

### Supplementary material 3: Row column cross tabulations and correlation matrix tables

Tables 3.1–3.4 show row and column crosstabulations of incentivized revealed risk preferences ‘risk’ against perceived willingness to take financial risk in percentages and respective absolute figures. Figures on the shaded diagonal represent subjects who precisely predict their preferences from the two methods used to elicit risk preferences.

Table 3.1: cross tabulation PWTFR versus IRRP: all subjects

risk	risk perception										Total
	1	2	3	4	5	6	7	8	9	10	
1	19	2	7	11	7	11	0	2	2	13	74
	25.68	2.7	9.46	14.86	9.46	14.86	0	2.7	2.7	17.57	100
	10.11	6.25	6.48	13.75	6.48	9.48	0	8.33	10	19.12	9.59
2	7	1	4	4	5	7	0	0	0	2	30
	23.33	3.33	13.33	13.33	16.67	23.33	0	0	0	6.67	100
	3.72	3.13	3.7	5	4.63	6.03	0	0	0	2.94	3.89
3	20	7	9	7	8	24	0	3	1	5	84
	23.81	8.33	10.71	8.33	9.52	28.57	0	3.57	1.19	5.95	100
	10.64	21.88	8.33	8.75	7.41	20.69	0	12.5	5	7.35	10.88
4	45	6	28	16	36	34	12	4	3	18	202
	22.28	2.97	13.86	7.92	17.82	16.83	5.94	1.98	1.49	8.91	100
	23.94	18.75	25.93	20	33.33	29.31	42.86	16.67	15	26.47	26.17
5	29	6	25	15	30	25	8	6	5	12	161
	18.01	3.73	15.53	9.32	18.63	15.53	4.97	3.73	3.11	7.45	100
	15.43	18.75	23.15	18.75	27.78	21.55	28.57	25	25	17.65	20.85
6	29	4	12	13	18	8	5	1	1	9	100
	29	4	12	13	18	8	5	1	1	9	100
	15.43	12.5	11.11	16.25	16.67	6.9	17.86	4.17	5	13.24	12.95
7	13	2	9	7	3	5	2	3	2	0	46
	28.26	4.35	19.57	15.22	6.52	10.87	4.35	6.52	4.35	0	100
	6.91	6.25	8.33	8.75	2.78	4.31	7.14	12.5	10	0	5.96
8	4	1	1	2	0	0	0	0	1	1	10
	40	10	10	20	0	0	0	0	10	10	100
	2.13	3.13	0.93	2.5	0	0	0	0	5	1.47	1.3
9	10	3	1	1	1	0	0	0	5	4	25
	40	12	4	4	4	0	0	0	20	16	100
	5.32	9.38	0.93	1.25	0.93	0	0	0	25	5.88	3.24
10	12	0	12	4	0	2	1	5	0	4	40
	30	0	30	10	0	5	2.5	12.5	0	10	100
	6.38	0	11.11	5	0	1.72	3.57	20.83	0	5.88	5.18
Total	188	32	108	80	108	116	28	24	20	68	772
	24.35	4.15	13.99	10.36	13.99	15.03	3.63	3.11	2.59	8.81	100
	100	100	100	100	100	100	100	100	100	100	100

