SUPPLEMENTARY MATERIALS

B Instructions

Below, we present the instructions for the DB^{high} treatment. Periods are referred to as Rounds.

B.1 Written instructions

Welcome.

You are about to participate in an experiment on decision making and you will be paid for your participation with cash vouchers, privately at the end of the session. The currency in this experiment is called tokens. All payoffs are denominated in this currency. Tokens that you earn in the experiment will be converted into US dollars using the rate 10 Tokens = \$1. In addition, you will get \$10 participation fee if you complete the experiment. The money you earn will depend on your decisions, the decisions of others and chance.

Do not talk to or attempt to communicate with other participants during the session. Please make sure to turn off phones, mp3 players and pagers now. The session will begin with a brief instructional period, during which you will be informed of the main features of the task and you will be shown how to use the computer.

Basic Steps.
In this experiment you will act as voters that distribute funds between yourself and others in a series of matches. Each match consists of two rounds. In each round you must decide on how to split a sum of money between yourself, two others and a group project. Proposals will be voted up or down (accepted or rejected) by majority rule; i.e., for proposals to pass they must get 2 or more votes.

Each match starts with round 1. Your three-member group will have to decide how to divide 200 tokens. To do this each member of the group will submit a proposal that specifies how the 200 tokens are divided between you, the two other voters and the group project.

After you have all made your proposals, one of them will be selected at random to be voted on. All proposals have equal probability of being selected. The proposed allocation will be posted on your computer screens and you will have to decide whether to accept or reject it.

- If the proposed allocation passes (gets 2 or more votes) – it is binding and you move on to the round 2.
- If the proposal is defeated (gets less than 2 votes), there will be a call for new proposals. This process will repeat itself until a proposed allocation passes (gets 2 or more votes).

In round 2, the group will again have to allocate 200 tokens between you, two other voters and the group project. The process is the same: each member of the group starts by submitting a proposal.

The difference with the previous round is that part of what the group allocated to the group project in round 1 is still available in round 2. In other words, the project size at the beginning of round 2 is 80% of the amount invested in the group project in round 1. For example, if the group project that passed in round 1 was 15 tokens, then the project size at the beginning of round 2 is 12 tokens. The total project size at the end of round 2 will be the project size at the beginning of round 2 (which is 12 tokens in our example) plus the investment in the group project in round 2.

After you have all made your proposals, one of the proposed allocations will be selected at random to be voted on and you will have to decide whether to accept or reject it.

- If the proposed allocation passes (gets 2 or more votes) – it is binding and you move on to round 1 in a new Match.
- If the proposal is defeated (gets less than 2 votes), there will be a call for new proposals and the process will repeat itself until a proposed allocation passes (gets 2 or more votes).

Payoffs

Your Payoff in round 1 depends only on the proposed allocation that passed:

$$\begin{array}{c}\text{Your}\\ \text{Payoff}\\ \text{in round 1}\end{array} = \begin{array}{c}\text{Your}\\ \text{Individual Allocation}\\ \text{in round 1}\end{array} + 5\times \left(\begin{array}{c}\text{Investment}\\ \text{in Group Project}\\ \text{in round 1}\end{array}\right)^{0.5}$$

Your Payoff in round 2 depends on the proposed allocation that passed and on the size of the group project at the beginning of round 2.

$$\begin{array}{c}\text{Your}\\ \text{Payoff}\\ \text{in round 2}\end{array} = \begin{array}{c}\text{Your}\\ \text{Individual Allocation}\\ \text{in round 2}\end{array} + 5\times \left(\begin{array}{c}\text{Project Size at the beginning of round 2}\\ +\\ \text{Investment in Group Project in round 2}\end{array}\right)^{0.5}$$

When you are considering what proposal to submit, the computer interface will let you compute the payoffs implied by your proposal for each voter of the group.

Number of matches

In this session there will be total of 10 matches with two rounds in each match. Before the beginning of each match, participants in the experiment will be divided randomly to the groups of 3 voters. The identity of your group members will never be revealed to you and your group members will never know your identity. You will stay in the same group in both rounds of a match. Once the second round of the match is over, you will be randomly allocated to a new group of 3 voters.

How tokens are converted into cash payments

At the conclusion of the experiment, one of the 10 matches played for tokens will be randomly selected by computer, and the tokens you earned in this match (both in the first and in the second round) will be converted into US dollars using a conversion rate of 10 Tokens = $1. In addition you will receive the $10 participation fee for completing the experiment.

To summarize

- The experiment consists of 10 matches. In each match participants are assigned to groups of 3 voters in each. Each match consists of two rounds.
- In each round all members of the group submit a proposal to allocate 200 tokens between a group project and individual allocations to each of the 3 voters. One of these proposals is selected at random and is voted on by all group members. All proposals have equal chance of being selected.
- Tokens allocated to the group project yield positive payoffs for all group members, while tokens allocated to the individual members of the group benefit only those members.
- The allocation passes if two or more voters accept it. If the allocation passes in round 1, the group moves on to round 2.
- If the allocation passes in round 2, a new match will begin. If the allocation is rejected, then there will be a call for new proposals.
- Your payoff in round 1 depends on your individual allocation in round 1 and the group investment in round 1.
- The project size at the beginning of round 2 is 80% of the investment in the Group Project in round 1.
- Your payoff in round 2 depends on your individual allocation in round 2, the investment in the Group Project in round 2 and the size of the Group Project at the beginning of round 2.
- Total payoff in the match = Payoff in round 1 + Payoff in round 2.
- Once the match is over, participants are randomly assigned to new groups of 3 voters in each and the next match begins, which is identical to the previous one.
- At the end of the experiment, one match is chosen randomly by the computer, and the tokens earned in this match are converted into US dollars, added to the participation fee and paid to participants in cash vouchers.

B.2 Difference in Instructions for Static and Dynamic treatments

The difference between instructions in the SB treatment and in the DB^{high} treatment presented above was the part describing that some portion of the public investment from round 1 survives to round 2 in the DB^{high} treatment, while it does not in the SB treatment. In particular, in the SB treatment, the instructions did not contain the sentence "The difference with the previous round is that part of what the group allocated to the group project in round 1 is still available in round 2."

In addition, payoffs for round 2 were described as follows:

Your Payoff in round 2 = Your Individual Allocation in round 2 $+5\times$ (Investment in Group Project in round 2)$^{0.5}$

B.3 Script and Slides

This script was read aloud while some slides were shown. See Figure 3 to follow most instructions. Comments between brackets were not read aloud.

