Online Appendix

Werner Güth, Kirsten Häger, Oliver Kirchkamp Joachim Schwalbach, "Testing Forbearance Experimentally—Duopolistic Competition of Conglomerate Firms".

A. Experimental Setup

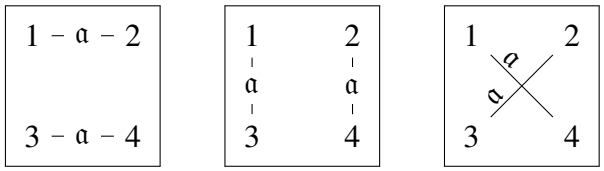
We have relied on matching groups with four participants each in all treatments except for treatment 13, where conglomerate firms interact with single firms on the same markets. There we have matching groups of six.

We study the following settings both in a long term and in a short term interaction setting (with the exception of the asymmetric markets case). In the long term setting, we first play a game with one of these matchings for the first 12 rounds. Then another game is announced, again for 12 rounds, where we use another matching.

In the short term interaction setting we switch among the following matchings every four rounds. We announce a new game after 12 rounds both in the long term and in the short term treatment to avoid as far as possible any biases between the long term and the short term design.

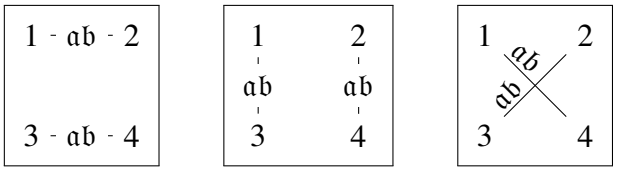
Participants are not aware of the small size of the matching group. All they know is that pairs are randomly formed in every four or in every twelve rounds.

Baseline treatment—no conglomerates: In our baseline treatment there are no conglomerates. The strategic interaction takes place only on a single market. If we write markets $\mathfrak{a}$ (and later $\mathfrak{b}$) next to connections between the four members of a matching group, then matching in the baseline treatments follows these three structures:



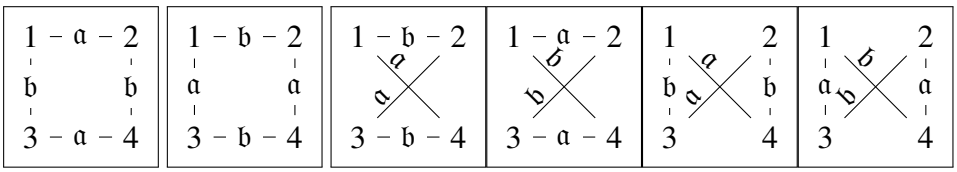
[a]

Homogeneous conglomerates: In the homogeneous conglomerate treatment (treatments 5-10), pairs of firms (denoted with numbers) simultaneously interact on two markets, $\mathfrak{a}$ and $\mathfrak{b}$, using the following matchings:



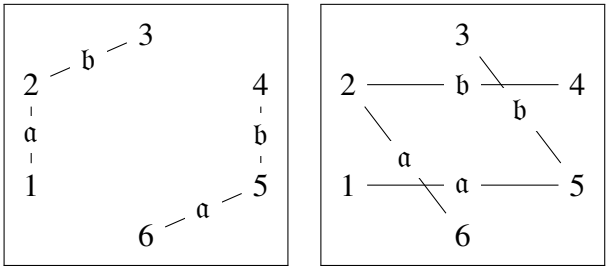
[b]

Heterogeneous conglomerates: When conglomerates are supposed to compete with two different conglomerates on both markets we use matchings as follows:



[c]

Asymmetric markets with conglomerates and single firms: When conglomerates are supposed to compete with non-conglomerates, each matching group of six participants contained two conglomerates and four "one market-firms", one for the a-market and one for the b-market for each conglomerate firm. Here we only ran a long term design with two sessions containing 3 matching groups each, i.e. with 36 participants (treatment 13).



[d]

A design with short term interaction would have required larger matching groups what might have questioned the comparability of the results across treatments.

Substitutes and complements: Interaction on the above markets might depend on whether products are strategic substitutes or complements. For the baseline treatment [a] without conglomerates (treatments 1-4) and the homogeneous conglomerates (treatments 5-10, [b]) we study all possible combinations. The case of heterogeneous conglomerates (treatments 11 and 12, [c]) and the case of conglomerates and single firms (treatment 13, [d]) is only studied in one setting each: products on the a-market are strategic substitutes, products on the b-market are strategic complements (again, see Table 2).

