Supplementary Materials for *Incentives, Productivity and Selection in Labor Markets: Evidence from Rural Malawi*

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BDM script

Labor allocation survey 2010 BDM response form NO MONITORING (NM)

Surveyor initials: _____ GVH: _____

Respondent ID: _____ Time: _____ (24:00)

Respondent name: _____ Date: _____

Before we proceed with your wage choices, do you have any questions?

If you agree to proceed, I will ask you whether you will be willing to work for several different wages. As we showed in the example, you will draw a token that determines which of these wages you receive. If you say no to that wage and you draw it, you will not be given a contract and you will not have a chance to change your mind. If you say yes to that wage and you draw it, you will be expected to work and be paid that rate for each scoop of beans that you sort. If you are part way through a scoop at 4pm, you will receive a portion of the pay for that scoop.

Do you wish to proceed? <<*circle one*>> Yes No

We will look at your beans to make sure you are sorting according to instructions. If you are not sorting according to instructions, we will ask you to go back and sort the beans again according to the instructions. Is this clear?

BDM Question Responses ***Respondent answers***

<<*For each of the following wages, confirm 3 times and describe implications of yes/no*>>

	Question:	*Code:*	*1st*	*2nd*	*3rd*	*FINAL*
1	If you pick MK 5, would you accept that as your wage?	Yes: 1 No: 0				
	Most people can sort at least 4 scoops in a day. If you sort 4 scoops and your rate is MK 5 per scoop, you will take home MK20 plus 50, for a total of MK70. You may earn more or less depending on how hard you work.					
2	If you pick MK 10, would you accept that as your wage?	Yes: 1 No: 0				
	Most people can sort at least 4 scoops in a day. If you sort 4 scoops and your rate is MK 10 per scoop, you will take home MK40 plus 50, for a total of MK90. You may earn more or less depending on how hard you work.					
3	If you pick MK 15, would you accept that as your wage?	Yes: 1 No: 0				
	Most people can sort at least 4 scoops in a day. If you sort 4 scoops and your rate is MK 15 per scoop, you will take home MK60 plus 50, for a total of MK110. You may earn more or less depending on how hard you work.					
4	If you pick MK 20, would you accept that as your wage?	Yes: 1 No: 0				
	Most people can sort at least 4 scoops in a day. If you sort 4 scoops and your rate is MK 20 per scoop, you will take home MK80 plus 50, for a total of MK130. You may earn more or less depending on how hard you work.					
5	If you pick MK 25, would you accept that as your wage?	Yes: 1 No: 0				
	Most people can sort at least 4 scoops in a day. If you sort 4 scoops and your rate is MK 25 per scoop, you will take home MK100 plus 50, for a total of MK150. You may earn more or less depending on how hard you work.					

BDM Draw Responses

	Question:	*Code:*	*Answer:*	*Instructions:*
6	What price did you draw from the basket?	MK		
7	*Did the respondent say he/she would accept a contract at that wage?*	Yes: 1 No: 0		1→8 0→9
8	*If yes, read:* You said you would accept a wage of <<*say wage*>>, so we will offer you a labor contract at that wage.			→ contract

Contract

I will work sorting beans until up to 4pm at the latest, and will receive _____ <<*Fill in wage*>> per scoop that I sort during that time.

ID Number: _____ Signature: _____

Comments *(refused the contract offer, was called away during the day, etc)***:**

