Workshop on

Stochastic General Equilibrium Models and Pension Policies

Preliminary Program

Saturday, June 16, 2007

9.00 – 9.15	Opening by **Lans Bovenberg** (Tilburg University and Netspar)
9.15 – 10.00	Paper by **Alexander Ludwig** (University of Mannheim) *On the Consequences of Demographic Change for Rates of Returns to Capital and the Distribution of Wealth and Welfare*
10.00 – 10.45	Paper by **Michael Reiter** (University of Pompeu Fabra) *Sharing Demographic Risk. Who is Afraid of the baby Bust?*
10.45 – 11.15	Break
11.15 – 12.00	Paper by **Wouter den Haan** (University of Amsterdam) *Solving Heterogeneous-Agent Models with Parameterized Cross-Sectional Distributions*
12.00 – 12.45	Paper by **Julián Díaz-Saavedra** (University of Granada) *Delaying Retirement in Spain*
12.45 – 14.00	Lunch
14.00 – 14.45	Paper by **Dirk Krueger** (University of Pennsylvania) *Taxing Capital? Not a Bad Idea After All!*
14.45 – 15.30	Paper by **Christian Habermann** (University of Würzburg) *Social Security with Rational and Hyperbolic Consumers*
15.30 – 16.00	Break
16.00 – 16.45	Paper by **Peter Broer** (CPB and Netspar) *Social Security Risk in General Equilibrium*
16.45 – 17.00	Closing
17.00 – 18.00	Drinks
19.30 – ….	Dinner

Abstracts of papers

Dirk Krueger and **Alexander Ludwig**
On the Consequences of Demographic Change for Rates of Returns to Capital, and the Distribution of Wealth and Welfare

This paper employs a multi-country large scale Overlapping Generations model with uninsurable labor productivity and mortality risk to quantify the impact of the demographic transition towards an older population in industrialized countries on world-wide rates of return, international capital flows and the distribution of wealth and welfare in the OECD. We find that for the U.S. as an open economy, rates of return are predicted to decline by 86 basis points between 2005 and 2080 and wages increase by about 4.1%. If the U.S. were a closed economy, rates of return would decline and wages increase by less. This is due to the fact that other regions in the OECD will age even more rapidly; therefore the U.S. is "importing" the more severe demographic transition from the rest of the OECD in the form of larger factor price changes. In terms of welfare, our model suggests that young agents with little assets and currently low labor productivity gain, up to 1% in consumption, from higher wages associated with population aging. Older, asset-rich households tend to lose, because of the predicted decline in real returns to capital.

Alexander Ludwig and **Michael Reiter**
Sharing Demographic Risk: Who is Afraid of the Baby Bust?

This paper studies the optimal reaction of a public PAYG pension system to demographic shocks. We compare the ex-ante first best and the second best solution of a Ramsey planner with full commitment to the outcome under simple rules that mimic the pension systems observed in the real world. The model, in particular the pension system, is calibrated to the German economy. The objective of the social planner is calibrated such that the size of the German pension system was optimal under the economic and demographic conditions of the 1960s. We find that the German system comes relatively close to the second best solution, but is more egalitarian in the sense that it generates a lower variability of the lifetime utility than the second best policy. Moreover, recent reforms that vary pension benefits in response to changes in the retiree-to-worker ratio improve the performance of the pension system. The recent baby boom-bust cycle leads to welfare losses of about 5% of lifetime consumption for some baby boom cohorts. To obtain these results, we find that it is crucial to model correctly the labor market distortions arising from the pension system.

Yann Algan, Oliver Allais, and **Wouter J. den Haan**
Solving Heterogeneous-Agent Models with Parameterized Cross-Sectional Distributions

A new algorithm is developed to solve models with heterogeneous agents and aggregate uncertainty that avoids some disadvantages of the prevailing algorithm that strongly relies on simulation techniques and is easier to implement than existing algorithms. A key aspect of the algorithm is a new procedure that parameterizes the cross-sectional distribution, which makes it possible to avoid Monte Carlo integration.

