Assignment III - Macroeconometrics

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1. Write out the model of interest. Provide information about the variable.

In this homework, I want to study the growth rate of the U.S. consumer prices index. The model of interest is:

$$p_t = \alpha^{us} + \beta^{us} p_{t-1} + \epsilon_t^{us} \tag{1}$$

The U.S. CPI time serie is available in the FRED database from 1947 at a monthly frequency with a base year around 1984. The serie does not have a tendency to come back to a particular mean and I decide the study differenced values instead.

2. Explain how you will get a prior for your model. (Do this AFTER you have worked through the lecture notes. It's not something you can do correctly before you'd done so.)

I obtain my prior from Canada. The country is close to the United States and shares a lot of the same standards of living, language and political stability.

So I go ahead and estimate the following equation for Canada and find:

$$p_t = \alpha^{C} + \beta^{C} p_{t-1} + \epsilon_t^{C} \tag{2}$$

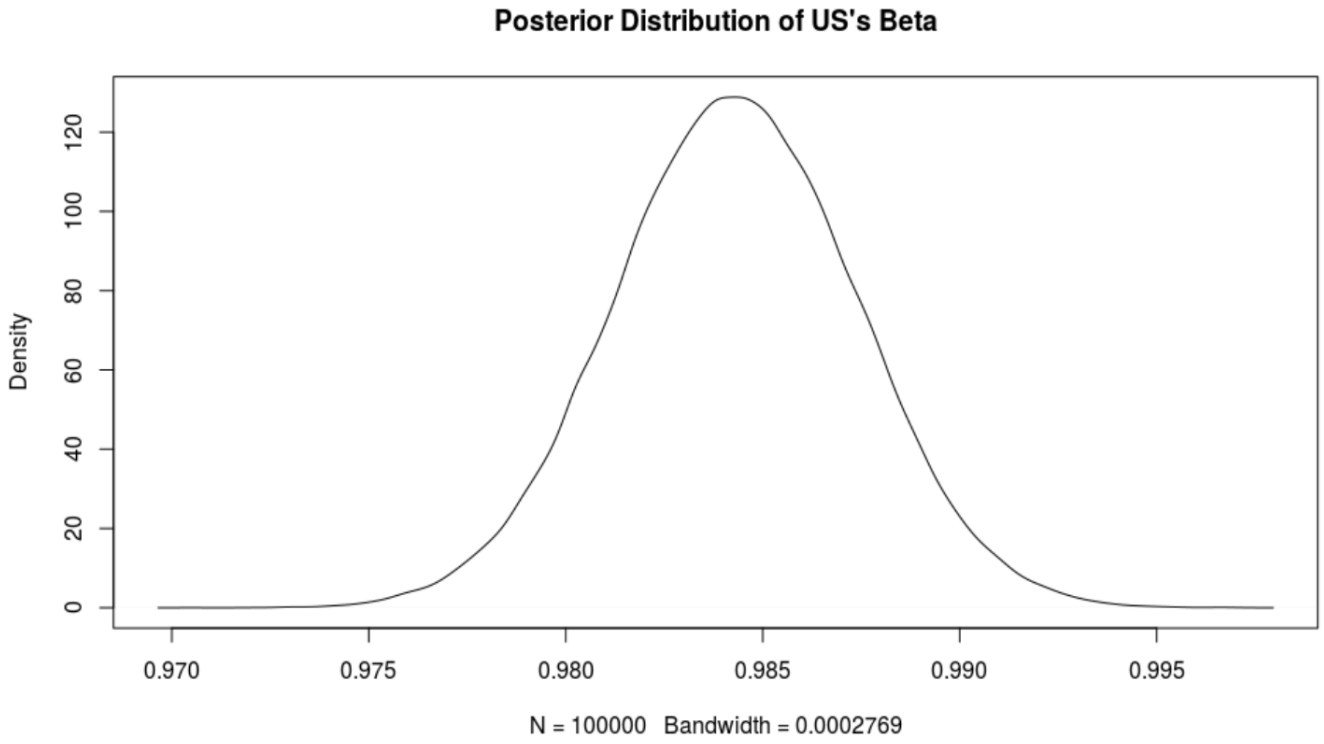
after estimation:

$$p_t = 0.002 + 0.227 p_{t-1} \tag{3}$$

This way, I have a reason to believe that β^{us} is probably closer to 0.227.

3. Summarize the posterior using Gibbs sampling with the informative prior you described above. You need to describe the mean and standard deviation of all the parameters. You also need to plot the posterior density of each parameter.

We find that the mean of the posterior for the US CPI is 0.984 and the standard deviation is 0.003.



4. Test that you are doing the sampling correctly as described in the lecture notes.

The posterior of the US does not fall between the OLS of the US and the OLS of Canada.