B. Experimental Instructions

Here we present the translation of the originally German instructions for treatment 6 (long term interaction, homogeneous conglomerates, strategic substitute and complement markets). The instructions for the other treatments differ only where necessary. In the experiment markets were called X and Y. To be consistent with the notation we use in the paper we use a *and* b *in the following.*

Welcome to this experiment and thank you for participating!

You can earn money in this experiment; the amount will depend on your own decisions and on the decisions of the other participants. *Therefore, it is very important that you read these instructions carefully.*

If you have any questions, please raise your hand. We will come to your seat and answer your questions. Please do not ask your questions out loud. All participants of this experiment

are given the same instructions, whereas the information that appears on the computer screen during the game is for the respective participant only. That is why you are *not allowed to look at the screens of the other participants or talk to them during the experiment*. Non-compliance with these rules will result in your exclusion from the experiment. Please switch off your mobile phones now.

In the following experiment you will play together with one partner. You and your partner represent two firms each. These firms are active in the same markets, namely market a and market b. Your task is to determine the sales volume of your firms in these markets. Your partner's task is to determine the sales volume of his/her firms in the same markets. Each of his/her firms will be confronted with one of your firms.

Your firm 1	market a ⟷	Partner's firm 1
Your firm 2	market b ⟷	Partner's firm 2

You will play the following twelve rounds with the same partner.

During the experiment you will see charts on the screen. In these charts you can see how your decision and the decision of the other firm influence your profit and the profit of the other firm on the market in question. [[see Figure 8]]

The rows of the chart show your sales volume which can be seen in the left margin. The sales volume of the other firm is shown in the columns. The amount you expect the other firm to choose can be seen in the top row. The number in each cell of the chart shows how much you earn in this round if you choose the amount indicated by the row of this cell, and the other firm chooses the amount indicated by this column.

The profit of your partner's firm in this market can be determined with the same chart. If you want to know how much the other firm will earn, all you have to do is invert the lines and rows of the chart, i.e. in this case your sales volume can be seen in the columns, and the sales volume of your partner is shown in the rows. The intersection cell shows the earnings of your partner's firm. This may help you find out which amount the other firm might choose. However, you cannot influence the sales volume chosen by the other firm. Nevertheless, it is important for your own decision to have a precise assumption about how the other firm will act.

To help you with your considerations you can click the sales volume you expect the other firm to choose in the top row and the sales volume you want to choose yourself in the left margin. The corresponding row and column will be indicated in red. The profit you will earn in this market in this round if your partner indeed acts as you guess will be circled. You can try several combinations if you want to. Please confirm your final decision by clicking the OK button. The payoff of one market in a round depends on the sales amount chosen by you and the sales amount chosen by the other firm.

To help you to keep track there is a table at your seat to fill in your sales volume, your partner's sales volume, and your profit after each round.

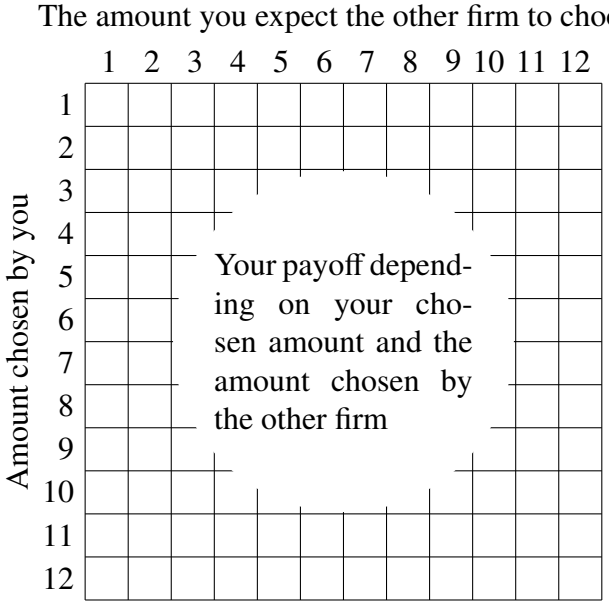


Figure 8: Example payoff chart from the instructions.

The profits in the charts are given in ECU (experimental currency units). You will be informed about the exchange rate of ECU into Euro on your computer screen at the beginning of the experiment. This rate is the same for all participants. At the end of the experiment you will be paid the sum of your profits from all rounds in Euro. This amount will be paid to you privately. No other participant will learn from us how much you have earned.