Table S1: Descriptive Statistics for Participants

	All	Low Season	High Season	Diff.	
	(1)	(2)	(3)	(4)	
Number of participants	689	355	334		
Number of daily observations	1875	1005	870		
Female	0.665	0.690	0.638	-0.052	
	(0.472)	(0.463)	(0.481)	[0.036]	
Age	34.9	34.6	35.2	0.6	
	(13.6)	(13.2)	(14.1)	[1.1]	
Number of adults in household	3.11	3.16	3.06	-0.10	
	(1.68)	(1.59)	(1.77)	[0.13]	
Number of other household members participating	0.24	0.19	0.29	0.10	**
	(0.57)	(0.55)	(0.60)	[0.04]	
Years of education	4.23	3.91	4.56	0.65	***
	(3.28)	(3.35)	(3.17)	[0.25]	
Female headed household	0.251	0.201	0.303	0.102	***
	(0.434)	(0.401)	(0.460)	[0.033]	
Participated in ganyu in last week	0.38	0.33	0.42	0.09	**
	(0.48)	(0.47)	(0.49)	[0.04]	
Days of ganyu last week, conditional on positive	3.76	4.22	3.38	-0.84	***
	(2.07)	(2.16)	(1.93)	[0.26]	
Days of ganyu last week	1.41	1.40	1.43	0.03	
	(2.22)	(2.34)	(2.09)	[0.17]	
Days of ganyu last month	2.80	3.09	2.50	-0.59	
	(6.07)	(6.90)	(5.03)	[0.46]	
Daily wage from recent ganyu (MKW)	298.5	257.7	336.7	79.0	***
	(303.2)	(179.0)	(381.0)	[24.1]	
Ever participated in ganyu for international org.	0.075	0.023	0.131	0.108	***
	(0.264)	(0.150)	(0.338)	[0.020]	
Household produces maize	0.999	1.000	0.997	-0.003	
	(0.038)	(0.000)	(0.055)	[0.003]	
Household produces beans	0.657	0.686	0.627	-0.059	
	(0.475)	(0.465)	(0.484)	[0.037]	
Household produces tobacco	0.381	0.478	0.279	-0.199	***
	(0.486)	(0.500)	(0.449)	[0.037]	
Household produces other agriculture	0.693	0.738	0.645	-0.093	***
	(0.462)	(0.440)	(0.479)	[0.035]	
Typical per year months without adequate food	3.35	3.56	3.12	-0.44	***
	(2.27)	(2.34)	(2.16)	[0.17]	
Household earns income from selling food products	0.387	0.360	0.415	0.055	
	(0.487)	(0.481)	(0.493)	[0.038]	
Household earns income from selling beer	0.021	0.009	0.033	0.024	**
	(0.143)	(0.093)	(0.180)	[0.011]	
Household earns income from ganyu	0.666	0.643	0.691	0.048	
	(0.472)	(0.480)	(0.463)	[0.036]	
Household earns income from selling crafts	0.077	0.037	0.119	0.082	***

(continued)

Table S1: Descriptive Statistics for Participants
(continued)

	(0.267)	(0.190)	(0.324)	[0.021]	
Household earns income from small shop	0.019	0.012	0.027	0.015	
	(0.137)	(0.107)	(0.163)	[0.011]	
Household receives remittances	0.018	0.014	0.021	0.007	
	(0.132)	(0.119)	(0.145)	[0.010]	
Alternative activity: housework	0.180	0.267	0.074	-0.193	***
	(0.385)	(0.443)	(0.262)	[0.034]	
Alternative activity: other ganyu	0.206	0.235	0.172	-0.063	*
	(0.405)	(0.425)	(0.378)	[0.038]	
	(4.08)	(4.43)	(3.62)	[0.39]	

*, **, *** denote significance at 10%, 5% and 1%, respectively.

Notes: this table presents means of participants' characteristics during the low and high season, with standard deviations in parentheses, as well as differences in means, with the standard error of the estimated difference in brackets.

Table S2: BDM Acceptance Rates, by Piece Rate

		Day of Week				Season		Monitoring		Gender	
Share agreeing to piece rate of:	All Days	Day 1	Day 2	Day 3	Day 4	Low	High	No	Yes	Male	Female
5	0.44	0.43	0.47	0.39	0.45	0.42	0.45	0.43	0.45	0.38	0.46
10	0.68	0.63	0.71	0.67	0.71	0.68	0.69	0.66	0.70	0.58	0.73
15	0.84	0.77	0.85	0.85	0.87	0.82	0.85	0.83	0.84	0.73	0.88
20	0.96	0.94	0.96	0.97	0.96	0.95	0.97	0.95	0.96	0.92	0.97
25	0.99	1.00	1.00	1.00	0.99	1.00	0.99	0.99	0.99	0.99	1.00

Notes: This table lists the share of participants willing to accept each piece rate (MWK). Sample is all participants in BDM.

