Who Cares About Equity? A Social Norm Revisited

Bernhard Kittel, University of Vienna

Fabian Paetzel, University of Bremen

Stefan Traub, University of Bremen

universität wien

Universität Bremen

Two Opposing Views on Distributive Justice

"Wealth for everyone"

"Work must pay off"
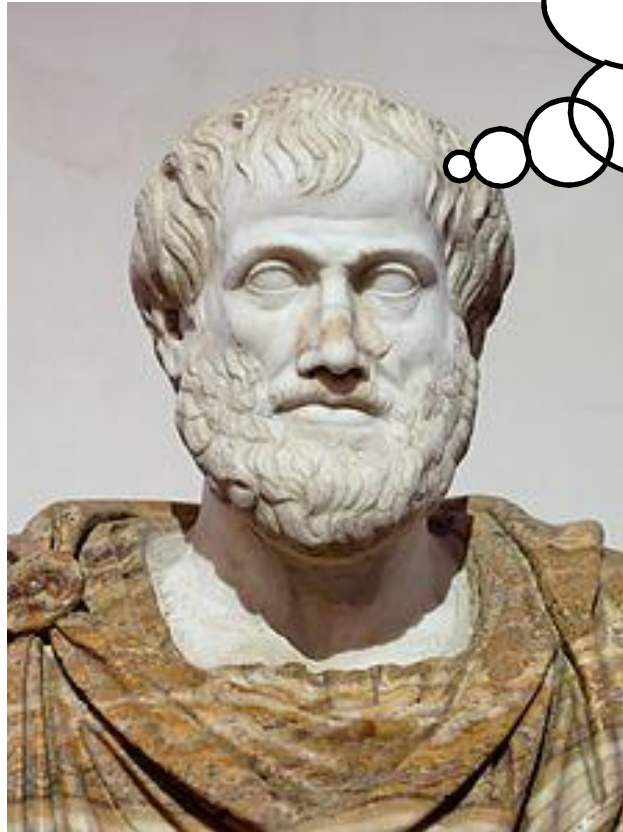
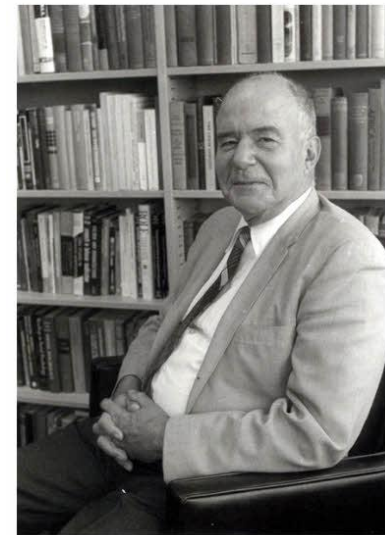Election Campaigns in Germany 2009

Motivation

THIS, THEN, IS WHAT THE JUST IS, THE PROPORTIONAL; WHAT IS UNJUST VIOLATES THE PROPORTION

NICOMACHEAN ETHICS (ARISTOTLE, 1999, P. 76)

George C. Homans (Social Behavior, 1961) "Equity [in terms of proportionality] is a social norm"

The Equity Principle Requires...

☐ A yardstick of distribution (effort, need, ...) and

☐ An agreeable standard of comparison (gross return, net return,...)

☐ Selten (1987): "Once the equity standard is known, the application of the equity principle is trivial...