Once you have read the instructions carefully, please start answering the questions on the computer screen. There will be one question at a time on the screen. These questions check your understanding of the experiment. Unfortunately, you will only be allowed to take part in the experiment if you understood the rules. If you make too many mistakes in the questionnaire, you cannot participate. If you are not sure about how to answer a question, you may read the instructions again, of course.

C. Frequencies of pairs of choices

Figures 9 and 10 displays frequencies of pairs of choices for the treatments with strategic substitutes and complements, respectively. In each graph, colors and sizes of the symbols show differences between relative frequencies of choices in a treatment (for a given market type, either strategic substitutes or complements) and the average of this market type (strategic substitutes or complements). The size (area) of the symbols is proportional to the relative frequencies of choices in this treatment minus the relative frequency of choices in all treatments with markets for strategic substitutes or complements, respectively. Numbers of treatments correspond to Table 2.

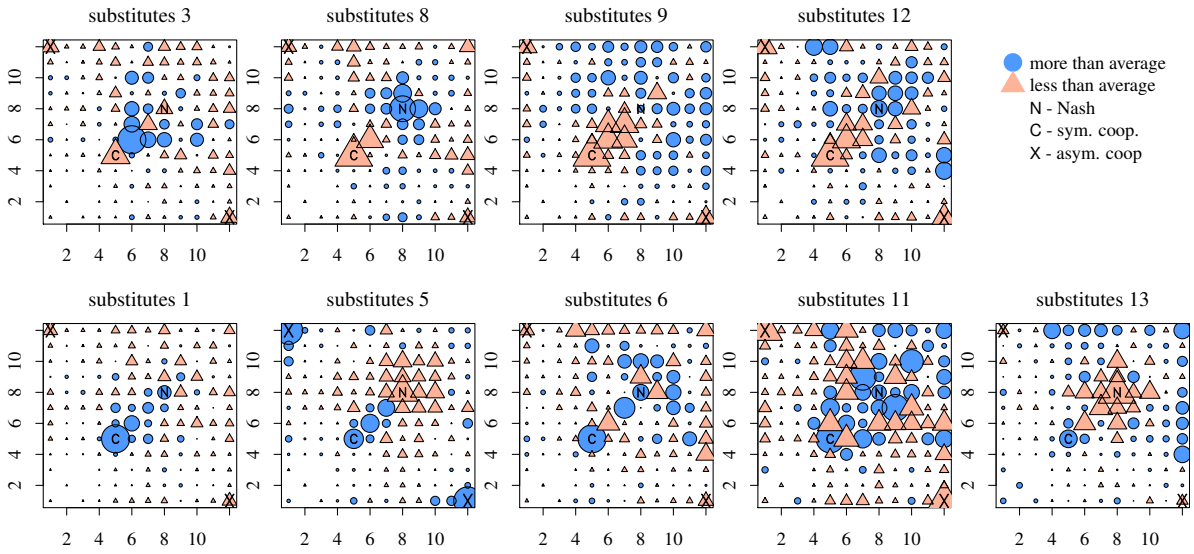


Figure 9: Frequencies of pairs of choices compared to average treatment—substitutes