Table 3.2: cross tabulation PWTFR versus IRRP: male subjects

					risk_perception						
risk	1	2	3	4	5	6	7	8	9	10	Total
1	6	2	4	6	2	10	0	0	2	6	38
	15.79	5.26	10.53	15.79	5.26	26.32	0	0	5.26	15.79	100
	5.77	8.33	12.5	12.5	4.55	20.83	0	0	25	21.43	10.56
2	6	1	1	2	1	1	0	0	0	1	13
	46.15	7.69	7.69	15.38	7.69	7.69	0	0	0	7.69	100
	5.77	4.17	3.13	4.17	2.27	2.08	0	0	0	3.57	3.61
3	14	5	5	6	3	7	0	0	0	1	41
	34.15	12.2	12.2	14.63	7.32	17.07	0	0	0	2.44	100
	13.46	20.83	15.63	12.5	6.82	14.58	0	0	0	3.57	11.39
4	28	4	6	9	18	12	9	0	0	7	93
	30.11	4.3	6.45	9.68	19.35	12.9	9.68	0	0	7.53	100
	26.92	16.67	18.75	18.75	40.91	25	45	0	0	25	25.83
5	19	4	4	10	14	12	6	3	1	5	78
	24.36	5.13	5.13	12.82	17.95	15.38	7.69	3.85	1.28	6.41	100
	18.27	16.67	12.5	20.83	31.82	25	30	75	12.5	17.86	21.67
6	16	3	3	9	5	5	4	0	1	3	49
	32.65	6.12	6.12	18.37	10.2	10.2	8.16	0	2.04	6.12	100
	15.38	12.5	9.38	18.75	11.36	10.42	20	0	12.5	10.71	13.61
7	5	2	1	5	1	0	1	1	2	0	18
	27.78	11.11	5.56	27.78	5.56	0	5.56	5.56	11.11	0	100
	4.81	8.33	3.13	10.42	2.27	0	5	25	25	0	5
8	1	0	1	1	0	0	0	0	1	1	5
	20	0	20	20	0	0	0	0	20	20	100
	0.96	0	3.13	2.08	0	0	0	0	12.5	3.57	1.39
9	5	3	0	0	0	0	0	0	1	0	9
	55.56	33.33	0	0	0	0	0	0	11.11	0	100
	4.81	12.5	0	0	0	0	0	0	12.5	0	2.5
10	4	0	7	0	0	1	0	0	0	4	16
	25	0	43.75	0	0	6.25	0	0	0	25	100
	3.85	0	21.88	0	0	2.08	0	0	0	14.29	4.44
Total	104	24	32	48	44	48	20	4	8	28	360
	28.89	6.67	8.89	13.33	12.22	13.33	5.56	1.11	2.22	7.78	100
	100	100	100	100	100	100	100	100	100	100	100

Table 3.3: cross tabulation PWTFR versus IRRP: female subjects

					risk_per						
risk	1	2	3	4	5	6	7	8	9	10	Total
1	13	0	3	2	5	1	0	2	0	7	33
	39.39	0	9.09	6.06	15.15	3.03	0	6.06	0	21.21	100
	16.25	0	3.95	7.14	7.81	1.47	0	10	0	17.5	8.17
2	1	0	3	2	4	6	0	0	0	1	17
	5.88	0	17.65	11.76	23.53	35.29	0	0	0	5.88	100
	1.25	0	3.95	7.14	6.25	8.82	0	0	0	2.5	4.21
3	6	2	4	1	5	17	0	3	1	4	43
	13.95	4.65	9.3	2.33	11.63	39.53	0	6.98	2.33	9.3	100
	7.5	25	5.26	3.57	7.81	25	0	15	8.33	10	10.64
4	17	2	22	7	18	22	3	4	3	11	109
	15.6	1.83	20.18	6.42	16.51	20.18	2.75	3.67	2.75	10.09	100
	21.25	25	28.95	25	28.13	32.35	37.5	20	25	27.5	26.98
5	10	2	21	5	16	13	2	3	4	7	83
	12.05	2.41	25.3	6.02	19.28	15.66	2.41	3.61	4.82	8.43	100
	12.5	25	27.63	17.86	25	19.12	25	15	33.33	17.5	20.54
6	9	1	9	3	13	3	1	1	0	6	46
	19.57	2.17	19.57	6.52	28.26	6.52	2.17	2.17	0	13.04	100
	11.25	12.5	11.84	10.71	20.31	4.41	12.5	5	0	15	11.39
7	8	0	8	2	2	5	1	2	0	0	28
	28.57	0	28.57	7.14	7.14	17.86	3.57	7.14	0	0	100
	10	0	10.53	7.14	3.13	7.35	12.5	10	0	0	6.93
8	3	1	0	1	0	0	0	0	0	0	5
	60	20	0	20	0	0	0	0	0	0	100
	3.75	12.5	0	3.57	0	0	0	0	0	0	1.24
9	5	0	1	1	1	0	0	0	4	4	16
	31.25	0	6.25	6.25	6.25	0	0	0	25	25	100
	6.25	0	1.32	3.57	1.56	0	0	0	33.33	10	3.96
10	8	0	5	4	0	1	1	5	0	0	24
	33.33	0	20.83	16.67	0	4.17	4.17	20.83	0	0	100
	10	0	6.58	14.29	0	1.47	12.5	25	0	0	5.94
Total	80	8	76	28	64	68	8	20	12	40	404
	19.8	1.98	18.81	6.93	15.84	16.83	1.98	4.95	2.97	9.9	100
	100	100	100	100	100	100	100	100	100	100	100

