

**SYRACUSE UNIVERSITY**  
**The Maxwell School of Citizenship and Public Affairs**

**PA 812: Ph.D. Seminar in Public Finance**  
**Professor Yinger, Spring 2015**

**Final Exam**

This is a closed-book exam. It is designed to take two hours, but you may take three hours if you wish.

The purpose of this exam is to test your skills as a public finance scholar. Focus on presenting the conceptual foundations of and the methodological approaches to the various questions. You should cite key studies in the literature when possible, but it is better to provide a complete conceptual and methodological answer than to worry about remembering every citation.

You may assume that you have any data that you need. Make sure you are clear about any other assumptions you are making, as well.

**You must answer any 2 of the following 5 questions.**

**1. How Much Do Students Forget over the Summer?**

You are interested in the question of whether students' learning degrades over the summer.

- a. Write down a simple education production function to estimate this effect (the simplest one you can think of). Explain what data you would need to estimate this model. Make sure you define all your terms and explain the meaning of your estimated coefficients.
- b. Discuss some of the threats to the validity of inferences from your simple model.
- c. Write down (and explain!) a more complicated model that addresses at least some of the threats to validity in your answer to part b.

## **2. Property Tax Classification and Economic Development**

Your state, Midwest, passed a new property tax classification scheme in 2000. You want to know whether this scheme affected economic development. Before this scheme was enacted, all property had to be assessed at 100 percent of its market value and the local mill rate applied to all property. Under the new scheme, the assessment requirement remains, but the mill rate can be 50 percent higher for commercial and industrial (C&I) property. Cities (which provide K-12 education and other key local public services) can decide not to use a classified property tax, but if they do, they have to set the rate on C&I property exactly 50 percent higher than the rate on residential property. Apartments are considered residential property under this scheme. In addition, all cities had to make their decision about whether to switch to a classified property tax in 2001. They could not re-visit the decision in later years. About one-quarter of the cities in Midwest enacted a classification scheme.

The problem, of course, is that the choice to switch to a classification scheme is endogenous. Fortunately, however, you have come up with a promising instrument, namely, whether railroads reached the city before 1900. It turns out that the cities with railroads before this date are the cities that developed large manufacturing sectors, which were accompanied by large amounts of commercial and industrial property. These are the cities where residents (i.e. voters!) have the most to gain from a classified tax and hence are the cities most likely to adopt one.

Your job is to design a study to estimate the impact of the classification scheme on economic development. Explain how you would measure economic development. Describe the data you would need, the specific hypotheses you would test, and the methods you would use.

## **3. Poverty, Limited English Proficiency, and Educational Costs**

Many studies estimate whether educational costs per pupil depend on the share of students who speak English as a second language or on the share of students who come from families with incomes below the poverty line. Your interviews with teachers have convinced you that these two effects interact with each other; in other words, the needs of students with limited English proficiency are greatly magnified when those students also come from a poor family. Your job is to design a study that tests this hypothesis.

Fortunately, the education department in your state has agreed to provide you with any data you need. This department has also asked you for a research proposal. This proposal should explain what data you would need, what model or models you would estimate, and how you would use your results to test this hypothesis.

#### **4. Sales Tax Incidence**

Studies of sales tax incidence distinguish between marginal cost (MC), the price “inclusive of tax” (Q), and the price “exclusive of tax” (P). The price inclusive of tax is what one observes in a market once the tax is imposed. The price exclusive of tax is what the firm receives. With no taxes and competitive markets,  $P=Q=MC$ . With taxes, competitive markets, and full shifting onto consumers:  $Q = P(1+t) = MC(1+t)$ .

Explain how you would build on this framework to estimate the incidence of the sales tax for a particular product. Indicate the data you would need, the methods you would use, and the way you would interpret your results.

#### **5. Toxic Site Clean-up and Property Values**

Salt City used to have a large toxic waste site near a downtown neighborhood. This neighborhood consists mainly of relatively inexpensive single-family houses. This site was finally cleaned up several years ago and turned into a park. All toxic material was removed. The park has playgrounds, ponds, walking paths, and other attractive features. You have been asked to design a study to estimate the impact of this clean-up on the prices of single-family houses in Salt City. Describe (a) the data you would need, (b) the methods you would use, and (c) the way you would interpret your results.