

Abstract: On the Distributional Implications of Demographic Change¹

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All major economies face severe population aging within the next decades leading to large drops in the labor force of some OECD countries. These strong changes in the population structure will have important implications for the macroeconomic composition of capital and labor in the production as Ludwig, Schelkle, and Vogel (2012) remark. The pure abundance of physical capital per worker gives rise to increasing wages and decreasing interest rates with direct consequences for the income distribution. Furthermore, findings by Krusell, Ohanian, Ríos-Rull, and Violante (2000) on the past evolution of the skill premium suggest that college households benefit more from the abundance of physical capital than high school households due to the existence of capital-skill complementarity.

Along those lines, this paper provides a quantitative assessment of the impact of future demographic change on the distributions of income, skills, and welfare in the German economy. The model accommodates household heterogeneity along both, the inter- and the intra-generational dimension and investigates the role of capital-skill complementarity in the production. Therefore, it builds on an overlapping generations structure in the tradition of Auerbach and Kotlikoff (1987) where households of the same generation differ exogenously by their (innate) ability for studying in college. Following Heckman, Lochner, and Taber (1998) households face an initial decision on tertiary education which splits them into *high-school* and *college* types respectively thereby determining their respective degree of substitutability by capital in production.

The main step of the investigation is to quantify the distributional effects arising from expected future demographic change and to show the relevance of different margins of adjustment of households (schooling, on-the-job skill formation, and hours worked) to the altered economic conditions. Quantitative experiments comparing year 2010 to year 2050 reveal the following preliminary results: 1) The Gini coefficient of net total income increases by more than 4 percentage points indicating higher overall income inequality in the aged economy. 2) Capital abundance induces ceteris paribus a demand side effect for college graduates due to capital-skill complementarity. Self-selection of households into college lead to an increase of the relative supply of college graduates by about 6 percentage points. 3) The average wage premium for college graduates over the life cycle drops by more than 20 percentage points showing that the supply side effect under 2) overcompensates the demand side effect in equilibrium. 4) Intra-generational wage inequality would increase and the increase in overall income inequality would be stronger if the fraction of college graduates in the economy remained fix. 5) Hours worked and on-the-job skill formation are margins of adjustment which are quantitatively of minor relevance.

In line with Ludwig, Schelkle, and Vogel (2012) the results suggest that skill development, here in particular at the external margin, will play a key role for economies in mitigating the consequences of expected future demographic change. The paper further highlights the special importance for intra-generational income inequality and gives thereby rise to education policies.

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