



The STSM-PACE-L Model

IAB's linked Micro-Macro Model

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Introduction

History of our model(s)

- “developed” in co-operation with the ZEW (Centre for European Economic Research)
- maintained and refined independently at the IAB
- What is behind STSM and PACE-L?

STSM: empirical labour supply model (behavioural microsimulation)

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PACE-L: applied general equilibrium model

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(iteratively) linked micro-macro model

Microsimulation model (1)

- tax-benefit model + labour supply model
- utility maximising households:
 - optimal labour supply choice at given wages w
- discrete choice: households choose their hours
 $h_j \in \{0, h_1, h_2, \dots, h_J\}$, usually $J \leq 7$
- s.t. budget constraint computed by the tax-benefit model

$$\max_{h_j} U(h_j, y_j(h_j), Z | \theta)$$

$$y_j = T(w \cdot h_j, Z)$$

- couples: unitary household model (van Soest 1995)

Microsimulation model (2)

- utility function: translog
- four types of households: flexible couples, partly-flexible couples, singles (M/F): 7.000 households
- estimation: Multinomial Logit
- simulations based on analytical transition probabilities (Bonin and Schneider 2006)
- tax-benefit model
 - detailed description of the German tax and transfer system (unemployment benefits, social assistance (for jobseekers), housing benefits, ...)
 - data: GSOEP, currently wave 2006, approx. 10.000 households

Macro model (1)

- multisectoral (7), static AGE Model (Shoven and Whalley 1992)
 - monopolistic competition in the goods markets
 - factors of production (M , K , L_o , H_i , $Grad$) enter NNCES production function
 - factor markets:
 - perfectly competitive capital market
 - perfectly competitive capital market for (university) graduates
 - imperfect competition in the markets for skilled (vocational training completed) and low-skilled workers
- ⇒ Nash bargaining, Right-to-manage
- ⇒ contractual wages exceed market-clearing wages
 - ⇒ endogenous (equilibrium) unemployment

Macro model (2)

- in each industry a trade union maximises utility

$$\ln U_s = \gamma_s \ln [L o_s (V_s^{Lo} - V_U^{Lo})] + (1 - \gamma_s) \ln [H i_s (V_s^{Hi} - V_U^{Hi})]$$

- equilibrium wages depend on income taxation, (cross-) labour demand elasticities, unions' bargaining power, and the value of the state 'unemployed'
- alternatively: separate wage bargaining for each skill group, insider model

Macro model (3)

- surplus of being employed (flow equilibrium with sector-specific employment probabilities)

$$V_s - V_U = \frac{w_s^n - rV_U}{r + \mu_s}$$

- sectoral wage differentials are compensated by hypothetical sectoral differences in unemployment (“dual labour market” approach)

Macro model (4)

- one-country model: international trade (Armington assumptions)
- foreign closure: small open economy (total stock of capital can be fixed)
- government:
 - collects taxes: income, profits, VAT, social security contributions
 - spends on unemployment benefits, social assistance and a composite public good
- progressive income tax (linear tax function) with two parameters: t_m and A .

Motivation for micro-macro link

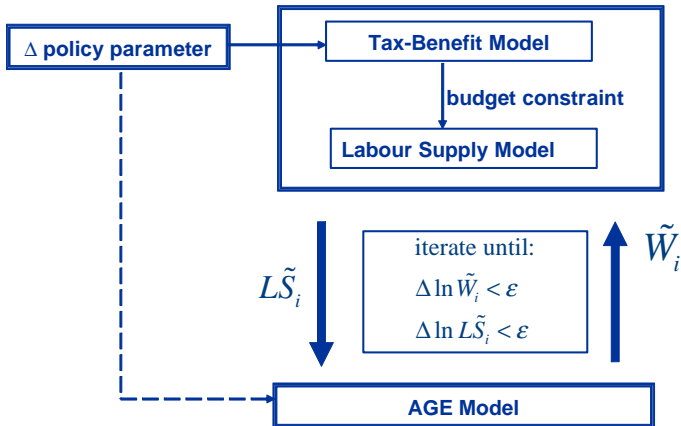
■ Microsimulation model:

- + “realistic” modelling of labour supply (in a macro context) wanted:
 - heterogeneous agents
 - participation and hours decision
 - complex tax and benefit rules \implies non-convex budget sets
- + importance of distributional effects: inequality measures, poverty rates

■ AGE model:

- + the ultimate goal, however: employment and wage effects of policy measures
- + motivation for AGE straightforward: micro-founded macroeconomic model

Micro-Macro Link



Linking channels

cpb

Microsimulation-AGE model

Bonn
13-11-2008

Linkage of the Two Modules

- Top-down:
 - Skill-specific wages
 - Skill-specific unemployment rates
 - Public budget surplus or deficit (depends on recycling)
- Bottom-up:
 - Skill-specific labour supply
 - Average income of the employed and the unemployed
 - Average marginal tax rate
 - Disposable income as percentage of gross income

Consistency in calibration

- factor demands: cost shares taken from the micro data (GSOEP)
- tax rates
- tax revenue and social security spending (sums)

Outlook/Wish List

Microsimulation model

- dealing appropriately with rationed households (demand-side restrictions)
- modelling non-take up and improving projection techniques (population weights)
- suspending IIA, using Random Parameters Logit instead

Macro model

- alternative macro closures: using different models
- moving on to a dynamic general equilibrium model

Discussion