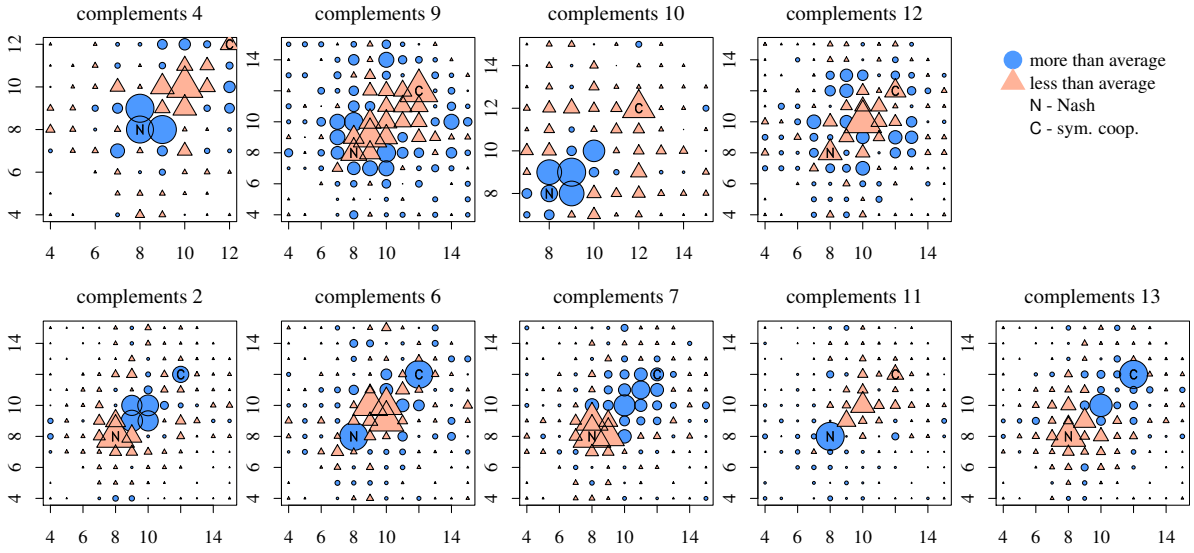


Figure 10: Frequencies of pairs of choices compared to average treatment—complements

	baseline		homogeneous		heterogeneous	
(Intercept)	−0.111	[−0.397; 0.198]	−0.036	[−0.168; 0.091]	0.070	[−0.054; 0.187]
$\Delta x_t^{\mathrm{BR\|E}} d_{\mathrm{sub}}$	0.263^{***}	[0.199; 0.314]	0.266^{***}	[0.242; 0.288]	0.058^{**}	[0.019; 0.098]
$\Delta x_t^{\mathrm{BR\|E}} d_{\mathrm{com}}$	1.756^{***}	[1.412; 2.081]	1.256^{***}	[1.123; 1.383]	1.394^{***}	[1.207; 1.578]
$\Delta x_t^{\mathrm{BR}} d_{\mathrm{sub}}$	0.382^{***}	[0.298; 0.442]	0.286^{***}	[0.260; 0.312]	0.413^{***}	[0.361; 0.461]
$\Delta x_t^{\mathrm{BR}} d_{\mathrm{com}}$	-0.801^{***}	[−1.173; −0.474]	-0.533^{***}	[−0.659; −0.403]	-0.672^{***}	[−0.879; −0.497]
$\dot{\pi}_{t-1} d_{\mathrm{sub}}$	0.051^{***}	[0.042; 0.058]	0.025^{***}	[0.022; 0.028]	0.028^{***}	[0.022; 0.035]
$\dot{\pi}_{t-1} d_{\mathrm{com}}$	0.022^{***}	[0.014; 0.034]	0.013^{***}	[0.009; 0.018]	0.014^{***}	[0.007; 0.021]
$\dot{\pi}_{t-2} d_{\mathrm{sub}}$	0.035^{***}	[0.027; 0.042]	0.016^{***}	[0.013; 0.019]	0.017^{***}	[0.011; 0.022]
$\dot{\pi}_{t-2} d_{\mathrm{com}}$	0.016^{**}	[0.005; 0.026]	0.006^{*}	[0.001; 0.011]	0.007^{+}	[−0.000; 0.013]
$\dot{\pi}_{t-3} d_{\mathrm{sub}}$	0.023^{***}	[0.017; 0.028]	0.009^{***}	[0.006; 0.011]	0.013^{***}	[0.008; 0.018]
$\dot{\pi}_{t-3} d_{\mathrm{com}}$	0.013^{**}	[0.004; 0.022]	0.007^{**}	[0.002; 0.011]	0.003	[−0.004; 0.009]
$\dot{\pi}^{\mathrm{O}}_{t-1} d^{\mathrm{O}}_{\mathrm{sub}} d_{\mathrm{sub}}$			0.007^{***}	[0.004; 0.010]		
$\dot{\pi}^{\mathrm{O}}_{t-1} d^{\mathrm{O}}_{\mathrm{com}} d_{\mathrm{sub}}$			0.036^{**}	[0.013; 0.059]	0.022	[−0.006; 0.045]
$\dot{\pi}^{\mathrm{O}}_{t-1} d^{\mathrm{O}}_{\mathrm{sub}} d_{\mathrm{com}}$			0.001	[−0.000; 0.002]	0.000	[−0.001; 0.001]
$\dot{\pi}^{\mathrm{O}}_{t-1} d^{\mathrm{O}}_{\mathrm{com}} d_{\mathrm{com}}$			0.006^{*}	[0.000; 0.011]		
$\dot{\pi}^{\mathrm{O}}_{t-2} d^{\mathrm{O}}_{\mathrm{sub}} d_{\mathrm{sub}}$			0.006^{***}	[0.003; 0.009]		
$\dot{\pi}^{\mathrm{O}}_{t-2} d^{\mathrm{O}}_{\mathrm{com}} d_{\mathrm{sub}}$			0.013	[−0.010; 0.041]	0.018	[−0.008; 0.043]
$\dot{\pi}^{\mathrm{O}}_{t-2} d^{\mathrm{O}}_{\mathrm{sub}} d_{\mathrm{com}}$			0.000	[−0.001; 0.001]	0.000	[−0.001; 0.001]
$\dot{\pi}^{\mathrm{O}}_{t-2} d^{\mathrm{O}}_{\mathrm{com}} d_{\mathrm{com}}$			0.001	[−0.005; 0.007]		
$\dot{\pi}^{\mathrm{O}}_{t-3} d^{\mathrm{O}}_{\mathrm{sub}} d_{\mathrm{sub}}$			0.006^{***}	[0.003; 0.009]		
$\dot{\pi}^{\mathrm{O}}_{t-3} d^{\mathrm{O}}_{\mathrm{com}} d_{\mathrm{sub}}$			0.016	[−0.007; 0.038]	−0.005	[−0.032; 0.019]
$\dot{\pi}^{\mathrm{O}}_{t-3} d^{\mathrm{O}}_{\mathrm{sub}} d_{\mathrm{com}}$			0.001	[−0.000; 0.002]	−0.001	[−0.002; 0.001]
$\dot{\pi}^{\mathrm{O}}_{t-3} d^{\mathrm{O}}_{\mathrm{com}} d_{\mathrm{com}}$			−0.001	[−0.006; 0.004]		
AIC	9069.962		36833.523		12698.150	
N	2292		9360		3168	