☐ ... It is possible that an equity standard is an assessment of the power situation rather than an expression of justice"

   ■ Principle of distributive appropriateness rather than justice

Related Literature

- Survey on experimental literature: Gaertner and Schokkaert (2011)
- Real-effort experiments: Hoffman and Spitzer (1985); Gächter and Riedl (2005)
- Surveys on Preplay communication/cheap talk: Farell and Rabin (1996), Crawford (1998), and Croson et al. (2003)
- Rabin (1994): "Negotiated rationalizability"; Costa-Gomes (2002)
- Crawford (1998): reassurance, reduction of uncertainty
- Roth (1985, 1987) : cheap talk focuses players' attention on small number of fairness norms in unstructured bargaining experiments
- Goeree and Yariv (2011): communication and collective decision making, institutions (voting rules) matter
- Balafoutas et al. (2013): linear public-goods game with heterogenous endowments, similar in focus, equity-efficiency trade off

Game

- ☐ "Pie" to be redistributed among three group members
  - ◼ Right-skewed: 1 rich, 2 poor
  - ◼ Symmetric: 1 rich, 1 middle, 1 poor
- ☐ Stage 1: Initial endowments either earned in real-effort task (quiz) (or randomly in one control treatment)
- ☐ Stage 2: Preplay communication (computerized chat)
- ☐ Stage 3: Vote on tax rate
- ☐ Results
  - ◼ Agreement: Application of tax rate and payoff of net endowments
  - ◼ Default: Discount rate of 50% and payoff of discounted initial endowments
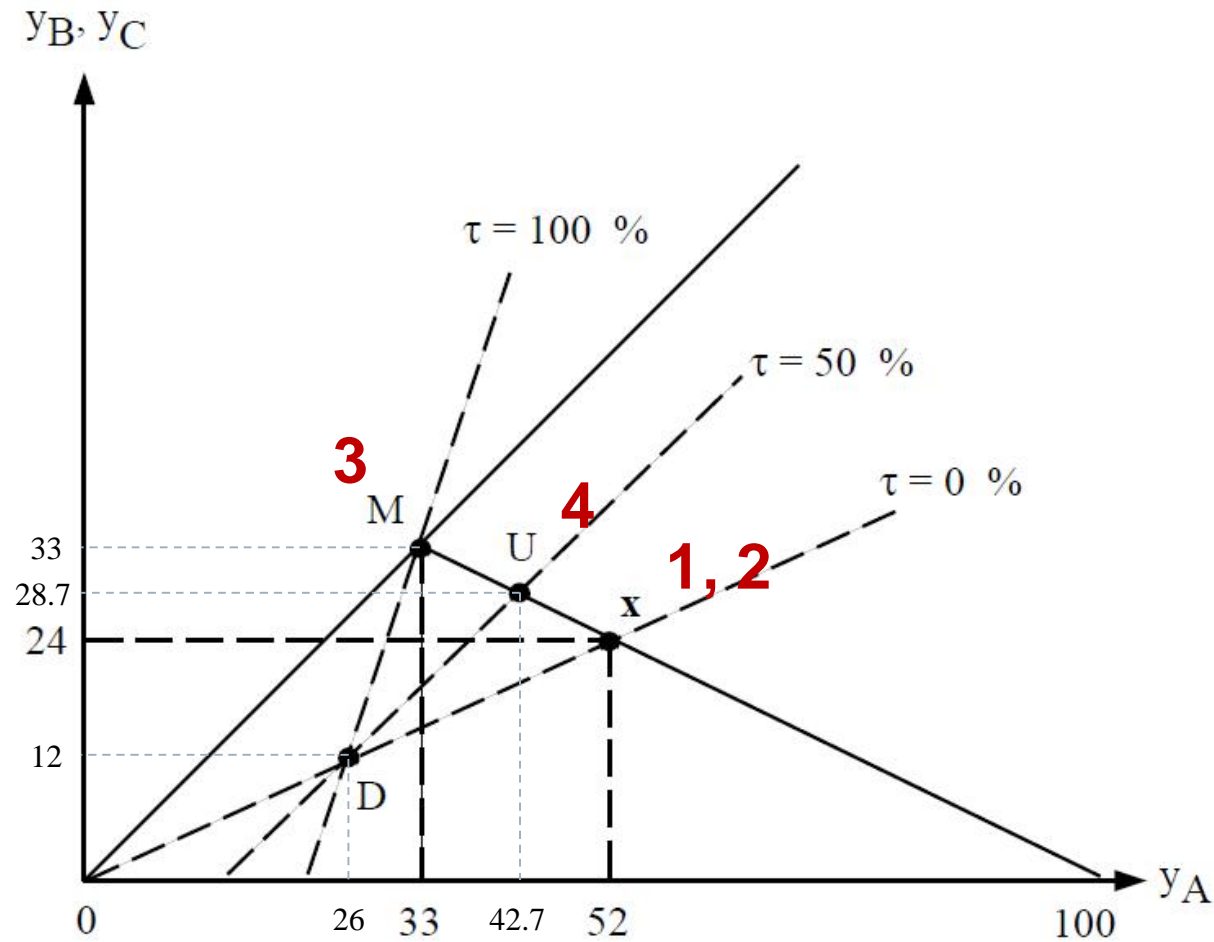 - ◼ Every agreement is a Nash equilibrium