B.3.1 Script

We will now conduct a practice round that will not count for money. As we move on this practice round please do not click or enter any information until I ask you to. If you have any questions raise your hand.

The experiment will take place over a sequence of 10 matches. We begin the match by dividing you into committees of three members each. Each of you is assigned to exactly one of these committees. In each match your committee will make budget decisions by majority over a sequence of two rounds.

[SHOW SLIDE A1+A2+A3+P=200]

[point while reading] In each round your committee has a budget of 200. Your committee must decide how to divide this budget into four categories, in integer amounts: the first three categories are the private allocations and they always have to be greater than or equal to 0. The fourth category is for investment in a project and it also must be greater than or equal to 0.

If your committee's budget decision is (A1, A2, A3,P), then A1 go directly to member 1's earnings, A2 to member 2 and A3 to member 3. The project investment produces earnings for all committee members in the following way.

The project earnings in a round depend on the size of the project at the end of that round. Specifically, each committee member earns an amount in points proportional to the square root of the size of the project at the end of the round (precisely equal to 5*sqrt(project size)). During the experiment, there will be a graph on the screen that shows exactly how project earnings will depend on project size.

[SHOW SLIDE GRAPH]

For example, if the size of the project at the end of the round equals 121, then each member earns exactly 5*sqrt(121) or 55 additional points in that round. If the size is equal to 25, each member earns exactly 5*sqrt(25) or 25 additional points in that round. In your display, earnings are always rounded to two decimal places. So, for example if the project size at the end of a round equals 70, each member earns 41.83 points from the project in that round.

As we said before, there are two rounds. The project size at the end of round 1 is simply what the committee allocated to the project in round 1. 80% of the amount invested in the project in round 1 carries over to round 2, so project size at the beginning of round 2 is 80% of project size in round 1. Finally project size at the end of round 2 is the project size at the beginning of round 2 plus the investment in the project in round 2.

At the end of each round your earnings for that round are computed by adding the project earnings to your private allocation. For example, if your private allocation is 20 and the end-of-round project size is 121, then your earnings for that round equal 20 + 5*sqrt(121) = 20+5*11 = 75. Your earnings for the match equal the sum of the earnings in both rounds of that match.

After the first match ends, we move to match 2. In this new match, you are reshuffled randomly into new committees of three members each. The match then proceeds the same way as match 1.

We will now go through one practice match very slowly. During the practice match, please do not hit any keys until I tell you, and when you are prompted by the computer to enter information, please wait for me to tell you exactly what to enter. You are not paid for this practice match.

[AUTHENTICATE CLIENTS-Start Multistage]

Please double click on the icon on your desktop that says BP2. When the computer prompts you for your name, type your First and Last name. Then click SUBMIT and wait for further instructions.

[accept and start game] [screenshot]

You now see the first screen of the experiment on your computer. It should look similar to this screen. [POINT]

You have been assigned by the computer to a committee of three subjects, and assigned a committee member number: 1, 2 or 3. This committee assignment and your member number stay the same for both rounds of this match, but will change across matches. It is very important that you take careful note of your committee member number.

Your committee decides on a budget for this round by the following voting procedure. First, every member is asked to type in a provisional budget proposal, consisting of four integers, A1, A2, A3 and P, which add up to 200. A1, A2, A3 and P have to be greater than or equal to 0.

Ok. In the example... committee member # individual allocations should be entered here project investment here. As we proceed note that any information pertaining to you specifically will be in red.

[point to graph as appropriate, while reading this]

As a visual aid, there is a graph on the left that shows exactly how project earnings will depend on project size. The current size of the project is marked with a large dot. If your committee decides to invest nothing this period, then this will be the size that determines your project earnings at the end of the round. You can use your mouse to move the cursor along the curve to figure out what your earnings will be for different levels of investment. Also, if you type in a budget amount in the Project box, the computer will compute and display the corresponding project earnings for you just below the box.

Take a minute to practice using your cursor to move along the curve, and typing in different possible investment levels for the Project.
But do not hit the confirm button yet.

[wait one minute]

At this time, go ahead and type in any provisional proposal you wish and hit the confirm button. You are not paid for this practice match so it does not matter what you enter.

[wait for responses] [screenshot]

After everyone in your committee has submitted a provisional budget proposal, your screen should now look similar to this one [POINT]. The computer has randomly selected one of the provisional

budget proposal submitted by the members of your committee to be the Round One Proposed Budget in your committee. In the top-right of your screen you are shown this proposed budget as well as which committee member made this proposal. [POINT]

[In this example Again: member Number Current project size Proposer Proposed budget. These numbers are random Note that when information is displayed in a quadruple, it is always listed in order of memberNumber. So... Also note : I am member 3, so the number is red.] At this moment all committee members are asked to vote on the Proposed Budget. The decision is made by majority rule. The Proposed Budget passes if it receives 2 or 3 votes. Otherwise, it fails, there will be a call for new proposals and the process will repeat itself until a proposed budget passes (gets 2 or 3 votes). To vote to accept the Proposed Budget, click on the "yes" button; to reject it, click on the "no" button. Please go ahead and vote "yes" now. Since this is a practice round that doesn't count for money please all click on "yes" button.

[wait for responses] [screenshot]

[point] In addition to your committee member number, you can see each member's vote, the outcome of the vote, and the end of round project size. You can also see your earnings in round 1 and the project size in the beginning of round 2.

[In this example Again, in order: memberNumber Votes Outcome End-Of-Round project size]

This marks the end of the round.

The table with columns in the bottom of your screen is the History panel and summarizes all of this important information.

[Go BRIEFLY over history panel]

[click to advance to next round] [screenshot]

Now the second round begins. In this second round, you keep the same committee member number as in the first round, and the members of your committee all stay the same. Notice that 80% of the project investment from round 1 carries over, so the round 2 beginning project size equals 0.8 times the project size at the end of round 1.

[In this example Project size upper right hand corner Project size at origin of graph]

In this second round each member of the committee is asked to submit Provisional Budget Pro-

posal of how to divide 200 between yourself, two other committee members and project investment. Please enter your Provisional Budget Proposal now.

