Problem Set II - Generalized Method of Moments

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1 Introduction

In our latest class, you learned the Generalized Method of Moments and how to estimate it in R. This problem set seeks to reaffirm your knowledge and even go beyond of what we learned. By the end of this problem set, you would have combined empirical analysis and the theoretical justification of your results, remember to use your economic intuition! If you happen to have any inquiries, please do not hesitate in contacting me via email (gmarinmunoz@iadb.org).

2 Empirical Analysis

In class, we saw the model proposed by Marin et al. (2020), and estimated the GMM model using some of the following moment conditions:

$$E_t[w_t - p_t - log(1+\tau^c) - c_t - \gamma h_t] = 0, \tag{1}$$

x

$$E_t[v_t - log(\beta) - p_t + p_{t+1} - c_t + c_{t+1}] = 0, \tag{2}$$

$$E_t[1 - log(\beta) - p_t + p_{t+1} - c_t + c_{t+1} - log(1-\delta+(1-\tau^k)r_{t+1})] = 0, \tag{3}$$

$$E_t[r_t - log(\alpha) + log(1-\tau^k) - \alpha(h_t - k_t)] = 0, \tag{4}$$

$$E_t[K_t - \epsilon log(K_{g,t}) - (1-\epsilon)log(K_{p,t})] = 0, \tag{5}$$

Form groups of maximum 3 students and answer the following questions. Extra points will be given to groups who embark in delivering the problem set in LaTeX.

1 Recall we found a solution for parameter ϵ that did not make sense according to our economic intuition. Indicate which model assumption was violated and how can we fix it. Hint: Plotting the variables of moment condition (5) should give you a clue of what is happening.

2 Estimate the GMM model using a modified version of moment condition (5) that solves the assumption that was violated. Explain how ϵ changes and what does it represents in the theoretical model.

3 Estimate the GMM model including moment condition (3), do the model results change? Why? Discuss the parameter values, significance, and theoretical implications.

Please deliver a PDF with the answers, output tables and discussion by Friday, March 31st, 8:00 p.m CST to my email (gmarinmunoz@iadb.org).

References

Marin, Gabriel, Julio Delgadillo, and Jürgen Von der Meden, "Enhancing Central Bank Decision Making with Machine Learning: An Application of Random Forest Regressions to Mexico," *Julio and Von der Meden, Jürgen, Enhancing Central Bank Decision Making with Machine Learning: An Application of Random Forest Regressions to Mexico (April 4, 2020)*, 2020.