Compliance in Social Dilemmas

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Motivation

- Social dilemmas are defined by a conflict between private (self) interest and potential gains to society from mutual cooperation.

  - e.g. public good provision by voluntary contributions, common pool resource management, incentives to vote.
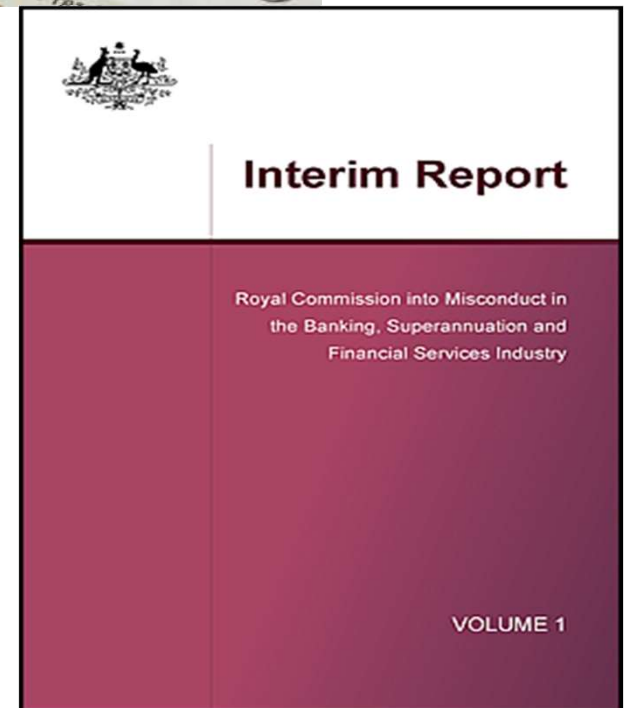
Motivation

- Many social dilemmas involve decisions made by firms (composed of principals and agents) rather than individuals.

Volkswagen Emissions scandal

Financial and Banking crisis

Motivation

- This introduces an Agency Risk.
  - Agents may not take appropriate preventive actions and therefore create a negative externality.
  - Besides harming external parties in a social dilemma, agent's insufficient care can harm the principal directly.
- Actions are unobservable.

Social Dilemmas with Agency Risk

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Research questions

- We explore compliance in social dilemmas with and without an agency risk.

- Does Agency Risk exacerbate social dilemma problems?

- Can appropriate contracts be designed to solve this problem?

Experimental Methodology

- Easier to measure non-compliance and the externality it creates.
  - Key variables such as effort, probability of accidents, violations, penalty known.

- Behavioural influences:Reciprocity, and other social motives can be observed/measured.

- Easier to make causal inferences using experiments: random assignment of treatment conditions.

Experimental methodology

- For many policy issues, the data required for empirical testing are simply unavailable, either in a timely fashion, or at all.
  - Lab provides perhaps the only opportunity to explore different policy options and counterfactuals (in a low cost, low risk setting).

- Even if theory and empirical evidence exist, lab experiments can test the robustness of those results to behavioral factors, sometimes uncovering unanticipated behavior that may undermine the success of a policy.

- Experiments are a useful complement to observational studies and in some cases an essential methodology in the economics tool kit.

Research framework

The principal observes the outcome but not the effort level.

Agent's effort choices determine the likelihood a bad outcome occurs.
  ◦ example: **pollution spill/emissions**.

Social dilemma arises because when a bad outcome occurs, not only do the principal's earnings fall but other principals in the group also suffer damages.
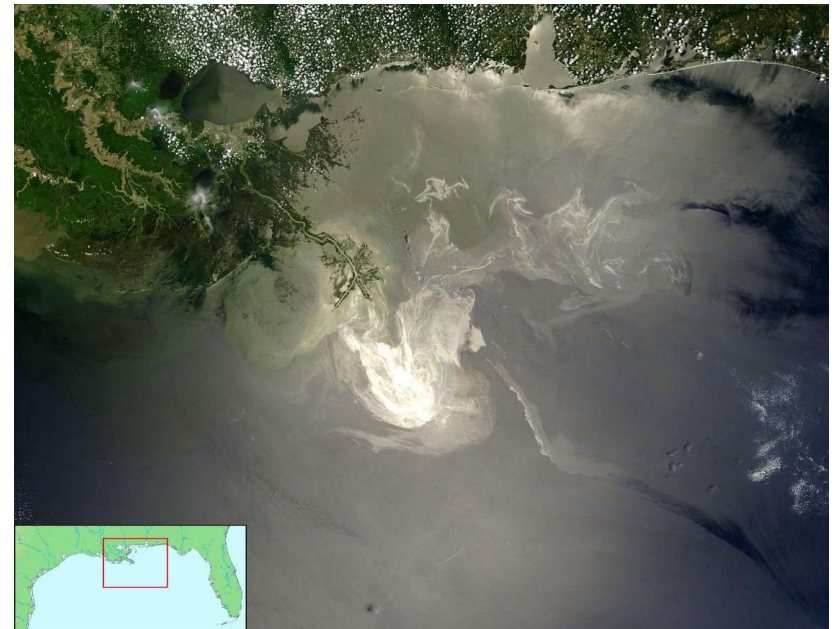
Social Dilemmas: Examples

Increased cost from regulatory scrutiny on all firms in the industry

Financial Crisis (Claessens and Kodres, 2014)

BP Deepwater Horizon Oil Spill (Aldy, 2014)

Royal Commission on Banking (The Age, Nov 8th 2018)

The confession files

Sarah Danckert
Clancy Yeates
John Collett

Assault, sexual harassment, ripped-off children, homophobic treatment of customers and bankers setting up fake accounts in their customers' names – this is just a taste of the misconduct laid bare by the nation's biggest banks in their initial submissions to the royal commission.