[screenshot]

One of the proposals was randomly chosen to be voted on. [In this example proposal]

On the graph, you can see the project size if this proposal will pass. At this time all committee members are asked to vote on the chosen budget proposal. If two or three members of the committee vote yes, then the proposal will pass and this will be the end of the match. If the proposal will fail then there will be a call for new proposals and the process repeats itself until the proposal is passed. You can now finish this round, by voting "yes" on the budget proposal.

[screenshot] [wait for them to finish]

Finally on this screen you see the proposal that passed and your earnings for this round.

Now we are ready for the comprehension quiz. Everyone must answer all the questions correctly before we go to the paid matches. The quiz has four pages. You must answer all the questions on Page 1 of the quiz to proceed to Page 2, and you must answer all the questions on Page 2 of the quiz to proceed to Page 3, etc.... If you answer any of the questions on a page incorrectly, you will be asked to try again. Please raise your hand if you have any questions during the quiz, and we will come to your desk and answer your question in private.

[reassure them its ok to ask for help]

[Quiz detailed below]

[WAIT FOR END OF QUIZ]

Are there any questions before we begin with the paid session?

[WAIT FOR QUESTIONS]

We will now begin with the first of 10 paid matches of the experiment. If there are any problems or questions from this point on, raise your hand and an experimenter will come and assist you in private.

B.4 Quiz

Handout in the instructions

[Not read: Extra handout to subjects that the experimenter reads with the subjects]

Following the instructions, there will be a practice session and a short comprehension quiz. All questions on the quiz must be answered correctly before continuing to the paid session. The first column shows possible allocations to the Group Project in round 1 from 200 to 0 with changes of 10 tokens. The second column displays how the investment in the group project will be transformed into tokens for payoffs. The third column shows what will be available for individual allocations in round 1. The fourth column shows the part of the round 1 Investment in the Group Project that will be available in round 2: The Size of the Project at the beginning of round 2. The last column displays the portion of round 2 payoffs that comes from the Project Size at the beginning of round 2.

Investment in Group Project in Round 1	Round 1 PAYOFF coming from GROUP PROJECT $5\times\left(\text{Investment in Group Project in Round 1}\right)^{0.5}$	Round 1 Budget remaining for Individual Allocations $200-\left(\text{Investment in Group Project in Round 1}\right)$	Group Project Size of Project at the Beginning of Round 2 $80\%\times\left(\text{Investment in Group Project in Round 1}\right)$	Round 2 PAYOFF coming from Investment in Round 1 $5\times\left(\text{Group Project Size at the beginning of Round 2}\right)^{0.5}$
200	70.71	0	160	63.25
190	68.92	10	152	61.64
180	67.08	20	144	60.00
170	65.19	30	136	58.31
160	63.25	40	128	56.57
150	61.24	50	120	54.77
140	59.16	60	112	52.92
130	57.01	70	104	50.99
120	54.77	80	96	48.99
110	52.44	90	88	46.90
100	50.00	100	80	44.72
90	47.43	110	72	42.43
80	44.72	120	64	40.00
70	41.83	130	56	37.42
60	38.73	140	48	34.64
50	35.36	150	40	31.62
40	31.62	160	32	28.28
30	27.39	170	24	24.49
20	22.36	180	16	20.00
10	15.81	190	8	14.14
0	0.00	200	0	0.00

Questions as they appear on the screens

Screen 1

1. For a budget proposal, what do your Private Investments and Project Investment have to add up to? a) 50; b)100; c)200; d) 250
2. There are two rounds in each match. a) True; b) False. There are ten rounds in each match. c)False. The number of rounds in each match depends on the roll of the die.

3. Your committee member number stays the same throughout the experiment. a) True; b) False. Your committee member number stays the same in every round of a match, but is reassigned for new matches.

4. You are reshuffled into a different committee for each match. a) True; b) False. You are in the same committee in all matches.

Screen 2

1. In round 1, assume that in the allocation supported by a majority of committee members the Project Investment is 30 and your individual allocation is 20. How much of your payoff would come from the Project Investment? a) 50; b) 38.73; c) 27.39; d) 65.19

2. How much of your payoff would come from the individual allocation? a) 30; b) 100; c) 20; d) 170

3. What size is the Project Investment at the beginning of round 2? a) 48; b) 24; c) 72; d) 112

4. How much of your payoff in round 2 would come from the Project Investment in round 1? a) 112.25; b) 24.49; c) 58.31; d) 15.81; e) 20

Screen 3

1. In round 1, assume that in the allocation supported by a majority of committee members the Project Investment is 100 and your individual allocation is 20. How much of your payoff would come from the Project Investment? a) 50; b) 38.73; c) 57.01; d) 65.19

2. How much of your payoff would come from the individual allocation? a) 30; b) 100; c) 20; d) 170

3. What size is the Project Investment at the beginning of round 2? a) 72; b) 88; c) 80; d) 40

4. How much of your payoff in round 2 would come from the Project Investment in round 1? a) 44.72; b) 25.50; c) 50.99; d) 22.36

Screen 4

1. In round 1, assume that in the allocation supported by a majority of committee members the Project Investment is 170 and your individual allocation is 20. How much of your payoff would come from the Project Investment? a) 171.03; b) 189.74; c) 206.76; d) 195.58

2. How much of your payoff would come from the individual allocation? a) 30; b) 100; c) 20; d) 170

3. What size is the Project Investment at the beginning of round 2? a) 144; b) 128; c) 136; d) 120

4. How much of your payoff in round 2 would come from the Project Investment in round 1? a) 30; b) 58.31; c) 129.15; d) 60

