

Problem 1

1. Replicate table 1 from Hamilton(1989) paper

TABLE I
MAXIMUM LIKELIHOOD ESTIMATES OF PARAMETERS AND ASYMPTOTIC STANDARD ERRORS
BASED ON DATA FOR U.S. REAL GNP, $t = 1952 : \text{II}$ TO $1984 : \text{IV}$

Parameter	Estimate	Standard error
α_1	1.522	0.2636
α_0	-0.3577	0.2651
p	0.9049	0.03740
q	0.7550	0.09656
σ	0.7690	0.06676
ϕ_1	0.014	0.120
σ_2	-0.058	0.137
ϕ_3	-0.247	0.107
ϕ_4	-0.213	0.110

2. Plot the filtered probabilities and the smoothed probabilities.
3. Find the business cycle dates. Do you arrive to the same conclusions as Hamilton?
4. Repeat 1-3 with Eviews, using the file *gnp_hamilton*

Problem 2

Using Argentina's monthly Industrial Production, s.a., period Jan-95 to Mar-13:

1. Estimate the same model as in exercise 1.
2. Plot the probabilities and the real growth rates.
3. Find the business cycle dates.

Problem 3

Using the same data on US GNP as in exercise 1:

1. Estimate the same model as in exercise 1, but now assuming three states in the economy and one lag.
2. Plot the smoothed probabilities and the GNP real growth in a same graph.

3. Which S_t corresponds to each state (i.e recession, stagnation or expansion)?
4. Find the business cycle dates and compare with exercise 1