Annexes[1]

Annex A. Coalition structures with 3 agents that are irrelevant for supply chains

Annex B. Supply chains with 2 and 4 agents

Annex C. Source codes – MATLAB and z-tree

Annex D. Empirical results

Annex E. Copies of scientific publications by the author on the topic of the dissertation

[1]The annexes are supplied in the enclosed compact disc

Annex A. Coalition structures with 3 agents that are irrelevant for supply chains

Figure 1A shows networks with coalition structures with for 3 agents that are irrelevant in the context of supply chains. The reason is that the agent(s) at the left that represents the starting point of the supply chain is not in the same component with the individual end customer.

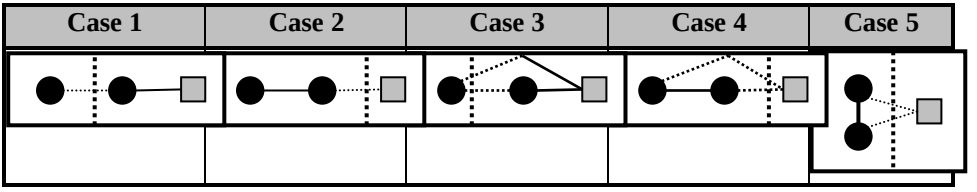


Fig. 1A. Irrelevant networks with coalition structures with for 3 agents

Figure 2A shows industrial supply chains with mass markets and coalition structures, which are not relevant in the thesis either. It is distinguished between restricted and non-restricted networks.

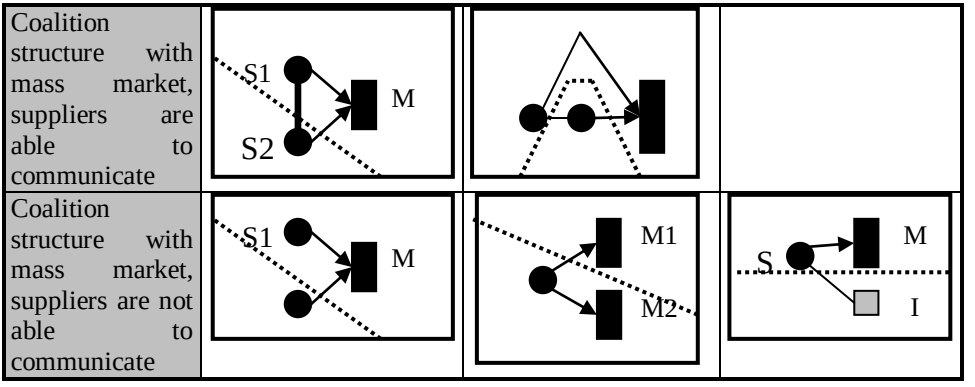


Fig. 2A. Industrial supply chains with mass markets and coalition structures

Annex B. Supply chains with 2 and 4 agents

Supply chains with 2 agents

Figure 1B shows the supply chain that just consists of a bilateral link. The two possibilities are that the customer is

- an individual or
- aggregated (mass market).

The characteristic function has the following structure for 2 agents: $v = (A; B; AB)$. The profit is distributed by 50% – 50%, as none of the agents has any advantageous alternative to this outcome. This is in accordance with the Shapley-rule with 2 agents $Sh_2 : Sh_2 = (50\%; 50\%)$.

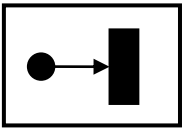
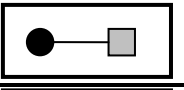
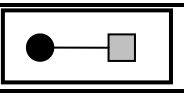
Connections		Supply chain	Allocation
1	**S – M**		Backward induction
2	**S –I**		50% – 50%
2	**S –I**		50% – 50%

Fig. 1B. Supply chains with 2 agents with individual customer and mass market

Supply chains with 4 agents

Figure 2B depicts the set of all supply chains with 4 agents.

The preconditions are that the supply chain must not be interrupted, i. e.

- the first and the last segment of the supply chain must be in the productive component,
- these agents must be connected at least indirectly, there must be the referring links.

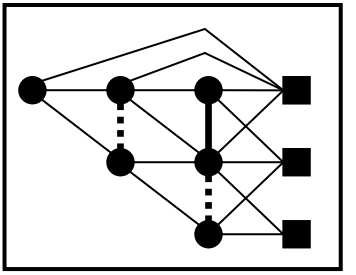
	Set of all 4 agents' supply chains
Suppliers: Complementors or competitors	

Fig. 2B. Sets of all supply chains with 4 agents

Figure 3B depicts systematically all supply chains that consist of 4 agents. Networks that do not fulfill these conditions are excluded and not depicted.

The cases 1-6 show systematically groups of supply chains with different constellations:

Case 1 (3 customers):

- There are no restricted grand coalitions.
- The distinction of individual or aggregated customers allows 4 combinations in each case.

Case 2 (2 direct suppliers):

- The number of restricted grand coalitions is 3 (in dependence of the number of links).
- The distinction of individual or aggregated customers allows 3 combinations in each case.

Case 3 (1 supplier, 1 pre-supplier):

- The number of restricted grand coalitions is 3.
- The distinction of individual or aggregated customers allows 3 combinations in each case.

Case 4 (3 suppliers):

- The number of restricted grand coalitions is 4.
- The distinction of individual or aggregated customers allows 2 combinations in each case.

Case 5 (1 pre-supplier, 2 suppliers):

- The number of restricted grand coalitions is 8.
- The distinction of individual or aggregated customers allows 2 combinations in each case.

Case 6 (2 pre-suppliers, 1 supplier):

- The number of restricted grand coalitions is 7.
- The distinction of individual or aggregated customers allows 2 combinations in each case.

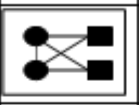
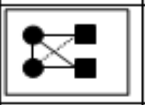
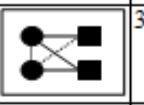
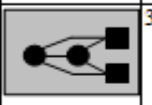
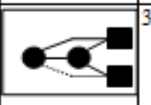
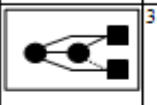
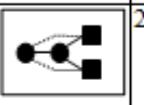
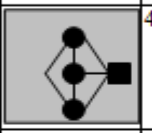
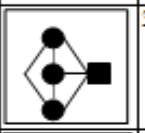
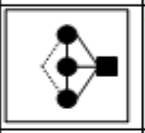
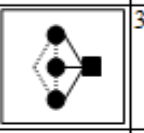
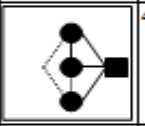
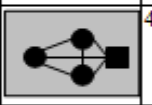
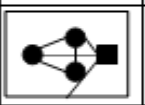
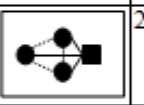
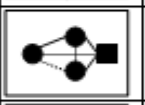
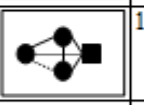
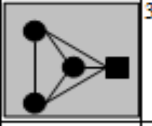
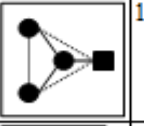
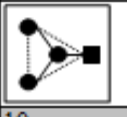
		GC	CS	RGC	CS	RGC	CS	RGC	CS
1	3 customers 1 supplier		2						
2	2 customers 2 suppliers		3		3		3		3
3	2 customers 1 supplier 1 pre-supplier		3		3		3		2
4	1 customer, 3 suppliers		4		3		4		3
					4				
5	1 customer, 2 suppliers, 1 pre-supplier		4		3		2		2
					1		1		1
					3		2		
6	1 customer, 1 supplier, 2 pre-suppliers		3		2		3		1
					3		1		3
					1				
	Sums:	6	19	10	26	8	19	7	15

Fig. 3B. Sets of all supply chains with 4 agents, depiction as basis for the calculation of the number of (restricted) grand coalitions

Table 1B summarizes the relevant grand coalitions, coalition structures, restricted grand coalitions and restricted coalition structures. Additionally the number of possibilities with mass markets is calculated.

Table 1B. Calculation of the possible supply chains with 4 agents with the combinations of mass markets and individual customers

Case	GC	CS	RGC	RCS	Factors: Mass markets, individual customers	P-GC	P-CS	P-RGC	P-RCS
	1	2	-	-	4				
2	1	3	3	9	3	3	9	9	27
3	1	3	3	8	3	3	9	9	24
4	1	4	4	14	2	2	8	8	28
5	1	4	8	15	2	2	8	16	30
6	1	3	7	14	2	2	6	14	28
Sum	6	19	25	60		12	40	56	137

Annex C. Source codes – MATLAB and z-tree

Table 1C lists all MATLAB and "z-tree" source code files that have been used for the simulations, experiments and data evaluations in chapter 3. Afterwards, the source codes are listed. The MATLAB source codes are comprehensive. The "z-tree" codes are only listed as far as they are directly accessible over the graphical interface. All other "z-tree" source code has been omitted.

Table 1C. MATLAB and "z-tree" files that have been programmed for the simulations, experiments and data evaluations

Program	Number		File
MATLAB	1.	1	cournot_werte_berechnung.m
		2	cournot_werte_schnell.m
		3	experiment_mass_market_result_round_profits.m
		4	experiment_mass_market_result_bar_chart_bilateral.m
		5	experiment_mass_market_result_cake_chart_unilateral.m
		6	experiment_individual_parameters_rnpvs_expected_events.m
		7	experiment_individual_parameters_rnpvs_unexpected_events.m
		8	experiment_individual_result_calculations_tables.m
		9	experiment_individual_result_low_costs_figure.m
z-tree	2.	1	4-2-2-1-cournot-equilibrium.ztt
			4-2-2-2-cournot-negotiations.ztt
		2	5-3-2-1 game dynamic low expected complete.ztt
			5-3-2-2 game dynamic low expected incomplete.ztt
			5-3-3-1 game dynamic low unexpected complete.ztt
			5-3-3-2 game dynamic low unexpected incomplete.ztt
		3	5-3-2-3 game dynamic high expected complete.ztt
			5-3-2-4 game dynamic high expected incomplete.ztt

1.1. File: cournot_werte_berechnung.m

```
clear;  syms q1 q2 p real;
a = 20; c1 = 1; c2=1; d=0.9;

Pi1 = '(a-q1-d*q2-c1)*q1';        Pi2 = '(a-q2-d*q1-c2)*q2';
Pi1d= diff(Pi1,q1);               Pi2d= diff(Pi2,q2);
```

```
S = solve(Pi1d,Pi2d);
q1_opt = eval(S.q1);            q2_opt = eval(S.q2);
p1 = a - q1_opt - d*q2_opt;     p2 = a - q2_opt - d*q1_opt;
q_total = q1_opt + q2_opt;
%q1 = (a-2*c1+c2) / 3; %q2 = (a-2*c2+c1) / 3
Pi1_opt = (p1 - c1) * q1_opt;   Pi2_opt = (p2 - c2) * q2_opt;
Pi_total=Pi1_opt+Pi2_opt;
if ((p1<c1) | (p2<c2) | (q1_opt<0) | (q2_opt<0))
   Pi1_opt=0; Pi2_opt=0;
end
%-----------------------------------------------------------------

Pi_cart = '(a-(q1+d*q2))*(q1)-c1*(q1)+(a-(q2+d*q1))*(q2)-c2*(q2)';
Pi1d_cart= diff(Pi_cart,q1);    Pi2d_cart= diff(Pi_cart,q2);
S_cart = solve(Pi1d_cart,Pi2d_cart);
q1_cart_opt = eval(S_cart.q1);  q2_cart_opt = eval(S_cart.q2);
q_cart_total = q1_cart_opt + q2_cart_opt;
p1_cart = a - q1_cart_opt - d*q2_cart_opt;
p2_cart = a - q2_cart_opt - d*q1_cart_opt;

%p_cart = a - q1_cart_opt - q2_cart_opt; %???
Pi1_cart_opt = (a- q1_cart_opt - d*q2_cart_opt - c1) *
q1_cart_opt;
Pi2_cart_opt = (a- q2_cart_opt - d*q1_cart_opt - c2) *
q2_cart_opt;
Pi_cart_total=Pi1_cart_opt+Pi2_cart_opt;
added_value = Pi_cart_total-Pi_total;
added_value_rel = (Pi_cart_total-Pi_total)/Pi_total;

if ((p1<c1) | (p2<c2) | (q1_cart_opt<0) | (q2_cart_opt<0))
     Pi1_opt=0; Pi2_opt=0;
end
```

1.2. File: cournot_werte_schnell.m

```
clear;
a = 20; c1 = 1; c2=1; d1=1; d2=0.9;
q1=6.5517; q2=5;
Pi1 = (a- d1*q1 - d2*q2 - c1) * q1;
Pi2 = (a- d1*q2 - d2*q1 - c2) * q2;
```