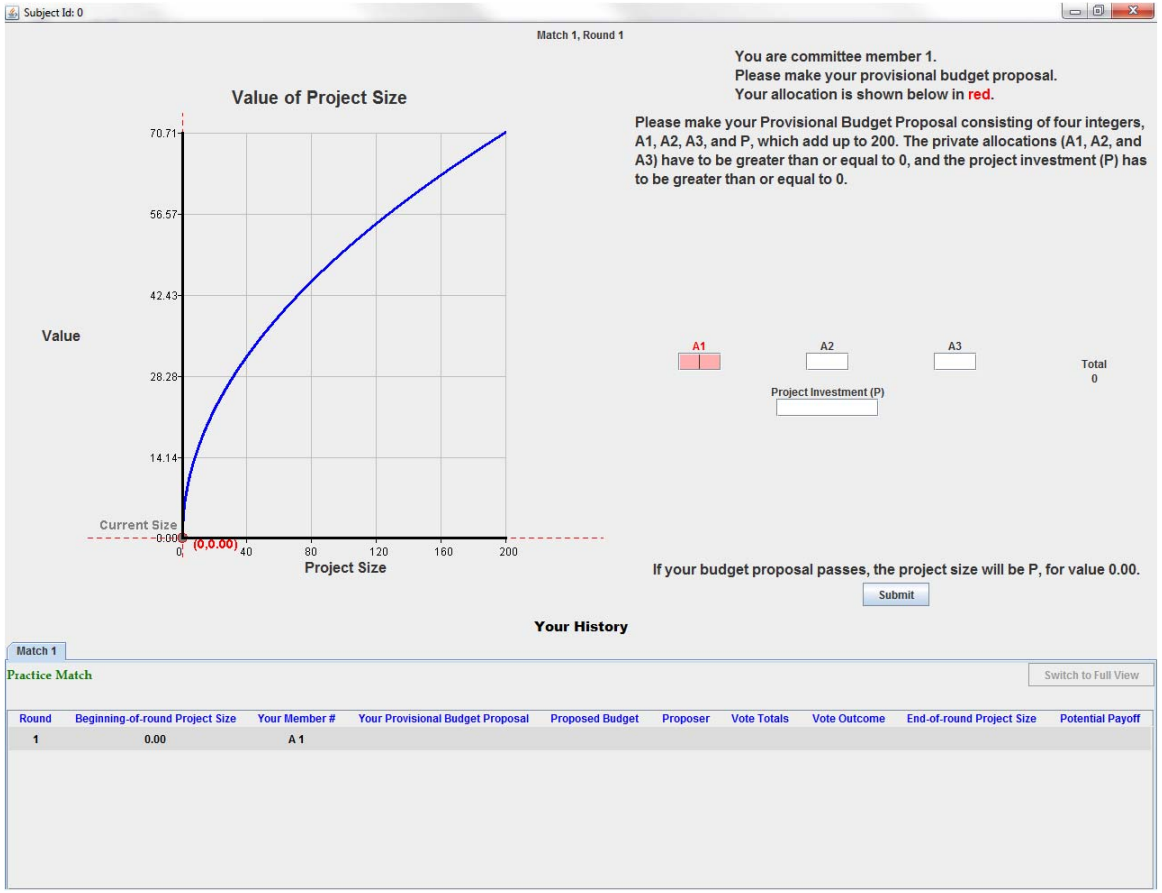

Figure 3: Screen shot

C Further Analysis at the Aggregate Level

C.1 Number of Stages

The data show a high proportion of accepted first-stage proposals, similar to levels previously reported in the literature (see, for example, Fréchette et al. (2003)). If we consider the last five matches in all treatments aggregating both periods, the percentage of accepted proposals is above 80%, and the median number of stages required to reach agreement is one. Figure 4 shows, for each period and treatment, the average number of stages needed for a proposal to pass as the session evolves.

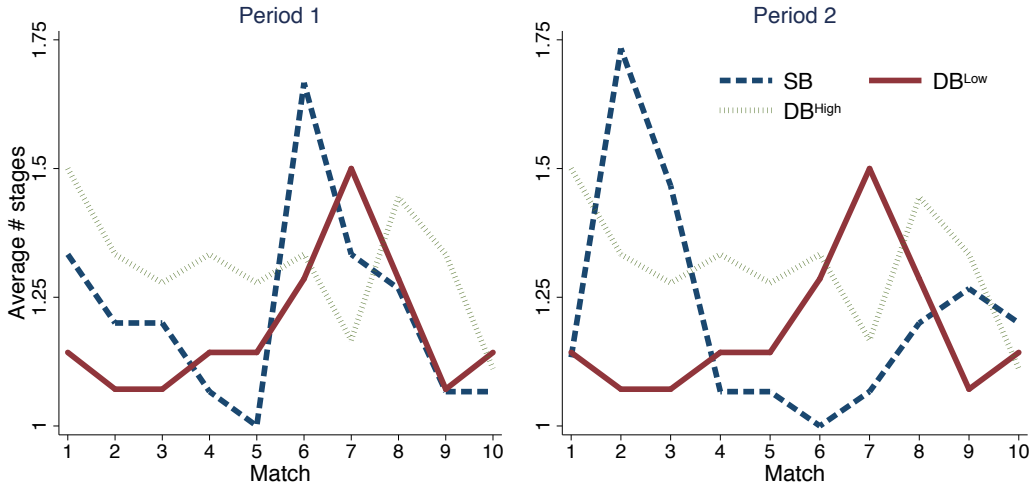

Figure 4: Average Number of Stages

C.2 Minimum Winning Coalitions

Table 10 summarizes information with respect to MWCs in our dataset. Several patterns, common to all treatments, emerge from the table. First, the proportion of MWCs is statistically higher in the second period than in the first period.[34]

Second, as subjects gain experience with the environment, they use MWCs more often. With the exception of the DB^{high} treatment (for period 1 proposals), in all cases, the number of proposals involving MWC is statistically higher when we focus on the last five matches.[35] Third, almost all subjects proposing an MWC in the first period behave likewise in the second. The corresponding

[34] We conduct a statistical test akin to Test 2 of Section 4.1. The dependent variable is a dummy variable that takes value 1 if the proposal involves an MWC. The control is a period dummy (1 for the second period) on the right-hand side. The p-values on the period dummy are: < 0.01, < 0.01 and 0.03 for the SB, DB^{low}, and DB^{high} treatments, respectively.

[35] We conduct a statistical test similar to Test 2. The dependent variable is a dummy variable that takes value 1 if the proposal involves an MWC. The control is a match dummy (1 for the matches 6-10) on the right-hand side. Focusing on period 1 proposals, the p-values on the match dummy are: < 0.01, 0.08 and 0.27 for the SB, DB^{low}, and DB^{high} treatments, respectively. The corresponding p-values for period 2 proposals are: < 0.01, < 0.01, and < 0.01.

Table 10: Proposals involving Minimum Winning Coalitions (in %)

Treatment		All Matches	Last Five
SB	Period 1	55.6	66.2
	Period 2	67.8	84.4
	Both	51.3	63.6
DB^{low}	Period 1	27.1	32.4
	Period 2	52.1	64.3
	Both	26.2	33.3
DB^{high}	Period 1	33.5	37.4
	Period 2	65.6	78.2
	Both	31.7	36.3

proportion reported in the third row of each treatment captures how many subjects proposed MWCs in both periods, and this figure closely follows the one reported for the first period.

