Online Appendices

These online appendices contain the following supplementary material to Sven Hoeppner, Lars Freund, and Ben Depoorter (2017), "The Moral Hazard Effect of Liquidated Damages: An Experiment on Contract Remedies", Journal of Theoretical and Institutional Economics, 174(1), forthcoming:

1. The instructions for all treatments translated from German into English. Differences between each treatment and the BASE treatment are emphasized with a background color. The on-screen instructions for the post tests are not included.

2. The parametrization in each treatment of the experiment.

3. Two robustness checks regarding the analysis of effort level choices.

The online supplementary material can be found at `http://www.coll.mpg.de/sites/www/files/HFD-JITE-appendices.zip` and further comprises:

1. the z-Tree program;

2. the raw z-Tree data;

3. a consolidated data set;

4. the commented R-script that was used for analyzing the data;

5. and a code book describing the important decision variables.

Appendix A

The following pages contain translations to English of the original German instructions. The original German instructions are on file with the corresponding author (Sven Hoeppner) and available upon request.

Instructions

Thank you for your participation in this experiment!

This study examines of human decision behavior in certain situations. Please read the instructions carefully since the information is important for your payment. If you have questions during the experiment, please raise your hand.

Please do not talk to other participants during the experiment. Communication is prohibited. In case of questions please contact us. If you violate these rules, you need to leave the experiment and will not receive any payments.

Payment

For the participation in the experiment you receive 4 Euro. The experiment consists of a main part and additional tasks. In the experiment you receive additional points that depend on your answers and the answers of other participants. Hence you can earn additional money with your decision. After the experiment points will be converted in Euro such that

200 points = 1 Euro

The payment will be conducted in private.

Main Part

You will be randomly and anonymously matched with another participant. Neither of the two persons will ever know who the other person is. The computer assigns each person either the role “Player A” or “Player B”. At the beginning of the main part you know whether you are “Player A” or “Player B”. Note: Your payment depends on your decision as “Player A” or “Player B”.

Both players start with 500 points. First Player A can choose between “invest” or “not invest”. If Player A chooses “not invest”, both players keep their 500 points and the game ends. If Player A chooses “invest”, Player B receives the 500 points of Player A. Then Player B has 1000 points. At the end of the game Player A receives either 1000 points or 200 points, depending on the decisions of Player B.

[TREATMENT LDT: Prior to her investment decision, Player A can decide whether the following rule should be introduced:

> *When after Player B’s decision Player A receives only 200 points, she can claim a transfer payment of 400 points from Player B to Player A.*

In case the rule has been introduced, Player A can claim the transfer after the decision of Player B.]

Player B can choose between I, II, III, IV and V. This decision of Player B influences the probability that Player A receives 1000 points. Player A will never know the choice of Player B. The following table shows how the payments of Player A depend on the decision of Player B:

Decision of B	Chance that A receives 1000 points	Chance that A receives 200 points
I	1/6, thus ■□□□□□	5/6, thus ■■■■■□
II	2/6, thus ■■□□□□	4/6, thus ■■■■□□
III	3/6, thus ■■■□□□	3/6, thus ■■■□□□
IV	4/6, thus ■■■■□□	2/6, thus ■■□□□□
V	5/6, thus ■■■■■□	1/6, thus ■□□□□□

Example: Suppose Player B chooses II; then Player A receives 1000 point with probability 2/6 and 200 points with probability 4/6.

But the decision of Player B is costly. The following table illustrates this:

Decision of B	I	II	III	IV	V
Cost for B in points	0	60	140	240	360

Example: Suppose Player B chooses II; then 60 points will be subtracted from the 1000 points. Please remember that Player A will never know the decision of Player B. He only receives the information about the payments.

The following table summarizes the main part up to now.

