



Rethinking the roles of  
**family, market & state**

Projecting changes in the size and composition of  
the Austrian labor force based on the dynamic  
microsimulation model microDEMS

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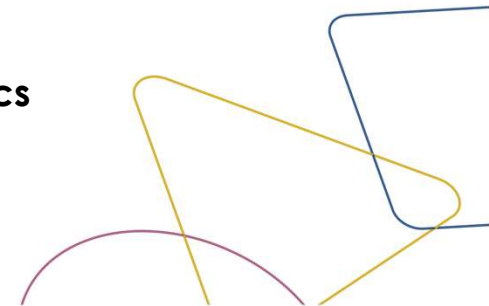
- Projection of size and composition of the workforce in Austria
  - Accounting for demographic change, family, education, health, and institutional settings
  - Consistency with official population projections (STATAT) but accounting for education
  - Individual characteristics, e.g., education, migration background, health
- Policy tool: identification of policy levers affecting labor careers; scenario-support
- Starting point for two Case Studies in SustainWELL Project:
  - Detailed modeling of migration vs. simple net-migration
  - Detailed modeling of retirement / pensions vs. simple replacement rate approach
- Requirements
  - Longitudinally consistent careers from education, first labor entry until retirement
  - Detailed pension regulations: types, reforms, eligibility rules based on individual careers
  - Realistic modeling of labor transitions, accounting for path dependency
  - In- / Outmigration by personal characteristics and duration of stay



- Two models at WIFO:
- **microWELT**: Comparative model used as a platform in various international projects based on harmonized or comparable data sources (EU-SILC, LFS,...)
  - Böheim et al. (2023) The Impact of Health and Education on Labour Force Participation in Aging Societies: Projections for the United States and Germany from Dynamic Microsimulations, *Population Research and Policy Review*, 42, (3)
  - Spielauer et al. (2023), The Effect of Educational Expansion and Family Change on the Sustainability of Public and Private Transfers, *Journal of the Economics of Ageing*, 25
- **microDEMS**: more detailed model for Austria based on cross-sectional (LFS, STATAT,..) and longitudinal data (ÖGK, DSVS,..)
  - Horvath et al.(2023) Socio-economic Inequality and Healthcare Costs Over the Life Course – A Dynamic Microsimulation Approach - *Public Health* (219), S.124-130
  - Horvath et al. (2023) Older Persons in the Labour Market: A Forecast until 2040 as a Basis for Economic Policy Measures, WIFO-Report.
  - Angel et al.(2023) Activatable Labour Market Potentials and "Hidden Unemployment" in Austria, WIFO-Report.