Table S3: Descriptive Pairwise Correlations

	Outcome Variable		
	WTA	Quantity	Errors
	(1)	(2)	(3)
Female	-2.086 ***	0.638 ***	-0.148 **
	(0.453)	(0.151)	(0.071)
Age	-0.030 *	-0.039 ***	0.013 ***
	(0.017)	(0.005)	(0.002)
Number of adults in household	0.018	-0.009	-0.001
	(0.114)	(0.039)	(0.016)
Number of other household members participating	0.441	0.119	-0.079 *
	(0.316)	(0.112)	(0.042)
Years of education	-0.021	-0.013	-0.029 ***
	(0.063)	(0.020)	(0.009)
Female headed household	-1.272 ***	-0.328 *	0.064
	(0.412)	(0.168)	(0.064)
Days of ganyu last week	-0.096 *	-0.009	0.011
	(0.054)	(0.024)	(0.010)
Days of ganyu last month	-0.022	-0.001	0.002
	(0.038)	(0.012)	(0.006)
Daily wage from recent ganyu (MKW)	0.000	0.000	-0.000
	(0.001)	(0.000)	(0.000)
Ever participated in ganyu for international org.	0.639	-0.535 **	0.062
	(0.643)	(0.267)	(0.106)
Household produces beans	0.188	0.234	-0.074
	(0.404)	(0.145)	(0.061)
Household produces tobacco	-0.235	0.111	-0.180 ***
	(0.399)	(0.142)	(0.057)
Household produces other agriculture	0.555	0.422 ***	-0.095
	(0.400)	(0.155)	(0.061)
Typical per year months without adequate food	0.011	0.044	0.022 *
	(0.078)	(0.036)	(0.013)
Household earns income from selling food products	-0.468	-0.190	-0.048
	(0.392)	(0.145)	(0.058)
Household earns income from selling beer	-1.955 **	-0.177	0.216
	(0.924)	(0.311)	(0.224)
Household earns income from ganyu	0.385	-0.056	0.104 *
	(0.403)	(0.152)	(0.061)
Household earns income from selling crafts	1.163	-0.456 *	-0.009
	(0.868)	(0.268)	(0.108)
Household earns income from small shop	0.243	-0.585	0.179
	(1.710)	(0.448)	(0.262)
Household receives remittances	-0.936	-0.282	0.079
	(0.867)	(0.747)	(0.193)

(continued)

Table S3: Descriptive Pairwise Correlations
(continued)

Alternative activity: housework	0.255		-0.001		0.070	
	(0.442)		(0.153)		(0.075)	
Alternative activity: other ganyu	-0.841	**	0.118		-0.070	
	(0.361)		(0.126)		(0.064)	
Alternative activity: work own land	-0.136		0.109		-0.027	
	(0.338)		(0.121)		(0.054)	
Alternative activity: work own business	-0.981	*	-0.505	***	0.195	**
	(0.502)		(0.159)		(0.095)	
Number of scoops expected that day	0.176	***	0.240	***	-0.044	***
	(0.055)		(0.030)		(0.011)	
Mean of dependent variable	9.9		7.1		1.8	
Standard deviation of dependent variable	5.7		1.9		1.0	
Mean number of participants	641		576		576	
Mean number of observations	1750		1379		1379	

*, **, *** denote significance at 10%, 5% and 1%, respectively.

