

**Public Finance Field Exam  
August 2015**

**Directions:** Answer both questions, in whatever order you prefer.

**1. Energy Conservation and Greenhouse Gas Emissions**

Over the years, the United States, other countries, and some US states have either introduced or considered a variety of policies with at least one aim being to influence the level of emissions of “greenhouse” gases, i.e., gases which contribute to global temperature increases in proportion to their carbon content. Discuss the effects of each of the following policies, in terms of their effectiveness at limiting global emissions efficiently and their distributional consequences:

- (1) A US carbon tax, set at a constant rate per ton of carbon on all emissions within the United States;
- (2) A US carbon tax, as in (1), but applied only to final consumer uses, such as tailpipe emissions of household vehicles, but not industrial uses, such as emissions by manufacturers and electricity producers;
- (3) A US “cap and trade” system for carbon emissions, as was proposed in 2009 by the American Clean Energy and Security Act, which if enacted would have limited emissions by industrial users by requiring them to obtain permits for emissions, with the number of permits set to reduce emissions from their current level and 85 percent of the permits given to existing producers, with the remaining 15 percent auctioned by the US government;
- (4) A California cap and trade system, as actually imposed under AB32 (the Global Warming Solutions Act of 2006), which gives all permits to the California producers governed by the system;
- (5) A US “alternative fuels” requirement, mandating each electricity generator to produce a certain fraction of its electricity using fuel with no carbon content, such as solar or wind power;
- (6) A US subsidy for the use of hybrid (gasoline and electric) or all-electric automobiles;
- (7) A worldwide carbon tax, set at the same rate across countries, with revenues kept by the nations where the taxes are paid;
- (8) A worldwide carbon tax, as in (7), but phased in gradually, with the tax rate increasing smoothly over a period of 50 years;
- (9) A worldwide carbon tax, as in (7), but with varying international rates set so that each nation achieves the same level of carbon emissions per capita.

## 2. The Earned Income Tax Credit

- a. Explain how the Federal Earned Income Tax Credit (EITC) works. Draw the EITC schedule as a function of family earnings, labeling clearly the phase-in range, the plateau, and the phase-out range. Explain the theoretical effects of the EITC on the labor supply of single parents both along the extensive and intensive margins.
- b. California is introducing a State level EITC in 2015 that works as follows. Up to the middle point of the Federal EITC phase-in range, the California EITC will be equal to 83% of the Federal EITC. From the middle point of the Federal EITC phase-in range to the end point of the Federal EITC phase-in range, the California EITC phases out linearly. Draw the California EITC schedule on top of the Federal EITC schedule from question a). Explain how the California EITC affects labor supply incentives of single parents along the intensive and extensive margins.  
For a single parent with 2 kids, the Federal EITC phase-in rate is 40%. How large is the total EITC phase-in rate when adding the California EITC on top of the Federal EITC?
- c. There is a concern that some tax filers take advantage of the Federal EITC by manipulating their reported income to maximize their tax refunds. Explain how this strategy works and how the presence of the California EITC could affect this manipulation strategy. Make sure to take into account the 15.3% social security tax on self-employment earnings in your discussion.
- d. By mid-2016, US population wide tax return data for year 2015 will be available for analysis. For the first year of implementation, do you expect to see tax manipulation responses, labor supply responses, or both? Explain your answer using what you know from the existing literature on behavioral responses to the Federal EITC.
- e. Explain how you would use the US population wide tax return data for year 2015 only to estimate whether the California EITC affects tax manipulation along the lines discussed in question c. Explain clearly your empirical strategy and the identification assumptions you would need. The simpler and more transparent your strategy, the better.
- f. Suppose now you want to estimate the labor supply effects of the California EITC. Suppose you can use repeated cross sectional data from both 2014 and 2015 US wide. Propose a simple graphical empirical strategy to evaluate whether the California EITC affects labor supply.
- g. Suppose more years have passed and that you now have access to 2016 and 2017 data as well (in addition to the 2014 and 2015 data you used in questions e. and f.). Explain how you would identify the medium-run effects on tax manipulation and labor supply responses of the California EITC.
- h. Do you think the California EITC is well designed based on your knowledge of optimal tax theory? Would you have recommended a different profile for the California EITC? For example, most state EITCs are designed instead as a straight percentage of the Federal EITC.