Social Preferences in the Labor Market

Mark Dean

Behavioral Economics Spring 2017

- We have presented evidence from the lab that people's preferences depend on
  - Fairness
  - What others get
- Now explore the implications of this for the labor market
- Two example
- Piece rate vs Relative Incentives
- Effect of minimum wage

Piece Rate Vs Relative Incentives

Bandiera, Barankay and Rasul [2005]

- Consider two possible ways of paying your workers
  - Piece rate: get paid β per unit produced
  - Relative incentives: get paid $\frac{\alpha}{\bar{e}}$ for every unit produced
- Where $\bar{e}$ is the average output of all workers
- Why use relative incentives?
- Reduces the risk to workers
- If it is a 'bad day' everyone does badly so average wage goes up

Selfish Worker

- How would a selfish worker behave?
- For simplicity, assume that
  - A worker who produces e_i has an effort cost $\frac{\theta_i e_i^2}{2}$
  - Has linear utility for money

- Objective function for the piece rate

$$\beta e_i - \frac{\theta_i e_i^2}{2}$$

- Gives FOC

$$e_i = \frac{\beta}{\theta_i}$$

- Objective function for the relative incentives

$$\frac{\alpha}{\bar{e}} e_i - \frac{\theta_i e_i^2}{2}$$

- Gives FOC

$$e_i = \frac{\alpha}{\bar{e}} \frac{1}{\theta_i + \frac{\alpha}{N\bar{e}^2}} = \frac{\beta}{\theta_i + \frac{\beta}{N\bar{e}}}$$

- Assuming piece rate is the same ex post so $\frac{\alpha}{\bar{e}} = \beta$

- Effort under piece rate:

$$e_i = \frac{\beta}{\theta_i}$$

- Effort under relative incentives

$$e_i = \frac{\beta}{\theta_i + \frac{\beta}{N\bar{e}}}$$

- Slightly lower due to effect of effort on the mean
- But this effect goes to zero as N gets large

Altruistic Worker

- Bandiera et el. consider a very simple model of social preferences
- Agents are altruistic
  - Not sure why this is
  - An interesting project would be to study the implications of these policies for inequality averse agents
- Get a fraction π_i of the utility of other workers
- How does this affect optimal behavior?

- Objective function for the piece rate

$$\beta e_i - \frac{\theta_i e_i^2}{2} + \pi_i \sum_j \left(\beta e_j - \frac{\theta_j e_j^2}{2} \right)$$

- Gives FOC

$$e_i = \frac{\beta}{\theta_i}$$

- Unchanged from selfish case

Altruistic Worker

- Objective function for the relative incentives

$$\frac{\alpha}{\bar{e}} e_i - \frac{\theta_i e_i^2}{2} + \pi_i \sum_j \left(\frac{\alpha}{\bar{e}} e_j - \frac{\theta_j e_j^2}{2} \right)$$

- Gives FOC

$$\frac{\beta - \pi_i \sum_j \frac{\beta e_j}{N\bar{e}}}{\theta_i + \frac{e_i}{N\bar{e}}}$$

- Effort lower than in the selfish case
- Worker takes into account that their higher effort lowers the rewards of all other workers

Experimental Setting

- Fruit farm in England
- Workers tend to be from Eastern Europe on farm-specific visas
    - Low attrition
- First half of the season paid relative incentives
- Second half of the season paid piece rate
- Sample
    - 142 workers
    - 108 days

Table I: Unconditional Differences in Productivity and Other Variables

Mean, standard errors in parentheses, and confidence interval in brackets

	Relative incentives	Piece rates	Difference
Worker productivity (kg/hr)	5.01 (.243) [4.53, 5.49]	7.98 (.208) [7.57, 8.39]	2.97***
Kilos picked per day	Confidential		23.2***
Hours worked per day	Confidential		-.475
Number of workers in same field	41.1 (2.38)	38.1 (1.29)	-3.11
Daily pay	Confidential		1.80
Unit wage per kilogram picked	Confidential		-.105***