There are also differences across treatments. First, when there is full depreciation (SB treatment), period 1 rates are, on average, higher than when compared to other treatments. In the DB treatments, only about a third of proposals involve MWCs in the first period, the lowest figures in the table. This difference almost disappears when we compare second-period rates. Second, although, in some cases, the differences are small, rates are slightly higher in the DB^{high} treatment than in the DB^{low} treatment.[36]

C.3 Period 1 investment

Figure 5 displays the histograms for Period 1 investment across treatments and for different subsets of proposals: all proposals, proposals that passed and proposals involving MWCs. Investment is heavily concentrated around the bargaining equilibrium prediction in the SB case but is relatively more spread out in DB treatments. In almost every DB case, we observe two modes for investment, one relatively close to the bargaining equilibrium and a second closer to the planner's solution. The exception is the DB^{high} case for proposals involving MWCs, in which most investment levels are relatively closer to the bargaining equilibrium.

D Additional analysis of the three hypotheses

In this section, we repeat the analysis presented in Section 4, but instead of using average investment levels, we use medians. As in Section 4, we focus on the experienced matches (last 5 matches in each experimental section). To compare median outcomes between different periods, proposal types,

[36] Again, we use a version of Test 2 for statistical analysis. The dependent variable is a dummy variable that takes value 1 if the proposal involves an MWC. The control is a treatment dummy (three pairwise comparisons in three separate regressions). When the treatment dummy takes value 0 for the SB treatment, the coefficients and p-values for the treatment dummy are: $\beta = -0.34$ and $p = 0.02$ (when comparing to DB^{low}), and $\beta = -0.28$ and $p = 0.06$ (when comparing to DB^{high}). When the treatment dummy involves DB^{low} (0) and DB^{high} (1), the coefficient is positive ($\beta = 0.06$), but not significant ($p = 0.59$).

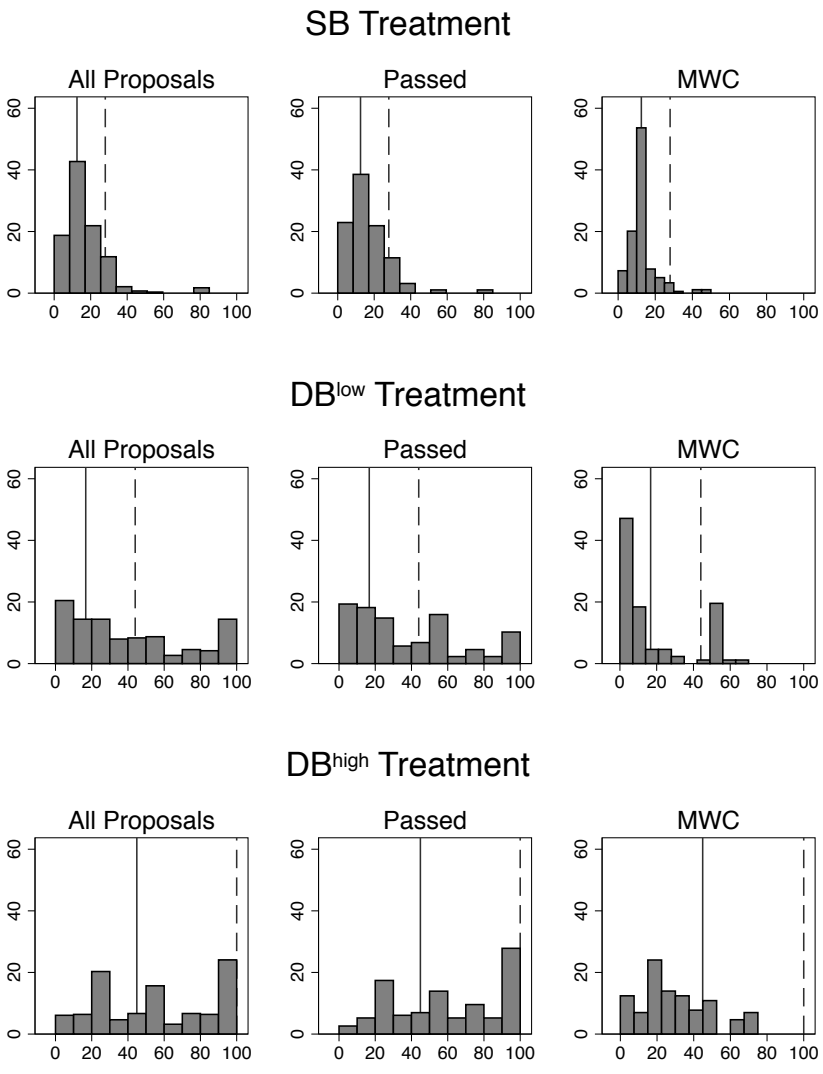

Figure 5: Distribution of Period 1 Investment as % of Budget

Notes: Solid lines depict Legislative Bargaining equilibrium, while dashed lines depict the planner's solution. Vertical axis measures the % of proposals in the corresponding bin.

and treatments, and to contrast them with theoretical predictions, we use quantile regressions and cluster standard errors at the session level. Depending on the question under consideration, we use the same three specifications of regressions outlined in Section 4.1.

D.1 Horizon Effect Hypothesis

Table 11 reports median investment levels in each treatment and in each period of the game. Consistent with our prediction, public investment is smaller in period 2 than in period 1 in both dynamic treatments. Regression analysis confirms this result. We perform Test 3 using three samples: all proposals (First Sample), proposals that satisfy the MWC constraint in both periods (Second Sample), and proposals that satisfy the MWC constraint in at least one period (Third Sample). In both dynamic treatments, we find that the difference is statistically significant with p-values below 0.01 for all three samples. In the static treatment, we observe no difference between median investment levels across periods. In fact, for this treatment, over half of the sample that uses all proposals involves a difference between median period 1 and period 2 investments of exactly zero. When we restrict the analysis to MWC proposals, the difference is exactly zero for almost three quarters of the sample. Thus, we conclude that our data support the horizon-effect hypothesis using median investment levels.

