ONLINE APPENDIX

for "Complexity and Biases: An Experimental Study"

Contents

Appendix A1: Instructions for B Sessions

Note: These instructions were used in B sessions run at Tilburg University. Instructions were the same, except for the exchange rate, for session run at the University of Queensland.

This session is part of an experiment in the economics of decision making. If you follow the instructions carefully and make good decisions, you can earn a considerable amount of money. At the end of the session your earnings will be paid to you in cash and in private. The amount you earn will depend on the decisions you make.

There are a number of people in this room who are participating in this session. It is important that you do not talk to any of the other people in the room until the session is over. Please TURN OFF your electronic devices such as phones and music players.

The session will consist of 24 periods, in each of which you can earn points. At the end of the experiment you will be paid an amount based on your total point earnings from all 24 periods. Points will be converted to cash using an exchange rate of 7000 points = 1 Euro. There will not be any show-up fee paid. Notice that the more points each individual earns, the more cash they will receive at the end of the session.

Each period in the experiment consists of two stages. In the first stage you make a choice among 3 Loans, each of which earns you the Value of the Loan. In the 2nd stage you get to choose between Repayment schedules for the Loan you have chosen in the 1st stage. Notice that the Repayment options for each Loan is different, therefore the options you have in the 2nd stage depends on your choice in the 1st stage. Your payoff for the period will be equal to the Value of the Loan minus the Repayment amount.

PAYOFF = VALUE of the Loan - REPAYMENT Amount

At the first stage of a period you will have a time limit of 120 seconds (2 minutes). The time limit for the 2nd stage will be 60 seconds (1 minute). Both of these time limits are strictly BINDING. If you do not make a choice in the time limit at any of the two stages in a period, you will get zero points for that period. However, even if you make a choice quicker than the allocated time limit for that stage you will have to wait until the time limit expires before you move to the next screen. You will see a waiting screen in the meantime.

When you have read the instructions carefully and are ready please click the OK button. After everyone in the session clicks OK the experiment will start.

If you have any questions please raise your hand, the experimenter will come to answer your question.

Appendix A2: Instructions for Simultaneous Treatment

This session is part of an experiment in the economics of decision making. If you follow the instructions carefully and make good decisions, you can earn a considerable amount of money. At the end of the session your earnings will be paid to you in cash and in private. The amount you earn will depend on the decisions you make.

There are a number of people in this room who are participating in this session. It is important that you do not talk to any of the other people in the room until the session is over. Please TURN OFF your electronic devices such as phones and music players.

The session will consist of 21 periods, in each of which you can earn points. At the end of the experiment you will be paid an amount based on your total point earnings from all 21 periods. Points will be converted to cash using an exchange rate of 3200 points = 1 AUD. There will not be any additional show-up fee paid. Notice that the more points each individual earns, the more cash they will receive at the end of the session.

At each period in the experiment you make a choice among 3 Loans, each of which earns you the Value of the Loan. Each loan is associated with 3 repayment schedules. Notice that the Repayment options for each Loan are different and the repayment options depend on the loan you choose. Your payoff for the period will be equal to the Value of the Loan minus the Repayment amount.

PAYOFF = VALUE of the Loan - REPAYMENT Amount

At each period you will have a time limit of 180 seconds (3 minutes). This time limit is strictly BINDING. If you do not make a choice in the time limit in a period, you will get zero points for that period. However, even if you make a choice quicker than the allocated time limit for that stage you will have to wait until the time limit expires before you move to the next screen. You will see a waiting screen in the meantime.

When you have read the instructions carefully and are ready please click the OK button. After everyone in the session clicks OK the experiment will start.

If you have any questions please raise your hand, the experimenter will come to answer your question.

