Discussion of "Reputation and Product Recalls" by Boyan Jovanovic

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The Model:

- Discrete time simplification of model.
- McDonald's Drive Through with long (countably infinite) line of customers: Each customer pays for expected number of fries, but by the time he sees how many in bag, too late to do anything about it.
- In current period, McDonalds can't do anything to affect the number of fries customer expects. That is an equilibrium object.
- But, if number of fries, $X = 1$, probability of public signal that McD's ripped off customer is zero. More generally, $1 - X$ is probability of public signal that customer was cheated.

The Model:

- X fries cost McDonalds $\frac{X^2}{2}$, so the marginal fry costs X.
- Marginal benefit is that increasing X linearly lowers probability of the public signal, so optimizing condition is

$$X = \beta(\text{continuation value if signal does not go off} - \text{continuation value if signal does go off}). \quad (1)$$

Equilibria:

- This game has lots of equilibria.
- Boyan uses data to choose among equilibria.
- Not sure this is Kosher.
- Everyone expecting $X = 0$ if the day of the month is a prime number is an equilibrium.
- Suppose that was also what the data showed. Is it ok at that point to simply declare victory?

A Suggestion which selects “Ratchet” strategy as the unique Markov Perfect Equilibrium:

- Borrow from Phelan (JET, 2006)
- Assume behavioral type which must set $X = 1$, with Markov exogenous and hidden type switches.
- ϵ: probability that optimizing type becomes behavioral type.
- δ: probability that behavioral type becomes optimizing type.
- $\frac{\epsilon}{\epsilon+\delta}$ long run or stationary probability of behavioral type.

A Suggestion which selects "Ratchet" equilibrium as the unique Markov Perfect Equilibrium:

- Boyan's Ratchet equilibrium misnamed. A better characterization is a Sisyphus equilibrium.
- Let ρ_i be equilibrium posterior that firm is behavioral type if it has been i periods since the public signal observed.
- Likewise, let X_i be the equilibrium number of fries and V_i be the value to the firm.

A Suggestion which selects "Ratchet" strategy as the unique Markov Perfect Equilibrium:

- Some equations:

$$\rho_0 = \epsilon.$$

$$V_0 = p(\epsilon + (1-\epsilon)X_0) - \frac{X_0^2}{2} + \beta(1-\epsilon)((1-X_0)V_0 + X_0 V_1).$$

$$X_0 = \beta(1-\epsilon)(V_1 - V_0).$$

$$\ldots$$

$$\rho_i = B(\rho_{i-1}, X_{i-1}).$$

$$V_i = p(\rho_i + (1-\rho_i)X_i) - \frac{X_i^2}{2} + \beta(1-\epsilon)((1-X_i)V_0 - X_i V_{i+1}).$$

$$X_i = \beta(1-\epsilon)(V_{i+1} - V_0).$$

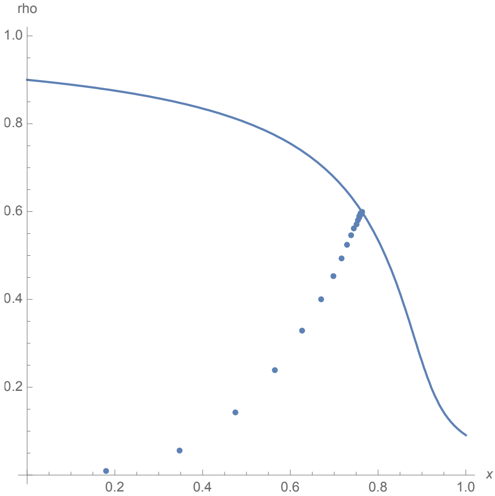
- If we assume eventually ρ_i, X_i, and V_i converge (they do), then if you truncate i, becomes N (non-linear) equations and N unknowns.

A Suggestion which selects "Ratchet" strategy as the unique Markov Perfect Equilibrium:

- A fixed point equation for ρ:

$$\rho = B(\rho, X). \tag{2}$$

- Gives locus of points where if you start at reputation ρ, have NO public signal when one should have happened with probability $1 - X$, then reputation ρ stays same.
- Happens when learning about type is exactly offset by drift toward stationary probability.


rho
1.0
0.8
0.6
0.4
0.2
0.2
0.4
0.6
0.8
1.0
x