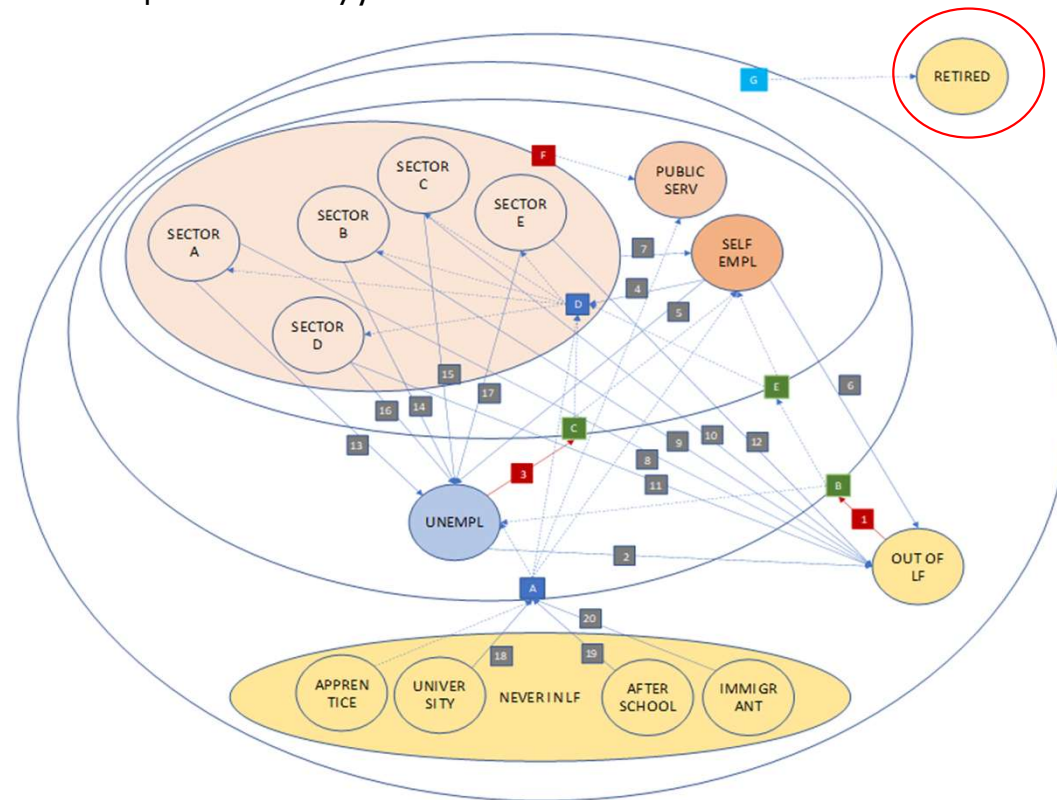


- Design
  - **Interacting population model** operating in **continuous time** (things can happen at any time); individuals **linked to families**
  - **Support of (optional) alignment to external targets** allowing reproducing official population projections, and scenarios concerning unemployment etc. while maintaining relative differences in risks by individual characteristics.
- Modgen/openM++
- Detailed biographies (schooling, family formation, employment careers, retirement)
- Base Scenario
  - Keep all factors impacting on labor force participation constant (health, age, education, family & job characteristics)
  - but account for changing retirement age of women (old age: +5 years; early +4 years)
- Case Studies
  1. **Pension law requires full life-time accounting!** → realistic labor market careers
  2. **Large migration flows** → in- & outmigration / careers by individual characteristics



