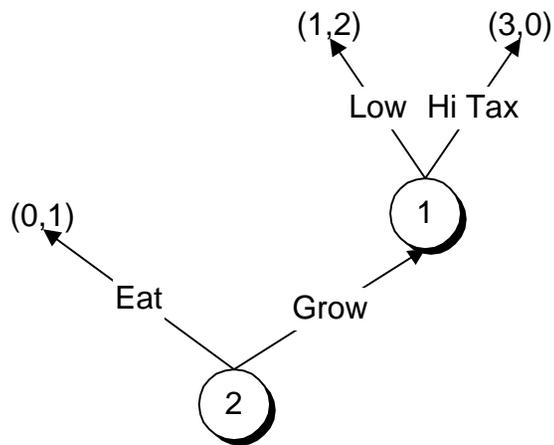


Copyright (C) 2001 David K. Levine

This document is an open textbook; you can redistribute it and/or modify it under the terms of version 1 of the open text license amendment to version 2 of the GNU General Public License. The open text license amendment is published by Michele Boldrin et al at <http://levine.sscnet.ucla.edu/general/gpl.htm>; the GPL is published by the Free Software Foundation at <http://www.gnu.org/copyleft/gpl.html>.

Long Run versus Short Run Players

recall the peasant dictator game



with normal form

		Player 2	
		eat	grow
Player 1			
hi tax		0*,1*	3*,0
low		0*,1	1,2*

- This has a unique Nash equilibrium at 0,1
- The unique Nash equilibrium is Pareto dominated by 1,2

Long Run vs. Short Run Players

- not sensible to suppose that dictator and peasant are equally patient
- natural assumption: many peasants, the dictator sets a single tax rate for all peasants
- so no individual peasant can have much effect on future taxes
- so even if peasants care about future, they cannot have any effect on it
- model the peasants as *short-run* players with discount factor 0
- the dictator is a *long-run* player with discount factor δ
- this is a very common model of government or large firm versus a large population

How Well Can a Patient Dictator Do?

- as always the repeated static equilibrium is subgame perfect

Dictator

- set low taxes in the first period, and as long as the peasants grow and there have been low taxes in the past
- if ever peasants failed to grow, or taxes have been hi in the past set hi taxes.

Peasants

- grow in the first period, and as long as the peasants grow and there have been low taxes in the past
- if ever peasants failed to grow, or taxes have been hi in the past then eat

optimality of peasants:

- if dictator strategy calls upon dictator to set l_0 , peasant grows; if dictator strategy calls upon dictator to set h_1 , peasant eats
- a *static best-response* for peasant
- alternatively, we can describe this as *rational expectations for the peasants*

optimality of dictator:

- utility from high taxes

$$(1 - \delta)^3$$

- utility from low taxes

$$1$$

- optimal if $\delta \geq 2/3$

Comparison to Stackelberg Equilibrium

	Player 2	
Player 1	eat	grow
hi tax	0,1	3,0
low	0,1	1,2

commit to hi tax get 0

commit to low taxes get 1

so Stackelberg is to precommit to low taxes

- in repeated game equilibrium and in Stackelberg equilibrium (with LR as leader) SR player always plays a static best response

Theorem: if the LR player is sufficiently patient, then static Stackelberg **payoff** is subgame perfect in repeated game.

Reputation Theory

suppose that SR player entertains the possibility that the LR player may actually be committed to the Stackelberg strategy (but isn't sure)

then a sufficiently patient LR player can get very close to the Stackelberg utility (that is, choose the equilibrium he likes best)