1.3. File: experiment_mass_market_result_round_profits.m

```
clear; scrsz = get(0,'ScreenSize'); figure('Position',[50 100 600
200]); hold on;
verzeichnis='c:\game theory\ergebnisse\phase 2010-2
dissertation\MS Excell experimental data\';
datei ='collected data - mass market.xls';
pfad = [verzeichnis, datei];  N=48;
```

```
dat1 = xlsread(pfad, 1, 'E54');          dat2 = xlsread(pfad, 2,
'E54');
dat3 = xlsread(pfad, 3, 'B3:F241');      dat4 = xlsread(pfad, 4,
'B3:F241');

for lv1=1:N
    lv2 = (lv1-1)*5;
    entscheidung3(lv1,1,:) = dat3(lv2+3,:); entscheidung3(lv1,2,:)
= dat3(lv2+4,:);
    entscheidung4(lv1,1,:) = dat4(lv2+3,:); entscheidung4(lv1,2,:)
= dat4(lv2+4,:);
end
entscheidung3_av_temp=(sum(entscheidung3(:,1,:)+entscheidung3(:,2,
:)))/(N*2);
entscheidung4_av_temp=(sum(entscheidung4(:,1,:)+entscheidung4(:,2,
:)))/(N*2);
for lv3=1:5
    entscheidung3_av(lv3) = entscheidung3_av_temp(:,:,lv3);
    entscheidung4_av(lv3) = entscheidung4_av_temp(:,:,lv3);
end
plot(dat1,'kv','linewidth',2);  plot(dat2,'ko','linewidth',2)
plot(entscheidung3_av,'kv-','linewidth',1);
plot(entscheidung4_av,'ko-','linewidth',1)
title('Comparison of the individual profits in the mass market
experiments','FontWeight','bold');
plot([0  6], [8 8],'-','Linewidth',3,'color','black');
plot([6  6], [0 8],'-','Linewidth',1,'color','black');
text(0.4,4,sprintf('Case 1: 1 round -\n no negotiation'));
text(0.4,7.3,sprintf('Case 2: 1 round -\n negotiation possible'));
text(3,4.5,sprintf('Case 3: 5 rounds -\n no negotiations'));
text(3,7.4,sprintf('Case 4: 5 rounds -\n negotiations possible'));
axis([0 6 3 8]); %grid;
set(gca, 'xtick', 1:1:5);  set(gca, 'ytick', 3:1:8);
xlabel('Round');  ylabel(sprintf('Average individual \n profit per
round'));
```

1.4. File: experiment_mass_market_result_bar_chart_bilateral.m

```
clear; scrsz = get(0,'ScreenSize'); hold on;
%vergleiche=[10.13 88.47; 7.53 65.46; 12.62 80.81; 15.91 79.14];

xbeschrift={'(5): PE'; ''; '(5.5)'; '(6)'; '(6.6)'; ''; '(5.5)';
            '(6)'; '(6.6)'; '';  '(6)'; '(6.6)'; ''; '(6.6): NE'}
%kombis=[ 8 0 9 7 4 0 2 6 1 0 2 1 0 8]
kombis=[16 0 3 6 7 0 1 2 4 0 2 2 0 5]
%kombis=[7      0  7    20  37  0   5   20  63 0  8  50 0   23];
%kombis=[65  0  5   13  29  0   2   34  31 0  5  44 0   12];

maxy =max(kombis);
colormap gray;
```

```
xlabel('Decisions of one agent in dependence of the other
participant''s decision');
set(gca,'XTick', 1:length(kombis))
set(gca,'XTickLabel',xbeschrift)
plot([   .5 5.5], [maxy+9 maxy+9],'-
','Linewidth',2,'color','black');
plot([   .5  .5], [maxy+9 0],'-','Linewidth',2,'color','black');
plot([ 5.5  5.5], [maxy+9 0],'-','Linewidth',2,'color','black');
plot([ 2  2], [maxy+9 0],'--','Linewidth',1,'color','black');
plot([ 6.5  9.5], [maxy+9 maxy+9],'-
','Linewidth',2,'color','black');
plot([ 6.5  6.5], [maxy+9 0],'-','Linewidth',2,'color','black');
plot([ 9.5  9.5], [maxy+9 0],'-','Linewidth',2,'color','black');
plot([10.5 12.5],   [maxy+9 maxy+9],'-
','Linewidth',2,'color','black');
plot([10.5 10.5],   [maxy+9 0],'-','Linewidth',2,'color','black');
plot([ 12.5  12.5], [maxy+9 0],'-','Linewidth',2,'color','black');
plot([13.5 14.5], [maxy+9 maxy+9],'-
','Linewidth',2,'color','black');
plot([13.5 13.5], [maxy+9 0],'-','Linewidth',2,'color','black');
plot([14.5 14.5], [maxy+9 0],'-','Linewidth',2,'color','black');
text(2.8,maxy+15,'(5)');    text(7.8,maxy+15,'(5.5)');
text(11.3,maxy+15,'(6)');   text(13.7,maxy+15,'(6.6)');

for lv=1:length(kombis)
    if (kombis(lv)~=0)  text(lv-
0.1,(kombis(lv)+5),num2str(kombis(lv))); end
end

bar(kombis);
ylim([0 maxy+20]);  %grid
```

1.5 File: experiment_mass_market_result_cake_chart_unilateral.m

```
clear; %scrsz = get(0,'ScreenSize'); %hold on;

%static equilibrium
%kombis=[36 20 18 22];      %prozente=[37.5 20.83 18.75 22.92];
%static negotiations
kombis=[48 50 14 18];       prozente=[50 11.5 14.6 23.7];
%dynamic equilibrium
%kombis=[78 100 106 196];   %prozente=[16.3 20.8 22 40.9];
%dynamic negotiation
%kombis=[177 74 101 128];   %prozente=[36.9 15.4 21 26.7];

explode=[1 0 0 0];          h=pie3(kombis,explode);
colormap gray;
textObjs = findobj(h,'Type','text');
pos = get(textObjs, {'Position'});
Names = {'5 units: ';'5.5 units: ';'6 units: '; '6.6 units: '};
```

```
for lv=1:4
    Names(lv) = strcat(Names(lv), num2str(kombis(lv)), ' /
',num2str(prozente(lv)),'%' );
end
newpos=pos;

%dynamic equi
%newpos{1}=newpos{1}+[.3 .3 0]; %newpos{2}=newpos{2}+[-0.1 -0.1
0];
%newpos{4}=newpos{4}+[0.1 0.2 0];
%dynamic negotiation
newpos{1}=newpos{1}+[0.6 0 -1] %newpos{2}=newpos{2}+[-0.1 -0.1 0]
newpos{3}=newpos{3}+[0 0 -0.7]

set(textObjs,{'String'},Names); set(textObjs,
{'Position'},newpos);
```

1.6. File: experiment_individual_parameters_rnpvs_expected_events.m

```
clear; scrsz = get(0,'ScreenSize'); figure('Position',[50 100 750
200]);
hold on; T=4; reihe=1; out_x=1:T; out_x0=horzcat(zeros(1,1),out_x)
%-------------------------------------------------------------
%low, complete:    %out_y1=  [50 55 70 85 ];  out_y2=  [45 45 70
95 ];
%low, incomplete:   %out_y1=  [60 50 40 30 ];   out_y2=  [40 45 55
65 ];
%high, complete:    %out_y1=  [80 70 60 50];    out_y2=  [90 75 60
45];
%high, incomplete:
out_y1=  [80 60 50 55];    out_y2=  [70 0 70 70];
%examples chapter 3.6
%out_y1=  [80 80 80 80];  out_y2=  [40 40 40 40];
%out_y1=  [80 70 65 60];  out_y2=  [40 50 70 80];
maxy=max(max(out_y1),max(out_y2));
%-------------------------------------------------------------
matsum1=repmat(out_y1',1,T);          matsum2=repmat(out_y2',1,T);
matsum1=tril(matsum1);                  matsum2=tril(matsum2);
rnpv1=sum(matsum1);                     rnpv2=sum(matsum2);
rnpv1=horzcat(rnpv1,zeros(1,1));
rnpv2=horzcat(rnpv2,zeros(1,1));
max_rnpv=max(max(rnpv1),max(rnpv2));
%-------------------------------------------------------------------
%1.row
subplot(1,3,1); plot(out_x,out_y1,'kx-','Linewidth',2);     grid
on;
text(out_x(2),out_y1(2)+5,'PV''s of S1');
ylim([0 maxy+5]);
axis([0 (T+1) 0 maxy+50]); set(gca, 'xtick',
min(out_x):1:max(out_x));
```

```
subplot(1,3,2); plot(out_x,out_y2,'kx-','Linewidth',1);     grid
on;
text(out_x(2),out_y2(2)-5,'PV''s of S2');
ylim([0 maxy+5]);
axis([0 (T+1) 0 maxy+50]);  set(gca, 'xtick',
min(out_x):1:max(out_x));

matsum1=repmat(out_y1',1,T);    matsum2=repmat(out_y2',1,T);
matsum1=tril(matsum1);          matsum2=tril(matsum2);
rnpv1=sum(matsum1);             rnpv2=sum(matsum2);
rnpv1=horzcat(rnpv1,zeros(1,1));rnpv2=horzcat(rnpv2,zeros(1,1));

subplot(1,3,3);
plot(out_x0,rnpv1,'kx-','Linewidth',2); hold on;
text(out_x0(2),rnpv1(2)-10,'residual NPV''s of S1');
plot(out_x0,rnpv2,'kx-','Linewidth',1);
text(out_x0(2),rnpv2(2)+10,'residual NPV''s of S2');
%grid on;
axis([0 (T+1) 0 max_rnpv+20])
set(gca, 'xtick', min(out_x):1:max(out_x));
```

1.7. File: experiment_individual_parameters_rnpvs_unexpected_events.m

```
clear; scrsz = get(0,'ScreenSize'); figure('Position',[50 100 750
400]);
hold on;
T=4; reihe=1; out_x=1:T; yoben = 20;
out_x0=horzcat(zeros(1,1),out_x)
%out_y1=ones(1,T)*11; %constant
%out_y2=ones(1,T)*6; %constant
%out_y1=[2 3 16 5 7 3 8 9 7 13 9 6 5 3 6 14 18 13 10 9];  %no
crossing
%out_y2=[4 3 5 5 6 9 8 5 13 6 8 16 7 6 4 5 2 8 8 4]; %no crossing
%-------------------------------------------------------------
% example chapter 3.6.5
shock1=2; shock2=3;
out_y1=  [ 30  40  55 65];
outy1_u1=[  0  40  55 65];
outy1_u2=[  0   0  75 85]; %change shock 2
out_y2=  [45 30 40 55];
outy2_u1=[0  60 65 70];    %change shock 1
outy2_u2=[0   0 65 70];

% only public information
shock1=2; shock2=3;
out_y1=  [ 40  45  55 65];
outy1_u1=[  0  45  55 65];
outy1_u2=[  0   0  70 80]; %change shock 2
out_y2=  [50 45 50 55];
outy2_u1=[0  60 65 70];    %change shock 1
```

```
outy2_u2=[0   0 65 70];

% also private information
%shock1=2; shock2=3;
%out_y1=  [ 65  55  50 40];  outy1_u1=[  0  45  40 35]; %change
shock 1
%outy1_u2=[  0   0  40 35];
%out_y2=  [55 45 35 30];
%outy2_u1=[0  45 35 30];     outy2_u2=[0   0 45 50];  %change
shock 2

maxy=max(max(out_y1),max(out_y2));
%-----------------------------------------------------------------
matsum1=repmat(out_y1',1,T);          matsum2=repmat(out_y2',1,T);
matsum1_u1=repmat(outy1_u1',1,T);
matsum2_u1=repmat(outy2_u1',1,T);
matsum1_u2=repmat(outy1_u2',1,T);
matsum2_u2=repmat(outy2_u2',1,T);
matsum1=tril(matsum1);                 matsum2=tril(matsum2);
matsum1_u1=tril(matsum1_u1);
matsum2_u1=tril(matsum2_u1);
matsum1_u2=tril(matsum1_u2);          matsum2_u2=tril(matsum2_u2);
rnpv1=sum(matsum1);                     rnpv2=sum(matsum2);
rnpv1_u1=sum(matsum1_u1);               rnpv2_u1=sum(matsum2_u1);
rnpv1_u2=sum(matsum1_u2);               rnpv2_u2=sum(matsum2_u2);
rnpv1=horzcat(rnpv1,zeros(1,1));
rnpv2=horzcat(rnpv2,zeros(1,1));
rnpv1_u1=horzcat(rnpv1_u1,zeros(1,1));
rnpv2_u1=horzcat(rnpv2_u1,zeros(1,1));
rnpv1_u2=horzcat(rnpv1_u2,zeros(1,1));
rnpv2_u2=horzcat(rnpv2_u2,zeros(1,1));
max_rnpv=max(max(rnpv1),max(rnpv2));
%-----------------------------------------------------------------
%1.row
subplot(3,3,1); plot(out_x,out_y1,'kx-','Linewidth',2), grid
axis([0 (T+1) 0 maxy+yoben])
set(gca, 'xtick', min(out_x):1:max(out_x));
subplot(3,3,2); plot(out_x,out_y2,'kx-','Linewidth',1), grid
ylim([0 maxy+5]);
axis([0 (T+1) 0 maxy+yoben])
set(gca, 'xtick', min(out_x):1:max(out_x));

matsum1=repmat(out_y1',1,T);    matsum2=repmat(out_y2',1,T);
matsum1=tril(matsum1);          matsum2=tril(matsum2);
rnpv1=sum(matsum1);             rnpv2=sum(matsum2);
rnpv1=horzcat(rnpv1,zeros(1,1));rnpv2=horzcat(rnpv2,zeros(1,1));
subplot(3,3,3);
plot(out_x0,rnpv1,'k-','Linewidth',2); hold on;
plot(out_x0,rnpv2,'k-','Linewidth',1);
%grid on;
axis([0 (T+1) 0 max_rnpv+yoben])
```

```
set(gca, 'xtick', min(out_x):1:max(out_x));
%-----------------------------------------------------------------
%2.row
subplot(3,3,4);
plot(out_x(shock1:T),out_y1(shock1:T),'kx:','Linewidth',1); hold
on;
plot(out_x(shock1:T),outy1_u1(shock1:T),'kx-','Linewidth',2); hold
on;
plot([shock1 shock1],[0 maxy+yoben],'-
','Linewidth',2,'color','black');
grid on;
axis([0 (T+1) 0 maxy+yoben]);
set(gca, 'xtick', min(out_x):1:max(out_x));
subplot(3,3,5);
plot(out_x(shock1:T),out_y2(shock1:T),'kx:','Linewidth',1); hold
on;
plot(out_x(shock1:T),outy2_u1(shock1:T),'kx-','Linewidth',1); hold
on;
plot([shock1 shock1],[0 maxy+yoben],'-
','Linewidth',2,'color','black');
grid on;    ylim([0 maxy+5]);
axis([0 (T+1) 0 maxy+yoben]); set(gca, 'xtick',
min(out_x):1:max(out_x));
subplot(3,3,6);
plot(out_x0(shock1+1:T+1),rnpv1(shock1+1:T+1),'k:','Linewidth',1);
hold on;
plot(out_x0(shock1+1:T+1),rnpv2(shock1+1:T+1),'k:','Linewidth',1);
hold on;
plot(out_x0(shock1+1:T+1),rnpv1_u1(shock1+1:T+1),'k-
','Linewidth',2); hold on;
plot(out_x0(shock1+1:T+1),rnpv2_u1(shock1+1:T+1),'k-
','Linewidth',1); hold on;

plot([shock1 shock1],[0 max_rnpv+yoben],'-
','Linewidth',2,'color','black');
%grid on;
axis([0 (T+1) 0 max_rnpv+yoben]);
set(gca, 'xtick', min(out_x):1:max(out_x));
%-----------------------------------------------------------------
%3.row
subplot(3,3,7);
plot(out_x(shock2:T),outy1_u1(shock2:T),'kx:','Linewidth',2); hold
on;
plot(out_x(shock2:T),outy1_u2(shock2:T),'kx-','Linewidth',2); hold
on;
plot([shock2 shock2],[0 maxy+yoben],'-
','Linewidth',2,'color','black');
grid on;
ylim([0 maxy+5]);
axis([0 (T+1) 0 maxy+yoben])
set(gca, 'xtick', min(out_x):1:max(out_x));
```

```
subplot(3,3,8);
plot(out_x(shock2:T),outy2_u1(shock2:T),'kx:','Linewidth',1); hold
on;
plot(out_x(shock2:T),outy2_u2(shock2:T),'kx-','Linewidth',1); hold
on;
plot([shock2 shock2],[0 maxy+yoben],'-
','Linewidth',2,'color','black');
grid; ylim([0 maxy+5]);
axis([0 (T+1) 0 maxy+yoben]); set(gca, 'xtick',
min(out_x):1:max(out_x));
subplot(3,3,9);
plot(out_x0(shock2+1:T+1),rnpv1_u1(shock2+1:T+1),'kx:','Linewidth'
,1); hold on;
plot(out_x0(shock2+1:T+1),rnpv2_u1(shock2+1:T+1),'kx:','Linewidth'
,1); hold on;
plot(out_x0(shock2+1:T+1),rnpv1_u2(shock2+1:T+1),'kx-
','Linewidth',2); hold on;
plot(out_x0(shock2+1:T+1),rnpv2_u2(shock2+1:T+1),'kx-
','Linewidth',1); hold on;
plot([shock2 shock2],[0 max_rnpv+yoben],'-
','Linewidth',2,'color','black');
%grid on;
axis([0 (T+1) 0 max_rnpv+yoben]);
set(gca, 'xtick', min(out_x):1:max(out_x));
```