Banks handed over the rap sheets to the royal commission after being asked by Commissioner Kenneth Hayne to confess to their misconduct. The extraordinary list of misdeeds was produced to guide the scope of inquiry's investigations and was provided to the commission earlier this year.

Yesterday, the Hayne royal commission released 215 documents detailing a decade of wrongdoing.

The bank's list of misconduct goes much further than the royal commission, which has only been able to investigate a slice of the misconduct. The documents span thousands of pages and detail a slew of other civil and potentially criminal breaches by the banks and their staff. The release of the documents comes about six weeks after the interim report of the Hayne

former Aussie office, assaulted someone and stole goods after a work event.
■ CBA failed to refund fees charges to victims of fraud (for example, international purchase fees made on stolen credit cards).
■ CBA's Aussie Home Loans sacked a staff member who made inappropriate comments and used sexual language with another employee. Two other Aussie Home Loans staff were counselled after customers complained they were treated in a homophobic manner. A third broker was disciplined for using foul language in a voicemail to a customer.

WESTPAC
■ Westpac sacked "a number" of staff for setting up accounts in customers' names without their knowledge in order to hit performance targets and get a bonus between 2013 and 2016. Staff "simulated" deposits and withdrawals to suggest the accounts were "active." An investigation resulted in some staff being fired.
■ The bank overcharged children by failing to apply the promised discounts to 160,000 bank accounts held by Westpac or St George customers aged under 21 or 18. The bank has paid out $9.2 million in compensation over the error since

checks in January and February of 2015. It paid $3.3 million to customers.
■ Various mortgage brokers provided the bank with false information when submitting home loan applications.

ANZ BANK
■ The bank failed to refund customers' accounts when they left cash in non-branch ATM cash dispensers between 2011 and 2015. The incident occurred because of an "oversight," and it led to 23,500 customers receiving $2.5 million in compensation.
■ ANZ's wealth business failed to put $28 million of default superannuation contributions into no-frills MySuper accounts between January and October of 2014, when the lower-cost super regime came into effect. About 2500 members received about $600,000 in compensation. It later identified a further $18 million in super contributions it had mishandled in a similar way, leading to another $423,000 in compensation.
■ ANZ reported the conduct of 39 advisers to the Australian Securities and Investments Commission in 2015, because it had "serious compliance concerns," and has made reports about the conduct of 41 advisers or representatives

64,000 lost or inactive super-annuation accounts worth $133 million to the Tax Office where customers were no longer a member of the relevant employer sponsored fund. It paid $7.2 million compensation last year.

AMP
■ AMP Bank failed to give required disclosure documents to people who were acting as guarantors on loans, which was reported to the corporate regulator in 2012. A similar problem came up again this January this year, due to a new IT system.
■ Its banking arm did not report cash deposits of $10,000 that were processed to Australia Post to the anti-money laundering agency, Austrac, as it required to.
■ The wealth giant has identified 60 advisers with "potential serious compliance concerns" since 2009 and 370 advisers with "potential other compliance concerns."

NAB
■ NAB's superannuation trustee NULIS made no refunds after the Centrelink schedules produced for some members were incorrect.
■ NAB-aligned planner misappropriated funds from client's super-annuation fund and trust account and advised them to invest in a

director and shareholder without full disclosure. Matter reported to Tasmania police. NAB "verbally" told ASIC in July 2016 but only made a formal breach report in October 2016. Banks have 10 days to report significant breaches. The client was refunded $3 million.
■ NAB terminated authorised representative Wealthfarm, a group based on the Gold Coast, after concerns were raised reps from Wealthfarm were receiving commissions from property developers.

MACQUARIE GROUP
■ Seven of its financial advisers have engaged in misconduct since it concluded a court-enforceable undertaking with the regulator in 2015. They have all left the bank.
■ The bank has had about 40 incidents involving the mishandling of client money in both 2016 and 2017, after the regulator slapped licence conditions on Macquarie over this issue in 2016. It said more than half the incidents were caused by human error and 70 per cent were fixed on the day of the breach.

FREEDOM INSURANCE
■ Several complaints about how hard it was to cancel policies with Freedom and about the behaviour of its call centre staff.

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advisers to the Australian Securities and Investments Commission in 2015, because it had "serious compliance concerns," and has made reports about the conduct of 41 advisers or representatives since then.
■ The bank failed to identify and pay the balances of about

Centrelink schedules produced for some members were incorrect.
■ NAB-aligned planner misappropriated funds from client's super-annuation fund and trust account and advised them to invest in a company in which the authorised representative was a

FREEDOM INSURANCE
■ Several complaints about h hard it was to cancel policies Freedom and about the behav of its call centre staff.
■ Freedom said that one custo with the surname of McDonal called in "extremely unhappy agent had sung Old McDonald Farm on a customer's voicema
■ Another complaint was was after a staff member left an inappropriate message on a customer voicemail in error he mistakenly believed that th caller had hung up. Another l voicemail using an inappropri word.