Results 2

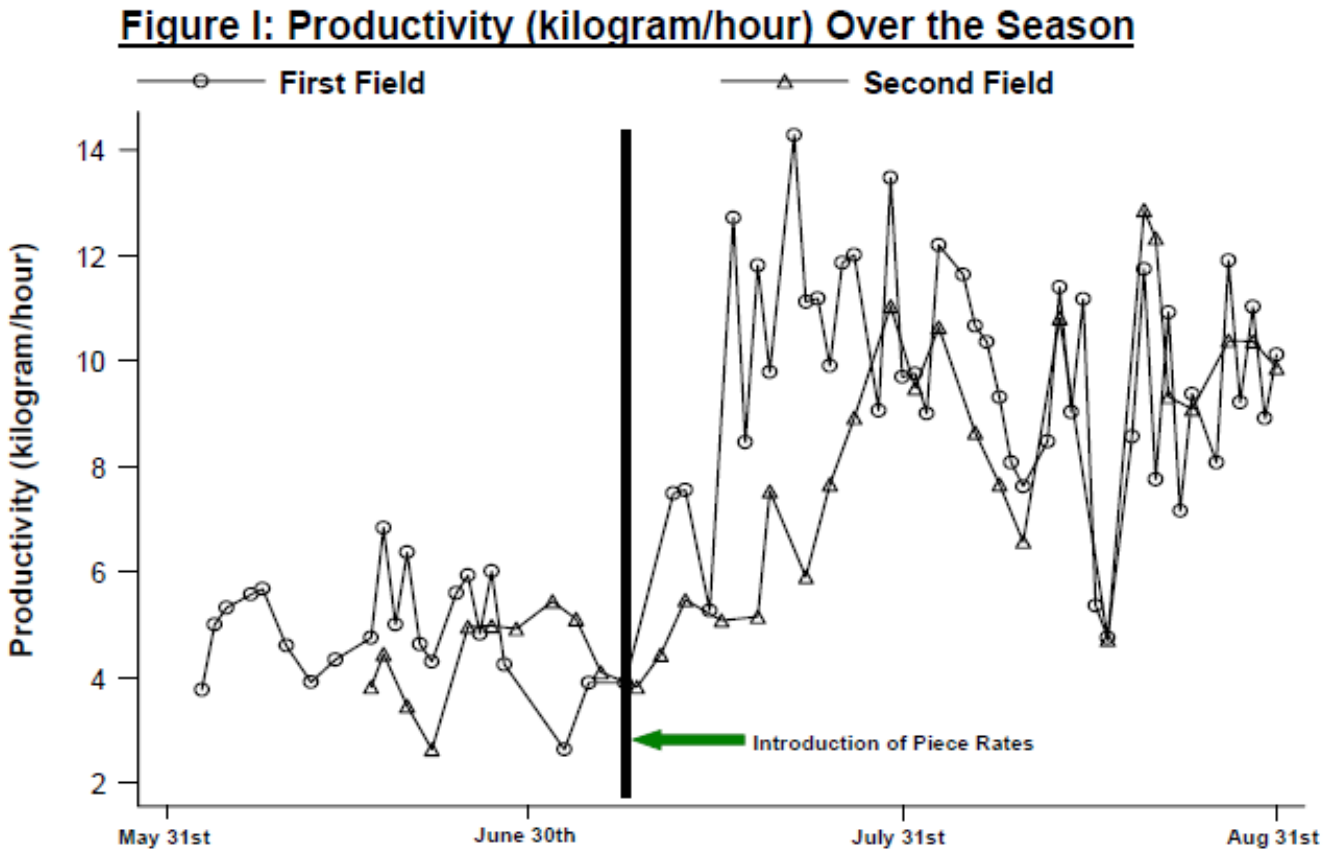