Table 3.4: cross tabulation PWTFR versus IRRP: low financial literacy subjects

					risk_per high lit						
risk	1	2	3	4	5	6	7	8	9	10	Total
1	1	2	3	2	0	4	0	0	0	6	18
	5.56	11.11	16.67	11.11	0	22.22	0	0	0	33.33	100
	1.67	25	5	7.14	0	6.67	0	0	0	37.5	5.77
2	1	1	1	2	1	3	0	0	0	0	9
	11.11	11.11	11.11	22.22	11.11	33.33	0	0	0	0	100
	1.67	12.5	1.67	7.14	1.92	5	0	0	0	0	2.88
3	8	2	7	2	3	12	0	0	1	1	36
	22.22	5.56	19.44	5.56	8.33	33.33	0	0	2.78	2.78	100
	13.33	25	11.67	7.14	5.77	20	0	0	12.5	6.25	11.54
4	14	2	19	2	16	17	3	2	1	4	80
	17.5	2.5	23.75	2.5	20	21.25	3.75	2.5	1.25	5	100
	23.33	25	31.67	7.14	30.77	28.33	37.5	16.67	12.5	25	25.64
5	11	1	15	8	18	16	3	3	3	3	81
	13.58	1.23	18.52	9.88	22.22	19.75	3.7	3.7	3.7	3.7	100
	18.33	12.5	25	28.57	34.62	26.67	37.5	25	37.5	18.75	25.96
6	11	0	8	5	13	5	2	0	0	2	46
	23.91	0	17.39	10.87	28.26	10.87	4.35	0	0	4.35	100
	18.33	0	13.33	17.86	25	8.33	25	0	0	12.5	14.74
7	4	0	3	2	0	3	0	2	1	0	15
	26.67	0	20	13.33	0	20	0	13.33	6.67	0	100
	6.67	0	5	7.14	0	5	0	16.67	12.5	0	4.81
8	2	0	0	1	0	0	0	0	1	0	4
	50	0	0	25	0	0	0	0	25	0	100
	3.33	0	0	3.57	0	0	0	0	12.5	0	1.28
9	1	0	1	0	1	0	0	0	1	0	4
	25	0	25	0	25	0	0	0	25	0	100
	1.67	0	1.67	0	1.92	0	0	0	12.5	0	1.28
10	7	0	3	4	0	0	0	5	0	0	19
	36.84	0	15.79	21.05	0	0	0	26.32	0	0	100
	11.67	0	5	14.29	0	0	0	41.67	0	0	6.09
Total	60	8	60	28	52	60	8	12	8	16	312
	19.23	2.56	19.23	8.97	16.67	19.23	2.56	3.85	2.56	5.13	100
	100	100	100	100	100	100	100	100	100	100	100

Table 3.5 : cross tabulation PWTFR versus IRRP: high financial literacy subjects

					risk_per						
risk	1	2	3	4	5	6	7	8	9	10	Total
1	18	0	4	9	7	7	0	2	2	7	56
	32.14	0	7.14	16.07	12.5	12.5	0	3.57	3.57	12.5	100
	14.06	0	8.33	17.31	12.5	12.5	0	16.67	16.67	13.46	12.17
2	6	0	3	2	4	4	0	0	0	2	21
	28.57	0	14.29	9.52	19.05	19.05	0	0	0	9.52	100
	4.69	0	6.25	3.85	7.14	7.14	0	0	0	3.85	4.57
3	12	5	2	5	5	12	0	3	0	4	48
	25	10.42	4.17	10.42	10.42	25	0	6.25	0	8.33	100
	9.38	20.83	4.17	9.62	8.93	21.43	0	25	0	7.69	10.43
4	31	4	9	14	20	17	9	2	2	14	122
	25.41	3.28	7.38	11.48	16.39	13.93	7.38	1.64	1.64	11.48	100
	24.22	16.67	18.75	26.92	35.71	30.36	45	16.67	16.67	26.92	26.52
5	18	5	10	7	12	9	5	3	2	9	80
	22.5	6.25	12.5	8.75	15	11.25	6.25	3.75	2.5	11.25	100
	14.06	20.83	20.83	13.46	21.43	16.07	25	25	16.67	17.31	17.39
6	18	4	4	8	5	3	3	1	1	7	54
	33.33	7.41	7.41	14.81	9.26	5.56	5.56	1.85	1.85	12.96	100
	14.06	16.67	8.33	15.38	8.93	5.36	15	8.33	8.33	13.46	11.74
7	9	2	6	5	3	2	2	1	1	0	31
	29.03	6.45	19.35	16.13	9.68	6.45	6.45	3.23	3.23	0	100
	7.03	8.33	12.5	9.62	5.36	3.57	10	8.33	8.33	0	6.74
8	2	1	1	1	0	0	0	0	0	1	6
	33.33	16.67	16.67	16.67	0	0	0	0	0	16.67	100
	1.56	4.17	2.08	1.92	0	0	0	0	0	1.92	1.3
9	9	3	0	1	0	0	0	0	4	4	21
	42.86	14.29	0	4.76	0	0	0	0	19.05	19.05	100
	7.03	12.5	0	1.92	0	0	0	0	33.33	7.69	4.57
10	5	0	9	0	0	2	1	0	0	4	21
	23.81	0	42.86	0	0	9.52	4.76	0	0	19.05	100
	3.91	0	18.75	0	0	3.57	5	0	0	7.69	4.57
Total	128	24	48	52	56	56	20	12	12	52	460
	27.83	5.22	10.43	11.3	12.17	12.17	4.35	2.61	2.61	11.3	100
	100	100	100	100	100	100	100	100	100	100	100

