AGING, LABOR MARKETS, PENSION REFORM

C. Keuschnigg and M. Keuschnigg

- **Pension system unsustainable in Austria:**
  - public pensions 2000: 14.5% of GDP, vs. 10.4% in EU
  - contributions: 10.25% workers, 12.55-15% employers
  - large gov. transfers to pension system: ≈2.5% of GDP
  - generous pensions: max. replacement rate 80%
    average net replacement rate 78%
  - actual av.retirement age much lower than statutory:
    58.5 for men and 56.8 for women
  - aging: dependency ratio from 23% in 2000 to 49% in 2050
- **Research and policy questions:**
  - labor market effects (unemployment, labor supply)
  - macroeconomic general equilibrium effects
  - net gains/losses, intergenerational redistribution

- **Main conceptual arguments:**
  - implicit tax component of contributions in an earnings related PAYG pension system
  - distortions: extensive and intensive labor supply
  - job creation, unemployment and aggregate income
- **Quantitative analysis, model innovations:**
  - OLG with demographics, workers and retirees
  - search unemployment and demographics
  - endogenous labor supply and search intensity
  - pension system with tax benefit linkage
- **Simulation scenarios for pension reform:**
  - Increasing life expectancy (LIFE)
  - Increasing population (AGE, baseline scenario)
  - Elimination of pension subsidies (Scenario FISC)
  - Cutting replacement rate (Scenario REPL)
  - Raising retirement age (Scenario RET)

THE MAIN ARGUMENT

- **Expected life-time utility:**

$$U_t = E\left[\bar{C}_t^i - \varphi\left(e_t^i\right)\right] - \psi\left(\zeta_t\right), \quad \bar{C}_t^i \equiv C_t^{1i} + C_{t+1}^{2i}/R.$$

Timing: 1. search $\Rightarrow$ 2. work $\Rightarrow$ 3. consume

- Wage and pension income:

$$\begin{aligned} \text{Worker} \ : \quad & y_t^E = (1-t)\, w_t e_t, \qquad y_t^U = z, \\ \text{Pensioner} \ : \quad & E_{t+1}^E = \phi_{t+1} \cdot (1-t)\, e_t w_t, \quad E_{t+1}^U = \bar{E}. \end{aligned}$$

- **Stage 3: consumption**

contribution rate t, implicit tax rate τ

$$\begin{aligned} \bar{C}_t^E &= (1-t)\, w_t e_t + \phi_{t+1} \cdot (1-t)\, e_t w_t / R = \left(1-\tau^i\right) w_t e_t \\ \tau^i &\equiv t - (1-t)\, \phi_{t+1}/R < t \end{aligned}$$

- Intertemporal effect on implicit tax:

lower replacement rate ϕ_{t+1} tomorrow

raises implicit tax τ^i already today!

LABOR MARKET EFFECTS:

- **Stage 2: work effort** determines

  job value $V^E = \max_e \left\{ \left(1 - \tau^i\right) we - \varphi(e) \right\}$

  $$\left(1 - \tau^i\right) w = \varphi'(e)$$

  implicit tax reduces

  – hours worked (intensive labor supply)

  – job value V^E (reward for search)

- **Search stage:** compare V^E with

  value of unemployment $V^U = z + \bar{E}/R$

  $$\begin{aligned} U &= \max_{\zeta} \left\{ \zeta f \cdot V^E + (1 - \zeta f) \cdot V^U - \psi(\zeta) \right\} \\ &\Rightarrow \quad \left(V^E - V^U\right) \cdot f = \psi'(\zeta). \end{aligned}$$

  – implicit tax reduces job value V^E, and

  return to search (extensive labor supply)

- **Wage bargaining:** tax shifting raises wages,

  reduces producer rent, reduces job creation

  $$(F_L - w)\, e \cdot q = \kappa R$$

COMPUTATIONAL MODEL

- Small open economy with OLG (Blanchard, Gertler)

  => workers, retirees and population dynamics

  => workers retire with probability $1-\omega$

  => *only* retirees die with probability $1-\gamma$

- **RETIREES**: maximize value $V^R\left(A_t^R, P^R\right)$,

  pension rights determine pensions:

$$E_t^k = \left(\varphi_k P^{R,k}/w_k\right) \cdot w_t = \hat{\varphi}_k \cdot w_t$$

  pension entitl. previously accumulated

$$P_{t+1}^W = w_t e_t n_t^E/T + \left[1-\vartheta\left(T\right)\right] P_t^W$$

- **WORKERS**: maximize expected utility

$$\begin{aligned} V^W\left(A_t^W, n_t^E, P_t^W\right) &= \max\left[\left(Q_t^W\right)^\rho + \beta\left(G\bar{V}_{t+1}\right)^\rho\right]^{\frac{1}{\rho}} \\ \bar{V}_{t+1} &= \omega V_{t+1}^W + \left(1-\omega\right) V_{t+1}^R \\ Q_t^W &= C_t^W - \varphi\left(e_t\right) n_t^E - \psi\left(\xi_t\right) n_t^U \end{aligned}$$

  s.t. savings $A_{t+1}^W = R_t A_t^W + \bar{w}_t^D + z_t^T - Q_t^W$

- Inflows and outflows of (un-)employment

$$n_{t+1}^E = \left(1-s\right) \cdot n_t^E + \xi_t f_t \cdot \left(1-n_t^E\right)$$

LONG-RUN RESULTS

	Variables	ISS	LIFE*	AGE*	REPL#	RET#
	ret.-worker ratio	0.454	0.552	0.552	0.552	0.446
t^{SS}	contribution rate	0.205	0.251	0.251	0.268	0.219
$\hat{t}^{SS}$	implicit s.s.tax	0.037	0.071	0.071	0.107	0.069
t^W	wage tax rate	0.205	0.353	0.353	0.258	0.135
r^P	replacement rate	0.781	0.781	0.781	0.703	0.703
u	unempl. rate	5.800	7.908	7.908	7.058	5.510
K	capital stock		-17.879	-12.952	4.944	25.381
L^D	labor demand		-17.879	-12.952	4.944	25.381
w	gross wage		0.075	0.075	-0.025	-0.004
e	labor supply		-10.375	-10.375	4.007	13.788
ξ	search intensity		-18.980	-18.980	7.946	27.067
$\bar{y}$	average income		-43.299	-39.897	23.848	98.045
E	pension p.c.		-11.790	-11.790	-5.554	6.312

- *) % change relative to ISS, #) % change rel. to AGE
- unemployment benefits partially indexed
- Av.wage income: $\bar{y} = (1 - t^w - t^{ss})w \cdot e \cdot N^E + z \cdot N^U$
- Entitlements: $P^W(w \cdot e \cdot n^E)$, pensions $E = \varphi \cdot P^w$

SUMMARY OF MAIN RESULTS

- strong labor market effects of

  aging and pension reform

- opposite short- and long-run effects!

- Future work on alternative policy scenarios

  – strengthening tax benefit link,

  – partial funding of the system,

  – introducing individual accounts