

Contents

1	Introduction	1
1.1	Methodology	3
1.2	Macroeconomic Consequences of Demographic Change: Focus and New Aspects	5
1.2.1	Global Demographic Change and International Trade	7
1.2.2	Quantifying the Sectoral and Distributional Effects of Population Aging in Germany	8
2	Computation of Equilibria in OLG Models with Many Heterogeneous Households	11
2.1	Introduction	11
2.2	Calibration in CGE models	15
2.2.1	CES Preferences	15
2.2.2	The Calibrated Share Form	16
2.3	CGE with Many Households: A Decomposition Approach	17
2.3.1	A Static Economy	17
2.3.2	A Decomposition Algorithm	18
2.4	Convergence Theory	23
2.4.1	Local Convergence	23
2.4.2	Global Convergence	26
2.5	OLG Models with Many Households	28
2.5.1	A Prototype Auerbach-Kotlikoff OLG Model	28
2.5.2	A Decomposition Algorithm for OLG Models	31
2.5.3	Algorithmic Performance	37
2.6	Concluding Remarks	41
3	Trade Liberalization and Global Demographic Change: A Quantitative Assessment	43
3.1	Introduction	43
3.2	Model Formulation	47
3.2.1	Heterogeneous Households	48

3.2.2	Firms and Production Structure	50
3.2.3	Feasibility Conditions and Model Closure	51
3.2.4	Equilibrium	52
3.3	Calibration and the Nature of Demographic Shocks	53
3.3.1	Calibration Strategy	53
3.3.2	Region-specific Population Dynamics	56
3.4	Model Results and Discussion	57
3.4.1	Demographic Change in a Two-Sector Economy Under Autarky	57
3.4.2	Globally Unsynchronized Aging Patterns and International Trade	59
3.4.3	Welfare Effects of Trade Liberalization Under Global Demographic Change	61
3.4.4	Aggregate Social Welfare	66
3.4.5	Sensitivity Analysis	67
3.5	Concluding Remarks	70
Appendix	73
3.5.1	Steady State Calibration	73
3.5.2	Solution Algorithm	75
4	Quantifying the Sectoral and Distributional Effects of Demographic Change in Germany	81
4.1	Introduction	81
4.2	Model Description	85
4.2.1	Firms	86
4.2.2	Foreign Trade	88
4.2.3	Households	89
4.2.4	Government	93
4.2.5	Market Clearing Conditions and Model Closure	94
4.2.6	Equilibrium	96
4.3	Calibration and Data	96
4.3.1	Numerical Implementation	97
4.3.2	Thought Experiment and Calibration of the Model	98
4.3.3	Input-Output Data	99
4.3.4	Representation of the Household Sector	100
4.3.5	Demographic Projections	102
4.3.6	Calibration of Free Parameters	102
4.3.7	Government	104
4.4	Results of the Benchmark Model	104
4.4.1	Macroeconomic Effects of Population Aging	104
4.4.2	Sectoral Change During the Demographic Transition	106
4.4.3	Distributional and Welfare Consequences of the Demographic Transition	109
4.5	Sensitivity Analysis	113

- 4.5.1 Age-specific Preferences: How Important Are Structural Changes in Final Consumption Demand? 114
- 4.5.2 Piecemeal Sensitivity Analysis 117
- 4.6 Concluding Remarks 118
- Appendix 1 121
- Appendix 2 121
- 5 Concluding Remarks 125**
- References 129**