Tuesday, August 30, 14:00, Room H2033

A Linear Programming Model for Calculating Green National Incomes

Albert E. Steenge, University of Twente
Monique Voogt, University of Twente

The present-day Dutch System of National Accounts consists of a core, which gives the major macro-economic aggregates, and modules which deal with special subjects related to the core. As part of the Dutch system recently an environmental module, the NAMEA (National Accounts Matrix including Environmental Accounts) has been developed. The NAMEA is a purely descriptive statistic, presenting in one framework monetary and physical flows (emissions). In the paper we describe how the NAMEA can be transformed into a linear programming model linking emissions to production and consumption levels. We present model simulations which determine changes in value added and Household consumption required for certain reductions in emission levels. We find that limited reductions are possible without a decrease in net domestic product. More substantial reductions lead to a decline in output approximately proportional to the size of the reductions. The model can be used to clarify interpretations of a "greennational income.

Tuesday, August 30, 14:30, Room H2033

On the Identification of Important Intersectoral Transactions

Thomas Siebe, Rheinisch-Westfälisches Inst. f. Wirtschaftsforschung

Concerning the maintenance and development of a disaggregated econometric model, the paper deals with some aspects related to the identification of important intermediate transactions. First of all, some methodological aspects related to earlier works are discussed. Then the study presents selection methods considering the consistency restrictions in an input-output scheme. By comparing the properties of alternative selection methods, the calculations confirm that the necessary level of endogenization can be bounded meaningfully by an a-priori investigation of the intersectoral relationships.

Furthermore, the results based on an actual input-output table have to be payed to intertemporal changes. During the past decade, intensive fluctations have been observed between the group of "important" and "unimportant" intersectoral transactions. This result is related to a well-known pattern of structural change in most developed economies: Especially in the industry, the service intensity increased. On the other hand the importance of energy and basic inputs of these sectors has sharply declined during the last years.

References:

J. Schintke, Fehlersimulationen mit Input-Output-Tabellen des Statistischen Bundesamtes. "Vierteljahrshefte zur Wirtschaftsforschung", Berlin, 3/1984, S. 341ff.

M. Kiy, Zur Modellierung der Vorleistungsstrukturen in Input-Output-Systemen - Eine sensitivitätsanalytische Untersuchung. "RWI-Mitteilungen", Berlin, Jg. 37/38 (1986/87), S. 85ff.

Tuesday, August 30, 15:00, Room H2033

Limit Price and Demand of Exhaustible Resource

Seiichi Katayama, Kobe University

We consider a problem of optimal depletion of natural resource with a renewable substitute. Limit pricing policy is employed. The well known Solow's paradox that the monopolist is the conservationist's best friends is examined under the condition when the demand has uncertain aspect. We compare monopolist case with competitive economy to see whether the Solow's paradox holds.

Tuesday, August 30, 15:30, Room H2033

Tradable CO_2 Emission Permits Versus CO_2 Taxes: Economic Impacts and Costs by Industry - An Applied General Equilibrium Analysis for West-Germany

Klaus Conrad, Universität Mannheim

The objective of this paper is to measure the economic impact of introducing CO_2- permits in order to stabilize CO_2 emissions. For an assessment of the macroeconomic implications of an integrated energy and environmental policy we employ an applied general equilibrium model (AGE) with an input-output matrix in 48 industries of the West-German economy. We assume that the environmental authority assigns permits free of charge to each industry based on its CO_2 emissions in 1993. Under economic growth the price of the permit will increase and there will be trade in these permits. Our dynamic AGE model determines the price of a permit up to the year 2000 and calculates the amount of money by industry for buying or from selling permits. The change of the industry structure will indicate which industries are on the demand side and which one are on the supply side of the market for permits. We also introduce a CO_2 tax to limit CO_2 emissions on their 1993 level and compare the performance of the economy and of the industries under this more expensive instrument with the performance under CO_2 permits.

