Advanced Microeconomics

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Problem 1

Proof: Follows from FOC, consistency and cyclical argument analogous to Aguiar and Kashev (2020)(AK2020).

Problem 2

Summing and rearanging, we get

$$d_A^t(v_{t,A} - v_{s,A}) - d_B^t(v_{t,B} - v_{s,B}) \geq \rho_t'(c_t^* - c_s^*) \; \forall \, t, s \in T$$

which is the determinsitc test analogous to the stochastic version Appendix E in AK2020.

Testing this deterministic model in a grid for $d_i \in [0.1, 1], i = \{A, B\}$ in increments of 0.05, I get a rejection rate of 95.86%. Which is high compared to the stochastic version in AK2020. Code can be found in my github website.

Problem 3

I think a way to test this simpler model, we could use the Method of Simulated Moments (MSM). We can define that the probability of individual **i** to be rational under this model, and the two given moments is the following

$$\begin{aligned} P(\text{individual } i \text{ is rational}) =& P\left(\mathbb{1}\left\{0 \geq (\rho_t - \rho_s)'(c_t - w_t - c_s + w_s)\right\}, \mathbb{E}[\rho_t c_t] = \rho_t^* c_t^*\right)) \\ =& \frac{1}{N} \sum \mathbb{1}\left(0 \geq (\rho_t - \rho_s)'(c_t - w_t - c_s + w_s), \mathbb{E}[\rho_t c_t] = \rho_t^* c_t^*\right)) \end{aligned}$$

So, we could simulate $\{w_t\}_{s=1}^S$ for each individual and estimate the model above.

For S=1000, I tested the model above and could get a 95.3% rejection rate in contrast to the 100% of the deterministic case. The result might seem low, however if we consider the restrictions on rationality this model imposes on individuals this might not seem as unlikely.(code).