This course has introduced a variety of mathematical approaches to thinking about the implications of rational choice. For the most part, rational choice has meant that decision makers engage in "optimization," with various side constraints. There may be budget constraints, production functions, informational problems (uncertainties and lack of knowledge of one's rival's plans or actions) or fundamental limits on what can be known (decision making under uncertainty). The purpose of the paper is for students to demonstrate that they can use variations of these models to analyze a problem of interest. Economic reasoning has been applied to all kinds of phenomena: consumer choice, the determination of market structures, price theory, the effects of taxes and regulation, markets for marriage, law enforcement, political decision making, and economic development. The tools covered in class can be applied to all these and more topics. So, there are an infinite range of topics that one can write upon.

What the following list is intended to do is to help you narrow your focus and get started on a paper. If you use an idea that fits one of the paper descriptions listed below, you can just get started on your paper. If not, please send me a paragraph via email that explains what you think you'll be doing. I'll OK it if it seems feasible given the time left and also satisfies the aim of the course. (I am not interested in pure theory papers, but in "practical" applications of the tools and concepts developed in class. In some cases, several of the models can be applied in the same paper.) In general, most student papers are "B's" of one kind or another, although I expect a number of "A" papers from this class.

One piece of advice: **start your modeling with the absolute simplest model you can think** of and add "bells and whistles" after you have fully understood the implications and limitations of that model. Your model(s) should provide the core of the analysis, but feel free to speculate about how variations and extensions of the model would work out—without actually doing the math or matrices. Also feel free to include graphs that illustrate how you model works. And, feel free to use the more general models that we will be covering after the second exam (although that is not required).

A Few Paper Topic Ideas

(1) Rational Ignorance. Model an individual's choice under uncertainty when he or she has limited information and so makes biased assessments of the expected value(s) associated with his or her actions. In which cases can you say that a "mistake" has been made by the individual. What factors can reduce this individual's error rate. (For example, would lower information costs do so? And if so, how could this be done?)

(2) Demand, Supply, and Supply Chain Problems. Model a market equilibrium of interest from the ground up (with utility functions and cost functions). Now try to

model the effect of a temporary shock on input prices (a sudden increase in costs). Discuss why firms may not fully adjust their capital stock or methods of production to take account of the new higher price(s) if they expect the shock to be temporary. Use an example or two from the supply shocks introduced by Covid closures of a wide variety of manufacturing facilities around the world.

(3) Simpler Supply and Demand Comparative Statics. Model a particular market (again from the ground up using utility functions and cost curves) and show what happens if income rises to the prices of normal goods. Show what happens if the price of a substitute increases. (You'll need to solve your model for an equilibrium pricing function rather than a single price to be able to do comparative statics, so leave income and prices abstract in the consumer budget constraints.)

(4) Legal Contests. Use the lottery model to characterize the outcomes of court proceedings in a civil law suit. How do investments in lawyers increase as the stakes in the legal outcome increases? How do the number of lawyer hours vary with the hourly cost of lawyer time? Is there any evidence that this pattern occurs in legal proceedings in the United States? If so, provide some.

(5) Economic Regulation. Analyze a market that has recently be subject to a significant regulatory change. Characterize the market equilibrium before the change and characterize how and why economic analysis predicts that the regulation will raise prices in the market of interest. (Hint: most regulations increase production costs.) Also, consider how the regulation might affect the extent of competition in the market of interest. (Regulations often impose a bit higher costs on small firms than large firms, because of economies of scale in regulatory paper work.)

(6) Voter Choices. Suppose that a voter is attempting to determine his or her preferred level of a public service. Assume initially that he or she knows the tax cost for the service. Now repeat the calculation for the case where the tax cost is uncertain (e.g. different tax prices are considered to be possible, but have different subjective probabilities associated with them). How does tax cost uncertainty affect the voter's demand for the service of interest?

(7) Student Competition for Grades. Suppose that the lottery model can be used to characterize competition for A's in a class, where instead of lottery tickets hours of studying are invested in the contest—hours that have an opportunity cost. Show how such competition increases the average knowledge of students. Show what happens if the cost of studying increases? Discuss and/or model why students study more for some classes than others.