Notes: this table presents point estimates and standard errors for pairwise regressions of key outcome variables (columns) on baseline characteristics (rows), plus dummy variables for day of week, monitoring treatment and season. The outcome variables are: (1) the minimum piece rate the subject was willing to accept; (2) the quantity (units) sorted during the day, conditional on being awarded a contract; (3) the number of errors per unit sorted, also conditional on being awarded a contract. Observation counts and the mean of the dependent variable are averages over each pairwise regression, since sample sizes vary slightly if data are missing. Standard errors robust to clustering at the participant level are in parentheses.

Table S4: Effect of Compensation and Monitoring on Quality of Output

	(1)	(2)	(3)
Piece rate = 5 (base)	0	0	0
	.	.	.
Piece rate = 10	-0.152	-0.140	-0.199
	(0.170)	(0.170)	(0.174)
Piece rate = 15	-0.183	-0.174	-0.092
	(0.152)	(0.156)	(0.161)
Piece rate = 20	-0.209	-0.178	-0.149
	(0.153)	(0.155)	(0.162)
Piece rate = 25	0.043	0.054	-0.020
	(0.154)	(0.157)	(0.160)
Monitoring	-0.844 ***	-0.843 ***	-0.836 ***
	(0.173)	(0.173)	(0.175)
Monitoring X (Piece rate = 10)	0.160	0.157	0.146
	(0.220)	(0.220)	(0.221)
Monitoring X (Piece rate = 15)	0.325	0.323	0.316
	(0.202)	(0.202)	(0.203)
Monitoring X (Piece rate = 20)	0.336	0.329	0.319
	(0.192)	(0.192)	(0.194)
Monitoring X (Piece rate = 25)	0.124	0.121	0.114
	(0.198)	(0.198)	(0.200)
Female	-0.174 *	-0.176 *	-0.174 *
	(0.071)	(0.071)	(0.071)
Min. WTA categories	No	Yes	Yes
Min. WTA X Draw	No	No	Yes
Mean Dep. Var.	1.883	1.883	1.883
SD Dep. Var.	1.012	1.013	1.013
Observations	1462	1461	1461

*, **, *** denote significance at 10%, 5% and 1%, respectively.

Notes: this table presents regressions of quality of output (number of errors detected per unit sorted) on the piece rate the participant faced, whether the participant was assigned to the monitoring treatment the interaction between the piece rate and monitoring, and an indicator for whether the participant was female. Other regressors not reported are the minimum piece rate the participant was willing to accept (Minimum WTA), in levels and interacted with monitoring, and season, district and day-of-week fixed effects. Individual random effects in all specifications. Standard errors robust to clustering at the participant level are in parentheses.

Table S5: Peer Effects: Quantity (Number of Units per Day)

	(1)	(2)		(3)	
Mean piece rate in work group (excluding own)	-0.007	0.065	**	0.471	*
	(0.009)	(0.027)		(0.273)	
Number of individuals in work group	-0.027	0.299	**	8.166	**
	(0.042)	(0.121)		(3.839)	
Work group size (squared)				-2.089	**
				(1.027)	
Work group size (cubic)				0.172	**
				(0.084)	
Mean piece rate x Work group size		-0.019	***	-0.382	
		(0.007)		(0.242)	
Mean piece rate x Work group size (squared)				0.099	
				(0.065)	
Mean piece rate x Work group size (cubic)				-0.008	
				(0.005)	
Mean min. WTA in work group (excluding own)	-0.003	-0.004		-0.004	
	(0.015)	(0.015)		(0.015)	
Observations	1440	1440		1440	

*, **, *** denote significance at 10%, 5% and 1%, respectively.

All regressions include district fixed effects and day-of-week fixed effects. Standard errors are twoway-clustered at the individual and work-group level.