MTAA
■ The members of industry fu MTAA Super suffered poor r during the GFC and that led t the Australian Prudential Re ation Authority asking questi about the fund's governance.
■ The fund was heavily invest unlisted investments and bec of the infrequency of valuatio was only later that the write-d started to flow through to mer accounts. Its performance improv followi review o fund.

The Agency Problem

- This social dilemma is embedded in an agency problem because effort is **unobservable** to the principal and **non-contractible**.

Three scenarios: Overview

- Agency contracts: 2 Treatments:
  - Unconditional Treatment: only a fixed wage is possible.
  - Conditional Treatment: Two wages offered: one for each outcome.

- Baseline Treatment: No agent, the Principal makes the effort choice.

Agency contracts: Unconditional

- Unconditional Wage: principals can only offer an unconditional wage contract to their agents, although a non-contractual (ex-post) bonus can be paid.

  ◦ Prediction (Selfish Preferences): The principal offers the minimum wage, the agent chooses the lowest effort possible, and the actual bonus paid is zero.
  ◦ Prediction (Gift exchange): based on Fair wage-effort hypothesis.

Fair wage-effort hypothesis
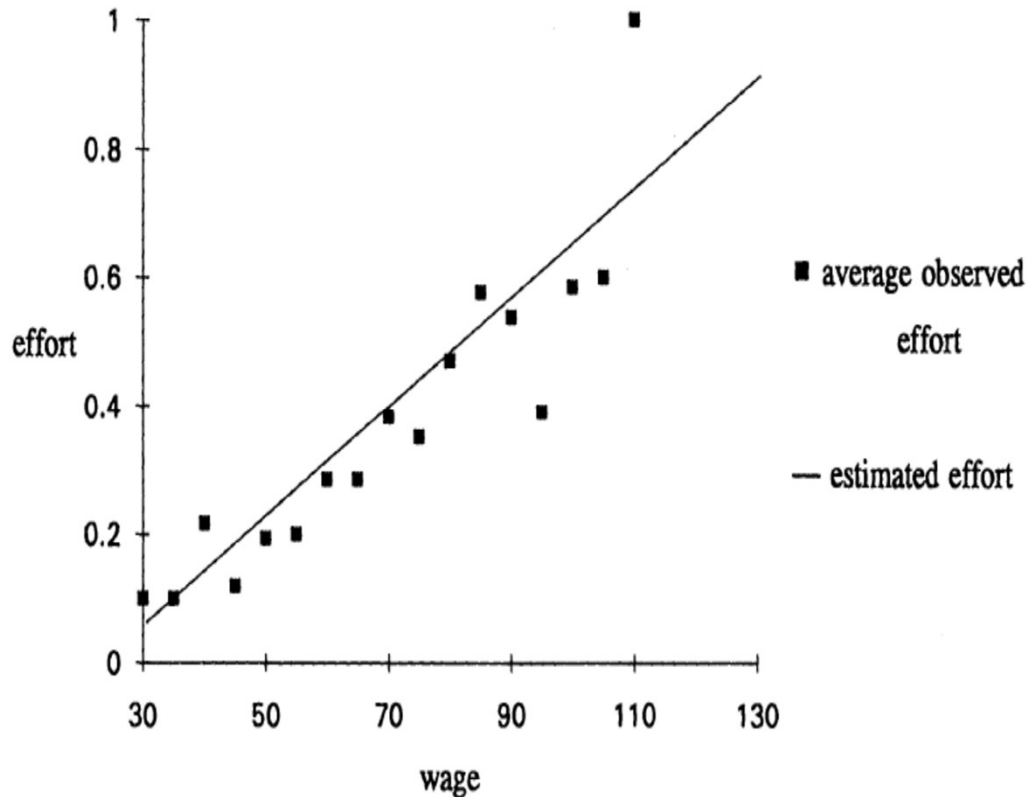
- Source: Fehr, Kirchsteiger & Riedl 1993

- Theoretical models: Akerlof 1982; Akerlof and Yellen 1990.

- **Gift-exchange**: Positive relationship between work effort and wages. Reciprocity can elicit higher wages and effort than predicted by standard theory, and improve welfare.

Agency contracts: Unconditional

- Gift exchange is usually shown in environments where the relationship between effort and outcome is **deterministic** and even though agent's effort is not contractible it is **observable**.

- **Our setting** has random shocks to unobservable effort **and** an accident that creates externalities.

- Prediction (Gift exchange): Principal offers more than the min wage available and due to positive reciprocity agent responds with more than the min effort. Due to the non-observability of agent's effort, however, any potential gift exchange effect is weak and overall effort remains below optimal level.

Agency contracts: Conditional

- Conditional Wage: wages can be conditioned on the accident outcome, and a non-contractual bonus can also be paid.
  - If the wage differential offered in the contract equals the total harm suffered by the principal from an accident, then the incentives of the agent align with those of the principal.

  - Prediction (Conditional Contract): Optimal wage for bad outcome would be zero and optimal wage for the good outcome would be the total harm suffered by the principal.

Baseline: Principal only

- Baseline scenario: No agent. Principal makes own effort choice directly.