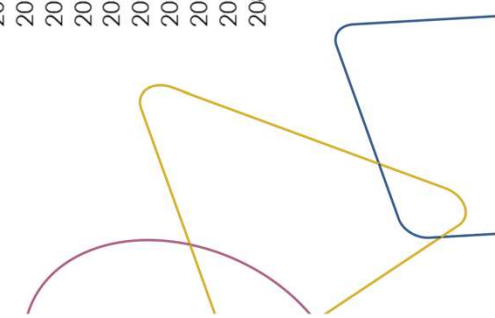
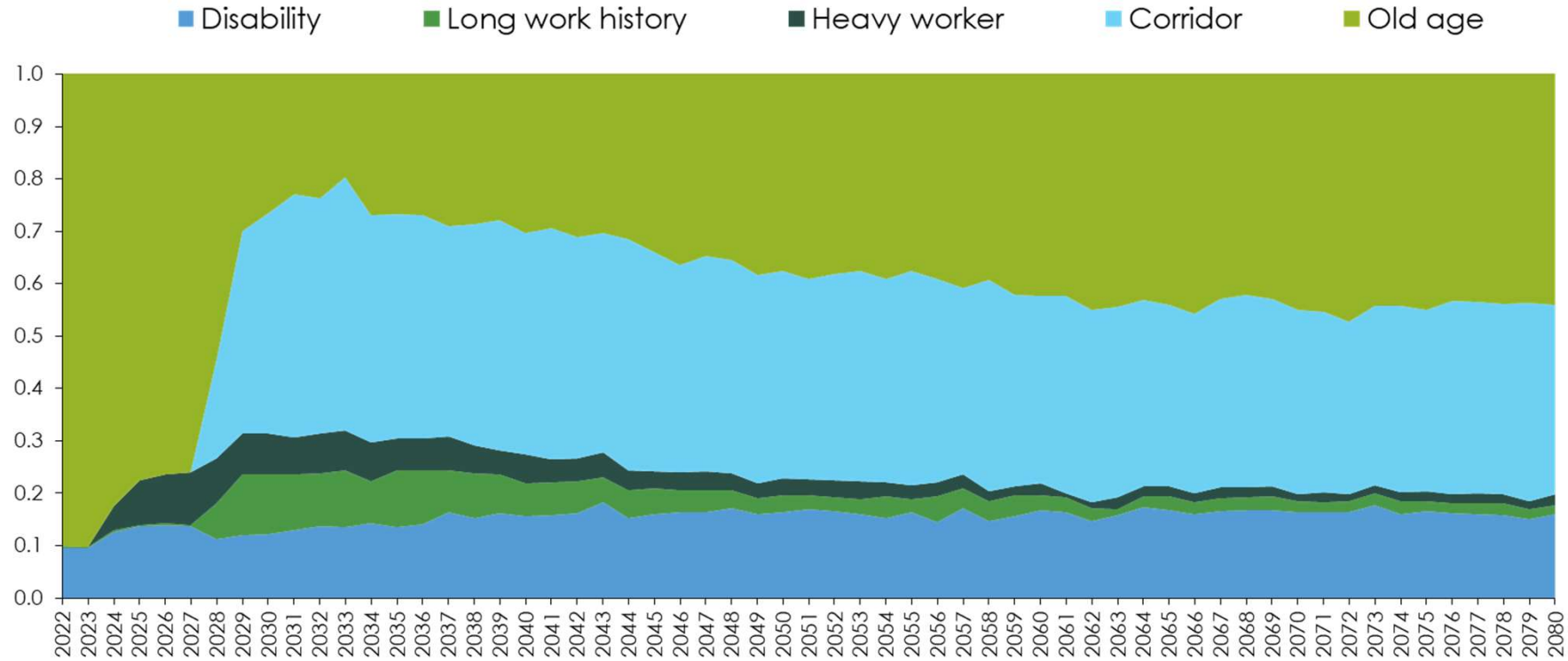
# microDEMS – Employment Transitions

- Labor market model reflects real-life mobility between labor market states
- Implemented by hazard regressions accounting for personal and family characteristics as well as duration of current state (path dependency)
- Sectoral differences
- Estimated on admin data
- ~100% population covered
- Health data
- Universe of employment spells