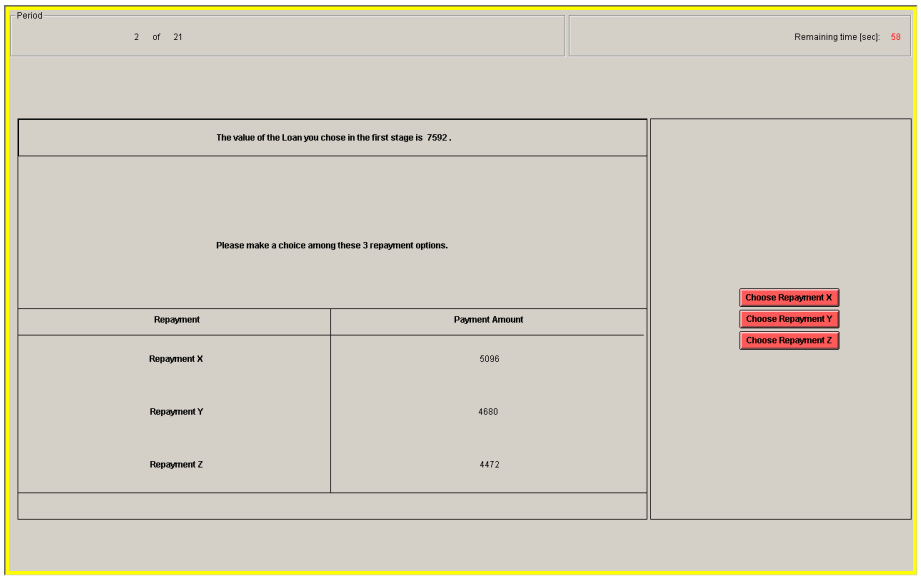


Figure 1: Example screen shot for repayment choice

Appendix B: Additional Results

B.1. Choices by location

Table 1 displays the choices by treatment and location of the sessions (Tilburg or Queensland). We do not find significant differences in choices by location, as indicated in the column MW-test, which reports p-values for Mann-Whitney tests.

A Sessions					
Treatment	**Choice**		**Tilburg**	**Queensland**	MW-test
SIMPLE	High	Mean	8.0%	12.9%	0.1476
		SD	0.19	0.21	
	Medium	Mean	83.9%	83.6%	0.5386
		SD	0.27	0.22	
	Low	Mean	8.0%	3.6%	0.4459
		SD	0.22	0.11	
COMPLEX BENEFIT	High	Mean	36.0%	41.4%	0.5662
		SD	0.27	0.32	
	Medium	Mean	48.8%	43.6%	0.5676
		SD	0.31	0.35	
	Low	Mean	15.2%	15.0%	0.7581
		SD	0.20	0.23	
COMPLEX COST	High	Mean	20.5%	25.0%	0.5862
		SD	0.27	0.31	
	Medium	Mean	71.4%	62.9%	0.3087
		SD	0.29	0.33	
	Low	Mean	8.0%	12.1%	0.4054
		SD	0.15	0.20	
B Sessions					
Treatment	**Choice**		**Tilburg**	**Queensland**	MW-test
SIMPLE	High	Mean	3.1%	5.4%	0.2653
		SD	0.12	0.18	
	Medium	Mean	95.3%	87.5%	0.1708
		SD	0.28	0.18	
	Low	Mean	1.6%	7.1%	0.456
		SD	0.26	0.06	
ONLY HIGH COMPLEX	High	Mean	25.0%	17.9%	0.3427
		SD	0.19	0.21	
	Medium	Mean	70.3%	78.6%	0.2327
		SD	0.29	0.23	
	Low	Mean	6.0%	3.1%	0.757
		SD	0.18	0.10	
HIGH & LOW COMPLEX	High	Mean	17.2%	10.7%	0.3647
		SD	0.18	0.27	
	Medium	Mean	76.6%	80.4%	0.6529
		SD	0.32	0.34	
	Low	Mean	6.3%	8.9%	0.8015
		SD	0.26	0.17	
COMPLEX COST	High	Mean	37.5%	32.1%	0.6012
		SD	0.40	0.33	
	Medium	Mean	43.8%	46.4%	0.8254
		SD	0.41	0.32	
	Low	Mean	18.8%	21.4%	0.7202
		SD	0.29	0.18	

Table 1: Product choices by treatment and location, for A and B sessions

B.3. Regression analysis of choices

This section presents the results from a multinomial regression analysis of the determinants of choices. Table 2 displays the estimated marginal effects of each treatment on the likelihood of choosing High and Low, relative to Medium. Columns (1) and (2) focus on A sessions, while columns (3) and (4) focus on B sessions. In columns (5) and (6) both types of sessions are pooled.