Table S6: Peer Effects: Quality (Number of Errors per Unit)

	(1)	(2)	(3)
Mean piece rate in work group (excluding own)	0.006	0.002	0.126
	(0.007)	(0.024)	(0.219)
Number of individuals in work group	0.012	-0.008	1.603
	(0.037)	(0.103)	(3.082)
Work group size (squared)			-0.521
			(0.818)
Work group size (cubic)			0.050
			(0.068)
Mean piece rate x Work group size		0.001	-0.121
		(0.006)	(0.189)
Mean piece rate x Work group size (squared)			0.036
			(0.051)
Mean piece rate x Work group size (cubic)			-0.003
			(0.004)
Mean min. WTA in work group (excluding own)	0.013	0.013	0.012
	(0.010)	(0.010)	(0.010)
Observations	1440	1440	1440

*, **, *** denote significance at 10%, 5% and 1%, respectively.

All regressions include district fixed effects and day-of-week fixed effects. Standard errors are twoway-clustered at the individual and work-group level.

Table S7: Elasticity of participation with respect to the piece rate

Range	Diff. in particip. rate	Mean participation rate	Diff. in piece rate	Mean piece rate	Arc elasticity
5-25	0.557	0.715	20	15	0.584
5-10	0.246	0.560	5	7.5	0.66
10-15	0.154	0.760	5	12.5	0.507
15-20	0.122	0.898	5	17.5	0.475
20-25	0.035	0.976	5	22.5	0.16

Notes: this table displays the arc elasticity of labor force participation with respect to the piece rate. At each piece rate (5, 10, 15, 20, 25), each BDM participant is coded as participating in the labor force if her minimum willingness to accept is less than or equal to the given piece rate. For each segment, the arc elasticity is calculated as: (difference in share participating / average share participating) / (difference in piece rates / average piece rate). 682 BDM participants, 1857 participant-day observations.

Table S8: Elasticity of output (quantity) with respect to the piece rate

Range	Full sample	Non-monitoring	Monitoring	Difference
	(1)	(2)	(3)	(4)
5-25	0.060	0.043	0.076	0.033
	(0.014)	(0.020)	(0.020)	(0.029)
5-10	0.045	0.032	0.059	0.027
	(0.048)	(0.060)	(0.071)	(0.089)
10-15	-0.008	-0.080	0.058	0.138
	(0.062)	(0.072)	(0.094)	(0.116)
15-20	0.195	0.280	0.119	-0.161
	(0.079)	(0.098)	(0.118)	(0.150)
20-25	-0.079	-0.199	0.037	0.235
	(0.102)	(0.127)	(0.141)	(0.174)

Notes: this table displays the arc elasticity of output quantity with respect to the piece rate, calculated as the estimated coefficient from regressing log output (units sorted per day) on the log piece rate, controlling nonparametrically for participant minimum WTA, as well as indicator variables for district and peak labor season, with worker random effects. The sample in column (1) is all workers, and the regression includes an indicator for the monitoring treatment. Columns (2) and (3) restrict the sample to workers under the monitoring and non-monitoring treatments, respectively, and column (4) shows the estimated difference between monitoring and non-monitoring. Standard errors are clustered at the worker level. 1461 worker-day observations (612 workers) total, of which 712 (452) under non-monitoring and 749 (455) under monitoring. The number of workers by monitoring treatment exceeds the total number of workers because workers could face different monitoring treatments on different days.

Figure 1: Marginal effect of minimum WTA on number of units sorted, by piece rate interval