## 2. Correlation matrix

Table 3.6: Incentivized revealed risk preferences (IRRP)

Variable	Partial Corr.	Semipartial Corr.	Partial Corr.^2	Semipartial Corr.^2	Significance Value
fin_literacy	0.1282***	0.1172	0.0164	0.0137	<b>0.0007</b>
female	0.069*	0.0628	0.0048	0.0039	<b>0.0682</b>
age	0.2312***	0.2156	0.0535	0.0465	<b>0.0000</b>
urban	-0.0963**	-0.0877	0.0093	0.0077	<b>0.0109</b>
lincome	-0.0519	-0.0471	0.0027	0.0022	0.1709
decisions	-0.1113***	-0.1016	0.0124	0.0103	<b>0.0032</b>
household_size	-0.033	-0.03	0.0011	0.0009	0.3834
PWTFR	-0.0376	-0.0341	0.0014	0.0012	0.3208
Risk tolerance	0.33***	0.3171	0.1089	0.1006	<b>0.0000</b>

Standard errors in parentheses \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

The study investigated the partial correlation between IRRP and other variables under consideration. IRRP was found to be positively significantly partially correlated with the variables; financial literacy, being female, age, and risk tolerance. Conversely, IRRP was found to be significantly negatively partially correlated with residing in the urban centers and participating in financial decision making. The study found an insignificant negative partial correlation between IRRP and PWTFR. The findings show that PWTFR cannot be used to represent individuals' IRRP since the variables are not significantly correlated. The results also suggest that individuals are more likely to understate or overstate the risk preferences when they complete the GRQ (PWTFR) in a survey.

The study also explored the correlation between risk tolerance (the individual gap between IRRP and PWTFR choices) with other variables under consideration (Table 3). The results show that financial literacy is significantly and negatively partially correlated with risk tolerance. Showing that higher financial literacy is associated with low risk tolerance gap. In addition, risk tolerance was found to be significantly and positively partially correlated with IRRP, being female and the household size. The risk tolerance gap could be explained precisely by IRRP whereas PWTFR was found to be insignificantly and negatively correlated with risk tolerance. The finding reveals that when the subject made risk preference under PWTFR they were casual and their responses did not correlate with their financial knowledge. The study results contradict the findings by Dohmen et al (2011) they concluded that the GRQ is significantly correlated with field elicited risk preferences. On the other hand, this study corroborates findings by studies that could not find a significant correlation between GRQ and incentivized elicited risk preferences (Csermely and Rabas, 2016; Lönnqvist et al., 2015).

