which they can address the different challenges?
- *Deci (1971):*
 - *Lab experiment*
 - *“A-B-A” (within-subject) design described in LN Section 7, Slides 10-12.*
 - *Treatments differ only in the presence / absence of a monetary (performance-contingent) reward in the second session.*
 - *Crowding-out effect measured after monetary incentive was removed → unclear whether intrinsic motivation should be measured during or after reward time.*
 - *Intrinsic motivation measured by time spent on task → unclear whether this is a reasonable proxy.*
 - *Experimenter left room to ensure that monitoring does not affect effort decision.*
 - *Additional treatment investigates the effect of verbal reward in similar setting.*
 - *Gneezy/Rustichini (QJE, 2000a)*
 - *Lab experiment*
 - *Between-subject design, i.e. no “A-B-A” approach*
 - *Subjects receive show-up fee plus performance-contingent reward (depending on treatment arm)*
 - *Different levels of commission rate allow to elicit effect of financial incentive itself, but different effects cannot be directly disentangled*
 - *Crowding-out effect measured during incentivized period (i.e. no diff-in-diff approach)*
 - *Intrinsic motivation measured through knowledge quiz instead of mechanical task*
 - *Follow-up experiment with (independent) principals allows to examine subjective perceptions about the effect of financial incentives on performance*
 - *Alternative examples from the course that could be discussed: Gneezy/Rustichini (J Legal Stud, 2000b): “A fine is a price” or Falk/Kosfeld (AER, 2006): “The hidden costs of control”*