- Prediction (Baseline): The principal will choose an effort level that is smaller than the socially optimal level.
  - Equivalently, accidents will occur more frequently than is socially optimal.

Hypotheses (compare across treatments)

- **H1** Effort: $e_i^{opt} > e_i^{base} \geq e_i^{cond} > e_i^{uncond}$

  (8)   (Nash=3)

- **H2**: Wages in Conditional > Wages in Unconditional
  - wages in unconditional should be the minimum possible, but could be higher because of reciprocity (gift exchange).

- **H3**: Bonus in Unconditional > Bonus in Conditional
  - In conditional, the bonus is not needed since the wage differential can align agent incentives. In unconditional, bonus may be paid sometimes due to reciprocity.

Experimental design

- Principals are randomly put into fixed groups of four. Any accident reduces the profit of each principal in the group.

- Accidents harm (only) principals, so even in the agency treatments where each group consists of four pairs, accidents are equally harmful to the group.

- Roles in agency treatments: randomly determined and fixed.

- Principal-agent pairings: fixed for (finitely) repeated interaction

Experimental design

- 15 periods and 3 stages in each period (agency treatments):

3 stages

1: Principal offers contract: Wage offer, desired effort, proposed (cheap talk) bonus

2: Agent chooses costly effort level (unobserved)

3: Accident may occur, wage is paid, and the Principal chooses bonus

15 periods
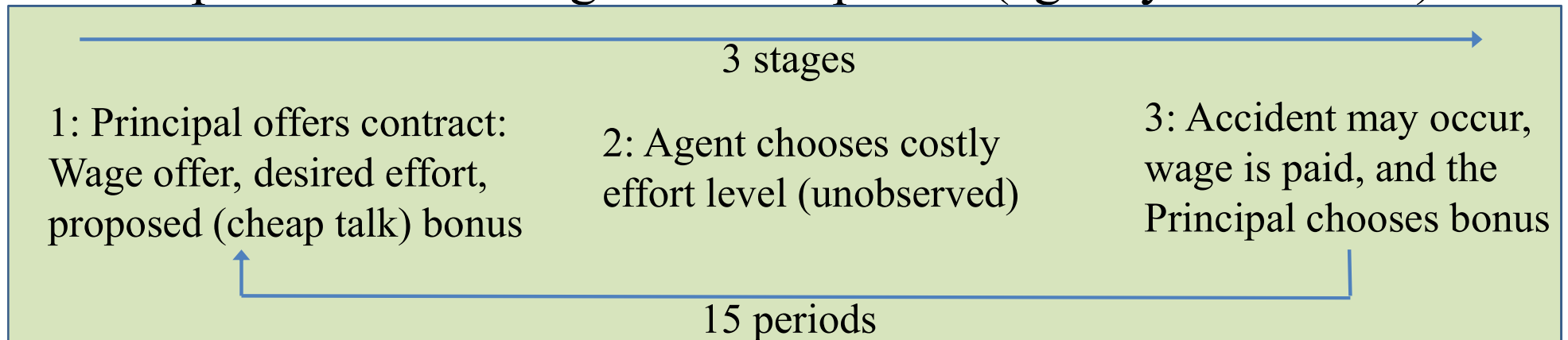
- The principal observes whether an accident has occurred but not the effort level chosen by the agent.

Accident Likelihood and Cost (Parameters)
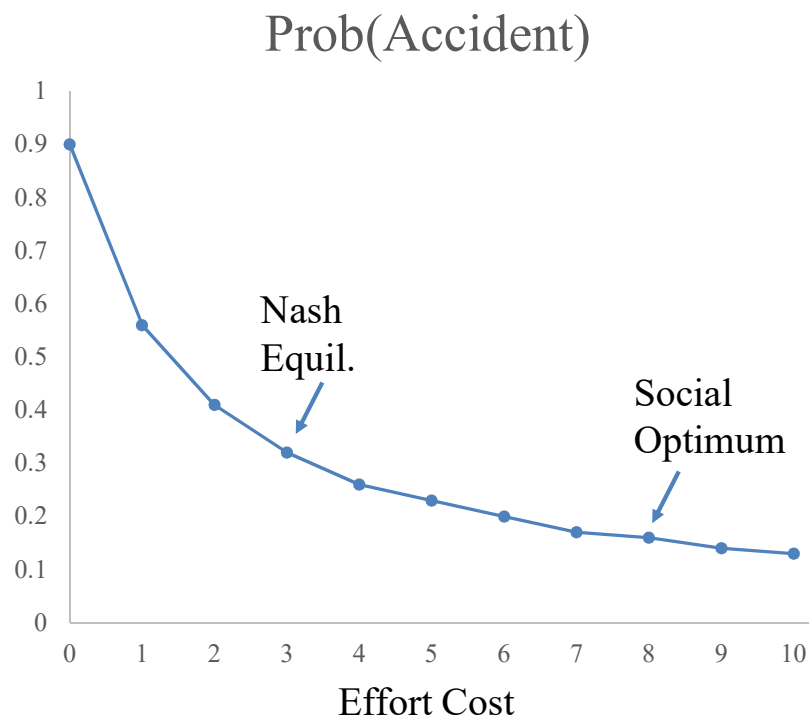
Prob(Accident)

Effort Range : 0 to 10.

