EC 313 Research Project Guidelines

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The research project will be due without fail by 5:00 P.M. on Friday, 5 May 2000 – prior to the final exam on Monday 8 May. It should be submitted via email to baum@bc.edu.

The research project for EC 313 should entail the development of a single Mathematica notebook that addresses some interesting question, or illustrates the working of a model, in economics, finance or a related discipline. You should choose a topic that permits you to develop Mathematica procedures that illustrate the problem, or economic model, with examples of the solution or of the model's workings and sensitivity to parameter values. Graphics (2-D or 3-D) should be used to illustrate relationships in the model.

As discussed in class, you might narrow the search for a reasonable topic by considering either micro-oriented topics or macro-oriented topics, and then narrowing the field further. Is there an elective course you have taken that has discussed an interesting phenomenon and how it might be modelled? Are you more interested in considering what an equilibrium might resemble, and how that equilibrium might change with different parameters – what we call comparative statics? This would be the appropriate framework for considering how a market might change if its dominant player was constrained, or how an economy might react to a different tax system, or how a two-firm duopoly might react to each other's actions, or how the world economy might react to drastic changes in energy prices. Alternatively, are you more interested in the trajectory that economic or financial variables might take in response to shocks to the environment – what we call dynamic models? Dynamic models of many economic systems have been developed – the "corn-hog" cycle, the Solow growth model, the "predator-prey" model of species interaction, and traditional models of closed and open economies – including models of a two-country world in which the players react to each other's actions (e.g. a trade war). Models that consider migration based on wage differentials have been used to explain why Third World countries end up with vast numbers of poor urban dwellers who have left the rural environment. Models of pollution and the need for developing economic incentives for clean air, or clean water are also generally dynamic in nature. And in any of these cases, a "Monte Carlo" study might be used to evaluate how a model subjected to random shocks might behave – usually computed by simulating the model's behavior over a large number of trials, and averaging over the outcomes. Please feel free to discuss any of your ideas with me, by stopping by or contacting me via email.

Contrary to the specifications on the syllabus, you need not prepare any web pages for the project; all materials should be included in the notebook, which should then be submitted via email. I would suggest you use the "Textbook" style for the notebook (Format->Style Sheet->Textbook), and use headings and subheadings appropriately. Text should be formatted with Style->Text, and references for any works cited should be given in the standard bibliographic format at the end of the notebook. Citations of materials on the Web should include the full URL of those resources.