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## Article

# Experimenting with the transition rule in dynamic games

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## Supplement to “Experimenting with the transition rule in dynamic games”

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This file provides a number of supplementary analyses and tables to the main paper.

TABLE S.I. Unique MPE in an endogenous game.

Player $i j$	$M_{DD}$	$M_{CD}$	$M_{DC}$	$M_{CC}$
$M_{DD}$	<b>SPE</b>	Player $j$ deviates to $D$ in low	Player $j$ deviates to $D$ in high	Player $j$ deviates to $D$ in low
$M_{CD}$	–	Either player deviates to $D$ in low	Player $i$ deviates to $D$ in low	Player $j$ deviates to $D$ in low
$M_{DC}$	–	–	Either player deviates to $D$ in high	Either player deviates to $D$ in high
$M_{CC}$	–	–	–	Either player deviates to $D$ in high

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TABLE S.II. Initial cooperation rates.

State	<i>Easy</i>			<i>Difficult</i>		
	<i>Static</i>	<i>Exog.</i>	<i>Endog.</i>	<i>Static</i>	<i>Exog.</i>	<i>Endog.</i>
Initial cooperation (all supergames)						
<i>Low</i>	0.726 (0.049)	0.719 (0.057)	0.822 (0.053)	0.602 (0.061)	0.591 (0.061)	0.841 (0.042)
<i>High</i>	0.676 (0.060)	0.552 (0.053)	0.834 (0.54)	0.356 (0.055)	0.316 (0.053)	0.678 (0.062)
Initial cooperation (last five supergames)						
<i>Low</i>	0.736 (0.062)	0.733 (0.063)	0.824 (0.057)	0.558 (0.076)	0.610 (0.069)	0.886 (0.047)
<i>High</i>	0.692 (0.067)	0.510 (0.070)	0.800 (0.066)	0.300 (0.064)	0.302 (0.063)	0.653 (0.065)

*Note:* The initial cooperation rate captures the frequency of *C* choices in each state using the first choice a subjects make in that state within the supergame. In the case of the low state, only period-one choices are included.

TABLE S.III. Aggregate cooperation (last five supergames).

Transition	Unweighted			State-Matched	
	Param.		$\Delta\psi$	Param.	
	<i>Easy</i>	<i>Diff.</i>		<i>Easy</i>	<i>Diff.</i>
<i>Static</i>	0.604 (0.049)	0.351 (0.044)	-0.252 (0.065)	0.595 (0.050)	0.319 (0.042)
<i>Exogenous</i>	0.561 (0.049)	0.383 (0.047)	-0.177 (0.067)	0.548 (0.050)	0.357 (0.047)
<i>Endogenous</i>	0.633 (0.046)	0.613 (0.035)	-0.020 (0.058)	0.633 (0.046)	0.613 (0.035)

*Note:* Coefficients in the first two data columns (and standard errors accounting for 252 subject clusters) are recovered from a linear probability model with six treatment-dummy regressors. Coefficients in the state-weighted column are derived from a similar model with the following set of mutually exclusive dummy variables: (i) a treatment dummies for the two *Endogenous* treatments, with coefficients representing  $\Pr\{C|\Psi_X\}$ ; and (ii) treatment-state-period dummies for the exogenous treatments, with coefficients representing  $\Pr\{C|t, \theta, \Psi_X\}$ . Reported coefficients for the *Exogenous* and *Static* treatments reflect the weighted sum  $Q(\Psi_X)$  across the relevant treatment-state-period coefficient to correct for differing state selection.

TABLE S.IV. P-values of hypothesis tests between initial cooperation rates (last five supergames).

	$S_L^{\text{Esy}}$	$S_L^{\text{Dif}}$	$S_H^{\text{Esy}}$	$S_H^{\text{Dif}}$	$Ex_L^{\text{Esy}}$	$Ex_L^{\text{Dif}}$	$Ex_H^{\text{Esy}}$	$Ex_H^{\text{Dif}}$	$En_L^{\text{Esy}}$	$En_L^{\text{Dif}}$	$En_H^{\text{Esy}}$	$En_H^{\text{Dif}}$
$S_L^{\text{Esy}}$	–	0.072	0.528	0.000	0.977	0.176	0.017	0.000	0.301	0.056	0.480	0.358
$S_L^{\text{Dif}}$	–	–	0.187	0.001	0.078	0.619	0.642	0.010	0.006	0.000	0.017	0.345
$S_H^{\text{Esy}}$	–	–	–	0.000	0.656	0.391	0.061	0.000	0.137	0.019	0.253	0.673
$S_H^{\text{Dif}}$	–	–	–	–	0.000	0.001	0.028	0.983	0.000	0.000	0.000	0.000
$Ex_L^{\text{Esy}}$	–	–	–	–	–	0.187	0.000	0.000	0.289	0.053	0.465	0.375
$Ex_L^{\text{Dif}}$	–	–	–	–	–	–	0.313	0.000	0.018	0.001	0.047	0.648
$Ex_H^{\text{Esy}}$	–	–	–	–	–	–	–	0.028	0.001	0.000	0.003	0.136
$Ex_H^{\text{Dif}}$	–	–	–	–	–	–	–	–	0.000	0.000	0.000	0.000
$En_L^{\text{Esy}}$	–	–	–	–	–	–	–	–	–	0.405	0.784	0.050
$En_L^{\text{Dif}}$	–	–	–	–	–	–	–	–	–	–	0.290	0.004
$En_H^{\text{Esy}}$	–	–	–	–	–	–	–	–	–	–	–	0.113
$En_H^{\text{Dif}}$	–	–	–	–	–	–	–	–	–	–	–	–