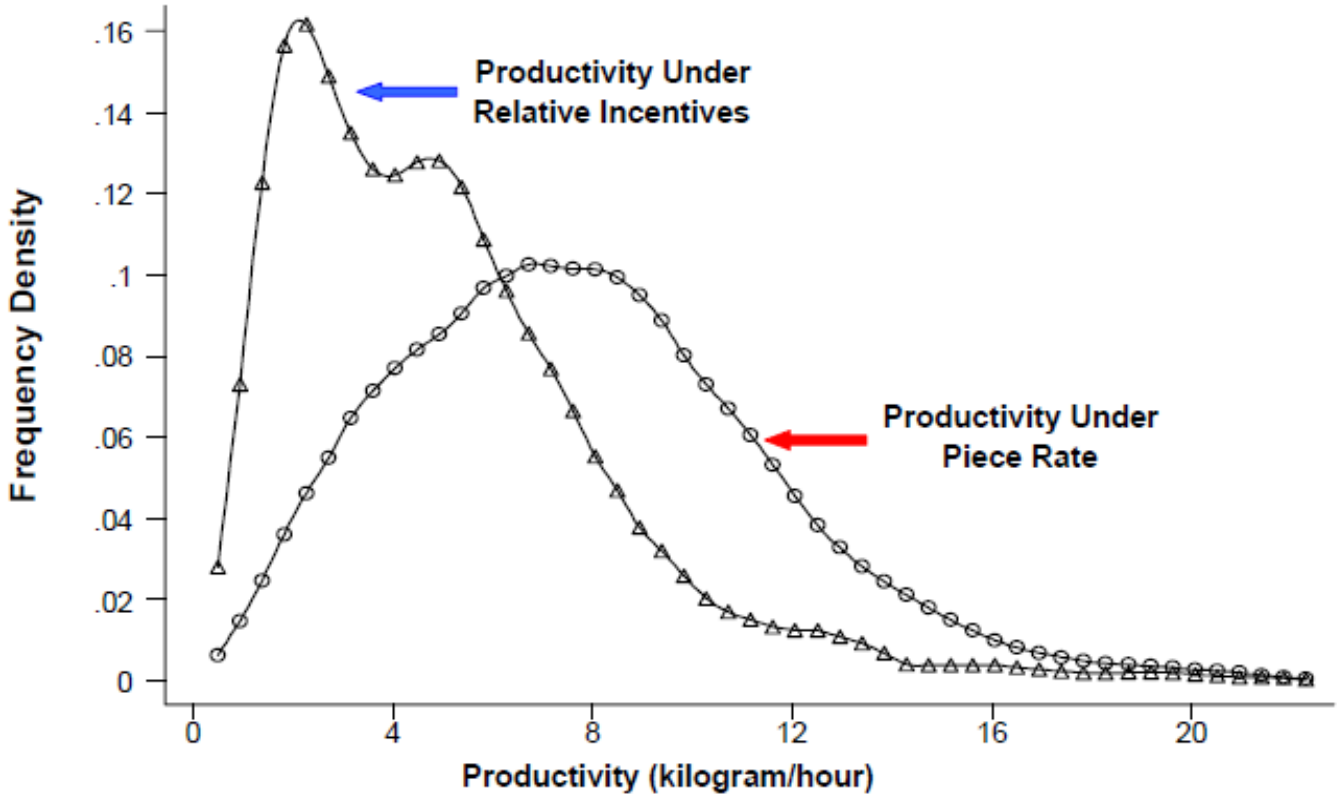
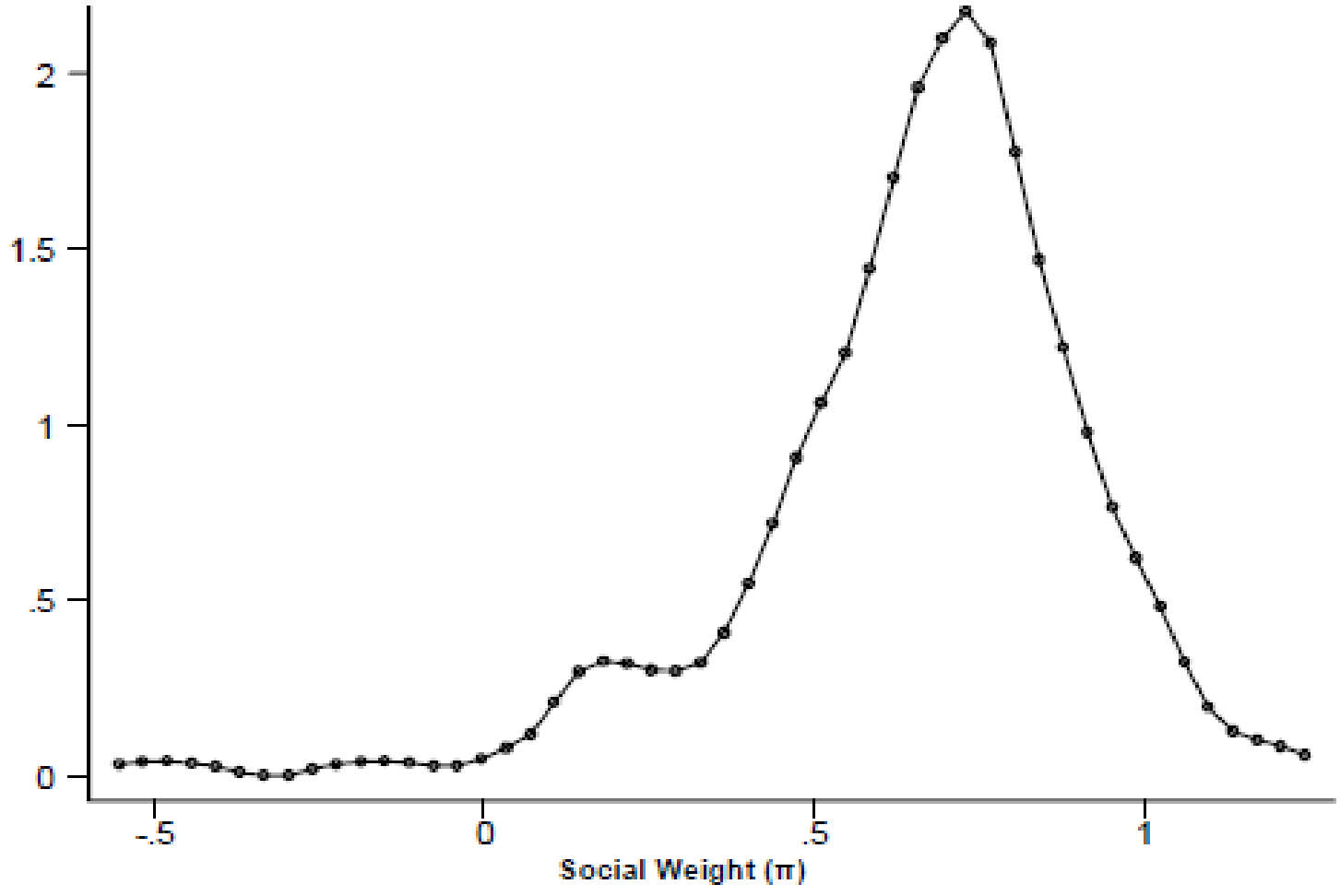