Hypotheses

☐ Four possible equity standards (Selten 1987):

1. Effort-proportional split with respect to gross payoff
2. Effort-proportional split with respect to surplus (= gross payoff – effort)
3. Equal split of gross payoff
4. Equal split of surplus

☐ Result in three focal points

Hypotheses

Figure 1: **Equity Standards.** The figure shows three focal points **x**, **U**, **M** and their corresponding group tax rates of a redistribution game with right-skewed distribution of initial Token endowments (52, 24, 24). $\overline{Mx}$ represents the bargaining set as well as the Pareto frontier. **D** marks the default option.

Hypotheses

H 1 (Majority Rule) *(i) Under majority rule and if the distribution of claims is right-skewed, BC and ABC coalitions prevail and agree on a tax rate of 100 %. (ii) If the initial distribution of claims is symmetric, some AB coalitions are formed and the average tax rate is between 0 % and 100 %. (iii) The expected default rate is zero.*

=► Point M, equal split of gross incomes/difference principle/antiproportional

H 2 (Unanimity Rule) *Under unanimity rule (i) the tax rate is 50 % and (ii) independent from the shape of the distribution of endowments. (iii) The default rate is higher than under majority rule.*

=► Point U, equal split of cooperation surplus

=► Point x, (effort) proportional split never occurs

Additional Hypotheses

AH 1 (Majority-Communication) *(i) Under majority rule the tax rate is higher if players can only exchange numbers (instead of arguments). (ii) The default rate is higher if free communication is disallowed.*

AH 2 (Unanimity-Communication) *(i) Under unanimity rule the tax rate is still 50 % if players can only exchange numbers (instead of arguments). (ii) The default rate is higher if free communication is disallowed.*

AH 3 (Majority-Validity of Claims) *(i) Under majority rule the tax rate is higher if players' initial endowments are based on chance (instead of real effort). (ii) The default rate is generally lower if endowments are based on chance.*

AH 4 (Unanimity-Validity of Claims) *(ii) Under unanimity rule the tax rate is still 50 % if players' initial endowments are based on chance (instead of real effort). (ii) The default rate is generally lower if endowments are based on chance.*

The Experiment

- University of Oldenburg and University of Bremen
- z-Tree (Fischbacher 2007)
- 216 subjects, 8 Rounds per subject (1728 observations)
- Between-subject variation:
    - Endowments: real effort vs. random
    - Preplay communication: open vs. restricted chat
    - Quorum: majority vs. Unanimity
- Within-subject variation
- Mean (high, low)
- Variance (high, low)
- Skewness (right, symmetric)

The Experiment

Table 1: Distributions of Initial Token Endowments

No.	Rank A	B	C	Mean	Variance	Skewness	A's Acceptable Tax Rates[a]
1	67	33	0	l (33)	h (0.8)	s (0)	[0,99]
2	133	67	0	h (67)	h (0.8)	s (0)	[0,100]
3	50	33	17	l (33)	l (0.4)	s (0)	[0,100]
4	100	67	33	h (67)	l (0.4)	s (0)	[0,100]
5	72	14	14	l (33)	h (0.8)	r (0.7)	[0,93]
6	144	28	28	h (67)	h (0.8)	r (0.7)	[0,93]
7	52	24	24	l (33)	l (0.4)	r (0.7)	[0,100]
8	104	48	48	h (67)	l (0.4)	r (0.7)	[0,100]

Table notes. [a]Tax rate for which $y_A \geq x_A/2$.