1.8. File: experiment_individual_result_calculations_table.m

```
clear;
verzeichnis='c:\game theory\ergebnisse\phase 2010-2
dissertation\MS Excell experimental data\';
datei ='collected data ind-dynamic - expected - gefiltert.xls';
pfad = [verzeichnis, datei];
% [40 161; 32 129; 34 137; 34 137 ;;; 39 157; 33 133]
%OOCS = [47.5  2.5 0; 50    5   0  ; 70    0        0 ; 90   0
5  ];  %e,low
%AD   = [25   25   0; 27.5 27.5 0  ; 35   17.5   17.5 ; 42.5 0
42.5];  %e,low
    %N=40; dat1 = xlsread(pfad, 1, 'B3:E161');
%OOCS = [50   10   0; 47.5 2.5  0  ; 47.5  0      7.5 ; 47.5 0
17.5];  %e,low
%AD   = [30   30   0; 25   25   0  ; 27.5  0     27.5 ; 32.5 0
32.5];  %e,low
    %N=32; dat1 = xlsread(pfad, 2, 'B3:E129');
%OOCS = [85    0   5;  0    0   0  ;  0    0   0 ;  0   0     0
];  %high
%AD   = [45    0  45; 37.5  0  37.5; 30   15   15 ; 22.5 0
22.5]; %high
%    N=34; dat1 = xlsread(pfad, 3, 'B3:E137');
OOCS = [75   10   0;  0    0   0  ;  0    0        0 ; 0   0     0
];  %high
```

```
AD   = [40   40   0; 30   30   0  ; 25   25        0 ; 27.5 27.5
0  ]; %high
    N=34; dat1 = xlsread(pfad, 4, 'B3:E137');
%datei ='collected data ind-dynamic - unexpected - gefiltert.xls';
%OOCS = [45    0   5; 52.5  0  7.5 ; 67.5 2.5       0 ; 75   5
0  ]; %u,low
%AD   = [25    0  25; 30    0  30  ; 35   35        0 ; 40   40
0  ]; %u,low
    %N=40; dat1 = xlsread(pfad, 1, 'B3:E161');
%OOCS = [60    5   0; 45    0   0  ; 42.5 0       2.5 ; 42.5 0
7.5]; %u,low
%AD   = [32.5 32.5 0; 22.5 22.5 0  ; 22.5 0      22.5 ; 25   0
25 ]; %u,low
    %N=33; dat1 = xlsread(pfad, 2, 'B3:E133');

OOCS = transpose(OOCS);  AD = transpose(AD);
OOCS_hori = OOCS(:)'; AD_hori   = AD(:)'; P = []; S1 = []; S2 =
[];
for lv=1:N
  P =  [P; dat1(((lv-1)*4+3),:)];
  S1 = [S1; dat1(((lv-1)*4+1),:)]; S2 = [S2; dat1(((lv-
1)*4+2),:)];
end
P_av  = mean(P); S1_av = mean(S1);  S2_av = mean(S2);
ratdat_av=[];
for lv2=1:4
   ratdat_av=[ratdat_av P_av(lv2) S1_av(lv2) S2_av(lv2)];
end

v_AD_matrix   = [P_av; S1_av; S2_av]' ./ AD';
v_OOCS_matrix = [P_av; S1_av; S2_av]' ./ OOCS';
v_AD   = ratdat_av ./ AD_hori; v_AD = v_AD(find(~isnan(v_AD) &
~isinf(v_AD)));
AD_einsen=ones(1,length(v_AD));
v_AD_betrag = abs(v_AD - AD_einsen);
v_AD_betrag_av = mean(v_AD_betrag');
v_OOCS   = ratdat_av ./ OOCS_hori;
v_OOCS = v_OOCS(find(~isnan(v_OOCS) & ~isinf(v_OOCS)));
OOCS_einsen=ones(1,length(v_OOCS));
v_OOCS_betrag = abs(v_OOCS - OOCS_einsen);
v_OOCS_betrag_av = mean(v_OOCS_betrag');

% high switching costs
v_OOCS_betrag_av_round1 = mean(v_OOCS_betrag);
v_AD_betrag_av_round1   = (v_AD_betrag(1)+v_AD_betrag(2))/2;
%v_AD_betrag_av_round234 =
(v_AD_betrag(3)+v_AD_betrag(4)+v_AD_betrag(5)+v_AD_betrag(7)+v_AD_
betrag(8)+v_AD_betrag(9))/6;
v_AD_betrag_av_round234 =
(v_AD_betrag(3)+v_AD_betrag(4)+v_AD_betrag(5)+v_AD_betrag(6)+v_AD_
betrag(7)+v_AD_betrag(8))/6;
```

1.9. File: experiment_individual_result_low_costs_figure.m

```
clear; scrsz = get(0,'ScreenSize'); figure('Position',[50 100 800
250]); hold on;

result= [10.13 88.47; 7.53 65.46; 12.62 80.81; 15.91 79.14];
links1=0.6; links2=2.45;  rechts1=2.55; rechts2=4.4; hoehe= 130;
colormap(gray);
plot([ links1  links2], [hoehe hoehe],'-
','Linewidth',2,'color','black');
plot([ links1  links1], [hoehe-10 hoehe],'-
','Linewidth',2,'color','black');
plot([ links2  links2], [hoehe-10 hoehe],'-
','Linewidth',2,'color','black');
plot([ rechts1  rechts2], [hoehe hoehe],'-
','Linewidth',2,'color','black');
plot([ rechts1  rechts1], [hoehe-10 hoehe],'-
','Linewidth',2,'color','black');
plot([ rechts2  rechts2], [hoehe-10 hoehe],'-
','Linewidth',2,'color','black');
text(1-0.3,25,strcat(num2str(result(1,1)), '%'));
text(2-0.3,25,strcat(num2str(result(2,1)), '%'));
text(3-0.3,25,strcat(num2str(result(3,1)), '%'));
text(4-0.3,25,strcat(num2str(result(4,1)), '%'));
text(1,100,strcat(num2str(result(1,2)), '%'));
text(2,100,strcat(num2str(result(2,2)), '%'));
text(3,100,strcat(num2str(result(3,2)), '%'));
text(4,100,strcat(num2str(result(4,2)), '%'));
text(1.1,hoehe+10,'Only expected events');
text(3.1,hoehe+10,'Also unexpected events');
text(0.65,hoehe-10,'Only public information');  text(1.55,hoehe-
10,'Also private information');
text(2.6,hoehe-10,'Only public information');   text(3.5,hoehe-
10,'Also private information');
title(sprintf('Experiments with low agent switching costs: \n
Comparison between the OOCS-rule and the AD-rule \n regarding the
average deviations (absolute values) between \n the theoretic
predictions and the experimental data'),'FontWeight','bold');
xbeschrift = {'OOCS     AD  '; 'OOCS     AD  '; 'OOCS     AD  ';
'OOCS     AD  '};
ybeschrift = {'0'; '50%'; '100%'; ''};
set(gca,'XTick', 1:4);
set(gca,'XTickLabel',xbeschrift);
set(gca,'YTickLabel',ybeschrift);
ylim([0 150]);                          bar(result,0.9 );
```

2.1. Files: 4-2-2-1-cournot-equilibrium.ztt and 4-2-2-2-cournot-negotiations.ztt
Excerpts with source codes:

Background:

```
subjects.do (
        // Default payoffs for 2 agents and 4 alternatives for both
        TotalProfit = 1000;
        array pbar[2];
        Pi11 = 1 ; Pi12 = 1 ; Pi13 = 1; Pi14 = 1;
        Pi21 = 1 ; Pi22 = 1 ; Pi23 = 1; Pi24 = 1;
        Pi31 = 1 ; Pi32 = 1 ; Pi33 = 1; Pi34 = 1;
        Pi41 = 1 ; Pi42 = 1 ; Pi43 = 1; Pi44 = 1;
)
```

Stage "Decision":

```
        // this player prefers: 1
        Pi11 = 8;    Pi12 = 5;   Pi13 = 3;   Pi14 = 1;
        Pi21 = 10;Pi22 = 7;     Pi23 = 4;   Pi24 = 2;
        Pi31 = 11;Pi32 = 8;     Pi33 = 5;   Pi34 = 3;
        Pi41 = 12;Pi42 = 9; Pi43 = 6;       Pi44 = 4;
```

Stage "Profit display":

```
// Pnum1 = NumPeriods;
// array ProfitHistory[20];
// array ProfitOthersHistory[20];

OthersChoice = find (same(Group) & not ( same (Subject)), Choice );
OthersTotalProfit = find (same(Group) & not ( same (Subject)), TotalProfit );

OthersPi11 =find (same(Group) & not ( same (Subject)), Pi11);
OthersPi12 =find (same(Group) & not ( same (Subject)), Pi12);
OthersPi13 =find (same(Group) & not ( same (Subject)), Pi13);
OthersPi14 =find (same(Group) & not ( same (Subject)), Pi14);
OthersPi21 =find (same(Group) & not ( same (Subject)), Pi21);
OthersPi22 =find (same(Group) & not ( same (Subject)), Pi22);
OthersPi23 =find (same(Group) & not ( same (Subject)), Pi23);
OthersPi24 =find (same(Group) & not ( same (Subject)), Pi24);
OthersPi31 =find (same(Group) & not ( same (Subject)), Pi31);
OthersPi32 =find (same(Group) & not ( same (Subject)), Pi32);
OthersPi33 =find (same(Group) & not ( same (Subject)), Pi33);
OthersPi34 =find (same(Group) & not ( same (Subject)), Pi34);
OthersPi41 =find (same(Group) & not ( same (Subject)), Pi41);
OthersPi42 =find (same(Group) & not ( same (Subject)), Pi42);
OthersPi43 =find (same(Group) & not ( same (Subject)), Pi43);
OthersPi44 =find (same(Group) & not ( same (Subject)), Pi44);
if ( Choice == 1) { if (OthersChoice ==1)  { Profit=Pi11;   OthersProfit=OthersPi11;  } };
if ( Choice == 1) { if (OthersChoice ==2)  { Profit=Pi12;   OthersProfit=OthersPi21;  } };
if ( Choice == 1) { if (OthersChoice ==3)  { Profit=Pi13;   OthersProfit=OthersPi31;  } };
```

```
if ( Choice == 1) { if (OthersChoice ==4)  { Profit=Pi14;   OthersProfit=OthersPi41;  } };
if ( Choice == 2) { if (OthersChoice ==1)  { Profit=Pi21;   OthersProfit=OthersPi12;  } };
if ( Choice == 2) { if (OthersChoice ==2)  { Profit=Pi22;   OthersProfit=OthersPi22;  } };
if ( Choice == 2) { if (OthersChoice ==3)  { Profit=Pi23;   OthersProfit=OthersPi32;  } };
if ( Choice == 2) { if (OthersChoice ==4)  { Profit=Pi24;   OthersProfit=OthersPi42;  } };
if ( Choice == 3) { if (OthersChoice ==1)  { Profit=Pi31;   OthersProfit=OthersPi13;  } };
if ( Choice == 3) { if (OthersChoice ==2)  { Profit=Pi32;   OthersProfit=OthersPi23;  } };
if ( Choice == 3) { if (OthersChoice ==3)  { Profit=Pi33;   OthersProfit=OthersPi33;  } };
if ( Choice == 3) { if (OthersChoice ==4)  { Profit=Pi34;   OthersProfit=OthersPi43;  } };
if ( Choice == 4) { if (OthersChoice ==1)  { Profit=Pi41;   OthersProfit=OthersPi14;  } };
if ( Choice == 4) { if (OthersChoice ==2)  { Profit=Pi42;   OthersProfit=OthersPi24;  } };
if ( Choice == 4) { if (OthersChoice ==3)  { Profit=Pi43;   OthersProfit=OthersPi34;  } };
if ( Choice == 4) { if (OthersChoice ==4)  { Profit=Pi44;   OthersProfit=OthersPi44;  } };

if ((Subject==1) & (Period==:Period) )
{
  pastprofits.new
  {
    incomeS1=-10; incomeS2=-10;
  }
}
pastprofits.do
{
 if ((:Subject==1) & (Period==:Period) ) { incomeS1=:Profit; }
 if ((:Subject==2) & (Period==:Period) ) { incomeS2=:Profit; }}
```