Figure I: Productivity (kilogram/hour) Over the Season
First Field
Second Field
Productivity (kilogram/hour)
14
12
10
8
6
4
2
Introduction of Piece Rates
May 31st
June 30th
July 31st
Aug 31st

Results 3


Frequency Density
.16
.14
.12
.1
.08
.06
.04
.02
0
0
4
8
12
16
20
Productivity (kilogram/hour)
Productivity Under
Relative Incentives
Productivity Under
Piece Rate

Estimated Distribution of Social Preferences



Effect of Social Networks

	(1a) Relative incentives	(1b) Relative incentives	(2a) Piece rates	(2b) Piece rates
Share of workers in the field that are friends	-1.68***	-5.52**	.072	1.17
	(.647)	(2.36)	(.493)	(1.60)
Share of workers in the field that are friends x number of workers in same field		1.60**		-.285
		(.684)		(.501)
Number of workers in same field		.182		.085
		(.117)		(.069)
Marginal effect of group size (at mean friends share)		.236**		.076
		(.110)		(.065)
Worker fixed effects	Yes	Yes	Yes	Yes
Field fixed effects	Yes	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes	Yes
Adjusted R^2	.3470	.3620	.3065	.3081
Number of observations (worker-field-day)	2860	2860	4400	4400

Two Puzzles about Minimum Wages

1. People rarely paid less than the minimum wage, even when they can be
2. Firms increase wages by more than is necessary for compliance

- Could this be because minimum wages affect what people perceive as 'fair'?