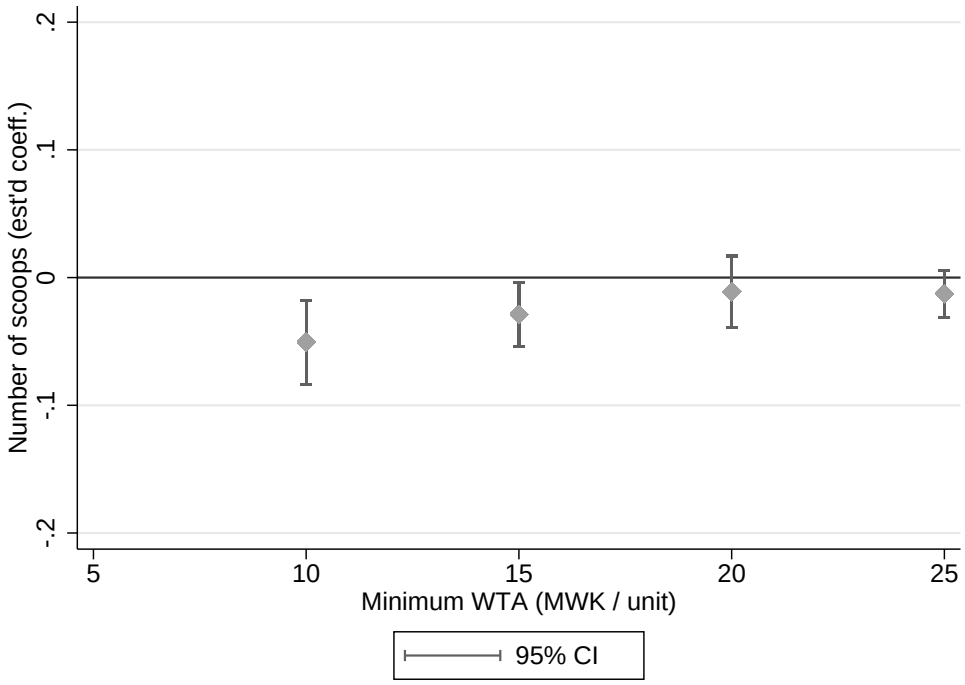

Figure 2: Marginal effect of minimum WTA on errors per unit, by piece rate interval

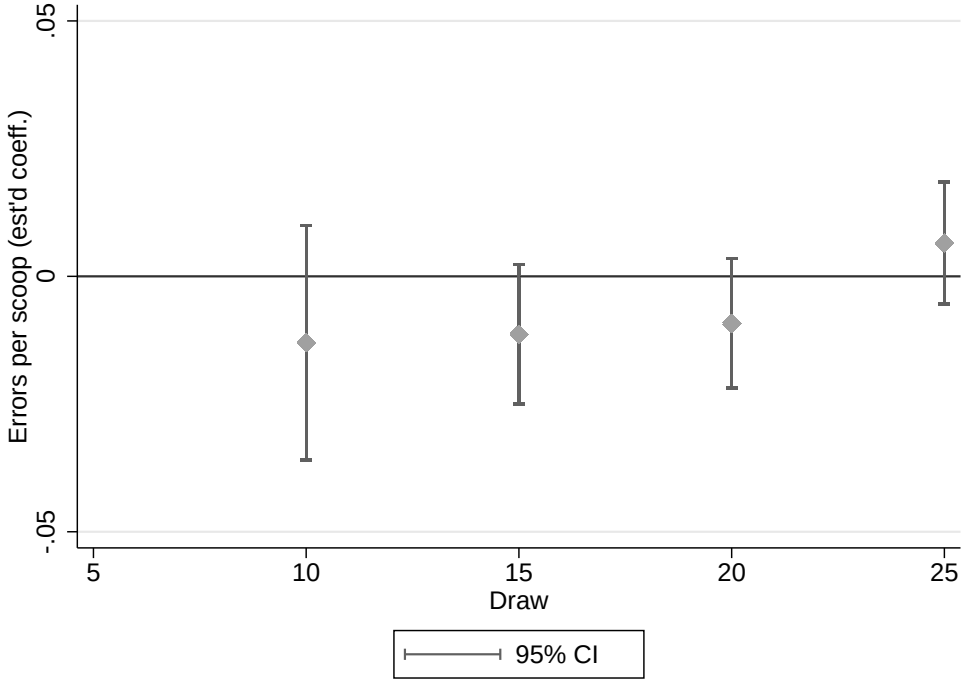

Figure 3: Marginal effect of piece rate draw on number of unit, by piece rate interval