2.3. Files: 5-3-2-1 game dynamic low expected complete.ztt, 5-3-2-2 game dynamic low expected incomplete.ztt, 5-3-3-1 game dynamic low unexpected complete.ztt, 5-3-3-2 game dynamic low unexpected incomplete.ztt

Excerpts with source codes:

Background:

```
globals.do (
SELLERTYPE = 1;
BUYERTYPE=2;
TimeAuction = 90;
TradeCounter = 0;
MaxTrades = 1;
Schluesselmarker = 101;
)
subjects.do (
Type = 0;
RValue = 0; RValueOS = 0;
MaxP = 1000; MinP = 0;
NumTrades = 0 ;
OthersProfit = 0; OthersTotalProfit = 0;
```

```
pwahl1 = 0;
if (Period >1 ) { pwahl1 = OLDsubjects.find( same( Subject ) , pwahl1 ); }
TreatmentDone = 0;
if (Period >1 ) { TreatmentDone = OLDsubjects.find( same( Subject ) , TreatmentDone ); }

profitscosts.new  {   array RValue1[20]; array RValue2[20]; }
profitscosts.do
{
  RValue1[1] = 50;   RValue1[2] = 55;   RValue1[3] = 70;   RValue1[4] = 85;
  RValue2[1] = 45;   RValue2[2] = 45;   RValue2[3] = 70;   RValue2[4] = 95;
}
)
contracts.do (
Buyer = -1; Seller = -1; Price = -1; Creator = -1; TradeID =-1;
)
partner.do (
partnerwahl = 0;
if (Period >1 ) {
  partnerwahl = OLDsubjects.find( partnerwahl );
}
)
```

Stage „Seller Auction“:

```
subjects.do (
boolvar1 = 0;
if ( ((pwahl1==0) | (pwahl1==Subject)) & (TreatmentDone == 0)    )   {boolvar1=1; }
Participate = if ((Type == SELLERTYPE) & (boolvar1==1) ,1,0);
if (Subject==1)
{
RValue = profitscosts.find(  same(Group), RValue1[:Period]);
            RValueOS = profitscosts.find(  same(Group), RValue2[:Period]);
}
if (Subject==2)
{
             RValue = profitscosts.find(  same(Group), RValue2[:Period]);
             RValueOS = profitscosts.find(  same(Group), RValue1[:Period]);
}
)

Active screen → Container → Button-sell → contracts.do (
Seller = : Subject; TradeID = TradeCounter;
subjects.do {
if ( Subject == : Buyer ) {  NumTrades = NumTrades +1;  Profit = Price ; }
if ( Subject == : Seller ) {  NumTrades = NumTrades +1;  Profit = RValue - Price ;  }
}
contracts.do {
             if ( Seller == :Seller & Buyer == -1 ) {  Buyer = -2;  }
             if ( Buyer == :Buyer & Seller == -1 ) {  Seller = -2;  }
}
if  (NumTrades == 1)  {  subjects.do { if (  same(Group)  )  {    LeaveStage=1;   }  }   }
```

```
)
```

Stage „Buyer Auction“:

```
subjects.do (
Participate = if (  (Type == BUYERTYPE)  ,1,0);
RValue = profitscosts.find(  same(Group), RValue1[:Period]);
RValueOS = profitscosts.find(  same(Group), RValue2[:Period]);
RValueMax = max ( RValue, RValueOS );
)
Active screen → Container → Button-buy → contracts.do (
Buyer = : Subject; TradeID = TradeCounter;
subjects.do {
if ( Subject == : Buyer ) {  NumTrades = NumTrades +1;  Profit = Price ; }
if ( Subject == : Seller ) {  NumTrades = NumTrades +1;  Profit = RValue - Price ;  }
}
contracts.do{
  if( Seller == :Seller & Buyer == -1 ) {  Buyer = -2; }
  if( Buyer == :Buyer & Seller == -1 ) {  Seller = -2; }
}
if  (NumTrades == 1)  {  subjects.do { if (  same(Group)  )  {    LeaveStage=1;   }  }   }
)
```

Stage „Profit display“:

```
subjects.do (
ProfitS1 = find (same(Group) & (Subject==1), Profit);
ProfitS2 = find (same(Group) & (Subject==2), Profit);
ProfitP =   find (same(Group) & (Subject==3), Profit);
TotalProfitS1 = find (same(Group) & (Subject==1), TotalProfit);
TotalProfitS2 = find (same(Group) & (Subject==2), TotalProfit);
TotalProfitP =   find (same(Group) & (Subject==3), TotalProfit);
if ((Subject==1) & (Period==:Period) )
{
   pastprofits.new
   {
     incomeS1=-10; incomeS2=-10;  incomeP=-10;
   }
}
pastprofits.do
{
  if ((:Subject==1) & (Period==:Period) ) { incomeS1=:Profit; }
  if ((:Subject==2) & (Period==:Period) ) { incomeS2=:Profit; }
  if ((:Subject==3) & (Period==:Period) ) { incomeP=:Profit; }
}
)
```

2.5. Files: 5-3-2-3 game dynamic high expected complete.ztt, 5-3-2-4 game dynamic high expected incomplete.ztt
Excerpts with source codes:

Stage „Seller Auction“:

```
subjects.do (
boolvar1 = 0;
if ( ((pwahl1==0) | (pwahl1==Subject)) & (TreatmentDone == 0)    )   {boolvar1=1; }

Participate = if ((Type == SELLERTYPE) & (boolvar1==1) ,1,0);
if (Subject==1)
{
  RValue = profitscosts.find(  same(Group), RValue1[:Period]);
//   RNPV =   profitscosts.find(  same(Group), RNPV1[:Period]);
  RValueOS = profitscosts.find(  same(Group), RValue2[:Period]);
 //  RNPVOS =   profitscosts.find(  same(Group), RNPV2[:Period]);
}

if (Subject==2)
{
    RValue = profitscosts.find(  same(Group), RValue2[:Period]);
//    RNPV =   profitscosts.find(  same(Group), RNPV2[:Period]);
    RValueOS = profitscosts.find(  same(Group), RValue1[:Period]);
 //   RNPVOS =        profitscosts.find(  same(Group), RNPV1[:Period]);
}
)

Active screen → Container (Negotiation) → Button-sell → contracts.do (
Seller = : Subject; TradeID = TradeCounter;
if ((pwahl1 != 1) & (pwahl1 != 2))  {
   partner.new  { partnerwahl = :Subject;  }
   partner.do {
        subjects.do {   pwahl1 = :partnerwahl;  }
   }
}
subjects.do {
if ( Subject == : Buyer ) {  NumTrades = NumTrades +1;  Profit = Price ; }
if ( Subject == : Seller ) {  NumTrades = NumTrades +1;  Profit = RValue - Price ;  }
}
contracts.do {
  if ( Seller == :Seller & Buyer == -1 ) {  Buyer = -2;  }
  if ( Buyer == :Buyer & Seller == -1 ) {  Seller = -2;  }
}
if  (NumTrades == 1)  {  subjects.do { if (  same(Group)  )  {    LeaveStage=1;   }  }   }
)

Active screen → Container (Renegotiation) → Button-sell → contracts.do (
Seller = : Subject; TradeID = TradeCounter;
```

```
subjects.do {
if ( Subject == : Buyer ) {  NumTrades = NumTrades +1;  Profit = Price ; }
if ( Subject == : Seller ) {  NumTrades = NumTrades +1;  Profit = RValue - Price ;  }
}
contracts.do {
  if ( Seller == :Seller & Buyer == -1 ) {  Buyer = -2;  }
  if ( Buyer == :Buyer & Seller == -1 ) {  Seller = -2;  }
}
if  (NumTrades == 1)  {  subjects.do { if (  same(Group)  )  {    LeaveStage=1;   }  }   }
)
```

Stage „Buyer Auction“:

```
subjects.do (
if (TreatmentDone == 0)   {boolvar1=1; }
Participate = if (  (Type == BUYERTYPE) & (boolvar1==1)  ,1,0);
RValue = profitscosts.find(  same(Group), RValue1[:Period]);
// RNPV =   profitscosts.find(  same(Group), RNPV1[:Period]);
RValueOS = profitscosts.find(  same(Group), RValue2[:Period]);
// RNPVOS =   profitscosts.find(  same(Group), RNPV2[:Period]);
RValueMax = max ( RValue, RValueOS );
)
Active screen → Container (Renegotiation) → Button-buy → contracts.do (
Buyer = : Subject; TradeID = TradeCounter;
subjects.do {
if ( Subject == : Buyer ) {  NumTrades = NumTrades +1;  Profit = Price ; }
if ( Subject == : Seller ) {  NumTrades = NumTrades +1;  Profit = RValue - Price ;  }
}
contracts.do{
  if( Seller == :Seller & Buyer == -1 ) {  Buyer = -2; }
  if( Buyer == :Buyer & Seller == -1 ) {  Seller = -2; }
}
if  (NumTrades == 1)  {  subjects.do { if (  same(Group)  )  {    LeaveStage=1;   }  }   }
)
```

Annex D. Empirical results

Table 1D lists the Microsoft files that contain the data from the internet experiments. The data has been produced by the entries of the participants.

Table 1D. List of the Microsoft Excel files with the data from the experiments

File	Content
Collected data - mass market.xls	Data from the 4 mass market experiments
Collected data ind-dynamic - expected.xls	Data from the 4 games with individual customers and expected events
Collected data ind-dynamic - unexpected.xls	Data from the 2 games with individual customers and unexpected events

Collected data - mass market.xls

Table 2D represents the 1-round mass market games. The left side lists the results of the 48 games without communication, the right side with communication. The choices and profits are listed separately.

Table 2D. Experimental data from chapter 4.2, the 1-round mass market games

1-round game without the possibility of communication						1-round game with the possibility of communication					
Game	Choice S1	Choice S2	Profit S1	Profit S2	Total	Game	Choice S1	Choice S2	Profit S1	Profit S2	Total
1	4	4	4	4	8	1	1	4	12	1	13
2	4	2	9	2	11	2	1	1	8	8	16
3	4	4	4	4	8	3	1	1	8	8	16
4	3	1	11	3	14	4	1	4	12	1	13
5	4	4	4	4	8	5	3	2	4	8	12
6	4	4	4	4	8	6	1	1	8	8	16
7	2	4	2	9	11	7	3	4	6	3	9
8	4	4	4	4	8	8	1	1	8	8	16
9	4	3	6	3	9	9	4	4	4	4	8
10	4	2	9	2	11	10	3	1	3	11	14
11	4	4	4	4	8	11	1	1	8	8	16
12	1	4	1	12	13	12	3	1	3	11	14
13	4	4	4	4	8	13	1	1	8	8	16
14	2	4	2	9	11	14	4	1	1	12	13
15	3	4	3	6	9	15	3	2	4	8	12

*Continuation of Table **33***

16	4	4	4	4	8	16	4	4	4	4	8
17	3	4	3	6	9	17	1	1	8	8	16
18	4	4	4	4	8	18	3	1	3	11	14
19	4	4	4	4	8	19	4	2	2	9	11
20	1	4	1	12	13	20	1	1	8	8	16
21	4	4	4	4	8	21	1	1	8	8	16
22	3	4	3	6	9	22	3	4	6	3	9
23	2	4	2	9	11	23	4	4	4	4	8
24	4	4	4	4	8	24	1	1	8	8	16
25	3	4	3	6	9	25	4	4	4	4	8
26	3	4	3	6	9	26	1	3	11	3	14
27	2	4	9	2	11	27	2	2	7	7	14
28	4	4	4	4	8	28	1	1	8	8	16
29	4	4	4	4	8	29	4	3	3	6	9
30	4	2	9	2	11	30	4	3	3	6	9
31	4	4	4	4	8	31	1	1	8	8	16
32	4	4	4	4	8	32	4	1	1	12	13
33	1	3	3	11	14	33	2	3	8	4	12
34	4	4	4	4	8	34	1	1	8	8	16
35	3	4	3	6	9	35	3	4	6	3	9
36	4	4	4	4	8	36	2	4	9	2	11
37	4	3	6	3	9	37	3	1	3	11	14
38	4	2	9	2	11	38	4	2	2	9	11
39	4	4	4	4	8	39	1	1	8	8	16
40	4	3	6	3	9	40	2	4	9	2	11
41	4	2	9	2	11	41	1	1	8	8	16
42	4	4	4	4	8	42	1	1	8	8	16
43	4	3	6	3	9	43	2	1	5	10	15
44	4	4	4	4	8	44	4	1	1	12	13
45	4	4	4	4	8	45	1	1	8	8	16
46	1	4	1	12	13	46	4	2	2	9	11
47	3	4	3	6	9	47	2	4	9	2	11
48	4	4	4	4	8	48	1	1	8	8	16
	164	174	214	235	449		108	98	295	336	631
	3,4167	3,625	4,458	4,896			2,25	2,0417	6,146	7	
	3,5208		4,677				2,1458		6,573		

Table 3D represents the 1-round mass market games. The left side lists the results of the 48 games without communication, the right side with communication. The choices and profits are listed separately for each of the 5 rounds.