	A receives (in points)				B receives (in points)
A chooses ***not invest***	500				500
A chooses ***invest***; B chooses I	1/6	1000	5/6	200	1000
A chooses ***invest***; B chooses II	2/6	1000	4/6	200	940
A chooses ***invest***; B chooses III	3/6	1000	3/6	200	860
A chooses ***invest***; B chooses IV	4/6	1000	2/6	200	760
A chooses ***invest***; B chooses V	5/6	1000	1/6	200	640

Hence, if Player A chooses „*not invest*“, the decision of player B has no influence on the payments. In this case Player B does not have to pay the costs. After Player B has made his decision, the computer determines the result for Player A.

[TREATMENT NTT: If Player A receives only 200 points the computer subtracts 400 points from Player B points. In this case Player B receives 400 points less.]

[TREATMENT FDT: If Player A only receives 200 points, Player A can “claim” or “forgo”. If Player A chooses “forgo”, the result does not change. If Player A chooses “claim“, there will be a transfer from Player B to Player A. In this case Player A receives 400 points from Player B.]

[TREATMENT RDT: If Player A only receives 200 points, Player A can “claim” or “forgo”. If Player A chooses “forgo”, the result does not change. If Player A chooses “claim“, there will be a transfer from Player B to Player A. The computer will randomly decide the amount of the transfer payment: with a probability of each 50% Player A will receive either 300 or 500 points from the transfer payment.

[TREATMENT LDT: If Player A only receives 200 points and previously introduced the additional rule, Player A can “claim” or “forgo”. If Player A chooses “forgo”, the result does not change. If Player A chooses “claim“, there will be a transfer from Player B to Player A. In this case Player A receives 400 points from Player B.]

Afterwards the main part is finished.

Additional Tasks

After main part has been finished, you can earn additional points in subsequent decisions tasks. These additional decisions tasks are independent from the main part. Hence your decisions from the main part have no influence on your payment from the additional tasks. Also, your decisions in the additional tasks have no influence on your results from the main part. You will receive the instructions for the additional tasks on your screen.

In case you have question concerning the instruction or the experiment, please raise your hand.

Appendix B

This appendix reports the parametrization for each treatment in Tables B1 to B4. The tables also depict (1) those effort levels that a self-interested and rational P wants A to select, (2) those that a self-interested and rational A selects, and (3) those that lead to the welfare maximizing outcome.

Table B1
Parametrization: BASE

		Player P				Player A				
a_A	$q(a_A)$	O_P	Π_P^S	Π_P^F	$E[\Pi_P]$	O_A	w	$\Psi(a_A)$	$\Pi_A(a_A)$	$\sum E[\Pi_i]$
e_0	1/6	500	1000	200	333 1/3	500	500	0	1000	1333 1/3
e_1	2/6	500	1000	200	466 2/3	500	500	60	940	1406 2/3
e_2	3/6	500	1000	200	600	500	500	140	860	1460
e_3	4/6	500	1000	200	733 1/3	500	500	240	760	1493 1/3
e_4	5/6	500	1000	200	866 2/3	500	500	360	640	1506 2/3

Table B2
Parametrization: NTT

			Player P				Player A					
a_A	$q(a_A)$	X	O_P	Π_P^S	Π_P^F	$E[\Pi_P]$	O_A	w	$\Psi(a_A)$	$\Pi_A(a_A)$	$E[\Pi_A]$	$\sum E[\Pi_i]$
e_0	1/6	400	500	1000	200	333 1/3	500	500	0	1000	666 2/3	1000
e_1	2/6	400	500	1000	200	466 2/3	500	500	60	940	673 1/3	1140
e_2	3/6	400	500	1000	200	600	500	500	140	860	660	1260
e_3	4/6	400	500	1000	200	733 1/3	500	500	240	760	626 2/3	1360
e_4	5/6	400	500	1000	200	866 2/3	500	500	360	640	573 1/3	1440