Friday, September 2, 10:30, Room H2033

Eine volkswirtschaftlich orientierte Interpretation der Dualität

Lothar Streitferdt, University of Hamburg

Eine Volkswirtschaft kann man als ein System von Quellen und Senken der Wertschöpfung beschreiben. Die Quellen der Wertschöpfung in einem solchen System sind die Unternehmungen und die Gebietskörperschaften (öffentliche Verwaltungen). Die Senken der Wertschöpfung sind die privaten Haushaltungen. Um die Wertschöpfung der Volkswirtschaft (Bruttosozialprodukt, Wohlstand) zu maximieren, muß jede einzelne Unternehmumg in der Volkswirtschaft ihre Wertschöpfung und damit ihren Beitrag zur gesamten Wertschöpfung maxi- mieren. Es wird am Modell gezeigt, wie die einzelne Unternehmung ihr wertschöpfungsmaximales Handlungsprogramm ermitteln kann. Das zur Maximierung der Wertschöpfung der Unternehmungen duale Problem läßt sich mit Hilfe des Kuhn-Tuckers-Theorems als das Problem der privaten Haushaltungen interpretieren, ihren Einsatz an Kapital und Arbeit zu minimieren, unter den Nebenbedingungen, die Bedürfnisse der Haushaltungen in einem Mindestausmaß zu befriedigen. Eine solche Interpretation ist sowohl aus der Sicht der Theorie der Ökonomie als auch aus der Sicht der Praxis interessant. Auf ihrer Grundlage können Input-Output-Modelle entwickelt werden, die wertvolle Einsichten für wirtschaftspolitische Entscheidungen liefern.

Friday, September 2, 11:00, Room H2033

Recursive Approach of Updating Input-Output Coefficients

Henryk Gurgul, University of Mining and Metallurgy, Krakow

In the paper it is demonstrated that the sequential filtering procedures in different fields of input-output analysis may be applied. The recursive procedures as the generalizations of the traditional models (i.e. OLS, GLS, 2SLS, 3SLS , models with time-varying parameters, ARMA and ARIMA) will be considered. These methods can be applied especially if the structure of economy is changing. In the paper are pointed out the advantages of these techniques over other techniques (no matrix inversions are needed, simple linear nature, independence of its forecasts between consecutive years). The sequential procedures may be applied in the static case and in the dynamic input-output analysis as well. These procedures are proper tools to consider both sides of the input-output model, i.e. primal and dual side. It will be also demonstrated that this kind of estimation may be applied to forward-lag-type and mixed type dynamic input-output model.

Friday, September 2, 11:30, Room H2033

A Factor Analysis Approach to Modelling Supply Equations in Agriculture

Juan Gutierrez Teutsch, Universidad de Santiago de Chile

This paper examines the possibility to use principal components factor analysis in the screening of potential predictor variables for inclusion in a subsecuent econometric investigation to estimate supply equations in agriculture. As economic modelling criteria, the partial adjustment-adaptive expectation framework is adopted. Cochrane-Orcutt interative procedure is used to estimate the proposed models in order to correct possible autocorrelation. The method is used to estimate aggregate area response functions for Chile sugar beet crops for the period 1975-1993, as an illustration fo the approach developed.

Friday, September 2, 12:00, Room H2033

Non Constant Returns in Multisectoral Dynamics

Maurizio Ciaschimi, University of Macerata

In the proposed paper a comparaison will be performed between the concepts of proportions, growth and cycles in a technological framework which switches from the hypothesis or constant returns of scale to that of non constant returns in the use of intermediate goods.

In the dynamic Leontief model proportions, intended as the structure of total output or of capital stock, do not adjust towards those implied by the balanced growth path, generating an explosive behaviour which will determine the negativity of economic aggregates.

The introduction of a simple (linear) hypothesis of non constant returns seems to imply the emergence of a region for the coefficients (both intermediate and capital coefficients) where proportions adjust towards a "guideline" leading to an "equilibrium configuration".

The nature of the "guideline", the nature of the "equilibrium configuration" - either attracting fixed point, attracting n-cycle, strange attractor - is analysed and commented as opposed to the equilibrium growth path.

Semi-Plenary Lecture
Friday, September 2, 14:00, Room H2053

The competitive element in systemic change

Wolfram Schrettl, DIW Berlin

An economic rationale is suggested for the observed synchronization, across countries, of systemic change. Transformation is interpreted as an investment decision under extreme uncertainty and with many competing "investors.Ïmitation or conformity in the process of systemic change can be explained by changes in environmental variables, inter alia by increased competitive pressure, improved information about the behavior of competitors. "Speculative"behavior emerges as a possibility. Reference is made to Schrettl, Schr. Verein f. Socialpolitik, Vol. 209, 1991, and Bikhchandani et al., J.P.E., Vol. 100, No. 5, 1992.