Table 3D. Experimental data from chapter 4.2, the 5-round mass market games

Period	**1**	**2**	**3**	**4**	**5**	**Total**		**Period**	**1**	**2**	**3**	**4**	**5**	**Total**
Game 1								**Game 1**						
Choice 1	2	4	4	2	1			Choice 1	1	1	1	4	4	
Choice 2	3	4	2	1	1			Choice 2	1	1	4	3	4	
S1	4	4	9	10	8	35		S1	8	8	1	6	4	27
S2	8	4	2	5	8	27		S2	8	8	12	3	4	35
Game 2	80	32	85	125	128			**Game 2**	128	128	145	45	32	
Choice 1	3	4	2	2	3			Choice 1	3	1	3	3	2	
Choice 2	4	4	4	1	4			Choice 2	3	1	4	4	3	
S1	3	4	2	10	3	22		S1	5	8	3	3	4	23
S2	6	4	9	5	6	30		S2	5	8	6	6	8	33
Game 3	45	32	85	125	45			**Game 3**	50	128	45	45	80	
Choice 1	2	2	1	1	1			Choice 1	2	4	4	4	4	
Choice 2	4	1	1	2	4			Choice 2	3	2	3	3	3	
S1	2	10	8	5	1	26		S1	4	9	6	6	6	31
S2	9	5	8	10	12	44		S2	8	2	3	3	3	19
Game 4	85	125	128	125	145			**Game 4**	80	85	45	45	45	
Choice 1	3	3	4	4	4			Choice 1	3	1	1	1	3	
Choice 2	2	4	4	2	4			Choice 2	4	1	1	4	4	
S1	8	3	4	9	4	28		S1	3	8	8	1	3	23
S2	4	6	4	2	4	20		S2	6	8	8	12	6	40
Game 5	80	45	32	85	32			**Game 5**	45	128	128	145	45	
Choice 1	3	4	4	3	4			Choice 1	3	4	2	4	3	
Choice 2	1	3	2	4	4			Choice 2	2	3	4	1	4	
S1	11	6	9	3	4	33		S1	8	6	2	12	3	31
S2	3	3	2	6	4	18		S2	4	3	9	1	6	23
Game 6	130	45	85	45	32			**Game 6**	80	45	85	145	45	
Choice 1	4	3	4	1	1			Choice 1	2	4	2	3	2	
Choice 2	2	4	2	2	1			Choice 2	3	2	3	3	3	
S1	9	3	9	5	8	34		S1	4	9	4	5	4	26
S2	2	6	2	10	8	28		S2	8	2	8	5	8	31
Game 7	85	45	85	125	128			**Game 7**	80	85	80	50	80	

*Continuation of **Table 3D***

Choice 1	3	4	4	1	1			Choice 1	3	1	1	3	4	
Choice 2	4	4	2	4	4			Choice 2	1	1	4	2	4	
S1	3	4	9	1	1	18		S1	11	8	12	8	4	43
S2	6	4	2	12	12	36		S2	3	8	1	4	4	20
Game 8	45	32	85	145	145			**Game 8**	130	128	145	80	32	
Choice 1	3	2	2	2	2			Choice 1	4	1	1	1	3	
Choice 2	1	2	1	4	4			Choice 2	2	1	1	3	4	
S1	11	7	10	2	2	32		S1	9	8	8	3	3	31
S2	3	7	5	9	9	33		S2	2	8	8	11	6	35
Game 9	130	98	125	85	85			**Game 9**	85	128	128	130	45	
Choice 1	4	3	4	4	3			Choice 1	3	2	4	1	1	
Choice 2	2	4	4	1	4			Choice 2	2	4	2	1	4	
S1	9	3	4	12	3	31		S1	8	2	9	8	1	28
S2	2	6	4	1	6	19		S2	4	9	2	8	12	35
Game 10	85	45	32	145	45			**Game 10**	80	85	85	128	145	
Choice 1	2	1	4	3	4			Choice 1	4	1	1	3	3	
Choice 2	4	3	3	1	4			Choice 2	3	1	4	2	4	
S1	2	11	6	11	4	34		S1	6	8	12	8	3	37
S2	9	3	3	3	4	22		S2	3	8	1	4	6	22
Game 11	85	130	45	130	32			**Game 11**	45	128	145	80	45	
Choice 1	3	4	3	1	4			Choice 1	4	3	1	1	3	
Choice 2	1	3	2	1	4			Choice 2	2	4	1	4	4	
S1	11	6	8	8	4	37		S1	9	3	8	1	3	24
S2	3	3	4	8	4	22		S2	2	6	8	12	6	34
Game 12	130	45	80	128	32			**Game 12**	85	45	128	145	45	
Choice 1	4	3	4	4	2			Choice 1	3	2	3	3	4	
Choice 2	1	4	4	3	4			Choice 2	1	4	4	2	4	
S1	12	3	4	6	2	27		S1	11	2	3	8	4	28
S2	1	6	4	3	9	23		S2	3	9	6	4	4	26
Game 13	145	45	32	45	85			**Game 13**	130	85	45	80	32	
Choice 1	4	1	3	4	3			Choice 1	2	1	4	3	4	
Choice 2	1	4	4	4	3			Choice 2	4	1	1	4	4	
S1	12	1	3	4	5	25		S1	2	8	12	3	4	29
S2	1	12	6	4	5	28		S2	9	8	1	6	4	28
Game 14	145	145	45	32	50			**Game 14**	85	128	145	45	32	
Choice 1	4	2	2	3	4			Choice 1	3	3	1	1	4	
Choice 2	2	3	3	1	3			Choice 2	1	4	1	1	1	
S1	9	4	4	11	6	34		S1	11	3	8	8	12	42

*Continuation of Table **3D***

S2	2	8	8	3	3	24		S2	3	6	8	8	1	26
Game 15	85	80	80	130	45			**Game 15**	130	45	128	128	145	
Choice 1	4	4	4	1	4			Choice 1	2	3	1	1	1	
Choice 2	1	2	1	4	2			Choice 2	3	4	1	1	4	
S1	12	9	12	1	9	43		S1	4	3	8	8	1	24
S2	1	2	1	12	2	18		S2	8	6	8	8	12	42
Game 16	145	85	145	145	85			**Game 16**	80	45	128	128	145	
Choice 1	4	1	4	1	3			Choice 1	2	3	4	1	1	
Choice 2	1	3	3	4	4			Choice 2	4	2	4	1	4	
S1	12	3	6	1	3	25		S1	2	8	4	8	1	23
S2	1	11	3	12	6	33		S2	9	4	4	8	12	37
Game 17	145	130	45	145	45			**Game 17**	85	80	32	128	145	
Choice 1	1	2	4	4	2			Choice 1	4	2	4	1	1	
Choice 2	4	3	1	3	4			Choice 2	2	3	1	1	4	
S1	1	4	12	6	2	25		S1	9	4	12	8	1	34
S2	12	8	1	3	9	33		S2	2	8	1	8	12	31
Game 18	145	80	145	45	85			**Game 18**	85	80	145	128	145	
Choice 1	2	2	4	2	1			Choice 1	3	2	1	3	4	
Choice 2	4	3	1	4	4			Choice 2	2	4	4	3	4	
S1	2	4	12	2	1	21		S1	8	2	1	5	4	20
S2	9	8	1	9	12	39		S2	4	9	12	5	4	34
Game 19	85	80	145	85	145			**Game 19**	80	85	145	50	32	
Choice 1	4	3	4	2	3			Choice 1	4	3	4	1	2	
Choice 2	2	4	2	4	3			Choice 2	2	2	3	1	3	
S1	9	3	9	2	5	28		S1	9	8	6	8	4	35
S2	2	6	2	9	5	24		S2	2	4	3	8	8	25
Game 20	85	45	85	85	50			**Game 20**	85	80	45	128	80	
Choice 1	2	2	4	1	3			Choice 1	4	3	2	3	2	
Choice 2	4	2	1	4	4			Choice 2	2	4	3	1	1	
S1	2	7	12	1	3	25		S1	9	3	4	11	10	37
S2	9	7	1	12	6	35		S2	2	6	8	3	5	24
Game 21	85	98	145	145	45			**Game 21**	85	45	80	130	125	
Choice 1	2	4	1	4	4			Choice 1	3	1	1	3	4	
Choice 2	4	2	3	3	4			Choice 2	4	2	4	4	4	
S1	2	9	3	6	4	24		S1	3	5	1	3	4	16
S2	9	2	11	3	4	29		S2	6	10	12	6	4	38
Game 22	85	85	130	45	32			**Game 22**	45	125	145	45	32	
Choice 1	1	2	3	3	3			Choice 1	3	3	3	2	2	

*Continuation of Table **3D***

Choice 2	4	4	3	3	4			Choice 2	4	1	4	2	2	
S1	1	2	5	5	3	16		S1	3	11	3	7	7	31
S2	12	9	5	5	6	37		S2	6	3	6	7	7	29
Game 23	145	85	50	50	45			**Game 23**	45	130	45	98	98	
Choice 1	1	2	3	2	3			Choice 1	4	3	3	3	1	
Choice 2	4	3	4	4	1			Choice 2	2	2	1	4	4	
S1	1	4	3	2	11	21		S1	9	8	11	3	1	32
S2	12	8	6	9	3	38		S2	2	4	3	6	12	27
Game 24	145	80	45	85	130			**Game 24**	85	80	130	45	145	
Choice 1	2	2	3	1	4			Choice 1	1	1	4	4	3	
Choice 2	4	4	2	4	2			Choice 2	1	1	1	3	4	
S1	2	2	8	1	9	22		S1	8	8	12	6	3	37
S2	9	9	4	12	2	36		S2	8	8	1	3	6	26
Game 25	85	85	80	145	85			**Game 25**	128	128	145	45	45	
Choice 1	2	4	3	1	4			Choice 1	2	3	1	1	2	
Choice 2	4	2	4	3	1			Choice 2	3	4	1	1	4	
S1	2	9	3	3	12	29		S1	4	3	8	8	2	25
S2	9	2	6	11	1	29		S2	8	6	8	8	9	39
Game 26	85	85	45	130	145			**Game 26**	80	45	128	128	85	
Choice 1	3	3	4	3	4			Choice 1	1	4	3	1	3	
Choice 2	2	4	2	4	2			Choice 2	1	2	4	3	4	
S1	8	3	9	3	9	32		S1	8	9	3	3	3	26
S2	4	6	2	6	2	20		S2	8	2	6	11	6	33
Game 27	80	45	85	45	85			**Game 27**	128	85	45	130	45	
Choice 1	2	3	3	2	2			Choice 1	1	3	4	1	3	
Choice 2	4	4	3	3	2			Choice 2	4	2	4	4	2	
S1	2	3	5	4	7	21		S1	1	8	4	1	8	22
S2	9	6	5	8	7	35		S2	12	4	4	12	4	36
Game 28	85	45	50	80	98			**Game 28**	145	80	32	145	80	
Choice 1	4	4	4	4	3			Choice 1	4	3	4	4	1	
Choice 2	1	3	2	3	2			Choice 2	1	2	3	2	1	
S1	12	6	9	6	8	41		S1	12	8	6	9	8	43
S2	1	3	2	3	4	13		S2	1	4	3	2	8	18
Game 29	145	45	85	45	80			**Game 29**	145	80	45	85	128	
Choice 1	2	3	1	4	4			Choice 1	3	1	1	1	1	
Choice 2	4	2	2	2	4			Choice 2	2	1	1	1	1	
S1	2	8	5	9	4	28		S1	8	8	8	8	8	40
S2	9	4	10	2	4	29		S2	4	8	8	8	8	36