Table 11: Public Investments as % of Budget and Inefficiencies in Experienced Matches (medians)

	Static Barg SB				Dynamic Barg with $\delta = 0.2$ DB^{low}						Dynamic Barg with $\delta = 0.8$ DB^{high}					
	$I_t^{P^*}$	$I_t^{L^*}$	I_t	Δ_t^S	$I_t^{P^*}$	$I_t^{L^*}$	I_t	Δ_t^T	Δ_t^D	$\frac{\Delta_t^D}{\Delta_t^T}$	$I_t^{P^*}$	$I_t^{L^*}$	I_t	Δ_t^T	Δ_t^D	$\frac{\Delta_t^D}{\Delta_t^T}$
Period $t = 1$																
Theory	28.0	12.5		15.5	44.0	16.7		27.3	11.8	**0.43**	100	44.9		55.1	39.6	**0.72**
Observed																
all			10.0	18.0			31.8	12.2	-5.8	–			55.0	45.0	27.0	**0.60**
MWC			10.0	18.0			10.0	34.0	16.0	**0.47**			25.0	75.0	57.0	**0.76**
Period $t = 2$																
Theory	28.0	12.5			19.4	9.2					0.0	0.0				
Observed																
all			10.0				5.0						0.0			
MWC			10.0				0.0						0.0			

Notes: $I_t^{P^*}$ is the theoretically predicted efficient level of public investment in period t. $I_t^{L^*}$ is the theoretically predicted level of public investment in the legislative bargaining solution in period t. I_t is the median investment level as % of Budget for each period in each treatment. Δ^S denotes Static Inefficiency. Δ^T denotes Total Inefficiencies. Δ^D denotes Dynamic Inefficiency. Total, static and dynamic inefficiencies are computed using investment levels reported in this table as described in Section 2.3. For each period t, category *all* includes all observed proposals in period t, while category *MWC* includes period t proposals that satisfy the MWC restriction as defined in Section 4.1.

D.2 Investment Hypothesis

The test of the investment hypothesis involves three pairwise comparisons: $I_1^{\text{SB}} < I_1^{\text{DB}^{\text{low}}}$, $I_1^{\text{SB}} < I_1^{\text{DB}^{\text{high}}}$, and $I_1^{\text{DB}^{\text{low}}} < I_1^{\text{DB}^{\text{high}}}$. We test these three inequalities for two categories of proposals: all proposals and MWC proposals, separately (Test 2). When considering all submitted proposals, the p-values for the estimated treatment indicator are $p < 0.01$ for I_1^{SB} versus $I_1^{\text{DB}^{\text{low}}}$, $p < 0.01$ for I_1^{SB} versus $I_1^{\text{DB}^{\text{high}}}$, and $p = 0.05$ for $I_1^{\text{DB}^{\text{low}}}$ versus $I_1^{\text{DB}^{\text{high}}}$. For MWC proposals, we get no statistical significance in the comparison between I_1^{SB} and $I_1^{\text{DB}^{\text{low}}}$ with $p = 1.00$, $p = 0.03$ for I_1^{SB} versus $I_1^{\text{DB}^{\text{high}}}$, and $p = 0.09$ for $I_1^{\text{DB}^{\text{low}}}$ versus $I_1^{\text{DB}^{\text{high}}}$.

In addition, we compare public investments with the theoretically predicted ones. Table 12 compares median investment levels in each treatment with those predicted by the planner and legislative bargaining solutions. The findings are largely in line with the reports for the mean discussed in the main text (Section 4.3). For example, in almost all cases, the null hypothesis that the median choice is equal to the planner's is rejected. As noted for the means, an exception is the period 1 investment in DB^{low} when using all proposals. There is a difference between means and medians in the case of period 2 investment in DB^{high}. The means (in Table 4) are reported to be significantly different from the theory, which prescribes -for the planner and the legislative bargaining equilibrium- an investment of 0. However, almost 75% of the observations are exactly at 0 (either looking at all proposals or at MWC) and the tests in Table 12 report that there is not a significant difference between the median and the theory.

Table 12: Statistical Tests Comparing Investment Levels in Experienced Matches with Planner and Legislative Bargaining Solutions, p-values

	All proposals					
	Period 1			Period 2		
	SB	DB^{low}	DB^{high}	SB	DB^{low}	DB^{high}
$H0$: $I_t = I_t^{P^*}$	<0.01	0.16	<0.01	<0.01	<0.01	1.00
$H0$: $I_t = I_t^{L^*}$	0.18	0.05	0.19	0.01	0.38	1.00
	MWC proposals					
	Period 1			Period 2		
	SB	DB^{low}	DB^{high}	SB	DB^{low}	DB^{high}
$H0$: $I_t = I_t^{P^*}$	<0.01	<0.01	<0.01	<0.01	<0.01	1.00
$H0$: $I_t = I_t^{L^*}$	<0.01	0.32	<0.01	0.04	<0.01	1.00

Notes: $I_t^{P^*}$ denotes the theoretically predicted efficient level of public investment in period t, while $I_t^{L^*}$ denotes the theoretically predicted level of public investment in legislative bargaining solution in period t. For each treatment, period and proposal category, we use Test 1 described in Section 4.1 with modification to quantile regressions to compare the observed levels of public investment with those predicted by the theory - namely, $I_t^{P^*}$ and $I_t^{L^*}$.

D.3 Dynamic Underprovision Hypothesis

Finally, Table 11 presents the decomposition of period 1 public investment into the static and dynamic components, which we use to examine the dynamic underprovision hypothesis. All results are in line with the findings reported for the means. Focusing on MWC proposals first, we find evidence to support all aspects of the hypothesis. First, dynamic inefficiencies in both DB^{low} and DB^{high} are positive and significantly different than zero, with $p < 0.01$ in both treatments. Second, dynamic inefficiencies in DB^{high} are significantly higher than in DB^{low} ($p < 0.01$).[37] When we consider all proposals, we still find evidence of higher dynamic inefficiencies in DB^{high} than in DB^{low} ($p < 0.01$) and that dynamic inefficiencies in DB^{high} are positive and significantly different than zero ($p < 0.01$). However, there is no evidence of dynamic inefficiencies in DB^{low} ($p = 0.45$).

E Further Analysis at the Individual Level

E.1 Distribution of Investment in Period 1

Figure 6 displays the distribution of period 1 investment by treatment and by strategy type for the last five matches of each session.