The Experiment

Results: MAJORITY Treatment – Coalition Type & Tax Level

			Focal Point and Tax Level					
	x		**U**				**M**	
Coalition	0 %	1-24 %	25-49 %	50 %	51-75 %	76-99 %	100 %	*sum*
			right-skewed					
AB	0	0	2	0	0	1	0	3
AC	0	0	0	1	0	0	0	1
BC	0	0	0	1	0	1	16	18
ABC	0	0	2	0	5	5	13	25
all	0	0	4	2	5	7	29	47
			Symmetric					
AB	1	6	3	3	1	0	0	14
AC	0	0	0	0	0	0	0	0
BC	0	0	1	1	2	1	4	9
ABC	0	4	9	3	2	0	4	22
all	1	10	13	7	5	1	8	45

Table notes. 48 group observations in each panel. Defaults with right-skewed (symmetric) initial token distribution: 1 (3). The table gives the absolute number of coalitions that agree on a tax rate within the given bracket.

Results: MAJORITY Treatment
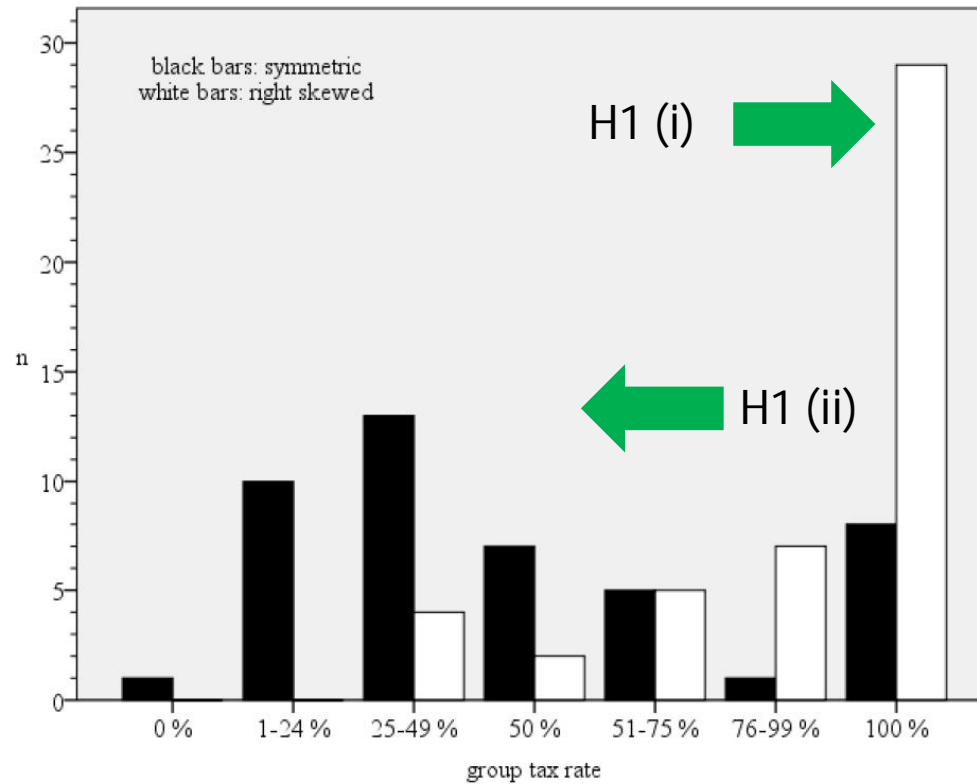

Figure 2: MAJORITY Treatment: Distribution of Tax Levels. The figure shows the absolute number of groups implementing the respective tax rate. The totals are 47 (45) with right-skewed (symmetric) distribution of initial token endowments.

