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Modeling Trade and Investment with WiNDC

WiNDC Short Summer Course 2022

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June 13-15, 2022

This short course is intended to help graduate students and professional economists interested in how to do trade policy analysis with assessment of state-level impacts applied general equilibrium models. We will be working with data calibrated to GTAP version 10 and the WiNDC version 3.0.3 (2014 base year) dataset. Lectures will be presented in person, live-streamed and recorded. Vaccinated participants may attend the course in person in Taylor Hall at the University of Wisconsin-Madison.

Course Overview

A. Monday, June 13, 2022

Over the past thirty years international trade economists have developed algebraic model formulations which have enabled policy analysts to characterize key relationships between economic parameters and economic variables which characterize the impact of policy shocks (quotas, tariffs and productivity shocks) on domestic factor prices and welfare. Early analyses remained limited in value for policy evaluation: the analysis was local, it provided only qualitative results, it was limited to very small models, and strictly interior solutions had to be assumed. The purpose of the introductory lectures on the first day of the course is to provide a primer for those wishing to do or teach general-equilibrium counterfactuals on computable general-equilibrium (CGE) or structural econometric models.

James Markusen will show how the tools from early local comparative statics analyses can be generalized via the use of Shepard's lemma, duality, complementarity and the Karush-Kuhn-Tucker theorem into a global, quantitative analysis of large changes in high-dimension models which also allows for regime changes and corner solutions. Tom Rutherford will then show how the resulting non-linear complementarity problem directly translates into a numerical model using GAMS (general algebraic modeling system). The lectures will be completed by concrete examples: comparison of a tax versus a real trade/transactions cost, comparison of a tax versus a quantitative restriction such as a quota or license, formulation of trade policy models in a small open economy, large open economy or multiregional frameworks.

B. Tuesday, June 14, 2022

Analysis of policies affecting markets in multiple countries requires both data and theory. The Global Trade Analysis Project (GTAP) consortium provides data, and the analyst confronts this data with a theoretical perspective. Despite some limitations in data coverage and quality, a key practical constraint lies in the informed translation of theoretical insights into quantitative policy evidence.

The Wisconsin National Data Consortium (WiNDC) is a research project which has been formed to provide the analytic community with a dataset and a collection of companion models which facilitate evidence-based economic research on the national and sub-national level. The tools are open-source and may be used for multi-sectoral, multi-household general equilibrium analysis.

The most recently WiNDC dataset is calibrated to align with GTAP version 10. The core data incorporates (approximately) quintile disaggregation of households, all US states, 10 regions/countries representing international trade and 32 economic sectors for 2014.

Tuesday's lectures and modeling exercises introduce the use of the GTAP-WiNDC framework for doing applied trade policy analysis with a focus on the geographic and household impacts of policy. We will focus on the impact of the steel tariffs introduced in the previous administration and, we will also consider simulations related to ongoing disruptions in international oil markets.

C. Wednesday, June 15, 2022

Extensions of general equilibrium models to account for investment and capital formation under consistent expectations have been in use for several decades. Lectures on Wednesday will focus on formulations of the WiNDC model which track investment response to shocks in international prices. The core model we work with is a Ramsey model in which intertemporal decisions are solved recursively. In our initial formulation, low income households operate on period-by-period budget constraints while higher income households optimize intertemporal dynastic welfare.

The afternoon lecture will present extensions of the dynastic model to represent overlapping generations of finitely lived households. In this approach (based on Rausch and Rutherford, 2007) the dynamic economy with many households is solved through the computation of a sequence of equilibria for a representative agent economies. This framework has been demonstrated to efficiently solve Auerbach-Kotlikoff OLG models with a large number of heterogeneous households.

Registration

To register, please send an email to the WiNDC manager stating your name, institutional affiliation, professional status (student or professional economist) and whether you intend to attend in person. The registration deadline is Friday, June 3, 2022.

The course is free of charge and we encourage participants to make a donation of $500 to the Agricultural and Applied Economics Fund - 112039090 at the University of Wisconsin-Madison. Please go to https://www.supportuw.org/how-to-give/. You will have the option to give online or by mail.

For more details, please see the course webpage.