Table 3.7: Risk tolerance (RT) gap

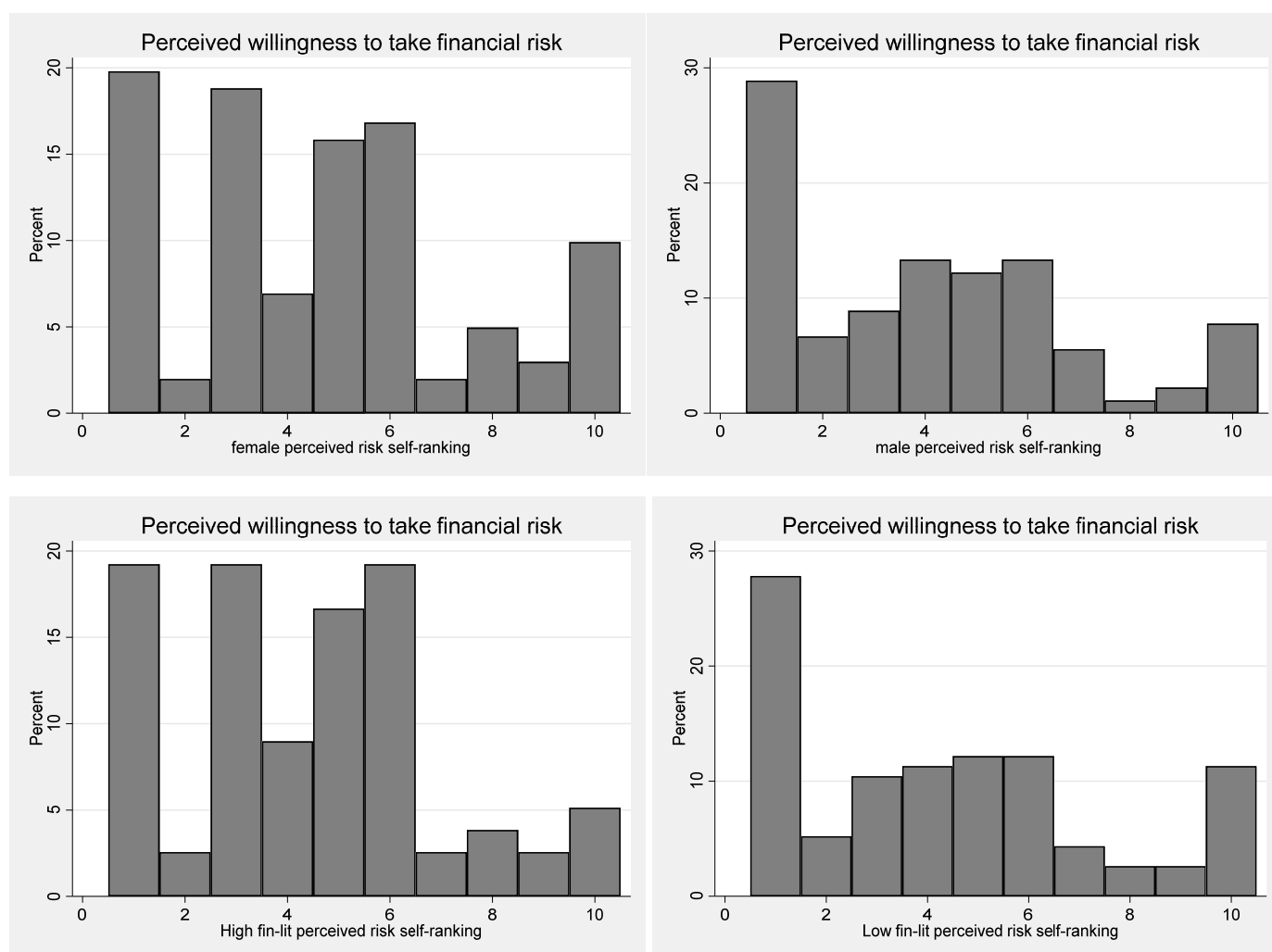
Variable	Partial Corr.	Semipartial Corr.	Partial Corr.^2	Semipartial Corr.^2	Significance Value
fin_literacy	-0.1759***	-0.1647	0.0309	0.0271	<b>0.0000</b>
female	0.0747**	0.0691	0.0056	0.0048	<b>0.0484</b>
age	0.013	0.012	0.0002	0.0001	0.7319
urban	0.062	0.0572	0.0038	0.0033	0.1017
lincome	-0.0181	-0.0167	0.0003	0.0003	0.6329
decisions	0.0314	0.029	0.001	0.0008	0.4071
household_size	0.0724**	0.067	0.0052	0.0045	<b>0.0556</b>
IRRP	0.33***	0.3223	0.1089	0.1039	<b>0.0000</b>
PWTFR	-0.0129	-0.0119	0.0002	0.0001	0.7339

Standard errors in parentheses \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## APPENDIX A

Appendix A provides further graphical analysis and t-test analysis of risk preference choices made by subjects across IRRP and PWTFR risk preference eliciting methods.