Results: MAJORITY Treatment

Table 3: Results of MAJORITY Treatment

Coalition	right-skewed				Symmetric			
	$\overline{\tau}^{\star}_{MR}$	s.e.	$\widetilde{\tau}^{\star}_{MR}$	r_{MR}	$\overline{\tau}^{\star}_{MS}$	s.e.	$\widetilde{\tau}^{\star}_{MS}$	r_{MS}
AB	55.0	(18.0)	45	6.4	24.8	(5.6)	22.5	31.1
AC	50.0	(.)	50	2.1	—	—	—	0.0
BC	96.7	(2.8)	100	38.3	75.6	(8.8)	80.0	20.0
ABC	83.7	(4.4)	100	53.2	48.7	(6.4)	42.5	48.9
mean (all)	86.1	(3.2)	100	97.9	46.6	(4.7)	45	93.8
default	—	—	—	2.1	—	—	—-	6.6

T-Tests: $p(\overline{\tau}^{\star}_{MR} = 100) = 0.000$ (one-tailed). $p(\overline{\tau}^{\star}_{MR}[BC] = 100) = 0.125$ (one-tailed). $p(\overline{\tau}^{\star}_{MR}[ABC] = 100) = 0.001$ (one-tailed). $p(\overline{\tau}^{\star}_{MR}[BC] = \overline{\tau}^{\star}_{MR}[ABC]) = 0.018$. $p(\overline{\tau}^{\star}_{MS} = 100) = 0.000$ (one-tailed). $p(\overline{\tau}^{\star}_{MS}[BC] = 100) = 0.012$ (one-tailed). $p(\overline{\tau}^{\star}_{MS}[ABC] = 100) = 0.000$ (one-tailed). $p(\overline{\tau}^{\star}_{MS}[BC] = \overline{\tau}^{\star}_{MS}[ABC]) = 0.025$. $p(\overline{\tau}^{\star}_{MR} = \overline{\tau}^{\star}_{MS}) = 0.000$.

χ^2-Tests: $p(r_{MR}[all] = r_{MS}[all]) = 0.010$. $p(r_{MR}[d,a] = r_{MS}[d,a]) = 0.307$.

KS-Tests: $p(F_{t_{MR}}) = \Phi) = 0.000$.

Binomial-Tests: $p_{MR[BC,ABC]}(\#(\tau = 100) \geq 29) = 0.032$.

Table notes. $n_{MR} = n_{MS} = 48$ group observations. $\overline{\tau}$ = mean tax rate (%); s.e. = standard error of the mean; $\tilde{\tau}$ = median tax rate (%); r = relative number of groups (%); KS = Kolmogorov-Smirnov test on normal distribution; M = majority; R = right-skewed; S = symmetric; all = all coalition types; d = default; a = agreement.

Results: UNANIMITY Treatment

Figure 3: UNANIMITY Treatment: Distribution of Tax Levels. The figure shows the absolute number of groups implementing the respective tax rate. The totals are 41 (44) with right-skewed (symmetric) distribution of initial token endowments.

Results: UNANIMITY Treatment

Table 5: Results of UNANIMITY Treatment

Coalition	right-skewed				Symmetric			
	$\overline{\tau}_{UR}^{\star}$	s.e.	$\widetilde{\tau}_{UR}^{\star}$	r_{UR}	$\overline{\tau}_{US}^{\star}$	s.e.	$\widetilde{\tau}_{US}^{\star}$	r_{US}
mean (ABC)	59.7	(2.4)	57.5	91.7	56.0	(2.8)	57	85.4
default	—	—	—	8.7	—	—	—	14.6

T-Tests: $p(\overline{\tau}_{UR}^{\star}[ABC] = 50) = 0.000.$ $p(\overline{\tau}_{US}^{\star}[ABC] = 50) = 0.041.$
$p(\overline{\tau}_{UR}^{\star}[ABC] = \overline{\tau}_{US}^{\star}[ABC]) = 0.324.$

χ^2-Tests: $p(r_{UR}[d,a] = r_{US}[d,a]) = 0.336.$

Table notes. $n_{UR} = n_{US} = 48$ group observations. $\overline{\tau}$ = mean tax rate (%);
s.e. = standard error of the mean; $\widetilde{\tau}$ = median tax rate (%); r = relative
number of groups (%); U = unanimity; R = right-skewed; S = symmetric; d =
default; a = agreement.