*Continuation of Table **3D***

Game 30	85	80	125	85	32		**Game 30**	80	128	128	128	128	
Choice 1	3	4	3	4	4		Choice 1	1	1	1	4	2	
Choice 2	4	2	4	1	3		Choice 2	1	1	1	1	4	
S1	3	9	3	12	6	33	S1	8	8	8	12	2	38
S2	6	2	6	1	3	18	S2	8	8	8	1	9	34
Game 31	45	85	45	145	45		**Game 31**	128	128	128	145	85	
Choice 1	4	2	2	3	4		Choice 1	4	4	1	1	1	
Choice 2	2	4	3	1	3		Choice 2	3	2	1	1	1	
S1	9	2	4	11	6	32	S1	6	9	8	8	8	39
S2	2	9	8	3	3	25	S2	3	2	8	8	8	29
Game 32	85	85	80	130	45		**Game 32**	45	85	128	128	128	
Choice 1	2	4	3	4	4		Choice 1	3	4	1	4	4	
Choice 2	4	2	4	1	3		Choice 2	2	2	4	3	4	
S1	2	9	3	12	6	32	S1	8	9	1	6	4	28
S2	9	2	6	1	3	21	S2	4	2	12	3	4	25
Game 33	85	85	45	145	45		**Game 33**	80	85	145	45	32	
Choice 1	4	3	4	3	4		Choice 1	3	1	1	1	4	
Choice 2	2	4	2	3	1		Choice 2	1	4	1	1	1	
S1	9	3	9	5	12	38	S1	11	1	8	8	12	40
S2	2	6	2	5	1	16	S2	3	12	8	8	1	32
Game 34	85	45	85	50	145		**Game 34**	130	145	128	128	145	
Choice 1	3	1	1	1	4		Choice 1	3	2	3	4	3	
Choice 2	1	1	1	4	4		Choice 2	2	4	2	3	3	
S1	11	8	8	1	4	32	S1	8	2	8	6	5	29
S2	3	8	8	12	4	35	S2	4	9	4	3	5	25
Game 35	130	128	128	145	32		**Game 35**	80	85	80	45	50	
Choice 1	2	2	2	3	2		Choice 1	1	1	1	1	1	
Choice 2	4	3	4	4	4		Choice 2	1	1	1	1	1	
S1	2	4	2	3	2	13	S1	8	8	8	8	8	40
S2	9	8	9	6	9	41	S2	8	8	8	8	8	40
Game 36	85	80	85	45	85		**Game 36**	128	128	128	128	128	
Choice 1	2	3	4	4	4		Choice 1	4	3	1	3	4	
Choice 2	4	4	4	4	4		Choice 2	2	4	1	1	1	
S1	2	3	4	4	4	17	S1	9	3	8	11	12	43
S2	9	6	4	4	4	27	S2	2	6	8	3	1	20
Game 37	85	45	32	32	32		**Game 37**	85	45	128	130	145	
Choice 1	4	2	4	1	4		Choice 1	1	3	1	1	3	
Choice 2	2	4	3	3	3		Choice 2	1	1	1	4	4	

Continuation of ***Table 3***

S1	9	2	6	3	6	26		S1	8	11	8	1	3	31
S2	2	9	3	11	3	28		S2	8	3	8	12	6	37
Game 38	85	85	45	130	45			**Game 38**	128	130	128	145	45	
Choice 1	1	3	4	2	3			Choice 1	3	2	1	1	4	
Choice 2	3	1	3	3	4			Choice 2	2	4	1	4	4	
S1	3	11	6	4	3	27		S1	8	2	8	1	4	23
S2	11	3	3	8	6	31		S2	4	9	8	12	4	37
Game 39	130	130	45	80	45			**Game 39**	80	85	128	145	32	
Choice 1	2	3	3	2	2			Choice 1	4	3	4	2	3	
Choice 2	4	4	3	2	4			Choice 2	2	2	3	4	4	
S1	2	3	5	7	2	19		S1	9	8	6	2	3	28
S2	9	6	5	7	9	36		S2	2	4	3	9	6	24
Game 40	85	45	50	98	85			**Game 40**	85	80	45	85	45	
Choice 1	3	4	4	4	3			Choice 1	1	1	1	4	2	
Choice 2	2	2	1	1	4			Choice 2	1	1	4	1	3	
S1	8	9	12	12	3	44		S1	8	8	1	12	4	33
S2	4	2	1	1	6	14		S2	8	8	12	1	8	37
Game 41	80	85	145	145	45			**Game 41**	128	128	145	145	80	
Choice 1	2	4	3	2	4			Choice 1	3	4	1	1	2	
Choice 2	4	1	4	4	4			Choice 2	2	4	1	1	4	
S1	2	12	3	2	4	23		S1	8	4	8	8	2	30
S2	9	1	6	9	4	29		S2	4	4	8	8	9	33
Game 42	85	145	45	85	32			**Game 42**	80	32	128	128	85	
Choice 1	2	1	2	3	2			Choice 1	4	2	1	1	3	
Choice 2	4	4	3	4	2			Choice 2	3	3	1	3	4	
S1	2	1	4	3	7	17		S1	6	4	8	3	3	24
S2	9	12	8	6	7	42		S2	3	8	8	11	6	36
Game 43	85	145	80	45	98			**Game 43**	45	80	128	130	45	
Choice 1	2	3	1	4	2			Choice 1	3	3	1	2	2	
Choice 2	3	4	4	1	4			Choice 2	2	3	1	1	4	
S1	4	3	1	12	2	22		S1	8	5	8	10	2	33
S2	8	6	12	1	9	36		S2	4	5	8	5	9	31
Game 44	80	45	145	145	85			**Game 44**	80	50	128	125	85	
Choice 1	1	4	4	4	4			Choice 1	3	1	1	2	4	
Choice 2	3	1	4	4	4			Choice 2	2	1	1	4	3	
S1	3	12	4	4	4	27		S1	8	8	8	2	6	32
S2	11	1	4	4	4	24		S2	4	8	8	9	3	32
Game 45	130	145	32	32	32			**Game 45**	80	128	128	85	45	

*Continuation of **Table 3D***

Choice 1	3	4	1	1	3			Choice 1	2	2	1	1	1	
Choice 2	4	2	3	3	4			Choice 2	4	3	1	1	1	
S1	3	9	3	3	3	21		S1	2	4	8	8	8	30
S2	6	2	11	11	6	36		S2	9	8	8	8	8	41
Game 46	45	85	130	130	45			**Game 46**	85	80	128	128	128	
Choice 1	2	3	4	2	4			Choice 1	4	4	1	1	3	
Choice 2	4	1	1	4	4			Choice 2	3	4	1	1	4	
S1	2	11	12	2	4	31		S1	6	4	8	8	3	29
S2	9	3	1	9	4	26		S2	3	4	8	8	6	29
Game 47	85	130	145	85	32			**Game 47**	45	32	128	128	45	
Choice 1	2	4	2	3	3			Choice 1	3	1	4	1	2	
Choice 2	4	1	3	4	3			Choice 2	1	1	2	1	1	
S1	2	12	4	3	5	26		S1	11	8	9	8	10	46
S2	9	1	8	6	5	29		S2	3	8	2	8	5	26
Game 48	85	145	80	45	50			**Game 48**	130	128	85	128	125	
Choice 1	2	3	1	1	4			Choice 1	1	1	1	1	1	
Choice 2	4	1	1	4	4			Choice 2	1	2	1	1	1	
S1	2	11	8	1	4	26		S1	8	5	8	8	8	37
S2	9	3	8	12	4	36		S2	8	10	8	8	8	42
	85	130	128	145	32				128	125	128	128	128	

Collected data ind-dynamic - expected.xls

Table 4D represents data from the 4 experiments with individual customers and only expected events. The profits are listed for each game, each participant and each round. At the beginning the summed profits are shown that result from rational cooperation partner selection and therefore represent Pareto-efficient allocations.

Collected data ind-dynamic - unexpected.xls

Table 5D represents data from the 2 experiments with individual customers and unexpected events. The profits are listed for each game, each participant and each round. At the beginning the summed profits are shown that result from rational cooperation partner selection and therefore represent Pareto-efficient allocations.

Table 4D. Experimental data from chapter 3.3, 4 games with individual customers and only expected events

	No negotiation Only public information					No negotiation Also private information					Negotiation Only public information					Negotiation Also private information				
Per.	1	2	3	4	Total	1	2	3	4	Total	1	2	3	4	Total	1	2	3	4	Total
	Pareto-efficient:					Pareto-efficient:					Pareto-efficient:					Pareto-efficient:				
	50	55	70	95	270	60	50	55	65	230	90	75	60	45	270	80	60	50	55	245
1	50	55	70	95	270	60	45	55	65	225	80	70	60	50	260	80	0	50	55	185
S1	9	14	9	0	32	5	0	0	0	5	20	20	16	18	74	30	0	12	10	52
S2	0	0	0	10	10	0	2	2	20	24	0	0	0	0	0	0	0	0	0	0
P	41	41	61	85	228	55	43	53	45	196	60	50	44	32	186	50	0	38	45	133
2	50	45	70	95	260	60	50	55	65	230	90	75	60	45	270	80	60	50	55	245
S1	10	0	0	0	10	5	3	0	0	8	0	0	0	0	0	35	15	21	18	89
S2	0	5	15	18	38	0	0	7	14	21	30	25	20	20	95	0	0	0	0	0
P	40	40	55	77	212	55	47	48	51	201	60	50	40	25	175	45	45	29	37	156
3	50	55	70	95	270	40	50	55	65	210	80	70	60	50	260	70	0	70	70	210
S1	13	13	0	0	26	0	8	0	0	8	15	30	15	15	75	0	0	0	0	0
S2	0	0	12	20	32	2	0	8	7	17	0	0	0	0	0	10	0	25	25	60
P	37	42	58	75	212	38	42	47	58	185	65	40	45	35	185	60	0	45	45	150
4	45	55	70	85	255	60	0	55	65	180	90	0	60	45	195	80	60	50	55	245
S1	0	12	10	0	22	12	0	0	0	12	0	0	0	0	0	20	15	22	25	82
S2	8	0	0	0	8	0	0	8	7	15	14	0	19	10	43	0	0	0	0	0

Continuation of ***Table 4D***

P	37	43	60	85	225	48	0	47	58	153	76	0	41	35	152	60	45	28	30	163
5	50	55	70	0	175	60	50	55	65	230	80	0	60	50	190	80	60	50	55	245
S1	10	10	10	0	30	13	3	0	0	16	13	0	10	13	36	20	12	15	22	69
S2	0	0	0	0	0	0	0	10	27	37	0	0	0	0	0	0	0	0	0	0
P	40	45	60	0	145	47	47	45	38	177	67	0	50	37	154	60	48	35	33	176
6	45	55	70	95	265	60	50	55	30	195	90	75	60	45	270	70	0	70	70	210
S1	0	15	9	0	24	15	3	0	2	20	0	0	0	0	0	0	0	0	0	0
S2	7	0	0	15	22	0	0	8	0	8	25	20	15	15	75	30	0	10	25	65
P	38	40	61	80	219	45	47	47	28	167	65	55	45	30	195	40	0	60	45	145
7	50	55	70	95	270	60	50	55	65	230	90	0	60	45	195	80	60	0	55	195
S1	10	13	9	0	32	13	4	0	0	17	0	0	0	0	0	30	30	0	15	75
S2	0	0	0	12	12	0	0	14	27	41	18	0	19	15	52	0	0	0	0	0
P	40	42	61	83	226	47	46	41	38	172	72	0	41	30	143	50	30	0	40	120
8	45	55	70	95	265	60	50	55	65	230	80	70	60	50	260	70	0	0	70	140
S1	0	12	0	0	12	12	3	0	0	15	10	16	13	14	53	0	0	0	0	0
S2	5	0	5	15	25	0	0	4	27	31	0	0	0	0	0	10	0	0	33	43
P	40	43	65	80	228	48	47	51	38	184	70	54	47	36	207	60	0	0	37	97
9	45	45	70	95	255	60	45	55	65	225	90	75	60	45	270	70	0	70	70	210
S1	0	0	4	0	4	14	0	0	0	14	0	0	0	0	0	0	0	0	0	0
S2	3	5	0	12	20	0	2	2	17	21	5	30	5	15	55	5	0	33	21	59
P	42	40	66	83	231	46	43	53	48	190	85	45	55	30	215	65	0	37	49	151
10	50	55	70	95	270	60	50	55	65	230	80	70	60	50	260	80	0	0	55	135
S1	2	6	1	0	9	15	3	0	0	18	5	5	55	20	85	5	0	0	5	10
S2	0	0	0	4	4	0	0	2	27	29	0	0	0	0	0	0	0	0	0	0

Continuation of ***Table 4D***

P	48	49	69	91	257	45	47	53	38	183	75	65	5	30	175	75	0	0	50	125
11	50	55	70	95	270	60	50	55	65	230	90	75	60	45	270	80	60	50	55	245
S1	2	6	2	0	10	18	4	0	0	22	0	0	0	0	0	5	15	27	9	56
S2	0	0	0	6	6	0	0	10	5	15	5	35	35	25	100	0	0	0	0	0
P	48	49	68	89	254	42	46	45	60	193	85	40	25	20	170	75	45	23	46	189
12	50	55	70	95	270	60	50	55	65	230	90	75	60	45	270	80	60	50	55	245
S1	4	2	0	0	6	17	2	0	0	19	0	0	0	0	0	34	4	16	22	76
S2	0	0	3	3	6	0	0	3	10	13	9	35	30	25	99	0	0	0	0	0
P	46	53	67	92	258	43	48	52	55	198	81	40	30	20	171	46	56	34	33	169
13	50	55	70	95	270	60	50	55	65	230	90	75	60	45	270	80	60	50	55	245
S1	2	6	0	0	8	2	4	0	0	6	0	0	0	0	0	0	17	7	6	30
S2	0	0	2	2	4	0	0	14	34	48	10	42	35	30	117	0	0	0	0	0
P	48	49	68	93	258	58	46	41	31	176	80	33	25	15	153	80	43	43	49	215
14	50	55	70	95	270	60	50	0	0	110	90	75	60	45	270	80	60	50	55	245
S1	3	5	1	0	9	5	3	0	0	8	0	0	0	0	0	15	28	31	27	101
S2	0	0	0	4	4	0	0	0	0	0	2	35	25	5	67	0	0	0	0	0
P	47	50	69	91	257	55	47	0	0	102	88	40	35	40	203	65	32	19	28	144
15	50	55	70	95	270	60	50	55	65	230	90	75	60	45	270	80	60	50	55	245
S1	4	6	1	0	11	2	1	0	0	3	0	0	0	0	0	9	29	25	34	97
S2	0	0	0	3	3	0	0	1	4	5	7	25	15	25	72	0	0	0	0	0
P	46	49	69	92	256	58	49	54	61	222	83	50	45	20	198	71	31	25	21	148
16	50	55	70	95	270	60	50	40	30	180	90	75	60	45	270	80	60	50	55	245
S1	4	9	5	0	18	2	4	2	2	10	0	0	0	0	0	8	36	32	10	86
S2	0	0	0	4	4	0	0	0	0	0	8	20	35	30	93	0	0	0	0	0