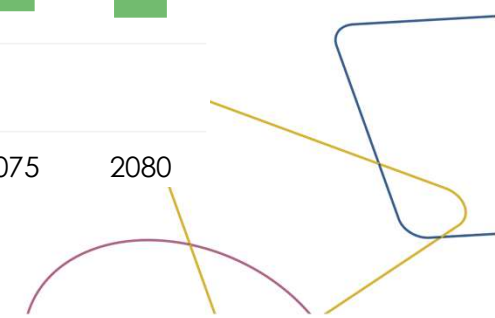
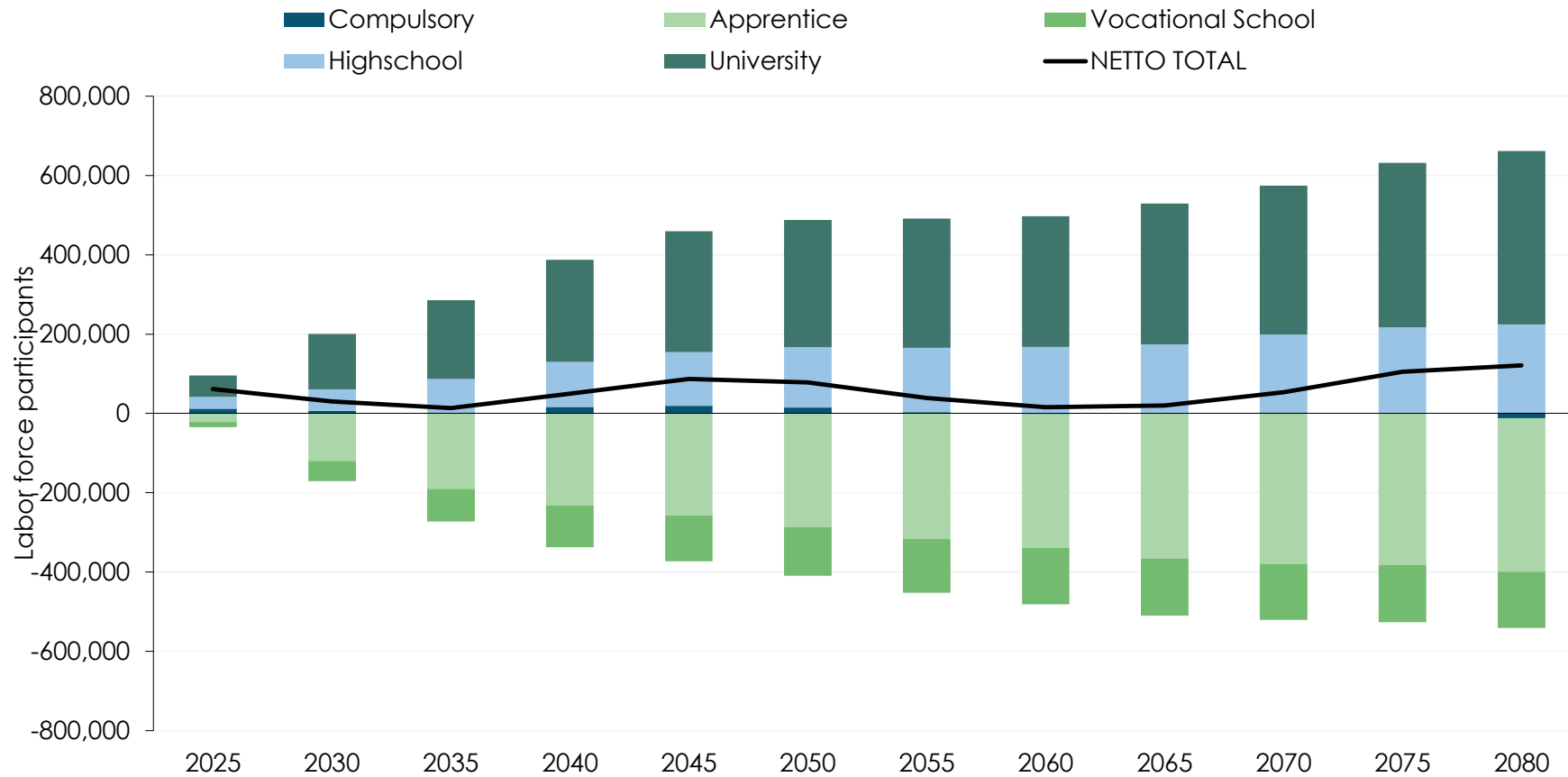
# Changing Retirement Transitions of Women