Results: Summary

- MAJORITY: (rs) egalitarian [M]; (sy) shift towards equal sharing of surplus [M-U]
- UNANIMITY: (rs) = (sy): equal sharing of surplus [U]

- Communication: NUMBERS VS. OPEN CHAT
  => defaults decrease with OPEN CHAT condition

- Endowments: RANDOM VS. EARNED
  => higher tax rates
  => even with UNANIMITY

- Proportionality with Respect to Effort is almost never observed

- Equal Sharing of Surplus [U] appreciates cooperation rather than effort

Conclusion

- ☐ Who cares about equity?

  - ■ Many groups (> 90%) reached a Pareto efficient Nash equilibrium
  - ■ Dominating equity principles:

    [M] equal sharing of gross surplus

    [U] equal sharing of net surplus

- ☐ However, equal sharing

  - ► of gross receipts is anti-proportional to effort (egalitarian)

  - ► of surplus appreciates cooperation rather than effort

- ☐ Equity in terms of proportionality is not pursued

- ☐ Institutional rules and a strong middle class protect the more prosperous from total expropriation

Who Cares About Equity? A Social Norm Revisited

Bernhard Kittel, University of Vienna

Fabian Paetzel, University of Bremen

Stefan Traub, University of Bremen

universität wien

Universität Bremen

Tables

Table 6: MAJORITY V.S. UNANIMITY Treatment

Coalition	right-skewed				Symmetric			
	$\overline{\tau}^{\star}_{jR}$	s.e.	$\widetilde{\tau}^{\star}_{jR}$	r_{jR}	$\overline{\tau}^{\star}_{jS}$	s.e.	$\widetilde{\tau}^{\star}_{jS}$	r_{jS}
MAJORITY ($j = M$)								
ABC	83.7	(4.4)	100	53.2	48.7	(6.4)	42.5	48.9
mean (all)	86.1	(3.2)	100	97.9	46.6	(4.7)	45	93.8
default	—	—	—	2.1	—	—	—-	6.6
UNANIMITY ($j = U$)								
mean (ABC)	59.7	(2.4)	57.5	91.7	56.0	(2.8)	57	85.4
default	—	—	—	8.7	—	—	—-	14.6

T-Tests: $p(\overline{\tau}^{\star}_{MR} = \overline{\tau}^{\star}_{UR}) = 0.000.$ $p(\overline{\tau}^{\star}_{MR}[ABC] = \overline{\tau}^{\star}_{UR}[ABC]) = 0.000.$
$p(\overline{\tau}^{\star}_{MS} = \overline{\tau}^{\star}_{US}) = 0.094.$ $p(\overline{\tau}^{\star}_{MS}[ABC] = \overline{\tau}^{\star}_{US}[ABC]) = 0.303.$

χ^2-Tests: $p(r_{MR}[d,a] = r_{UR}[d,a]) = 0.168.$ $p(r_{MS}[d,a] = r_{US}[d,a]) = 0.181.$
$p(r_M[d,a] = r_U[d,a]) = 0.060$

Table notes. $n_{jk} = 48$ group observations ($j \in \{M,U\}, k \in \{R,S\}$). $\overline{\tau} =$ mean tax rate (%); s.e. = standard error of the mean; $\tilde{\tau} =$ median tax rate (%); $r =$ relative number of groups (%); $M =$ majority; $U =$ unanimity; $R =$ right-skewed; $S =$ symmetric; $d =$ default; $a =$ agreement.