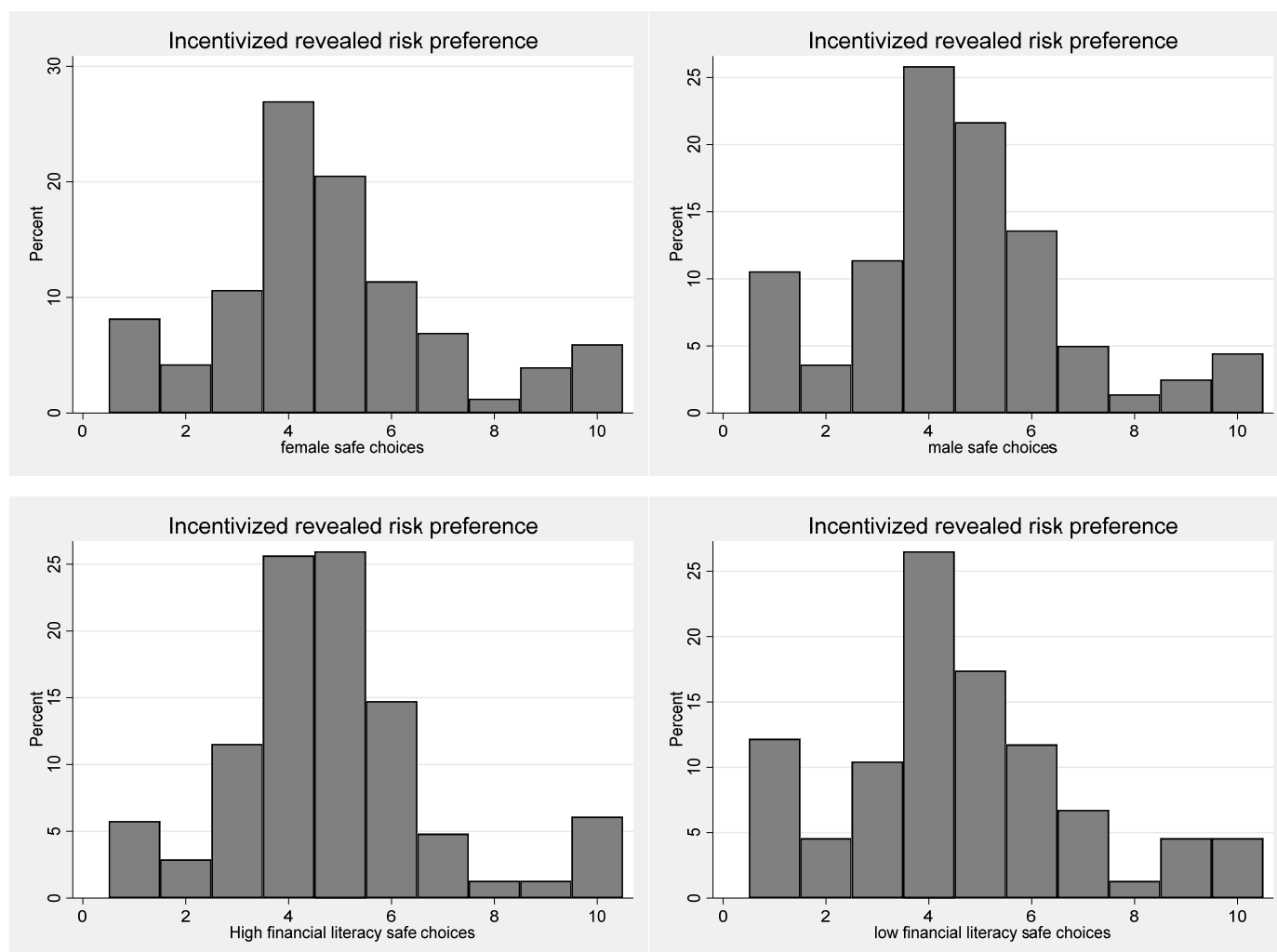
### PWTFR graphs by gender and by financial literacy level



**Figure 3. 1:** Perceived willingness to take financial risk graphs, show percentage of self-reported PWTFR rankings made by the respondents on a 10 point Likert Scale by gender and by financial literacy level. Perceived risk self-ranking 'bar graph 1' shows subjects who self-reported that they are 'very willing' to take financial risk in the investments while 'bar graph 10' show percentage of subjects 'not willing' to take financial risk.