## Baseline Scenario



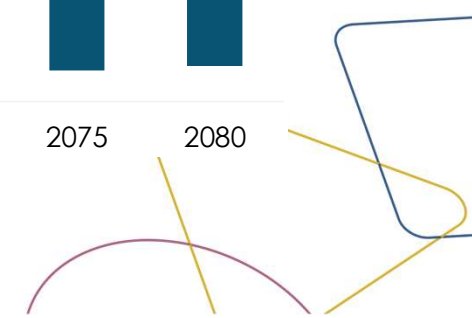
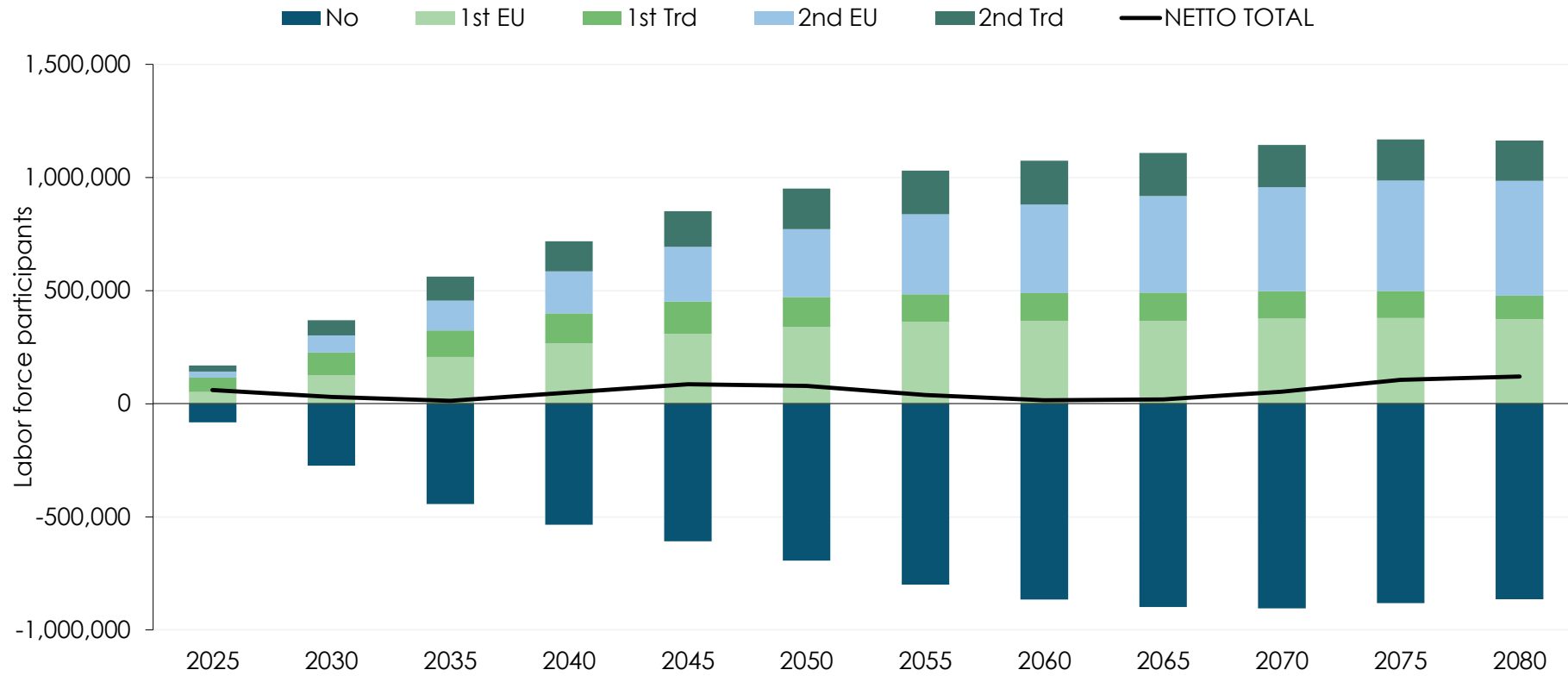
# Change in labor force by education attainment