Tables

Table 7: Results of Numbers-Majority treatment

Coalition	right-skewed				Symmetric			
	$\overline{\tau}^\star_{NMR}$	s.e.	$\widetilde{\tau}^\star_{NMR}$	r_{NMR}	$\overline{\tau}^\star_{NMS}$	s.e.	$\widetilde{\tau}^\star_{NMS}$	r_{NMS}
AB	80.0	(20.0)	80	4.2	40.0	(9.4)	40	22.9
AC	72.5	(17.5)	72.5	4.2	64.7	(11.6)	72	6.3
BC	97.4	(1.5)	100	45.8	90.0	(6.3)	100	12.5
ABC	91.9	(3.0)	100	45.8	48.0	(5.9)	47.5	58.3
mean (all)	93.1	(1.9)	100	100	52.4	(4.7)	50	100
default	—	—	—	0.0	—	—	—-	0.0

T-Tests: $p(\overline{\tau}^\star_{NMR} = 100) = 0.001$ (one-tailed). $p(\overline{\tau}^\star_{NMR}[BC] = 100) = 0.045$ (one-tailed). $p(\overline{\tau}^\star_{NMS} = 100) = 0.000$ (one-tailed). $p(\overline{\tau}^\star_{NMS}[BC] = 100) = 0.088$ (one-tailed).
KS-Tests: $p(F_{t_{MR}}) = \Phi) = 0.000$.
Binomial-Tests: $p_{MR}(\#(\tau = 100) \geq 34) = 0.006$.

Comparison with Majority, see Table 3.

T-Tests: $p(\overline{\tau}^\star_{NMR} = \overline{\tau}^\star_{MR}) = 0.067$. $p(\overline{\tau}^\star_{NMS} = \overline{\tau}^\star_{MS}) = 0.384$.
χ^2-Tests: $p(r_{NMR}[d,a] = r_{MR}[d,a]) = 0.315$. $p(r_{NMS}[d,a] = r_{MS}[d,a]) = 0.078$. $p(r_{NM}[d, a] = r_M[d, a]) = 0.043$. $p(r_{NMR}[all] = r_{MR}[all]) = 0.774$. $p(r_{NMS}[all] = r_{MS}[all]) = 0.205$. $p(r_{NM}[all] = r_M[all]) = 0.358$.

Table notes. $n_{NMR} = n_{NMS} = 48$ group observations. $\overline{\tau}$ = mean tax rate (%); s.e. = standard error of the mean; $\tilde{\tau}$ = median tax rate (%); r = relative number of groups (%); KS = Kolmogorov-Smirnov test on normal distribution; NM = numbers-majority; M = majority; R = right-skewed; S = symmetric; all = all coalition types; d = default; a = agreement.

Tables

Table 8: Results of Numbers-Unanimity Treatment

Coalition	right-skewed				Symmetric			
	$\overline{\tau}^\star_{NUR}$	s.e.	$\widetilde{\tau}^\star_{NUR}$	r_{NUR}	$\overline{\tau}^\star_{NUS}$	s.e.	$\widetilde{\tau}^\star_{NUS}$	r_{NUS}
mean (ABC)	55.4	(2.7)	60	77.1	50.5	(3.5)	50	72.9
default	—	—	—	22.9	—	—	—-	27.1

T-Tests: $p(\overline{\tau}^\star_{NUR} = 50) = 0.057$. $p(\overline{\tau}^\star_{NUS} = 50) = 0.890$.

Comparison with Unanimity, see Table 5.

T-Tests: $p(\overline{\tau}^\star_{NUR} = \overline{\tau}^\star_{UR}) = 0.240$. $p(\overline{\tau}^\star_{NUS} = \overline{\tau}^\star_{US}) = 0.213$.

χ^2-Tests: $p(r_{NUR}[d,a] = r_{UR}[d,a]) = 0.049$. $p(r_{NUS}[d,a] = r_{US}[d,a]) = 0.132$. $p(r_{NU}[d,a] = r_U[d,a]) = 0.015$.