Probability of Accidents: 0.9 to 0.13

Principal Earnings = 35 – wage – (15×total number of accidents) – bonus

Agent Earnings = wage – effort cost + bonus

Procedures

- Subjects also participated in a Risk task (Eckel and Grossman, 2008) and Social Value Orientation task (Murphy 2010).

- Five periods randomly picked for payment.

- Paid quiz to check comprehension.

- 7 independent groups of 8 each for conditional & unconditional treatments; 6 independent groups of 4 for baseline (136 total subjects: university students)
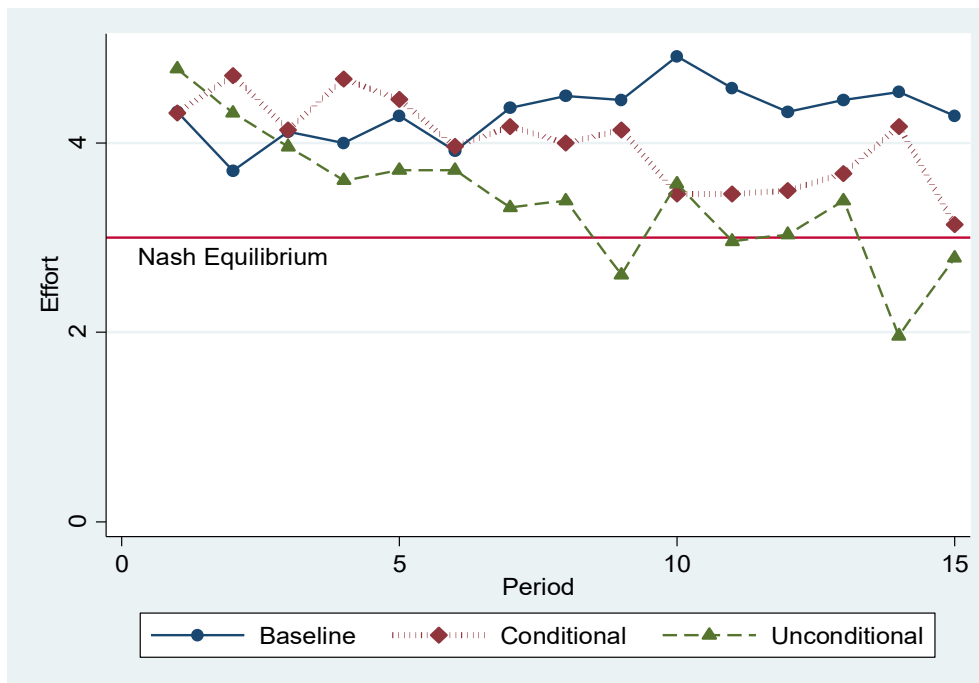
- Average earnings of $28, IQR={$22, $34}, 80-90 minutes.

Results

- Graphs and conservative (non-parametric) statistical tests.

- Panel data models with individual subjects representing random effects.
  - Cluster standard errors at group level
  - Include risk, social preference and demographic controls.
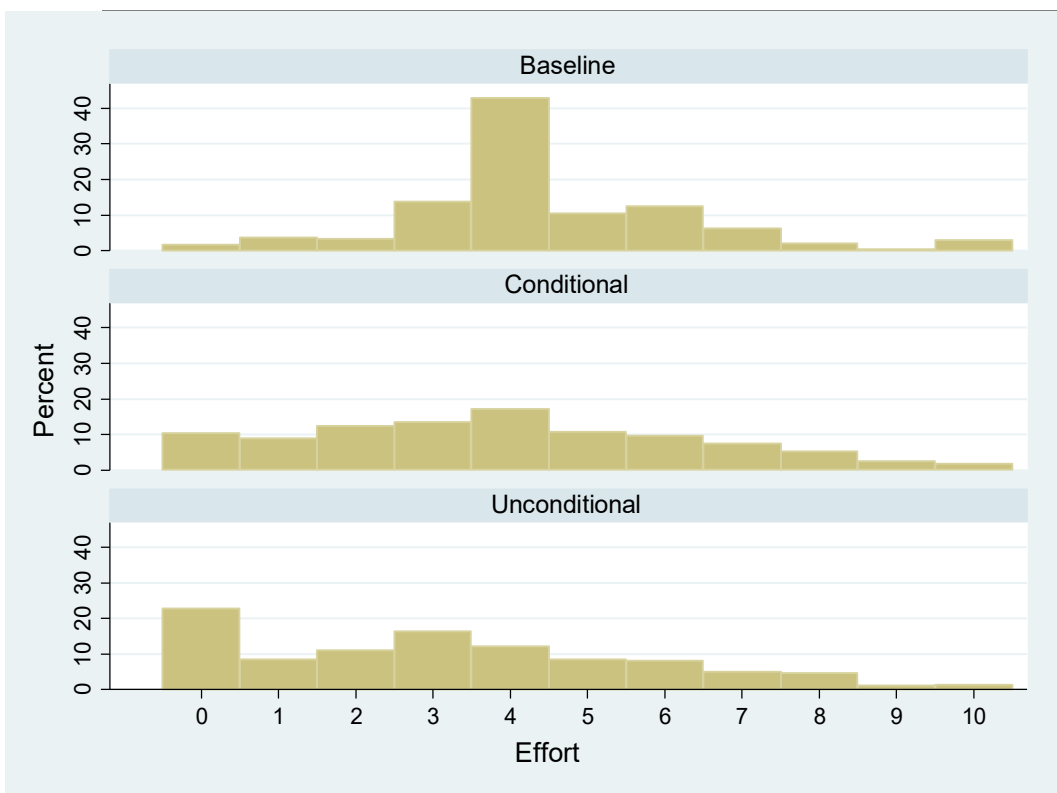
Results: Effort choices

Overall effort choices in all treatments are between the Nash equilibrium (3) and the socially optimal level (8).