An Experimental Test

Falk Fehr and Zehnder [2006]

- An experimental session consists of
  - 6 'Firms'
  - 18 'Workers'
- In each period, firm is matched to 3 workers
- Firms decide
  - What wage w to offer
  - How many workers to make the offer to
- Workers choose reservation wage
  - i.e. lowest wage that they would accept
  - Not observed by firm prior to offer

Payoffs

- Workers receive w if they receive and accept an offer 0 otherwise
- Firm's payoff:

TABLE I
FIRMS' REVENUE FUNCTION

Employed workers	Total revenue	Marginal revenue
0	0	–
1	390	390
2	740	350
3	1000	260

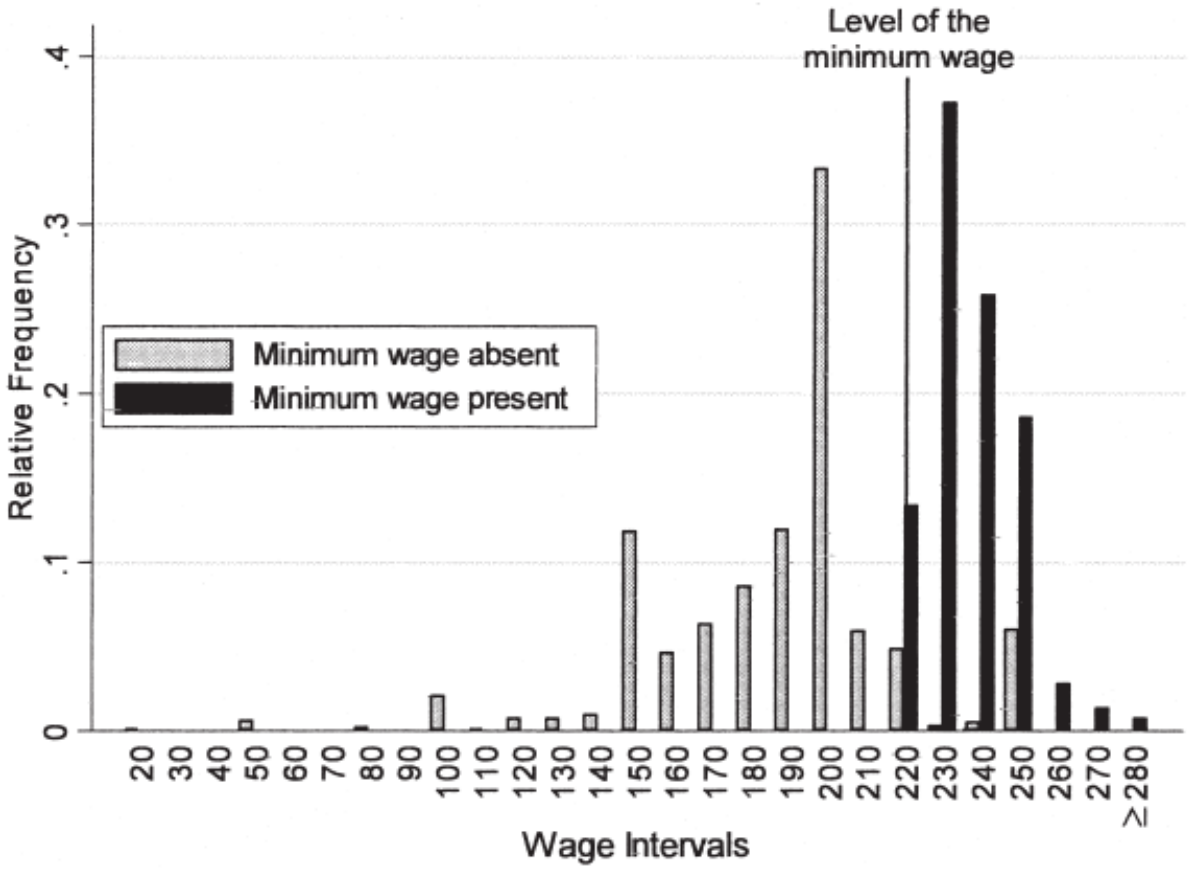
Treatments

- Two environments
  - No minimum wage (NO)
  - Minimum wage of 220 (MW)
- Two treatments
  - 15 periods of NO, 15 periods of MW
  - 15 periods of MW, 15 periods on NO