### IRRP graphs by gender and by financial literacy level



**Figure 3.2:** The incentivized revealed risk preference (IRRP) graphs show percentage of respondents by the number of safe choices. Subjects who made a single safe choice are highly risk loving 'bar graph 1' while those that made ten safe choices 'bar graph 10' are highly risk averse.

### T-TEST analysis

**Table 3.8: Paired t-test PWTFR and IRRP**

Variable	observation	mean	Std. Err.	Std. Dev	[95% Con. Inter]
PWTFR	772	4.3782	0.10	2.78	4.18 - 4.57
IRRP	772	4.696	0.08	2.19	4.54 - 4.85
diff	772	-0.32	0.13	3.63	-0.58 - -0.06
Mean(diff)=mean (PWTFR-IRRP)				t=-2.44	
H <sub>0</sub> : mean(diff)=0				Degrees of freedom=771	
Ha: mean(diff) < 0		Ha: mean(diff) != 0		Ha: mean(diff) > 0	
Pr(T < t) = 0.01		Pr(T > t) = 0.02		Pr(T > t) = 0.99	

**Table 3.9: t-test analysis PWTFR by gender.**

Group	observation	mean	Std. Err.	Std. Dev	[95% Con .Inter]
male	360	4.09	0.15	3.80	3.80– 4.38
female	404	4.67	0.14	2.78	4.40 – 4.95
Combined	764	4.40	0.10	2.79	4.20–4.6
diff		-0.23	0.20		-0.98 - -0.19
Mean(diff)=mean (PWTFR-IRRP)				t=-2.91	
H <sub>0</sub> : mean(diff)=0				Degrees of freedom=762	
Ha: mean(diff) < 0		Ha: mean(diff) != 0		Ha: mean(diff) > 0	
Pr(T < t) = 0.00		Pr(T > t) = 0.00		Pr(T > t) = 0.998	

**Table 3.10: t-test analysis IRRP by gender**

Group	observation	mean	Std. Err.	Std. Dev	[95% Con .Inter]
male	360	4.58	0.11	2.13	4.36 – 4.80
female	404	4.81	0.11	2.23	4.59 – 5.03
Combined	764	4.70	0.08	2.19	4.55–4.86
diff		-0.23	0.16		-0.54 - 0.09
Mean(diff)=mean (PWTFR-IRRP)				t=-1.43	
H <sub>0</sub> : mean(diff)=0				Degrees of freedom=762	
Ha: mean(diff) < 0		Ha: mean(diff) != 0		Ha: mean(diff) > 0	
Pr(T < t) = 0.07		Pr(T > t) = 0.15		Pr(T > t) = 0.92	

**Table 3.11: t-test analysis, PWTFR by financial literacy level**

Group	observation	mean	Std. Err.	Std. Dev	[95% Con .Inter]
Low fin literacy	460	4.37	0.14	2.97	4.09 – 4.64
High fin literacy	312	4.40	0.14	2.48	4.12 – 4.67
Combined	772	4.38	0.10	2.78	4.18–4.57
diff		-0.03	0.20		-0.43 - 0.37
Mean(diff)=mean (PWTFR-IRRP)				t=-1.43	
H <sub>0</sub> : mean(diff)=0				Degrees of freedom=770	
Ha: mean(diff) < 0		Ha: mean(diff) != 0		Ha: mean(diff) > 0	
Pr(T < t) = 0.44		Pr(T > t) = 0.87		Pr(T > t) = 0.56	

**Table 3.12: t-test analysis, IRRP by financial literacy level**

Group	observation	mean	Std. Err.	Std. Dev	[95% Con .Inter]
Low fin literacy	460	4.60	0.11	2.30	4.39 – 4.81
High fin literacy	312	4.83	0.11	2.02	4.61 – 5.06
Combined	772	4.70	0.08	2.19	4.54–4.86
diff		-0.23	0.16		-0.54 - 0.09
Mean(diff)=mean (PWTFR-IRRP)				t=-1.43	
H <sub>0</sub> : mean(diff)=0				Degrees of freedom=770	
Ha: mean(diff) < 0		Ha: mean(diff) != 0		Ha: mean(diff) > 0	
Pr(T < t) = 0.08		Pr(T > t) = 0.15		Pr(T > t) = 0.92	