The paper also develops a new simulation procedure that not only avoids cross-sectional sampling variation but is also more than ten times faster than the standard procedure of simulating an economy with a large but finite number of agents. This procedure can help to improve the efficiency of the most popular algorithm in which simulation procedures play a key role.

Javier Díaz-Giménez and **Julián Díaz-Saavedra**
Delaying Retirement in Spain

We study the reform of the Spanish public pension system in an overlapping generations model economy populated by households who differ in their education, receive a stochastic endowment of efficiency labor units, and face disability and survival risks. The households understand the link between the payroll taxes that they pay and the public pensions that they receive, and they decide how much to consume and to work and when to retire from the labor force. We calibrate this economy to Spanish data so that it replicates its fiscal policy instruments, its macroeconomic aggregates and ratios, and the Lorenz curves of its income and earnings distributions. We use the model economy to study the aggregate, distributional, retirement and welfare consequences of a reform of the public pension system that delays the first retirement age from 60 to 63 years and the normal retirement age from 65 to 68 years. We find this reform makes the Spanish public pension system sustainable until the year 2060.

Juan Carlos Conesa, Sagiri Kitao, and **Dirk Krueger**
Taxing Capital? Not a Bad Idea After All!

In this paper we quantitatively characterize the optimal capital and labor income tax in an overlapping generations model with idiosyncratic, uninsurable income shocks, where households also differ permanently with respect to their ability to generate income. The welfare criterion we employ is ex-ante (before ability is realized) expected (with respect to uninsurable productivity shocks) utility of a newborn in a stationary equilibrium. Embedded in this welfare criterion is a concern of the policy maker for insurance against idiosyncratic shocks and redistribution among agents of different abilities. Such insurance and redistribution can be achieved by progressive labor income taxes or taxation of capital income, or both. The policy maker has then to trade off these concerns against the standard distortions these taxes generate for the labor supply and capital accumulation decision. We find that the optimal capital income tax rate is not only positive, but is significantly positive. The optimal (marginal and average) tax rate on capital is 36%, in conjunction with a progressive labor income tax code that is, to a first approximation, a flat tax of 23% with a deduction that corresponds to about $6,000 (relative to an average income of households in the model of $35,000). We argue that the high optimal capital income tax is mainly driven by the life cycle structure of the model whereas the optimal progressivity of the labor income tax is due to the insurance and redistribution role of the income tax system.

Hans Fehr and Christian Habermann
Social Security with Rational and Hyperbolic Consumers

The present paper studies the role of social security in an economy populated by overlapping generations of individuals that have time-consistent or time-inconsistent preferences, face mortality and individual income risk, borrowing constraints as well as progressive income taxes. Our simulations start from an artificial equilibrium where social security is completely neutral. Next we introduce successively alternative deviations from neutrality in order to isolate the various economic effects of social security. The latter are mainly the insurance provision against mortality and income risk, the negative liquidity effects for young households and the provision of a commitment technology for present-biased hyperbolic consumers. Our simulations indicate that the positive effects of social security dominate the negative ones for a wide range of parameter combinations. For our central parametrization social security induces an overall welfare gain that amounts to roughly 1.5 percent of aggregate resources in the hyperbolic model and a welfare loss of about 0.5 percent of resources in the model with rational consumers.

D. Peter Broer
Social Security Risk in General Equilibrium

How secure is social security in an ageing society? Hitherto, the risk profile of pension schemes has been analyzed almost exclusively from the point of view of pension funds, using asset liability (ALM) models. This approach largely neglects the demand for insurance on the part of the households and the response of households to changes in pension provisions and the risk of pension arrangements. This paper studies the interaction between macro-economic risks, pension arrangements and social security in a general equilibrium framework with overlapping generations of risk-averse households. Important sources of risk are productivity shocks, capital return shocks, and demographic shocks. To keep the dimensionality within bounds, the numerical implementation uses a sparse grid and state space aggregation. The model is used to discuss the effect of the institutional design of pension systems on the risk profile of pension arrangements, and the effect of pension risk on labor supply and private saving by households.

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