Note: To compute these  $p$ -values, we first run a regression in which the unit of observation is the choice a subject makes in a period of a supergame. The sample is constrained to the last five supergames and to periods in which the subject makes the first choice in each state. The dependent variable takes value 1 if the subject decided to cooperate and 0 otherwise. The right-hand side includes a fully saturated set of dummies that account for differences in cooperation rates across three dimensions: the treatment (*Easy-Endog*, *Easy-Exog*, *Easy-Static*, *Easy-Endog*, *Easy-Exog*, *Easy-Static*), the state (Low, High). Standard errors are clustered by subject. The table reports the  $p$ -values of bilateral comparisons between coefficients for the treatment cross state dummies. The table reports the  $p$ -value of a  $t$ -test in which the null hypothesis is Row Estimate = Column Estimate. There is one row per (initial-cooperation rate) coefficient estimate and one column per (initial-cooperation rate) coefficient, where notation is as follows.  $S$ ,  $Ex$ , and  $En$  capture whether the coefficient corresponds to a static, exogenous, or endogenous treatment, respectively. The superscript (*Esy*, *Dif*) identifies if the coefficient corresponds to a *easy* or *difficult* parameterization, respectively. The subscript ( $L$ ,  $H$ ) identifies if the coefficient corresponds to behavior in the low or high state, respectively. For example,  $En_L^{\text{Dif}}$  corresponds to the coefficient estimated for *Diff-Endog*  $\times$  Low State.

TABLE S.V. Common sequences of actions as percent of histories (last five supergames).

Treatment	Five or more observed supergames			
<i>Easy-Endog</i>	CC, <b>CC</b> , <b>CC</b> , <b>CC</b> , <b>CC</b>	DC, DD, DD, DD, DD	CC, <b>DC</b> , <b>DC</b> , <b>DD</b> , DC	DC, DC, DD, DD, DD
	37.1	10.5	6.7	4.8
<i>Diff-Endog</i>	CC, <b>CC</b> , <b>CC</b> , <b>CC</b> , <b>CC</b>	CC, <b>DC</b> , <b>DD</b> , DC, DD	CC, <b>CC</b> , <b>CC</b> , <b>CC</b> , <b>DC</b>	CC, <b>DC</b> , <b>DD</b> , DD, DD
	20.0	6.7	5.7	4.8
<i>Easy-Exog</i>	CC, CC, CC, CC, CC	DC, DD, DD, DD, DD	DD, DD, DD, DD, DD	
	36.2	20.0	5.7	
<i>Diff-Exog</i>	DC, DD, DD, DD, DD	DD, DD, DD, DD, DD	CC, CC, CC, CC, CC	DC, DC, DD, DD, DD
	22.9	18.1	18.1	4.8
<i>Easy-Static</i> (low)	CC, CC, CC, CC, CC	DC, DD, DD, DD, DD	DC, DC, DD, DD, DD	
	50.9	18.9	9.4	
<i>Diff-Static</i> (low)	CC, CC, CC, CC, CC	DC, DD, DD, DD, DD	DD, DD, DD, DD, DD	DC, DC, DD, DD, DD
	25.0	20.0	13.3	11.7
<i>Easy-Static</i> (high)	<b>CC</b> , <b>CC</b> , <b>CC</b> , <b>CC</b> , <b>CC</b>	<b>DC</b> , <b>DD</b> , <b>DD</b> , <b>DD</b> , <b>DD</b>	<b>DD</b> , <b>DD</b> , <b>DD</b> , <b>DD</b> , <b>DD</b>	
	42.3	25.0	9.6	
<i>Diff-Static</i> (high)	<b>DD</b> , <b>DD</b> , <b>DD</b> , <b>DD</b> , <b>DD</b>	<b>DC</b> , <b>DD</b> , <b>DD</b> , <b>DD</b> , <b>DD</b>		
	46.7	22.2		

Note: In endogenous and static-transition treatments, high-state action pairs are displayed in bold face.

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