Session:	(1)	(2)	(3)	(4)	(5)	(6)
	A Session		B Session		A and B Sessions	
	High	Low	High	Low	High	Low
COMPLEX COST	0.286***	0.094**	0.293***	0.111***	0.284***	0.098***
	(0.037)	(0.034)	(0.077)	(0.031)	(0.032)	(0.025)
COMPLEX BENEFIT	0.185***	0.048			0.186***	0.050
	(0.041)	(0.034)			(0.038)	(0.029)
ONLY HIGH COMPLEX			0.178*	-0.017	0.175***	-0.040
			(0.083)	(0.037)	(0.053)	(0.039)
HIGH & LOW COMPLEX			0.163*	0.031	0.150**	0.025
			(0.078)	(0.038)	(0.054)	(0.035)
A Session					0.074	-0.013
					(0.039)	(0.030)
Tilburg	0.038	-0.006	0.031	-0.031	0.034	-0.017
	(0.048)	(0.033)	(0.040)	(0.045)	(0.033)	(0.027)
Period	-0.015***	-0.001	-0.015***	0.002	-0.015***	-0.000
	(0.002)	(0.002)	(0.004)	(0.002)	(0.002)	(0.001)
Male	-0.093*	-0.014	-0.036	0.013	-0.072*	-0.002
	(0.044)	(0.033)	(0.038)	(0.040)	(0.032)	(0.026)
Age	0.004	0.003	0.004	0.006	0.004	0.005
	(0.009)	(0.003)	(0.005)	(0.004)	(0.006)	(0.003)
Observations	751	751	478	478	1229	1229
Nr. of subjects	63	63	60	60	123	123
Pseudo - R2	0.1132	0.1132	0.1486	0.1486	0.1258	0.1258
Pseudo - Loglikelihood	-569.59	-569.59	-310.11	-310.11	-882.75	-882.75

Table 2: Determinants of Choices

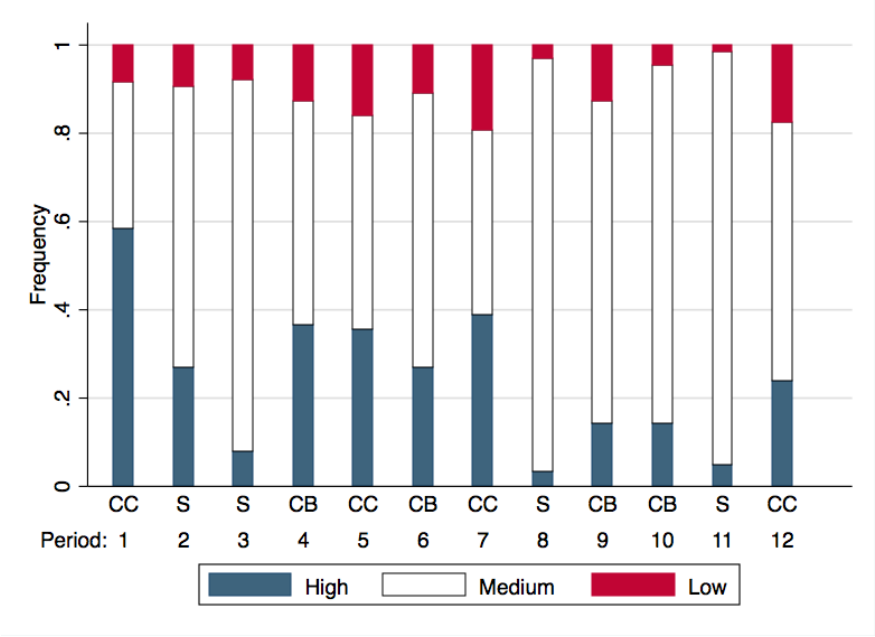
Note: This table presents estimated marginal effects from a multinomial logit regression on loan choice, where medium is the base outcome. The variables COMPLEX COST, COMPLEX BENEFIT, ONLY HIGH COMPLEX and HIGH & LOW COMPLEX are dummies that takes value one in the corresponding treatment, zero otherwise. A Session is a dummy that takes value one if the subject was in an A session. Tilburg is a dummy variable that takes value one if the subject participated in the experiment at Tilburg University, zero if he did at the University of Queensland. Period is the period of the experiment. Male is a dummy variable that takes value 1 if the subject is a male, age is the subject's age. Robust standard errors are estimated, clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