Continuation of ***Table 4D***

P	46	46	65	91	248	58	46	38	28	170	82	55	25	15	177	72	24	18	45	159
17	50	55	70	95	270	60	50	55	65	230	90	75	60	45	270	80	60	0	55	195
S1	3	1	2	0	6	15	1	0	0	16	0	0	0	0	0	7	21	0	27	55
S2	0	0	0	3	3	0	0	2	3	5	12	45	25	5	87	0	0	0	0	0
P	47	54	68	92	261	45	49	53	62	209	78	30	35	40	183	73	39	0	28	140
18	50	55	70	95	270	60	50	55	65	230	80	70	60	50	260	80	60	50	55	245
S1	2	3	3	0	8	19	1	0	0	20	10	40	34	25	109	9	33	27	24	93
S2	0	0	0	6	6	0	0	1	4	5	0	0	0	0	0	0	0	0	0	0
P	48	52	67	89	256	41	49	54	61	205	70	30	26	25	151	71	27	23	31	152
19	50	55	70	95	270	60	45	55	65	225	90	75	60	45	270	80	60	50	55	245
S1	2	1	3	0	6	0	0	0	0	0	0	0	0	0	0	6	5	33	28	72
S2	0	0	0	7	7	0	2	2	7	11	2	35	25	25	87	0	0	0	0	0
P	48	54	67	88	257	60	43	53	58	214	88	40	35	20	183	74	55	17	27	173
20	50	45	70	95	260	60	50	55	65	230	90	75	60	45	270	80	60	50	55	245
S1	2	0	0	0	2	14	2	0	0	16	0	0	0	0	0	4	21	35	21	81
S2	0	0	3	3	6	0	0	2	4	6	5	5	20	25	55	0	0	0	0	0
P	48	45	67	92	252	46	48	53	61	208	85	70	40	20	215	76	39	15	34	164
21	50	55	70	95	270	60	50	55	65	230	90	0	0	45	135	80	60	50	55	245
S1	1	6	1	0	8	2	2	0	0	4	0	0	0	0	0	9	39	33	19	100
S2	0	0	0	1	1	0	0	3	3	6	40	0	0	25	65	0	0	0	0	0
P	49	49	69	94	261	58	48	52	62	220	50	0	0	20	70	71	21	17	36	145
22	50	55	70	95	270	60	50	55	65	230	90	75	60	45	270	80	60	50	55	245
S1	3	5	0	0	8	2	7	0	0	9	0	0	0	0	0	1	13	32	34	80
S2	0	0	1	1	2	0	0	2	6	8	5	45	35	22	107	0	0	0	0	0

Continuation of ***Table 4D***

P	47	50	69	94	260	58	43	53	59	213	85	30	25	23	163	79	47	18	21	165
23	50	55	70	95	270	60	50	55	65	230	90	75	60	45	270	80	60	50	55	245
S1	7	4	1	0	12	2	1	0	0	3	0	0	0	0	0	0	34	33	5	72
S2	0	0	0	7	7	0	0	12	5	17	5	50	30	0	85	0	0	0	0	0
P	43	51	69	88	251	58	49	43	60	210	85	25	30	45	185	80	26	17	50	173
24	50	55	70	95	270	60	50	55	65	230	90	75	60	45	270	70	0	70	70	210
S1	1	7	4	0	12	2	3	0	0	5	0	0	0	0	0	0	0	0	0	0
S2	0	0	0	9	9	0	0	2	33	35	10	25	37	30	102	1	0	5	25	31
P	49	48	66	86	249	58	47	53	32	190	80	50	23	15	168	69	0	65	45	179
25	50	55	70	95	270	60	50	40	65	215	90	75	0	0	165	80	60	50	55	245
S1	2	3	0	0	5	3	4	40	0	47	0	0	0	0	0	9	33	38	23	103
S2	0	0	4	2	6	0	0	0	33	33	0	49	0	0	49	0	0	0	0	0
P	48	52	66	93	259	57	46	0	32	135	90	26	0	0	116	71	27	12	32	142
26	50	55	70	95	270	60	50	55	65	230	90	75	60	0	225	80	60	50	55	245
S1	3	8	6	0	17	12	1	0	0	13	0	0	0	0	0	8	5	27	27	67
S2	0	0	0	7	7	0	0	6	4	10	15	41	44	0	100	0	0	0	0	0
P	47	47	64	88	246	48	49	49	61	207	75	34	16	0	125	72	55	23	28	178
27	50	55	70	95	270	60	50	55	65	230	90	75	60	45	270	80	60	50	55	245
S1	7	1	0	0	8	13	1	0	0	14	0	0	0	0	0	9	26	33	29	97
S2	0	0	3	6	9	0	0	4	7	11	19	32	15	37	103	0	0	0	0	0
P	43	54	67	89	253	47	49	51	58	205	71	43	45	8	167	71	34	17	26	148
28	50	55	70	95	270	60	45	55	65	225	90	75	60	45	270	80	60	50	55	245
S1	2	9	0	0	11	18	0	0	0	18	0	0	0	0	0	7	31	18	4	60
S2	0	0	2	4	6	0	1	2	1	4	25	7	5	13	50	0	0	0	0	0

Continuation of ***Table 4D***

P	48	46	68	91	253	42	44	53	64	203	65	68	55	32	220	73	29	32	51	185
29	50	55	70	95	270	60	50	55	65	230	90	75	60	45	270	70	0	70	70	210
S1	2	9	0	0	11	17	1	0	0	18	0	0	0	0	0	0	0	0	0	0
S2	0	0	3	8	11	0	0	13	33	46	35	35	15	32	117	20	0	45	36	101
P	48	46	67	87	248	43	49	42	32	166	55	40	45	13	153	50	0	25	34	109
30	50	55	70	95	270	60	50	40	65	215	90	75	60	45	270	80	60	50	55	245
S1	3	9	7	0	19	15	3	0	0	18	0	0	0	0	0	1	15	14	36	66
S2	0	0	0	4	4	0	0	0	5	5	4	42	28	17	91	0	0	0	0	0
P	47	46	63	91	247	45	47	40	60	192	86	33	32	28	179	79	45	36	19	179
31	50	55	70	95	270	60	50	55	65	230	90	75	60	45	270	80	60	0	0	140
S1	6	2	5	0	13	5	7	0	0	12	0	0	0	0	0	3	14	0	0	17
S2	0	0	0	1	1	0	0	1	30	31	5	5	35	30	75	0	0	0	0	0
P	44	53	65	94	256	55	43	54	35	187	85	70	25	15	195	77	46	0	0	123
32	50	55	70	95	270	60	50	55	65	230	90	75	60	45	270	80	60	50	55	245
S1	1	9	4	0	14	15	4	0	0	19	0	0	0	0	0	35	39	34	2	110
S2	0	0	0	8	8	0	0	12	34	46	15	10	44	22	91	0	0	0	0	0
P	49	46	66	87	248	45	46	43	31	165	75	65	16	23	179	45	21	16	53	135
33	50	55	70	95	270	60	50	55	65	230	90	75	0	45	210	80	60	50	55	245
S1	2	3	0	0	5	18	5	0	0	23	0	0	0	0	0	8	35	33	19	95
S2	0	0	6	1	7	0	0	14	31	45	12	30	0	25	67	0	0	0	0	0
P	48	52	64	94	258	42	45	41	34	162	78	45	0	20	143	72	25	17	36	150
34	50	55	70	95	270	60	50	55	65	230	90	75	60	45	270	80	60	50	55	245
S1	4	9	0	0	13	19	4	0	0	23	0	0	0	0	0	42	42	23	41	148
S2	0	0	2	2	4	0	0	14	32	46	2	30	32	21	85	0	0	0	0	0

Continuation of ***Table 4D***

P	46	46	68	93	253	41	46	41	33	161	88	45	28	24	185	38	18	27	14	97
35	50	55	70	95	270	60	50	40	65	215	90	75	60	45	270	80	60	50	55	245
S1	3	2	0	0	5	5	2	2	0	9	0	0	0	0	0	19	23	45	47	134
S2	0	0	8	6	14	0	0	0	7	7	5	30	37	23	95	0	0	0	0	0
P	47	53	62	89	251	55	48	38	58	199	85	45	23	22	175	61	37	5	8	111
36	50	55	70	85	260	60	50	55	65	230	90	75	60	45	270	80	60	50	55	245
S1	2	1	0	1	4	5	1	0	0	6	0	0	0	0	0	35	35	3	29	102
S2	0	0	4	0	4	0	0	2	7	9	12	19	25	26	82	0	0	0	0	0
P	48	54	66	84	252	55	49	53	58	215	78	56	35	19	188	45	25	47	26	143
37	50	55	70	95	270	60	50	55	65	230	90	75	60	45	270	80	60	50	0	190
S1	2	3	0	0	5	18	2	0	0	20	0	0	0	0	0	15	36	44	0	95
S2	0	0	2	1	3	0	0	12	34	46	20	30	26	19	95	0	0	0	0	0
P	48	52	68	94	262	42	48	43	31	164	70	45	34	26	175	65	24	6	0	95
38	50	55	70	95	270	60	50	55	65	230	80	70	60	0	210	80	60	50	55	245
S1	1	2	0	0	3	17	3	0	0	20	0	30	24	0	54	15	38	20	17	90
S2	0	0	0	7	7	0	0	2	34	36	0	0	0	0	0	0	0	0	0	0
P	49	53	70	88	260	43	47	53	31	174	80	40	36	0	156	65	22	30	38	155
39	50	55	70	95	270	60	50	55	65	230	90	75	60	45	270	70	0	70	70	210
S1	2	3	0	0	5	19	4	0	0	23	0	0	0	0	0	0	0	0	0	0
S2	0	0	4	9	13	0	0	13	5	18	38	30	30	5	103	5	0	5	14	24
P	48	52	66	86	252	41	46	42	60	189	52	45	30	40	167	65	0	65	56	186
40	50	55	70	95	270	60	45	55	65	225	90	75	60	45	270	80	60	50	55	245
S1	2	8	0	0	10	18	0	0	0	18	0	0	0	0	0	45	22	29	50	146
S2	0	0	2	1	3	0	2	14	30	46	5	39	33	24	101	0	0	0	0	0

Continuation of ***Table 4D***

P	48	47	68	94	257	42	43	41	35	161	85	36	27	21	169	35	38	21	5	99
41	50	55	70	95	270	60	45	55	65	225	90	75	60	45	270	80	60	50	55	245
S1	4	9	0	0	13	1	0	0	0	1	0	0	0	0	0	20	44	40	15	119
S2	0	0	6	8	14	0	1	8	27	36	5	37	30	28	100	0	0	0	0	0
P	46	46	64	87	243	59	44	47	38	188	85	38	30	17	170	60	16	10	40	126
42	50	55	70	95	270	60	50	55	65	230	90	75	60	45	270	80	60	50	55	245
S1	2	7	6	0	15	19	4	0	0	23	0	0	0	0	0	13	25	30	15	83
S2	0	0	0	4	4	0	0	14	20	34	1	38	19	29	87	0	0	0	0	0
P	48	48	64	91	251	41	46	41	45	173	89	37	41	16	183	67	35	20	40	162
43	50	55	70	95	270	60	50	55	65	230	90	75	60	45	270	80	60	50	55	245
S1	3	9	5	0	17	18	3	0	0	21	0	0	0	0	0	5	50	20	0	75
S2	0	0	0	6	6	0	0	12	33	45	5	30	22	24	81	0	0	0	0	0
P	47	46	65	89	247	42	47	43	32	164	85	45	38	21	189	75	10	30	55	170
44	50	55	70	95	270	60	50	55	65	230	90	75	60	45	270	70	0	70	70	210
S1	4	4	1	0	9	19	4	0	0	23	0	0	0	0	0	0	0	0	0	0
S2	0	0	0	8	8	0	0	14	30	44	1	63	14	20	98	0	0	60	35	95
P	46	51	69	87	253	41	46	41	35	163	89	12	46	25	172	70	0	10	35	115
45	50	55	70	95	270	60	50	55	65	230	0	0	0	0	0	80	60	50	55	245
S1	4	8	3	0	15	15	4	0	0	19	0	0	0	0	0	4	15	15	35	69
S2	0	0	0	2	2	0	0	12	33	45	0	0	0	0	0	0	0	0	0	0
P	46	47	67	93	253	45	46	43	32	166	0	0	0	0	0	76	45	35	20	176
46	50	55	70	95	270	60	45	40	65	210	90	75	60	45	270	80	60	50	55	245
S1	1	3	2	0	6	16	0	0	0	16	0	0	0	0	0	7	44	22	26	99
S2	0	0	0	1	1	0	1	0	5	6	30	15	36	22	103	0	0	0	0	0

Continuation of ***Table 4D***

P	49	52	68	94	263	44	44	40	60	188	60	60	24	23	167	73	16	28	29	146
47	50	55	70	95	270	60	45	55	65	225	90	75	60	45	270	80	60	50	55	245
S1	3	2	0	0	5	15	0	0	0	15	0	0	0	0	0	5	29	29	26	89
S2	0	0	6	6	12	0	0	14	33	47	5	41	14	26	86	0	0	0	0	0
P	47	53	64	89	253	45	45	41	32	163	85	34	46	19	184	75	31	21	29	156
48	50	55	70	95	270	60	50	55	65	230	90	75	60	45	270	80	60	50	55	245
S1	3	7	2	0	12	5	3	0	0	8	0	0	0	0	0	9	31	25	25	90
S2	0	0	0	7	7	0	0	2	15	17	9	51	29	17	106	0	0	0	0	0
P	47	48	68	88	251	55	47	53	50	205	81	24	31	28	164	71	29	25	30	155