Table 13 reports median investments by strategy type, period and treatment and complements Table 6 in the text that reports mean levels.

Table 13: Investment as % of Budget in Experienced Matches

Treatment	Type MM			Type EM			Type EE		
	theory	median	p-value	theory	median	p-value	theory	median	p-value
Period 1									
SB	12.5	10.0	< 0.01	28.0	25.0	< 0.01	28.0	25.0	< 0.01
DB^{low}	16.7	10.0	0.33	44.0	36.2	0.68	44.0	40.0	0.74
DB^{high}	44.9	25.0	< 0.01	100	85.0	0.03	100	85.0	< 0.01
Period 2									
SB	12.5	10.0	0.09	12.5	10.0	0.57	28.0	25.0	0.07
DB^{low}	9.2	0.0	< 0.01	9.2	0.0	< 0.01	19.3	25.0	0.18
DB^{high}	0.0	0.0	†	0.0	0.0	†	0.0	25.0	0.16

Notes: For each type of proposal and each treatment, we use quantile regressions and report p-value from a test in which the null hypothesis is that the estimate equals the theoretically predicted one. Standard errors are clustered by session. † In these cases, approximately 75% of the observations involve an actual investment of 0, and there is not enough variability in the data to report a test.

E.2 Distribution of Private Allocations

Private allocations capture how the budget remaining after public investment is divided among committee members, and Table 14 summarizes the relevant information. For each treatment, there are two statistics: the allocation to the proposer (x^{Pr}) and the allocation to a non-proposer in the

[37] To compute these p-values, we use a quantile regression and the specification of Test 2, where the dependent variable is the difference between the planner's period 1 investment and actual period 1 investment.

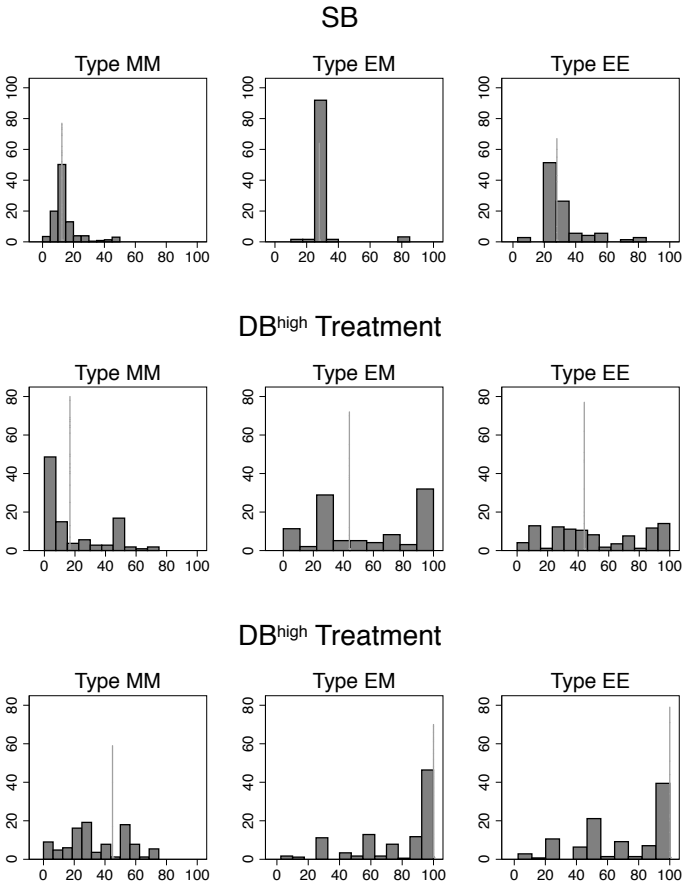

Figure 6: Distribution of Period 1 Investment as % of Budget

Notes: Lines depict the theory's predictions

Table 14: Private Allocations as % of Budget

Treatment		Type MM				Type EM				Type EE			
		Period 1		Period 2		Period 1		Period 2		Period 1		Period 2	
		Theory	Med.	Theory	Med	Theory	Med	Theory	Med	Theory	Med	Theory	Med
SB	x^{Pr}	58.4	45.0	58.4	45.0	24.0	25.0	58.4	45.0	24.0	25.0	24.0	25.0
	x^{C}	29.1	42.5	29.1	42.5	24.0	25.0	29.1	45.0	24.0	25.0	24.0	25.0
DB^{low}	x^{Pr}	55.6	45.0	60.1	50.0	18.7	16.5	60.1	50.0	18.7	20.0	26.9	25.0
	x^{C}	27.8	45.0	30.3	49.0	18.7	15.0	30.3	50.0	18.7	20.0	26.9	25.0
DB^{high}	x^{Pr}	36.8	35.0	66.7	49.5	0	5.0	66.7	50.0	0	10.0	33.3	23.5
	x^{C}	18.4	35.0	33.3	45.0	0	5.0	33.3	50.0	0	10.0	33.3	23.5

Notes: Column Theory depicts predicted values. Column Med states observed medians. x^{Pr} is allocation to a proposer, x^{C} is allocation to a non-proposer who is a coalition member

coalition (x^C).[38] The 'theory' values presented in the table correspond to the bargaining equilibrium for Type MM proposals and to the identified theoretical candidate within each type in other cases.

Proposals involving MWCs should reflect proposer power: allocations should theoretically double that of the non-proposer coalition member. To test for the presence of proposal power, we construct the ratio between the allocation to the proposer and the non-proposer in the coalition (x^{Pr}/x^C). We then use a random effects model and regress that ratio on a constant (clustering by session). Under the null hypothesis of no proposal power, the coefficient estimated on the constant is not different than one. We can reject the null only in the case of Type MM proposals in the SB treatment. In that case, there is a small presence of proposal power at levels comparable to previous reports in the literature (see, for example, Fréchette et al. (2003)). There is no evidence of proposal power in DB treatments.

E.2.1 Strategy Types as the session evolves

Table 8 in the main text of the paper describes one way to look at how subjects transition among strategies. Here, we present an alternative perspective according to which we consider the proportion of subjects who use only one strategy type or more during a session. Table 15 shows for each treatment, the proportion of subjects who use only one type, two types or all types. Slightly more than 20% of subjects across treatments use all three strategy types. Most subjects use two strategy types, with the groups 'Type MM and Type EM' and 'Type EM and Type EE' being the most common.

