

Handout on Computational Experiments

Economics 613a: Computational Methods for Macroeconomics

Fall 2006

The material on the economic computational experiment is largely taken from Kydland and Prescott's paper "The Computational Experiment: An Econometric Tool". You should use the questions posed here as guides when preparing your presentations.

Steps in an Economic Computational Experiment

Step 1: Pose a Question Computational experiments are designed for questions of a quantitative nature. Thus the first step in conducting such an experiment is to have a well-designed quantitative question.

1. What is/are the quantitative question(s) that the study seeks to answer?

Step 2: Use Well-Tested Theory The next step is to choose a theory to guide in the development of a model. The theory can be thought of as "an explicit set of instructions for building...a mechanical imitation system."

1. What theory does the study use to develop its computational experiment?
2. Is the theory well-tested?
3. Is this theory well-suited to address the question(s) at hand?

Step 3: Construct a Model Economy Keeping the question in mind, the next step is to use the economic theory to guide in the construction of a model economy. There are two issues to focus on when writing down the model economy. First one has to determine how much detail to include. The second major issue to consider is the feasibility of conducting the computational experiment given the particular setup.

1. What are the key features of the model economy? Why is each feature present? Does the inclusion of the feature help the researcher in addressing his question and, if yes, how?
2. Are there any important or potentially important features that the researcher abstracts from? Why are these features not included? If they were included would the model still be computationally tractable?
3. Is the model well-suited for addressing the question(s) at hand?

Step 4: Calibrate the Model Economy Calibrating means choosing a set of parameter values so that the model is consistent with the real world along a limited, but clearly specified, number of dimensions.

1. What is the researcher's calibration strategy? Along what dimensions do they make the model consistent with the real world?
2. How do they obtain real world measurements? Do they use the right measurements?

Step 5: Run the Experiment The final step in conducting a computational experiments consists in using the instrument (a computer program that generates equilibrium realizations of our calibrated model economy) that we have created to answer the quantitative question(s) posed.

1. What algorithm is used to compute the model? Why was it chosen?
2. How do the researchers use the calibrated model economy to answer their question?
3. What are the results?