Table B3
Parametrization: FDT & LDT

			Player P				Player A					
a_A	$q(a_A)$	X	O_P	Π_P^S	Π_P^F	$E[\Pi_P]$	O_A	w	$\Psi(a_A)$	$\Pi_A(a_A)$	$E[\Pi_A]$	$\sum E[\Pi_i]$
e_0	1/6	400	500	1000	600	666 2/3	500	500	0	1000	666 2/3	1333 1/3
e_1	2/6	400	500	1000	600	733 1/3	500	500	60	940	673 1/3	1406 2/3
e_2	3/6	400	500	1000	600	800	500	500	140	860	660	1460
e_3	4/6	400	500	1000	600	866 2/3	500	500	240	760	626 2/3	1493 1/3
e_4	5/6	400	500	1000	600	933 1/3	500	500	360	640	573 1/3	1506 2/3

Table B4
Parametrization: RDT

					Player P				Player A					
a_A	$q(a_A)$	X^H	X^L	$E[\tilde{X}]$	O_P	Π_P^S	$E[\Pi_P^F]$	$E[\Pi_P]$	O_A	w	$\Psi(a_A)$	$\Pi_A(a_A)$	$E[\Pi_A]$	$\sum E[\Pi_i]$
e_0	1/6	500	300	400	500	1000	600	666 2/3	500	500	0	1000	666 2/3	1333 1/3
e_1	2/6	500	300	400	500	1000	600	733 1/3	500	500	60	940	673 1/3	1406 2/3
e_2	3/6	500	300	400	500	1000	600	800	500	500	140	860	660	1460
e_3	4/6	500	300	400	500	1000	600	866 2/3	500	500	240	760	626 2/3	1493 1/3
e_4	5/6	500	300	400	500	1000	600	933 1/3	500	500	360	640	573 1/3	1506 2/3

Appendix C

This appendix reports robustness checks regarding our two treatment effects on effort choices of players A.[13] First, in LDT players A chose significantly lower effort levels. Visual inspection of Figure 2 in the main text suggests that this effect is mainly driven by players A in LDT opting more often for the lowest effort level. We dichotomize effort decisions of players A in FDT and LDT to differentiate between the lowest effort level and all higher effort levels. Next we estimate both a linear probability model and a logit model. Treatment LDT enters as dummy variable and we add the controls that we also employed in the main text. Table C1 reports the results of the best fitting estimations. As suspected, LDT has a negative and strongly significant effect on the probability that players A select the lowest effort level.

Table C1
Robustness Check: LDT versus FDT

	$\sum_{i=0}^{0} e_i$ v. other		$\sum_{i=0}^{1} e_i$ v. other		$\sum_{i=0}^{2} e_i$ v. other		$\sum_{i=0}^{3} e_i$ v. other	
	(LPM)	(Logit AMEs)	(LPM)	(Logit AMEs)	(LPM)	(Logit AMEs)	(LPM)	(Logit AMEs)
LDT	-0.308***	-318***	-0.219*	-0.215*	-0.183*	-0.151	-0.073	-0.077
	(0.114)	(0.112)	(0.114)	(0.116)	(0.103)	(0.105)	(0.066)	(0.074)
age	0.021	0.024	0.034**	0.036*	0.026**	0.024	0.007	0.006
	(0.014)	(0.018)	(0.014)	(0.020)	(0.013)	(0.016)	(0.008)	(0.008)
male	-0.172	-0.168	-0.202*	-0.203*	-0.045	-0.109	-0.089	-0.093
	(0.119)	(0.115)	(0.119)	(0.118)	(0.108)	(0.104)	(0.070)	(0.072)
risk aversion	0.011	-0.006	0.013	0.013	0.004	0.009	0.002	-0.004
	(0.029)	(0.034)	(0.029)	(0.035)	(0.026)	(0.030)	(0.017)	(0.024)
ambiguity aversion		0.015		0.004		0.006		0.000
		(0.014)		(0.013)		0.011		(0.007)
SVO type	-0.438***	-0.371***	-0.468***	-0.382***	-0.248**	-0.213*	0.094	0.098**
	(0.122)	(0.112)	(0.029)	(0.131)	(0.111)	(0.129)	(0.072)	(0.046)
(Intercept)	1.429***	–	1.021*	–	0.331	–	-0.290	–
	(0.516)		(0.515)		(0.467)		(0.303)	
Res.Dev.	–	52.785	–	54.574	–	42.625	–	22.543
AIC	–	66.785	–	68.574	–	56.625	–	36.543
Res. SE	0.431	–	0.431	–	0.391	–	0.254	–
Adj. R^2	0.242	–	0.265	–	0.126	–	0.000	–