Table 7: Estimation of equations (28), (29) and (30)

	asym. conglom.		asym. single	
(Intercept)	−0.247	[−0.572; 0.173]	0.083	[−0.347; 0.428]
$\Delta x_t^{\mathrm{BR\|E}} d_{\mathrm{sub}}$	0.152^{***}	[0.064; 0.223]	0.277^{***}	[0.185; 0.359]
$\Delta x_t^{\mathrm{BR\|E}} d_{\mathrm{com}}$	0.855^{***}	[0.433; 1.211]	1.367^{***}	[0.716; 1.945]
$\Delta x_t^{\mathrm{BR}} d_{\mathrm{sub}}$	0.260^{***}	[0.169; 0.359]	0.456^{***}	[0.335; 0.573]
$\Delta x_t^{\mathrm{BR}} d_{\mathrm{com}}$	-0.473^{*}	[−0.869; −0.079]	-0.713^{*}	[−1.365; −0.178]
$\dot{\pi}_{t-1} d_{\mathrm{sub}}$	0.038^{***}	[0.024; 0.050]	0.054^{***}	[0.038; 0.069]
$\dot{\pi}_{t-1} d_{\mathrm{com}}$	0.019^{+}	[−0.001; 0.037]	0.017	[−0.005; 0.037]
$\dot{\pi}_{t-2} d_{\mathrm{sub}}$	0.026^{***}	[0.013; 0.039]	0.044^{***}	[0.031; 0.059]
$\dot{\pi}_{t-2} d_{\mathrm{com}}$	0.012	[−0.008; 0.030]	0.009	[−0.011; 0.030]
$\dot{\pi}_{t-3} d_{\mathrm{sub}}$	0.007	[−0.003; 0.017]	0.024^{***}	[0.012; 0.035]
$\dot{\pi}_{t-3} d_{\mathrm{com}}$	−0.000	[−0.017; 0.018]	0.016^{+}	[−0.001; 0.037]
$\dot{\pi}^{\mathrm{O}}_{t-1} d_{\mathrm{sub}}$	−0.039	[−0.105; 0.039]		
$\dot{\pi}^{\mathrm{O}}_{t-1} d_{\mathrm{com}}$	−0.001	[−0.003; 0.002]		
$\dot{\pi}^{\mathrm{O}}_{t-2} d_{\mathrm{sub}}$	0.007	[−0.069; 0.077]		
$\dot{\pi}^{\mathrm{O}}_{t-2} d_{\mathrm{com}}$	−0.000	[−0.004; 0.002]		
$\dot{\pi}^{\mathrm{O}}_{t-3} d_{\mathrm{sub}}$	0.011	[−0.055; 0.080]		
$\dot{\pi}^{\mathrm{O}}_{t-3} d_{\mathrm{com}}$	−0.001	[−0.003; 0.001]		
AIC	2867.955		2843.091	
N	648		648	

Table 8: Estimation of equation (30) for asymmetric conglomerates