In line with simple tests, the likelihood of choosing High is larger in COMPLEX COSTS than in the omitted treatment SIMPLE. In A sessions the likelihood of choosing High in COMPLEX COSTS is higher than that of Low (p-value<0.01). In B sessions, we obtain a similar result (p-value=0.03). Finally, when both A and B sessions are pooled, the result remains unchanged: the effect of COMPLEX COST is stronger on the likelihood of choosing High, than on the likelihood of choosing Low (p-value<0.01). Also, the likelihood of choosing High is higher in COMPLEX

COST than in COMPLEX BENEFIT (p-value=0.07). While the likelihood of choosing Low does not differ across COMPLEX COST and COMPLEX BENEFIT (p-value=0.35). The bias towards the High option remains in treatments in which there is heterogeneity in the complexity of costs. When only the High option, or both the Low and High options, have complex costs, the likelihood that High is chosen is significantly higher, relative to SIMPLE.

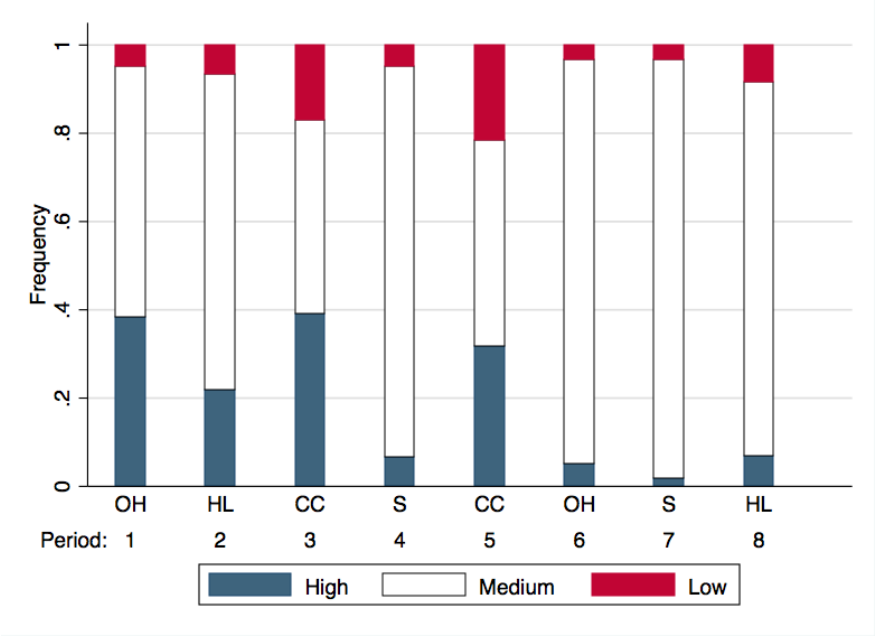
B.3. Decisions over time

Figures 2 and 3 below display choices over time. Figure 2 displays choices by period in A sessions. Figure 3 displays choices by period in B sessions. Recall that the order of the treatments was randomized ex-ante, and all subjects experienced the same order in A and B sessions.



Note: S denotes SIMPLE, CC denotes COMPLEX COST and CB denotes COMPLEX BENEFIT.