*: $p < 0.10$; **: $p < 0.05$; ***: $p < 0.01$.

We want to understand the impact of this effect. Therefore we continue by running the same models (1) for the two lowest effort levels against all higher effort levels, (2) for the three lowest effort levels against all higher effort levels, and (3) for the four lowest effort levels against the highest effort level. Table C1 illustrates that the negative effect of LDT continually decreases and becomes less significant as we add effort levels. We conclude that the overall negative treatment effect of LDT compared to FDT is caused by changes in the lowest effort level.

[13] We are grateful to Christoph Engel for this suggestion.

Second, in NTT players A chose significantly higher effort levels. Figure 2 in the main text indicates that this effect is mainly driven by players A in NTT opting more often for the two highest effort levels than players A in BASE. Thefore, we do the same exercise for the effect of NTT compared to BASE. We differentiate between the highest effort level and all lower effort levels and estimate both a linear probability model and a logit model with treatment NTT enters as dummy variable and additional controls. Table C2 reports the results of the best fitting estimations. As suspected, NTT has a positive and significant effect on the probability that players A select the highest effort level. When continually including the next lowest effort level and running the same estimations, we find that the positive and significant effect increases with the inclusion of effort level 4. The effect vanishes as soon as comparing the three highest effort levels with the two lowest effort levels. We conclude that the overall positive treatment effect of NTT compared to BASE results from changes in the two highest effort levels.

Table C2

Robustness Check: NTT versus BASE

	$\sum_{i=5}^{5} e_i$ v. other		$\sum_{i=4}^{5} e_i$ v. other		$\sum_{i=3}^{5} e_i$ v. other		$\sum_{i=2}^{5} e_i$ v. other	
	(LPM)	(Logit AMEs)	(LPM)	(Logit AMEs)	(LPM)	(Logit AMEs)	(LPM)	(Logit AMEs)
NTT	0.175**	0.180**	0.266**	0.267**	0.170	0.173	-0.001	0.011
	(0.082)	(0.085)	(0.123)	(0.123)	(0.140)	(0.135)	(0.132)	(0.125)
age	0.026***	0.020	0.020	0.019	0.012	0.015	0.005	0.005
	(0.009)	(0.017)	(0.014)	(0.017)	(0.016)	(0.019)	(0.015)	(0.017)
male								
risk aversion	-0.037*	-0.033	-0.037	-0.036	-0.031	-0.032	-0.065*	-0.066
	(0.022)	(0.026)	(0.033)	(0.033)	(0.038)	(0.038)	(0.036)	(0.043)
ambiguity aversion	-0.002	-0.003	-0.002	-0.002	0.024	0.024	0.024	0.022
	(0.010)	(0.009)	(0.015)	(0.014)	(0.018)	(0.018)	(0.017)	(0.017)
SVO type								
(Intercept)	-0.299	–	-0.024	–	0.069		0.727*	
	(0.265)		(0.400)		(0.454)		(0.428)	
Res.Dev.	–	26.041	–	56.087	–	78.450	–	62.403
AIC	–	36.041	–	66.087	–	68.450	–	72.403
Res. SE	0.289	–	0.436	–	0.495	–	0.466	–
Adj. R^2	0.172	–	0.070	–	0.037		0.039	–

*: $p < 0.10$; **: $p < 0.05$; ***: $p < 0.01$.