Different from 8 in all treatments (sign rank test p value < 0.05)

Baseline and Conditional: different from 3 (p value:0.028; 0.018)

Unconditional: not different from 3 (p value:0.672)
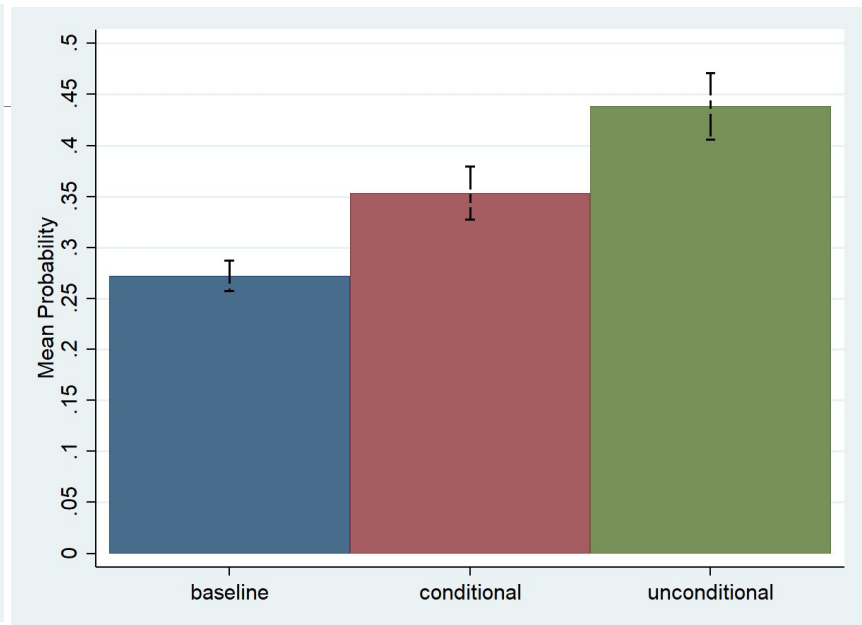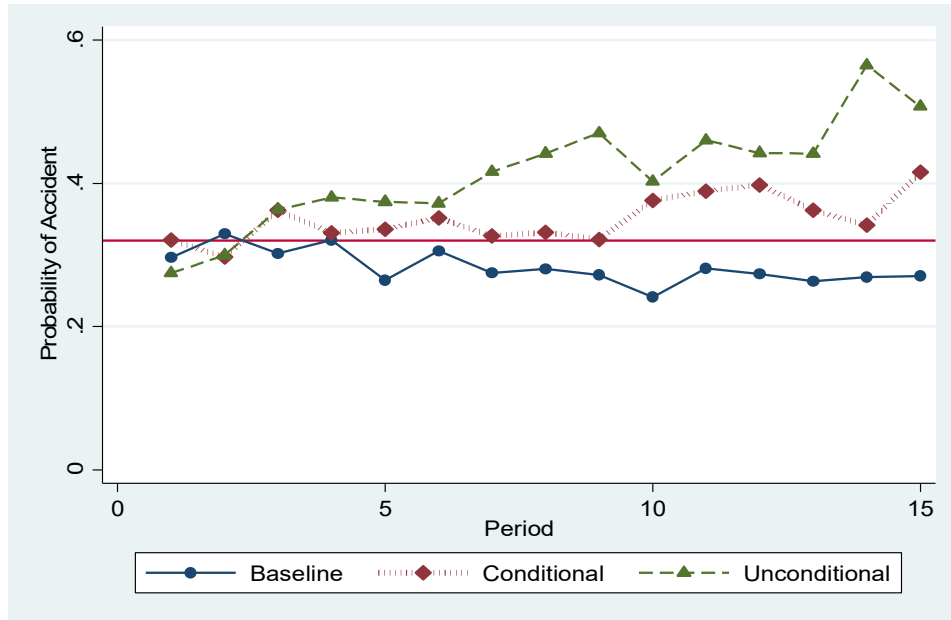
Results: Effort choices

Consistent with Hypothesis 1, mean effort choice is not different in the Baseline and Conditional wage treatments (although variance differs (p-value<0.01))

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and is significantly lower in the Unconditional wage treatment.

