14.581 Fall 2019
Problem Set #2
(due Thursday October 17)

I. Ricardian Model

1. (20 points) This question asks you to discuss some recent empirical work on estimating the (reduced-form) gains from trade, and how this work relates to theoretical work on the gains from trade.

   (a) State how large the estimated 'gains from openness' are in Frankel and Romer (1999), and Feyrer (2009) Paper 1 and Feyrer (2009) Paper 2. Discuss whether you think the estimates in the two Feyrer (2009) papers are smaller or larger than the true average treatment effect of openness to international trade.

   (b) Do the estimates in Feyrer (2009) Paper 2 line up with the predictions for the size of the gains from trade in the Eaton and Kortum (2002) model?

   (c) Discuss an amendment to Feyrer (2009) Paper 2 that would explore the extent to which the theoretical predictions about the size of the gains from trade in Eaton and Kortum (2002) fit the data. Be clear about what regression you're proposing, why you're proposing it, and what the estimates would tell us.

   (d) State a concern you have with one of the instrumental variable strategies in either of the two Feyrer papers. Explain in which direction the IV estimates are biased if your concern is valid. Do the results in Nevo and Rosen (REStat, 2012) place useful bounds on the true parameter if your concern is valid?

2. (70 points) This question asks you to comment on, replicate, and extend the work of Costinot, Donaldson and Komunjer (2012).

   (a) Can you suggest a better (or at least alternative) instrument for producer prices than the one used by CDK (2012)?

   (b) The file *cdk2010.dta* on Stellar contains the dataset used by CDK (2012) in Stata format. Using this dataset and Stata (or otherwise) pursue the methodology of CDK (2012) to estimate θ. Please attach your code and results (or log files). *Hint: The package "reghdfe," which you'll need to install, will be much faster at estimating this twoway fixed-effect model than the default alternatives in Stata (e.g. putting the largest set of fixed-effects into "areg" and then explicitly coding up the other set as a set of dummies).*

   (c) Derive a system of (nonlinear) equations that can be used to solve for the effect that a generalized foreign shock (a shock to any country's

bilateral trade costs or the productivity in any country-industry) of known size (in proportional terms) has on the proportional change in wages in any country in the CDK (2012) model. You can assume that each country's trade imbalance is a constant proportion of world GDP both before and after the shock (but these constants can vary across countries). Note that this should be a system of N equations in N unknowns (the wage changes)[1]; that is, all variables in the equations other than these N unknowns must be a function of either observables (trade shares by country pair and sector) in an initial equilibrium prior to the shock or be the generalized foreign shock.

(d) Using Matlab (or otherwise) and the derivation in part (c) above, solve for the effect on welfare in each country of an 80 percent rise in productivity in Japan's productivity in every sector. Please attach your code and results. Comment on the countries that are most and least affected by this change in Japan and try to offer an explanation. You may assume that the only sectors of the economy are those for which there is data in the *cdk2010.dta* file (these sectors span manufacturing only, so the assumption is that non-manufacturing doesn't exist), and that the only countries in the world are those represented in this file.

(e) How do your findings in part (d) compare to those of Hsieh and Ossa (JIE 2016)?

3. (10 points) Consider the section of Costinot (Ecta 2009) that deals with the Ricardian model.

   (a) Discuss its testable predictions.

   (b) Outline how you would test these predictions. What data would you need? What form would the test take? How would you perform statistical inference on this test?

[1] Note that one of N equations is redundant due to Warlas' law, and N unknowns are pinned down up to a constant.