Figure 2: Choices by treatment and period in A Sessions



Note: S denotes SIMPLE, OH denotes ONLY HIGH COMPLEX, HL denotes HIGH & LOW COMPLEX and CC denotes COMPLEX COST.

Figure 3: Choices by treatment and period in B Sessions

B.4. Decision times by location

Tables 3 and 4 display decision times by treatment and session type at TU and UQ, respectively. In A sessions, the average time subjects need to make a choice among options in TU is: 55.6 seconds (secs) in SIMPLE, 90.4 secs in COMPLEX COST and 87.7 in COMPLEX BENEFIT. In UQ the average time to make a choice among options is: 59.5 secs in SIMPLE, 93.4 in COMPLEX COST and 92.8 in COMPLEX BENEFIT. The difference in decision time across location in each treatment is not significant for SIMPLE and COMPLEX COST (Mann-Whitney (MW) tests, p-value>0.44 in both cases), and it is marginally significant in COMPLEX BENEFIT (MW-test, p-value=0.09).

In B sessions, the average time subjects need to make a choice among options in TU is: 54.4 secs in SIMPLE, 90.5 secs in ONLY HIGH COMPLEX, 91.8 secs in HIGH & LOW COMPLEX and 95.5 secs in COMPLEX COST. In UQ the average time to make a choice among options is: 56.8 secs in SIMPLE, 88.5 secs in ONLY HIGH COMPLEX, 82.8 secs in HIGH & LOW COMPLEX and 96.0 secs in COMPLEX COST. The difference in decision times among options is not significant for any treatment (MW-tests, p-value>0.2 in all cases).

Treatment	SIMPLE		COMPLEX COST		COMPLEX BENEFIT	ONLY HIGH COMPLEX	HIGH & LOW COMPLEX
Session	*A session*	*B session*	*A session*	*B session*	*A Session*	*B session*	*B session*
Distribution of decision time (in seconds)							
Choice among options							
<20	3.6%	1.6%	0.7%	1.6%	0.7%	1.6%	3.1%
20-40	27.1%	32.8%	5.1%	3.2%	5.0%	1.6%	3.1%
40-60	33.6%	32.8%	8.8%	9.5%	10.0%	6.3%	7.8%
60-80	17.1%	20.3%	13.2%	6.3%	19.3%	18.8%	14.1%
80-100	12.1%	4.7%	20.6%	19.0%	26.4%	34.4%	18.8%
>100	6.4%	7.8%	51.5%	60.3%	38.6%	37.5%	53.1%
Choice among costs							
<20	97.1%	89.1%	33.1%	23.8%	98.6%	64.1%	75.0%
20-40	2.9%	9.4%	30.1%	19.0%	1.4%	17.2%	3.1%
40-60	0.0%	1.6%	36.8%	57.1%	0.0%	18.8%	21.9%
% of No Choice							
Among options	0.0%	0.0%	2.9%	1.6%	0.0%	0.0%	0.0%
Among costs	0.0%	0.0%	2.2%	1.6%	0.0%	0.0%	0.0%

Table 3: Decision time by treatment and session, at Tilburg University

Treatment	SIMPLE		COMPLEX COST		COMPLEX BENEFIT	ONLY HIGH COMPLEX	HIGH & LOW COMPLEX
Session	*A session*	*B session*	*A session*	*B session*	*A Session*	*B session*	*B session*
Distribution of decision time (in seconds)							
Choice among options							
<20	5.4%	0.0%	3.6%	3.6%	3.6%	1.8%	5.5%
20-40	22.3%	17.9%	3.6%	7.1%	0.9%	1.8%	9.1%
40-60	27.7%	42.9%	5.4%	3.6%	7.1%	17.9%	12.7%
60-80	19.6%	28.6%	8.1%	5.4%	9.8%	8.9%	10.9%
80-100	18.8%	10.7%	20.7%	12.5%	34.8%	21.4%	16.4%
>100	6.3%	0.0%	58.6%	67.9%	43.8%	48.2%	45.5%
Choice among costs							
<20	85.7%	98.2%	16.2%	30.4%	83.9%	69.6%	81.8%
20-40	9.8%	1.8%	24.3%	19.6%	11.6%	10.7%	9.1%
40-60	4.5%	0.0%	59.5%	50.0%	4.5%	19.6%	9.1%
% of No Choice							
Among options	0.0%	0.0%	0.9%	0.0%	0.0%	0.0%	1.8%
Among costs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Table 4: Decision time by treatment and session, at University of Queensland