Results: Probability of accidents

Likelihood of accidents is significantly different across all three treatments, with highest in Unconditional and lowest in Baseline.
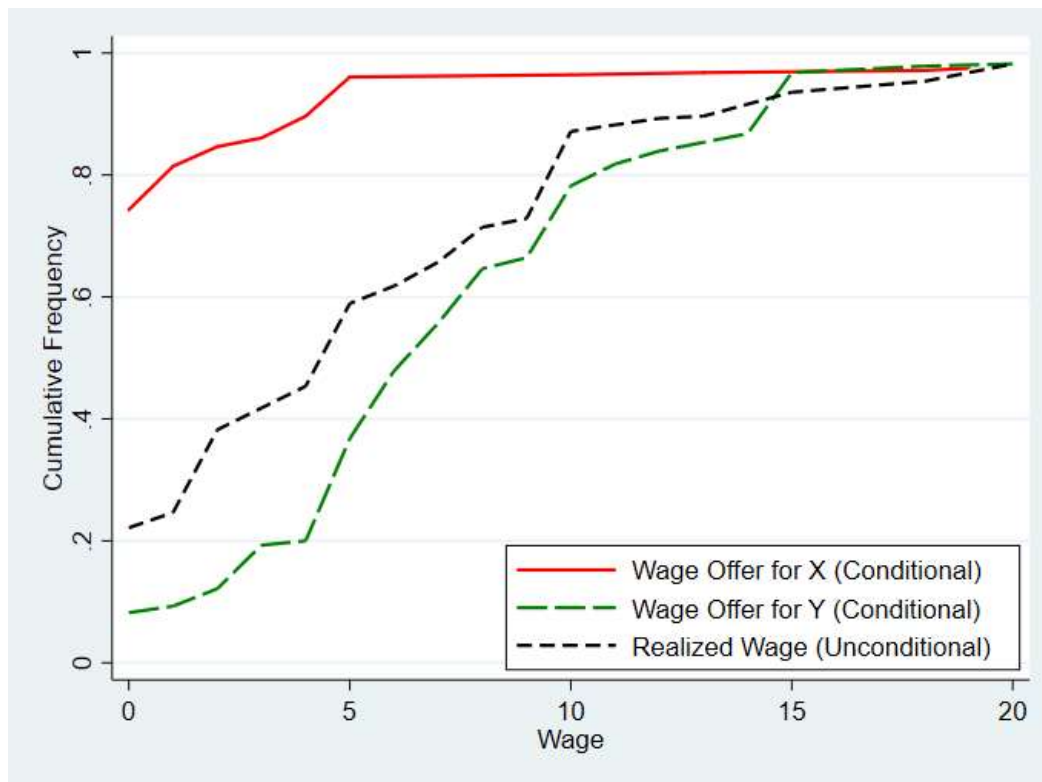
Results: Wages paid

Principals pay much lower wages in the event of an accident when wages can be conditioned on the accident outcome (p value=0.018).

Contrary to Hypothesis 2, wages paid are not different in the Conditional and Unconditional treatments (p-value=0.848).
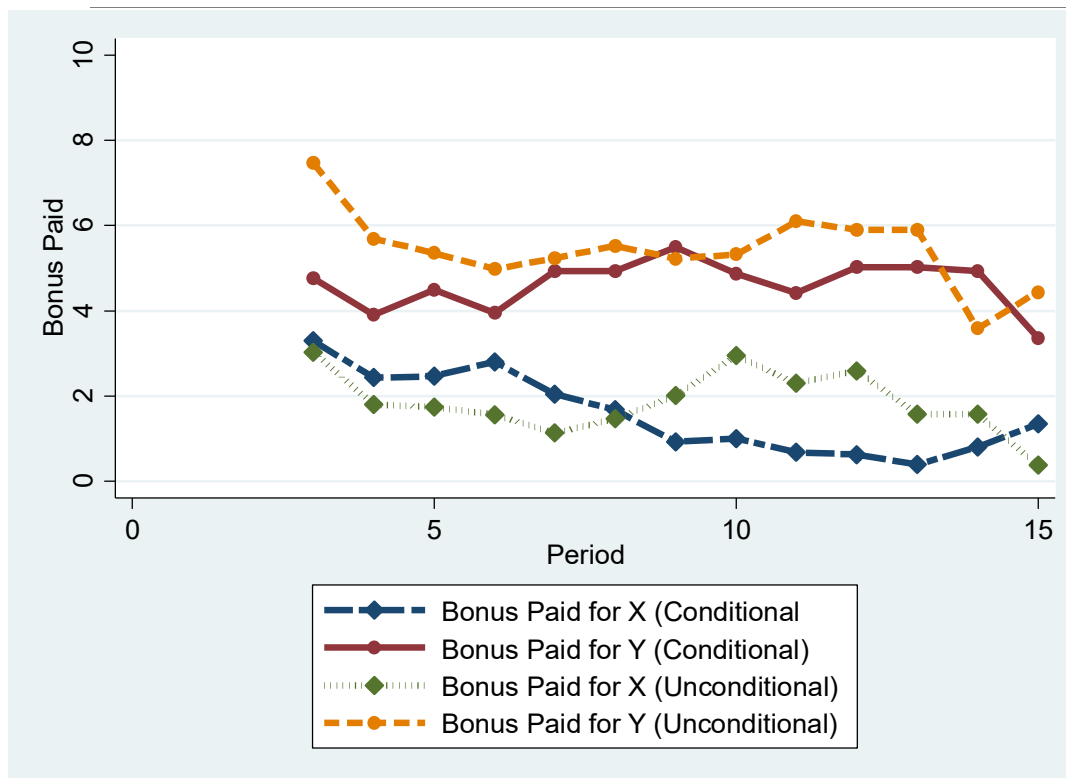
Results: Cumulative Distribution of Wages

