724 Macroeconomic Theory: Investment Adjustment Costs

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Introduction

- Outline models being compared (no equations)
- Overview of analysis and results

Description

- Description of standard RBC model
- Description of investment adjustment costs
- Methods used to solve RBC model
- Methods used to solve investment adjustment costs
- How was RBC model simulated
- How was investmnet adjustment costs model simulated

Analysis

- Compare the two models
- table of moments reporting sd, sd relative to Y, and autocorrelations, correlation with output for all variables of interest.
- Highlight difference in the moments of the two models
- What is causing these differences?
- Key economic forces driving these results
- Use impulse response functions to clarify explanations and illustrate economics of the system.
- Check sensitivity of results to key parameter choices
- Compare your results to one published article using related models.

Conclusion

- A brief conclusion

Matlab Code

- Provide matlab code

Appendix

- Derivations of first order conditions
- Derivation of steady state.

Rough Work

RBC model

$$\begin{aligned} \max E_0 \sum^{\infty} \beta^t [\ln c_t + \psi \ln(1 - n_t) \\ \text{s.t.} \\ c_t + i_t &= y_t \\ y_t &= A_t k^{\alpha} n_t^{1-\alpha} \\ k_{t+1} &= (1-\delta)k_t + i_t \\ \ln A_{t+1} &= \rho \ln A_t + \epsilon_{t+1} \\ \epsilon_{t+1} &\ iid(0, \sigma_{\epsilon}^2) \\ k_0 \text{ and } A_0 \text{ are given and } &> 0 \end{aligned}$$

with $\psi > 0, \beta, \delta, \rho \in (0, 1)$

Solve through optimal control

This doesn't work says intial values are too far from steady state

Solving the investment adjustment costs model. The model will follow the same specification as "Shapiro (86) The Dynamic Demand for Capital and Labor" This model has a change in the production in that changing the capital stock now incurss costs.

$\ln(y_t) = \ln(f(k_t, n_t, A_t)) - \frac{\alpha_k}{2}[\frac{\delta k_t}{k_{t-1}}]^2$

2. Solve standard RBC model and Investment adjustmnet costs model.
3. The project is a quantitative exercise comparing the properties of two models. It is not a momentmatching exercise.
4. The project report must not exceed 10 pages in length (margins of one inch and line spacing=1.5)including references but excluding tables and graphs.
5. The project report must include the following parts:

(a) A brief introduction outlining the models being compared (no equations though) and providingan overview of the analysis and results.

(b) A careful description of the two models used in the analysis and a brief discussion of the methodused to solve and simulate the model.

(c) An analysis that focuses on comparing the two models. In your analysis, you must produce atable of moments reporting standard deviations, standard deviations relative to the standarddeviation of output, autocorrelations, and correlations with output for all variables of interest.The analysis should highlight the di erences in the moments of the two models and should provideexplanations for these di erences. What are the key economic forces that drive the results. Oftenimpulse response graphs help to clarify your explanations and illustrate the economics of thesystem. Check the sensitivity of your results to key parameter choices. Compare your results toone published article using related models.

(d) A brief conclusion.

6. Together with your report, you must submit one matlab program and an appendix that includes the derivation of the first-order conditions of the models being solved and the derivation of the steady-state. Note that this appendix can be handwritten. This appendix is due immediately before studentpresentations begin.