E.2.2 Strategies of type MM and EM: Payoff Comparison

Given that strategies type MM and type EM persist to the end of the session in both DB treatments, we inspect further differences in payoffs between them. To do this, we assume the place of a period 1

[38] In proposals satisfying definition A, x^C is computed for each proposal as the average to both coalition members other than the proposer.

Table 15: Proportion of subjects who use one, two, or all strategy types

	Treatment		
	SB	DB^{low}	DB^{high}
Only Type MM	15.6%	4.8%	9.3%
Only Type EM	0.0%	0.0%	0.0%
Only Type EE	0.0%	9.5%	3.7%
Only Type MM or Type EM	31.1%	26.2%	29.6%
Only Type MM or Type EE	15.6%	9.5%	3.7%
Only Type EM or Type EE	15.5%	28.6%	29.6%
All Types$^{\times}$	22.2%	21.4%	24.1%

Notes: $^{\times}$ All types involve subjects who used Type MM, Type EE and Type EM at some point in the experiment. It is possible that some of these subjects also used strategies classified as "Other."

Table 16: Period 1 Payoff Levels: Accepted Proposals

Treatment	Mean Period 1 Payoffs to proposers			Additional Period 2
	Type MM	Type EM	Type EE	Payoff if A1=1
SB	112.6	85.5	85.4	13.6
DB^{low}	107.4	80.1	81.7	15.2
DB^{high}	105.5	76.0	78.2	14.5

proposer and consider her alternatives. That is, we focus on subjects who were proposers in period 1 and compare earnings depending on the value of A1 (see Section 4.4 for a definition).

For type EM proposals to be attractive, there should be a period 2 reward. Thus, we look at period 2 payoffs of period 1 proposers, $u_2 = x_2^{P1} + f(g_2)$, and estimate $u_2 = \alpha_0 + \alpha_1 A1 + \epsilon$. A positive estimate for α_1 would suggest that using a strategy type EM in period 1 increases payoffs in period 2. The last column of Table 16 presents the estimates for α_1, which are significant at the 5% level for all treatments. Quantitatively, additional payoffs imply an extra 15% in the second period. The extra gain in period 2 comes at the cost of a lower period 1 payoff: in comparison to the bargaining solution, a proposal closer to the planner's implies higher payoffs for the committee as a whole, but lower payoffs for the proposer. Table 16 shows mean period 1 payoffs to the proposer, depending on proposal type. There are negligible differences between type EM and EE proposals, but such proposals lag compared to type MM: on average, they represent between 72% and 76% of type MM payoffs, depending on treatment. Yet, if we add the additional period 2 payoff, the differences shrink: a proposal of type EM involves between 86% and 89% of the payoffs to a type MM proposal.

E.2.3 Type EM strategies: Punishments and Rewards estimates

Table 17 provides the estimates used for our computations in Table 9.

E.2.4 Determinants of Voting

Now, we study the features that determine whether or not a proposal passes. This exercise can also help explain why some strategy types are selected. If, for example, a proposal type EM or a

Table 17: Type EM strategies: Punishment and Rewards Random Effects Estimates

	SB		DB^{low}		DB^{high}	
Variable	Coeff.	Rob. Sd. Err.	Coeff.	Rob. Sd. Err.	Coeff.	Rob. Sd. Err.
Constant	20.50***	(1.26)	19.52***	(2.35)	22.29**	(1.25)
$A1$	2.60***	(0.98)	1.79	(2.89)	-2.59	(1.31)
$EM_{strategy}$	-6.36	(4.56)	-9.07***	(2.63)	-2.74***	(3.08)
$A1 \times EM_{strategy}$	4.92	(13.29)	15.54**	(7.97)	12.09***	(4.07)
Number of Observations	300		280		360	

Notes: * indicates significance at 10%, ** indicates significance at 5%, *** indicates significance at 1%.

Table 18: Period 1 Voting: Random Effects Probit (Marginal Effects)

	SB		DB^{low}		DB^{high}	
Variable	Coefficient	Rob. Std. Err.	Coefficient	Rob. Std. Err.	Coefficient	Rob. Std. Err.
Investment Payoff	0.02*	(0.01)	0.03***	(0.01)	0.04***	(0.01)
Private Allocation	0.06***	(0.07)	0.05***	(0.01)	0.05***	(0.01)
Proposer Private Allocation	-0.02***	(0.01)	-0.02***	(0.01)	-0.03***	(0.01)
MWC	0.61*	(0.34)	0.23	(0.37)	0.05	(0.25)
Equal Split	0.12	(0.21)	0.25	(0.27)	0.23	(0.23)
Number of Observations	450		420		540	

Notes: * indicates significance at 10%, ** indicates significance at 5%, *** indicates significance at 1%. Only the first stage of proposals for each round is considered. Investment Payoff $= 5 \cdot \text{investment}^{0.5}$.

type EE is more likely to be voted up in period 1, then it may be more likely to be selected vis a vis a proposal involving an MWC. We focus on stage 1, period 1 proposals that were submitted for voting, and we estimate

$$vote_{im} = 1\left\{\beta_0 + \beta_1\left(f(I_1)_{im}\right) + \beta_2 x_{1,im} + \beta_3 x_{1,im}^{Pr} + \beta_4 E_{im} + \beta_5 MWC_{im} + \alpha_i + \nu_{im} \geq 0\right\},$$

where $vote_{im}$ is a dummy variable that takes value 1 if subject i approves the proposal in match m, and $1\{\cdot\}$ is an indicator function that takes value one if the left-hand side of the inequality inside the braces is greater than or equal to zero, and the value zero otherwise. Explanatory variables include the investment payoff ($f(I_1)$), the private period 1 allocation (x_1), the allocation to the proposer (x_1^{Pr}) and dummy variables for whether the proposal involves an Equal Split (E) or an MWC. The equation is estimated using a random effects probit, with a one-way subject error component for all rounds. Table 18 reports the corresponding marginal effects.

The coefficients provide evidence that there is a positive effect of investment payoff and private allocations on the probability of voting positively for a proposal and a negative effect from higher private allocations to the proposer. This is consistent with previous estimates in the literature (see Fréchette et al. (2003, 2005)). Estimates on the Equal Split and MWC dummies are positive but not significant in the DB treatments. This suggests that there is not a particular gain in terms of higher likelihood of a proposal passing because it involves an Equal Split or an MWC.