Many 0 wage offers for accident outcome (X) in Conditional treatment, as predicted.
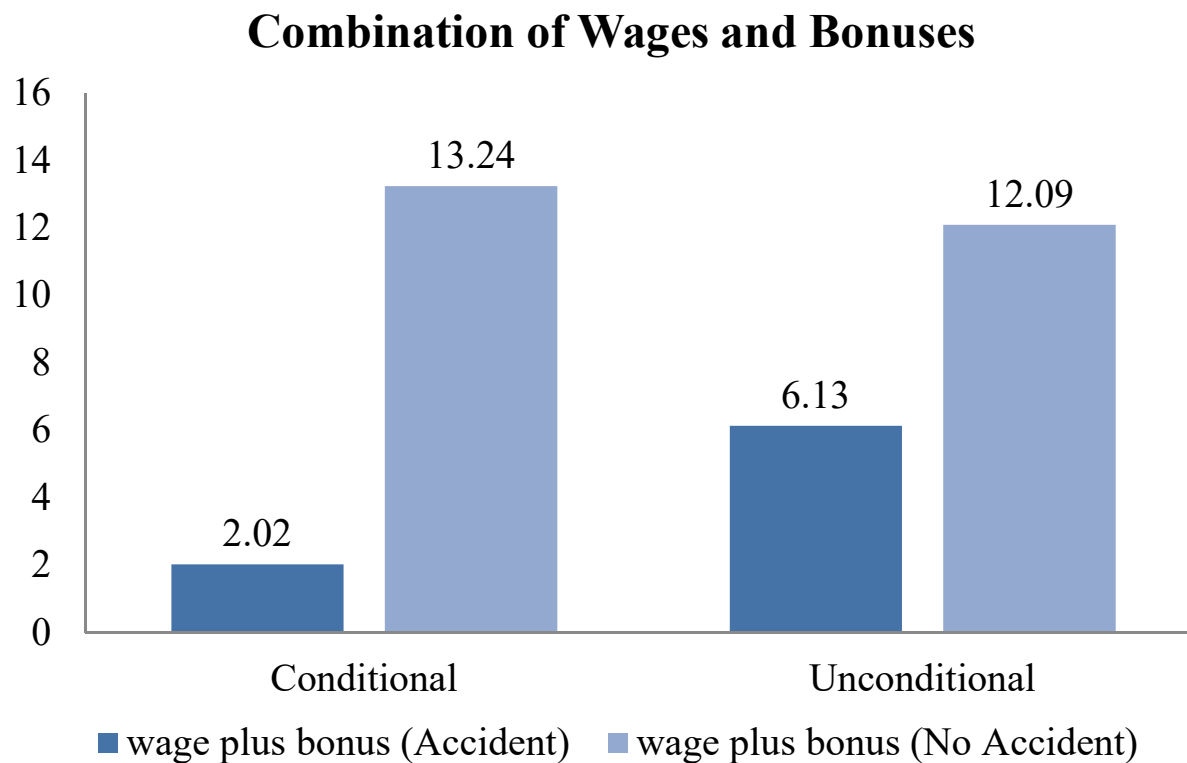
But widely dispersed wages in other cases.

Results: Bonus paid (3-Period Moving Average)

Contrary to Hypothesis 3, average bonus payments are not significantly different in the two agency treatments (p value =0.565).

Also not different when separated by no-accident and accident outcomes.

Results: Wage and Bonus Combination

Combination of Wages and Bonuses

Wage and bonus combination is close to the optimal wage offer (15) for the no accident case.

Principals use the combination to try to solve the agency problem

- wage plus bonus (Accident)
- wage plus bonus (No Accident)

Chart values:
- Conditional — Accident: 2.02, No Accident: 13.24
- Unconditional — Accident: 6.13, No Accident: 12.09

Results: Earnings and Accidents

	Baseline	Conditional	Unconditional
Earnings	14.56	9.88	5.69
	(1.69)	(2.41)	(1.78)
Accidents	0.267	0.354	0.436
Realized	(0.029)	(0.043)	(0.032)

Welfare comparisons across treatments: Actual accident frequency is greater and average earnings are lower in the Unconditional treatment than the Baseline treatment.

No significant difference between the Baseline and Conditional treatment.

Results: Impact of Accidents

- Accidents reduce earnings for the whole group: negative externality

- These cost on average $16 (in experimental currency) in the Baseline

- $21 in the Conditional

- $26 in the Unconditional treatment

Summary

- All three treatments fall short of achieving the social optimum: thus creating a social dilemma.

- Principals use a combination of conditional (on outcome) wage and bonuses to solve the agency problem.

- Therefore when conditional contracts are possible, agency risk does not exacerbate the social dilemma (which still exists).

- Unconditional (gift exchange) contracts, however, worsen the social dilemma: reciprocity is insufficient to incentivize the agent.

Conclusion

- Many social dilemmas around us have an agency feature.
  - We demonstrate that in such environments with outcome uncertainty, relying solely on reciprocity is insufficient to incentivize the agent.
  - **Outcome uncertainty makes informal contracts ineffective**

- For such challenging (and realistic) environments we find that explicit (conditional wage) contracts perform better—and can actually make the agency relationship perform as well as the baseline (no agency).
  - **Conditional wages appear to be necessary to incentivize effort**

THANK YOU!