B.5. Regression analysis of decision times

Table 5 presents the results of a regression analysis of decision times. We use tobit regressions, which take into account censoring of decision times at 120 seconds (for product choices) and 60 seconds (for cost choices). All observations, including those of subjects who failed to make a decision in time, are included.

In line with the results reported in the body of the text, we find that there is a small but not significant increase in decision time among options between COMPLEX COST and COMPLEX BENEFIT (χ^2-test, p-value=0.12, one-sided). Further, there is no significant difference in decision

	(1)	(2)	(3)	(4)	(5)	(6)
	Choice among options			Choice among costs		
	A Session	B Session	A and B Sessions	A Session	B Session	A and B Sessions
COMPLEX COST	35.88***	39.87***	37.00***	27.96***	27.69***	28.05***
	[2.737]	[3.301]	[2.141]	[1.509]	[2.088]	[1.223]
COMPLEX BENEFIT	34.01***		34.40***	0.26		0.44
	[2.347]		[2.214]	[0.383]		[0.574]
ONLY HIGH COMPLEX		32.71***	30.98***		9.53***	9.98***
		[2.991]	[2.621]		[1.240]	[1.449]
HIGH & LOW COMPLEX		33.43***	32.59***		9.26***	8.95***
		[3.289]	[2.869]		[1.641]	[1.702]
A Session			-1.18			0.87
			[2.815]			[1.725]
Tilburg	-2.47	2.57	-0.21	-6.56***	1.88	-3.30**
	[3.859]	[4.716]	[2.974]	[1.875]	[2.263]	[1.491]
Period	-0.59***	-0.36*	-0.51***	-0.49***	-0.70***	-0.58***
	[0.129]	[0.197]	[0.110]	[0.062]	[0.112]	[0.058]
Male	9.69***	2.26	6.85**	-1.85	-1.21	-1.83
	[3.186]	[4.812]	[2.694]	[1.876]	[2.286]	[1.441]
Age	-0.46	0.09	-0.32	0.25	0.44	0.31
	[0.691]	[0.696]	[0.500]	[0.257]	[0.313]	[0.193]
Constant	70.28***	55.26***	67.01***	12.07*	4.22	8.76*
	[14.652]	[14.920]	[10.755]	[6.792]	[7.105]	[4.624]
Observations	756	480	1,236	756	480	1,236
Nr. of subjects	63	60	123	63	60	123
Pseudo-R2	0.0431	0.0330	0.0379	0.0974	0.0498	0.0722
Pseudo-loglikelihood	-3464	-2215	-5688	-2939	-2001	-4979

Table 5: Determinants of decision times

Note: This table presents estimated coefficients from a tobit regression on decision time, among options (columns (1) to (3)) and among costs (columns (4) tp (6)). The variables COMPLEX COST, COMPLEX BENEFIT, ONLY HIGH COMPLEX and HIGH & LOW COMPLEX are dummies that takes value one in the corresponding treatment, zero otherwise. A Session is a dummy that takes value one if the subject was in an A session. Tilburg is a dummy variable that takes value one if the subject participated in the experiment at Tilburg University, zero if he did at the University of Queensland. Period is the period of the experiment. Male is a dummy variable that takes value 1 if the subject is a male, age is the subject's age. Robust standard errors are estimated, clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

times among options between ONLY HIGH COMPLEX and HIGH & LOW COMPLEX (χ^2-test, p-value=0.28, one-sided), and there is a significant increase between HIGH & LOW COMPLEX and COMPLEX COST (χ^2-test, p-value=0.05, one-sided).