Table 5D. Experimental data from chapter 2.3, 4 games with individual customers and unexpected events

Per	1	2	3	4	Total	Per	1	2	3	4	Total	Per	1	2	3	4	Total	Per	1	2	3	4	Total
	Pareto-efficient:											Pareto-efficient:											
	50	60	70	80	260							65	45	45	50	205							
1	40	60	70	80	250	**25**	50	60	70	80	260	**1**	65	45	45	0	155	**25**	65	45	45	50	205
S1	10	0	12	5	27	S1	0	0	4	7	11	S1	22	0	0	0	22	S1	2	0	0	0	2
S2	0	5	0	0	5	S2	3	5	0	0	8	S2	0	0	6	0	6	S2	0	7	3	9	19
P	30	55	58	75	218	P	47	55	66	73	241	P	43	45	39	0	127	P	63	38	42	41	184
2	50	0	70	70	190	**26**	50	60	70	80	260	**2**	65	45	45	0	155	**26**	65	45	45	50	205
S1	0	0	15	0	15	S1	0	0	4	3	7	S1	26	12	0	0	38	S1	4	5	0	0	9

Continuation of ***Table 5D***

S2	5	0	0	0	5	S2	3	8	0	0	11	S2	0	0	5	0	5	S2	0	0	0	13	13
P	45	0	55	70	170	P	47	52	66	77	242	P	39	33	40	0	112	P	61	40	45	37	183
3	50	60	70	80	260	**27**	50	60	70	80	260	**3**	0	45	40	50	135	**27**	65	45	45	50	205
S1	0	0	15	15	30	S1	0	0	2	4	6	S1	0	0	1	0	1	S1	4	0	0	0	4
S2	10	15	0	0	25	S2	1	9	0	0	10	S2	0	0	0	16	16	S2	0	3	1	2	6
P	40	45	55	65	205	P	49	51	68	76	244	P	0	45	39	34	118	P	61	42	44	48	195
4	50	45	65	80	240	**28**	50	60	70	80	260	**4**	65	45	40	0	150	**28**	65	45	45	50	205
S1	0	10	0	22	32	S1	0	0	5	2	7	S1	40	12	3	0	55	S1	4	0	0	0	4
S2	15	0	10	0	25	S2	3	14	0	0	17	S2	0	0	0	0	0	S2	0	3	4	13	20
P	35	35	55	58	183	P	47	46	65	78	236	P	25	33	37	0	95	P	61	42	41	37	181
5	40	60	70	80	250	**29**	50	60	70	80	260	**5**	55	45	40	35	175	**29**	65	45	45	50	205
S1	2	0	15	20	37	S1	0	0	2	3	5	S1	0	6	4	10	20	S1	2	3	0	0	5
S2	0	20	0	0	20	S2	9	14	0	0	23	S2	25	0	0	0	25	S2	0	0	4	5	9
P	38	40	55	60	193	P	41	46	68	77	232	P	30	39	36	25	130	P	63	42	41	45	191
6	50	60	70	70	250	**30**	50	60	70	80	260	**6**	55	45	40	50	190	**30**	65	45	45	50	205
S1	0	0	20	0	20	S1	0	0	1	15	16	S1	0	7	1	0	8	S1	7	0	0	0	7
S2	15	15	0	10	40	S2	1	2	0	0	3	S2	10	0	0	21	31	S2	0	3	3	8	14
P	35	45	50	60	190	P	49	58	69	65	241	P	45	38	39	29	151	P	58	42	42	42	184
7	50	60	70	70	250	**31**	50	60	70	80	260	**7**	55	45	45	50	195	**31**	65	45	45	50	205
S1	0	0	10	0	10	S1	0	0	1	2	3	S1	0	0	0	0	0	S1	8	1	0	0	9
S2	25	19	0	10	54	S2	8	7	0	0	15	S2	20	0	9	13	42	S2	0	0	3	3	6
P	25	41	60	60	186	P	42	53	69	78	242	P	35	45	36	37	153	P	57	44	42	47	190
8	50	60	70	70	250	**32**	50	60	70	80	260	**8**	55	45	0	50	150	**32**	65	45	45	50	205
S1	0	0	10	0	10	S1	0	0	2	2	4	S1	0	0	0	0	0	S1	3	0	0	0	3
S2	12	17	0	9	38	S2	4	6	0	0	10	S2	10	15	0	20	45	S2	0	1	3	5	9

*Continuation of **Table 5D***

P	38	43	60	61	202	P	46	54	68	78	246	P	45	30	0	30	105	P	62	44	42	45	193
9	50	60	70	70	250	**33**	50	60	70	80	260	**9**	65	45	45	50	205	**33**	65	45	45	50	205
S1	0	0	11	0	11	S1	0	0	6	10	16	S1	30	0	0	0	30	S1	4	0	0	0	4
S2	12	17	0	9	38	S2	11	17	0	0	28	S2	0	7	8	17	32	S2	0	4	4	11	19
P	38	43	59	61	201	P	39	43	64	70	216	P	35	38	37	33	143	P	61	41	41	39	182
10	50	60	70	80	260	**34**	50	60	70	80	260	**10**	55	45	45	50	195	**34**	65	45	45	50	205
S1	0	0	4	6	10	S1	0	0	3	7	10	S1	0	0	0	0	0	S1	8	0	0	0	8
S2	5	7	0	0	12	S2	7	6	0	0	13	S2	20	5	10	10	45	S2	0	0	4	12	16
P	45	53	66	74	238	P	43	54	67	73	237	P	35	40	35	40	150	P	57	45	41	38	181
11	50	60	70	80	260	**35**	50	60	70	80	260	**11**	65	45	45	35	190	**35**	65	45	45	50	205
S1	0	0	9	3	12	S1	0	0	4	4	8	S1	27	0	0	2	29	S1	8	0	0	0	8
S2	7	7	0	0	14	S2	8	17	0	0	25	S2	0	5	10	0	15	S2	0	2	4	9	15
P	43	53	61	77	234	P	42	43	66	76	227	P	38	40	35	33	146	P	57	43	41	41	182
12	50	60	70	80	260	**36**	50	60	70	80	260	**12**	65	45	45	50	205	**36**	65	45	45	50	205
S1	0	0	4	8	12	S1	0	0	2	9	11	S1	26	8	0	0	34	S1	4	2	0	0	6
S2	3	4	0	0	7	S2	3	3	0	0	6	S2	0	0	9	12	21	S2	0	0	3	8	11
P	47	56	66	72	241	P	47	57	68	71	243	P	39	37	36	38	150	P	61	43	42	42	188
13	50	60	70	80	260	**37**	50	60	70	80	260	**13**	0	45	45	50	140	**37**	65	45	45	50	205
S1	0	0	2	3	5	S1	0	0	3	2	5	S1	0	0	0	0	0	S1	1	4	0	0	5
S2	3	4	0	0	7	S2	6	13	0	0	19	S2	0	6	15	20	41	S2	0	0	3	7	10
P	47	56	68	77	248	P	44	47	67	78	236	P	0	39	30	30	99	P	64	41	42	43	190
14	50	60	70	80	260	**38**	50	60	70	80	260	**14**	65	45	0	0	110	**38**	65	45	45	50	205
S1	0	0	2	8	10	S1	0	0	2	13	15	S1	15	20	0	0	35	S1	4	0	0	0	4
S2	8	6	0	0	14	S2	7	7	0	0	14	S2	0	0	0	0	0	S2	0	3	3	5	11
P	42	54	68	72	236	P	43	53	68	67	231	P	50	25	0	0	75	P	61	42	42	45	190

Continuation of ***Table 5D***

15	50	60	70	80	260	**39**	50	60	70	80	260	**15**	65	45	45	50	205	**39**	65	45	45	50	205
S1	0	0	3	11	14	S1	0	0	1	11	12	S1	15	0	0	0	15	S1	9	0	0	0	9
S2	6	9	0	0	15	S2	8	25	0	0	33	S2	0	12	5	20	37	S2	0	3	2	9	14
P	44	51	67	69	231	P	42	35	69	69	215	P	50	33	40	30	153	P	56	42	43	41	182
16	50	60	70	80	260	**40**	50	60	70	80	260	**16**	65	0	0	50	115	**40**	65	45	45	50	205
S1	0	0	2	12	14	S1	0	0	2	9	11	S1	17	0	0	0	17	S1	4	0	0	0	4
S2	7	14	0	0	21	S2	9	13	0	0	22	S2	0	0	0	10	10	S2	0	6	3	7	16
P	43	46	68	68	225	P	41	47	68	71	227	P	48	0	0	40	88	P	61	39	42	43	185
17	50	60	70	80	260	**41**	50	60	70	80	260	**17**	55	45	45	50	195	**41**	65	45	45	50	205
S1	0	0	0	1	1	S1	0	0	2	2	4	S1	0	0	0	0	0	S1	2	0	0	0	2
S2	4	9	0	0	13	S2	7	4	0	0	11	S2	7	0	5	6	18	S2	0	4	3	7	14
P	46	51	70	79	246	P	43	56	68	78	245	P	48	45	40	44	177	P	63	41	42	43	189
18	50	60	70	80	260	**42**	50	60	70	80	260	**18**	55	45	45	50	195	**42**	65	45	45	50	205
S1	0	0	4	8	12	S1	0	0	2	2	4	S1	0	2	0	0	2	S1	2	0	0	0	2
S2	4	5	0	0	9	S2	3	4	0	0	7	S2	8	0	9	6	23	S2	0	4	3	9	16
P	46	55	66	72	239	P	47	56	68	78	249	P	47	43	36	44	170	P	63	41	42	41	187
19	50	60	70	80	260	**43**	50	60	70	80	260	**19**	65	45	45	50	205	**43**	65	45	45	50	205
S1	0	0	4	8	12	S1	0	0	2	9	11	S1	9	6	0	0	15	S1	2	0	0	0	2
S2	3	12	0	0	15	S2	2	3	0	0	5	S2	0	0	7	11	18	S2	0	4	3	3	10
P	47	48	66	72	233	P	48	57	68	71	244	P	56	39	38	39	172	P	63	41	42	47	193
20	50	60	70	80	260	**44**	50	60	70	80	260	**20**	65	45	45	50	205	**44**	65	45	45	50	205
S1	0	0	4	4	8	S1	0	0	5	9	14	S1	9	3	0	0	12	S1	4	3	0	0	7
S2	7	11	0	0	18	S2	2	14	0	0	16	S2	0	0	3	5	8	S2	0	0	3	11	14
P	43	49	66	76	234	P	48	46	65	71	230	P	56	42	42	45	185	P	61	42	42	39	184
21	50	60	70	80	260	**45**	50	60	70	80	260	**21**	65	45	45	50	205	**45**	65	45	45	50	205

Continuation of ***Table 5D***

S1	0	0	1	3	4	S1	0	0	5	9	14	S1	7	1	0	0	8	S1	6	0	0	0	6
S2	4	17	0	0	21	S2	9	2	0	0	11	S2	0	0	2	9	11	S2	0	4	3	9	16
P	46	43	69	77	235	P	41	58	65	71	235	P	58	44	43	41	186	P	59	41	42	41	183
22	50	60	70	80	260	**46**	50	60	70	80	260	**22**	65	45	45	50	205	**46**	65	45	45	50	205
S1	0	0	6	9	15	S1	0	0	3	3	6	S1	3	0	0	0	3	S1	2	4	0	0	6
S2	5	11	0	0	16	S2	2	3	0	0	5	S2	0	10	8	4	22	S2	0	0	4	8	12
P	45	49	64	71	229	P	48	57	67	77	249	P	62	35	37	46	180	P	63	41	41	42	187
23	50	60	70	80	260	**47**	50	60	70	80	260	**23**	65	45	45	50	205	**47**	65	45	45	50	205
S1	0	0	2	8	10	S1	0	0	5	4	9	S1	8	3	0	0	11	S1	4	0	0	0	4
S2	3	7	0	0	10	S2	2	3	0	0	5	S2	0	0	4	8	12	S2	0	4	4	9	17
P	47	53	68	72	240	P	48	57	65	76	246	P	57	42	41	42	182	P	61	41	41	41	184
24	50	60	70	80	260	**48**					260	**24**	65	45	45	50	205	**48**	65	45	45	50	205
S1	0	0	6	2	8	S1	0	0	5	13	18	S1	4	0	0	0	4	S1	6	4	0	0	10
S2	5	8	0	0	13	S2	7	7	0	0	14	S2	0	6	4	9	19	S2	0	0	3	7	10
P	45	52	64	78	239	P	43	53	65	67	228	P	61	39	41	41	182	P	59	41	42	43	185

Annex E. Copies of scientific publications by the author on the topic of the dissertation

Papers in the Reviewed Scientific Journals

Stein, H. 2010. Allocation rules with outside option in cooperation games with time-inconsistency. *Journal of Business Economics and Management* 10(1): 56–96. ISSN 2029-4433.

Stein, H. 2010. Literature overview on the field of co-opetition. *Verslas: Teorija ir Praktika [Business: Theory and Practice*] 11(2): 256–265. ISSN 1822-4202.

Stein, H.; Ginevičius, R. 2010. The experimental investigation of the profit distribution in industrial supply chains with an outside option. *Technological and Economic Development of Economy* 16(3): 487–501. ISSN 2029-4921.

Stein, H.; Ginevičius, R. 2010. Overview and comparison of profit sharing in different business collaboration forms. *Journal of Business Economics and Management* 11(3): 428–443. ISSN 2029-4433.

In other editions:

Stein, H; Ginevičius, R. 2010. New co-opetition approach for supply chain applications and the implementation of a new allocation rule. *6th International Scientific Conference, May 13–14, 2010, Vilnius, Business and Management 2010*: 1092–1099. ISSN 2029-4441.