Predictions

- Notice that this is effectively an ultimatum game
- If players are self interested
  - Wage offers will be 0 or 1 in absence of minimum wage
  - Will be 220 with minimum wage
  - Reservation wages will be 0 or 1
- If players have Rabin fairness preferences
  - Wages higher than 0 with no minimum wage
  - Will be higher than 220 with minimum wage
  - Reservation wage will be higher that 0 with no minimum wage
  - Will be higher that 220 with minimum wage

Results - Wage Offers

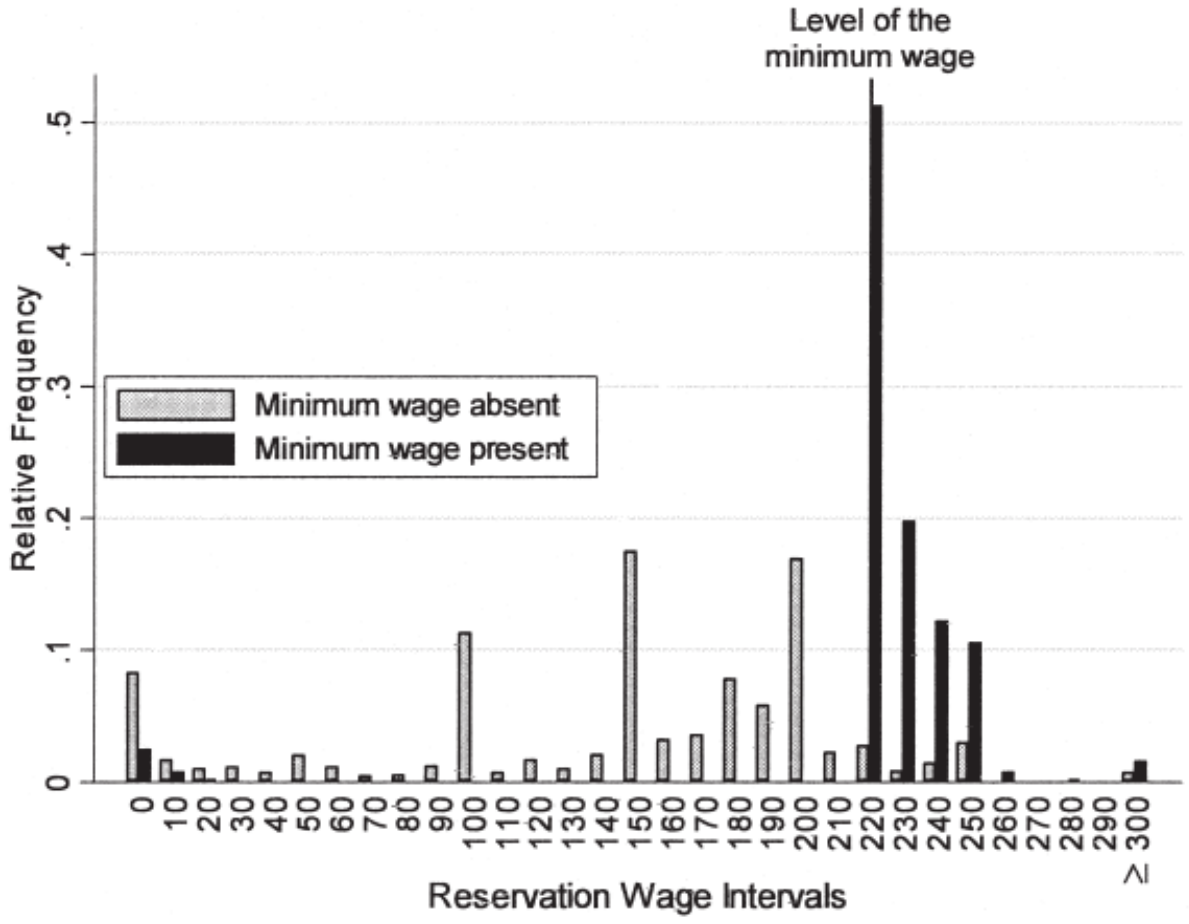


Results - Wage Offers

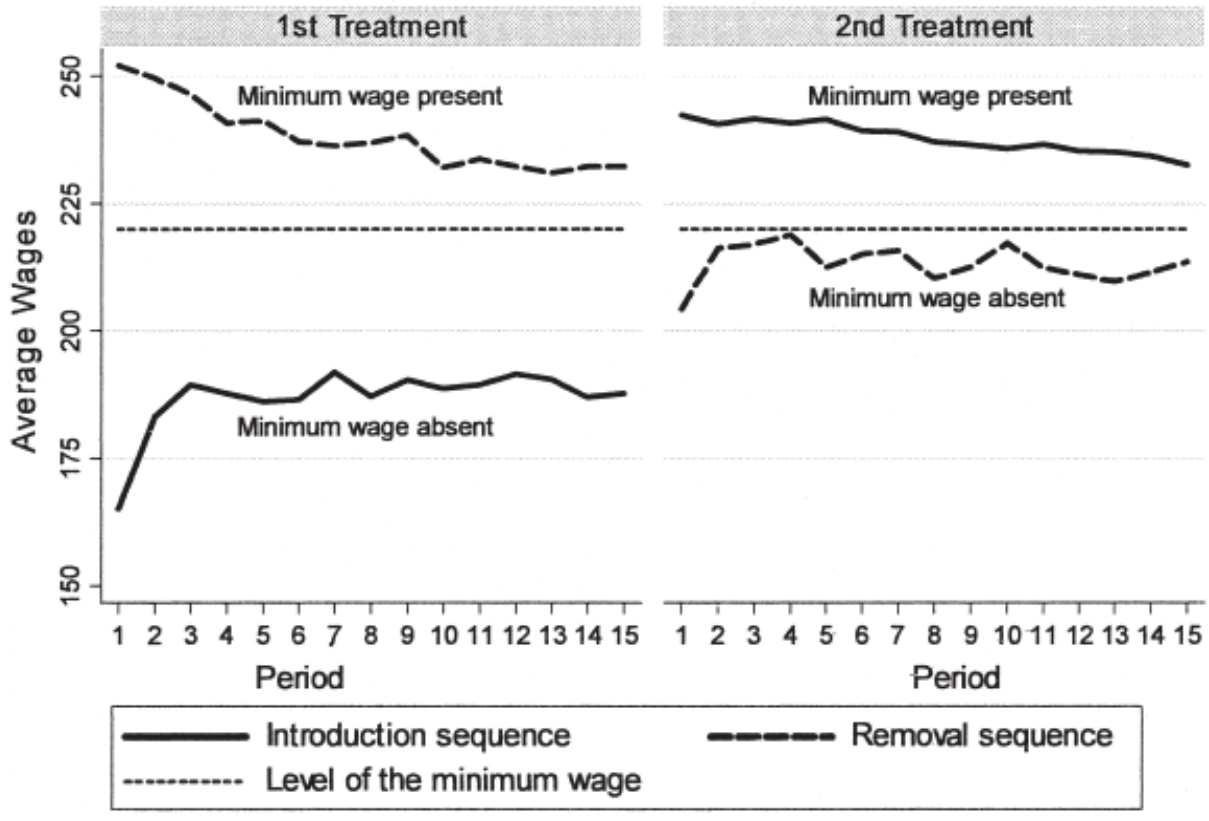
TABLE II
EFFECTS OF INTRODUCING A MINIMUM WAGE ON WAGES AND EMPLOYMENT

Dependent variable:	(1) wage	(2) employment
Minimum wage dummy	50.11***	.291***
	(7.46)	(.048)
Constant	187.58***	2.10***
	(8.38)	(.078)
Number of observations	2021	900
Prob $> F$	.003	.0038
R^2	.533	.0357

Results - Reservation Wages



Results - Effect of Removing a Minimum Wage



Summary

- Without a minimum wage
  - Firms offer wages above 0
  - Workers have reservation wages above 0
  - As we would expect from either inequality aversion or fairness
- The introduction of a minimum wage
  - Increases wage offers above the minimum wage
  - Increases reservation wages above the minimum wage
  - As we would expect from a fairness model
- After removal of a minimum wage
  - Wages remain higher that they were before its introduction
  - Not predicted by either model
  - Change the perception of what is fair?