

Economics 431
Homework 5
Due Wed, Aug 1

Part I. The tipping game (this example due to Stephen Salant)

The customer comes to a restaurant for dinner every day and is served by the same waiter. The waiter can give either good or bad service. The customer *observes* the quality of the service and decides whether or not to tip.

Waiter's strategy is quality of service: good G or bad B .

Customer's strategy must tell him what to do when the service is good and what to do when the service is bad. The customer, therefore, has 4 strategies: Always tip no matter what the service (TT), tip only if good service (TN), tip only if bad service (NT) and never tip (NN). Good service is worth \$ 10 to the customer, bad service is worth 0. The size of the tip is fixed at \$ 5. Giving good service costs the waiter \$ 2, whereas giving bad service costs the waiter 0. The payoff matrix for this game is the following:

	TT	TN	NT	NN
G	3,5	3,5	-2,10	-2,10
B	5,-5	0,0	5,-5	0,0

a) What is the Nash equilibrium of this game if played only once?

Suppose the customer comes to the restaurant every day and repeatedly plays the same game with the waiter.

b) If the customer knows he is permanently moving out of town in three weeks and tells this to the waiter, what is the subgame perfect equilibrium of the repeated game?

c) Suppose that on any given day both customer and waiter know that the customer will return for dinner tomorrow with probability p and will never return with probability $1 - p$. Also assume that the interest rate is zero (what is the discount factor then?)

Consider the following agreement between the customer and the waiter

The waiter: Starts with giving good service. Continues to give good service in the current period if and only if has been giving good service in the past and has been always tipped in the past. Otherwise, gives bad service forever.

The customer: Starts with tipping only for good service (TN). Continues to tip only for good service in the current period provided that he had always tipped in the past and had been given only good service in the past. Otherwise, never tips (NN) in the current period.

For which values of p the strategies just described is a subgame perfect equilibrium of the repeated game?

d) Let the game be exactly the same as in part c). Let waiter's strategy be the same as in part c). However, now the customer's strategy is different:

The customer starts with always tipping, no matter what the service (TT). Continues to always tip in the current period provided that he had always tipped in the past and had been given only good service in the past. Otherwise, never tips (NN) in the current period.

If you are to show that this strategy profile is a subgame perfect equilibrium for some values of p , how does your analysis in c) change? (Hint: now the waiter may have profitable deviations after some histories).

Part II Practice exams

Winter 2002 Second Midterm, Question 4

Fall 2003 Second Midterm, Question 4

Part III End of chapter and Practice problems

Practice problems to Chapter 14: 14.4, 14.5.

End of chapter problem 14.1, 14.2, 14.3