Table notes. $n_{NUR} = n_{NUS} = 48$ group observations. $\overline{\tau}$ = mean tax rate (%); s.e. = standard error of the mean; $\tilde{\tau}$ = median tax rate (%); r = relative number of groups (%); NU = numbers-unanimity; U = unanimity; R = right-skewed; S = symmetric; d = default; a = agreement.

Tables

Table 9: Results of RANDOM-MAJORITY Treatment

Coalition	right-skewed				Symmetric			
	$\overline{\tau}^{\star}_{RMR}$	s.e.	$\widetilde{\tau}^{\star}_{RMR}$	r_{RMR}	$\overline{\tau}^{\star}_{RMS}$	s.e.	$\widetilde{\tau}^{\star}_{RMS}$	r_{RMS}
AB	—	—	—	0.0	25.8	(8.8)	30	12.5
AC	95.0	(.)	95	2.1	62.5	(17.5)	62.5	4.2
BC	97.4	(2.4)	100	35.4	93.7	(3.7)	100	20.8
ABC	97.7	(1.7)	100	62.5	73.7	(5.5)	90	62.5
mean (*all*)	97.5	(1.3)	100	100	71.4	(4.6)	81	100
default	—	—	—	0.0	—	—	—-	0.0

T-Tests: $p(\overline{\tau}^{\star}_{RMR} = 100) = 0.034$ (one-tailed). $p(\overline{\tau}^{\star}_{RMR}[BC] = 100) = 0.139$ (one-tailed). $p(\overline{\tau}^{\star}_{RMS} = 100) = 0.000$ (one-tailed). $p(\overline{\tau}^{\star}_{RMS}[BC] = 100) = 0.063$ (one-tailed).

Comparison with MAJORITY, see Table 3.

T-Tests: $p(\overline{\tau}^{\star}_{RMR} = \overline{\tau}^{\star}_{MR}) = 0.002$. $p(\overline{\tau}^{\star}_{RMS} = \overline{\tau}^{\star}_{MS}) = 0.000$.
χ^2-Tests: $p(r_{RM}[d,a] = r_M[d,a]) = 0.043$. $p(r_{RM}[all] = r_M[all]) = 0.051$.

Table notes. $n_{RMR} = n_{RMS} = 48$ group observations. $\overline{\tau}$ = mean tax rate (%); s.e. = standard error of the mean; $\tilde{\tau}$ = median tax rate (%); r = relative number of groups (%); RM = random-majority; M = majority; R = right-skewed; S = symmetric; *all* = all coalition types; d = default; a = agreement.

Tables

Table 10: Results of Random-Unanimity Treatment

Coalition	right-skewed				Symmetric			
	$\overline{\tau}^\star_{RUR}$	s.e.	$\widetilde{\tau}^\star_{RUR}$	r_{RUR}	$\overline{\tau}^\star_{RUS}$	s.e.	$\widetilde{\tau}^\star_{RUS}$	r_{RUS}
mean (ABC)	70.9	(2.6)	70	85.4	60.5	(2.6)	60	97.9
default	—	—	—	14.6	—	—	—-	2.1

T-Tests: $p(\overline{\tau}^\star_{RUR} = 50) = 0.000.$ $p(\overline{\tau}^\star_{RUS} = 50) = 0.000.$

Comparison with Unanimity, see Table 5.

T-Tests: $p(\overline{\tau}^\star_{RUR} = \overline{\tau}^\star_{UR}) = 0.002.$ $p(\overline{\tau}^\star_{RUS} = \overline{\tau}^\star_{US}) = 0.240.$

χ^2-Tests: $p(r_{RU}[d,a] = r_U[d,a]) = 0.468.$

Table notes. $n_{RMR} = n_{RMS} = 48$ group observations. $\overline{\tau}$ = mean tax rate (%); s.e. = standard error of the mean; $\tilde{\tau}$ = median tax rate (%); r = relative number of groups (%); RU = random-unanimity; U = unanimity; R = right-skewed; S = symmetric; d = default; a = agreement.