## Absolut difference to 2022 , Baseline Scenario



# Change in labor force by migration background

## Absolut difference to 2022, Baseline Scenario

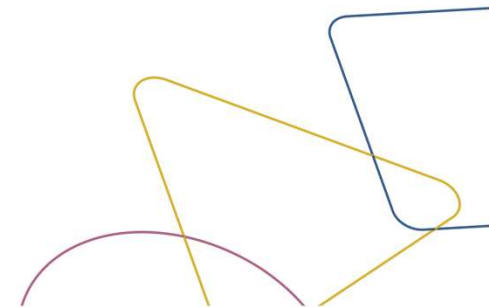




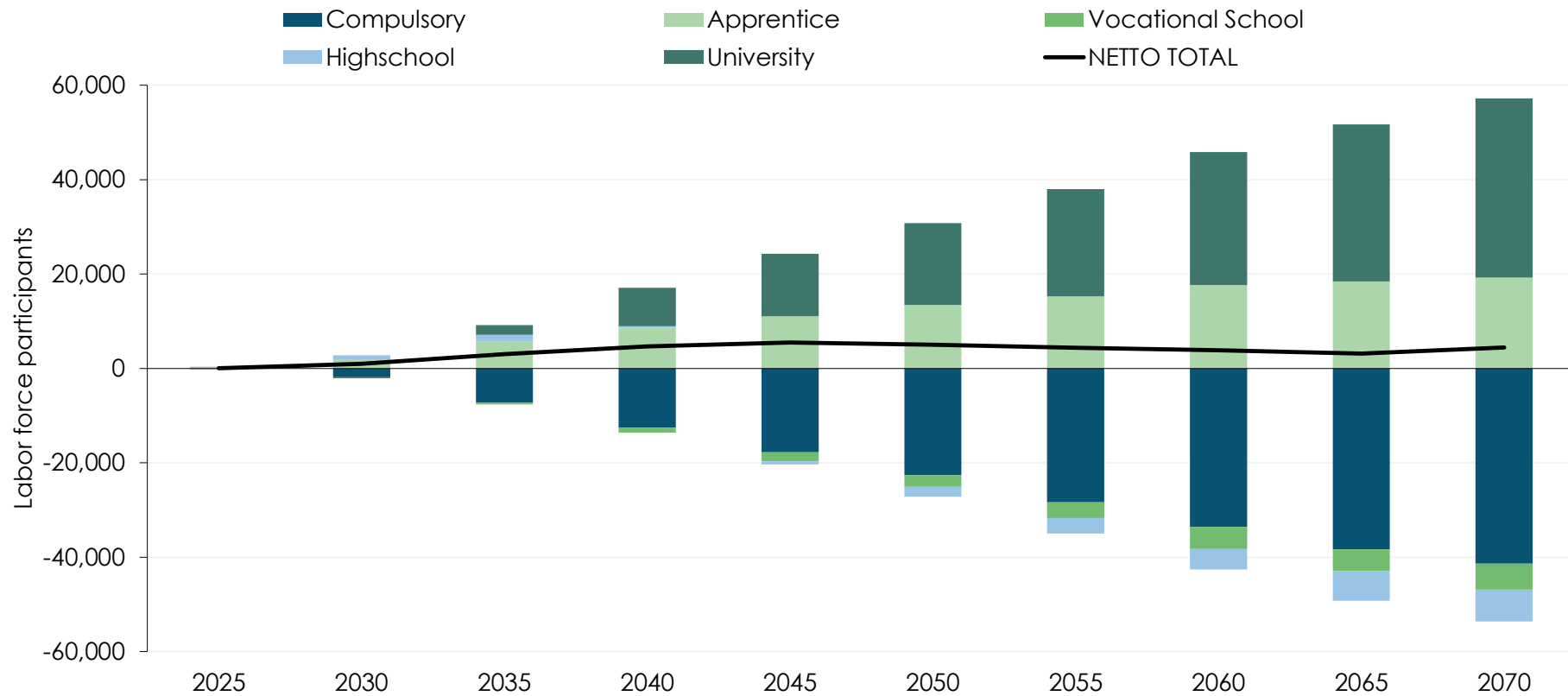
## Policy scenario – Improving education outcomes of 2<sup>nd</sup>. Generation migrants with 3<sup>rd</sup> country background

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- How would the elimination of differences in educational careers between young people from "2nd generation third countries" and young people without a migration background affect the labor market and employment?
  - Base scenario: Factors influencing educational careers are gender, parents' education, migration background
  - Alternative scenario: From birth year 2010, no differences in educational trajectories with otherwise identical characteristics, such as parental education

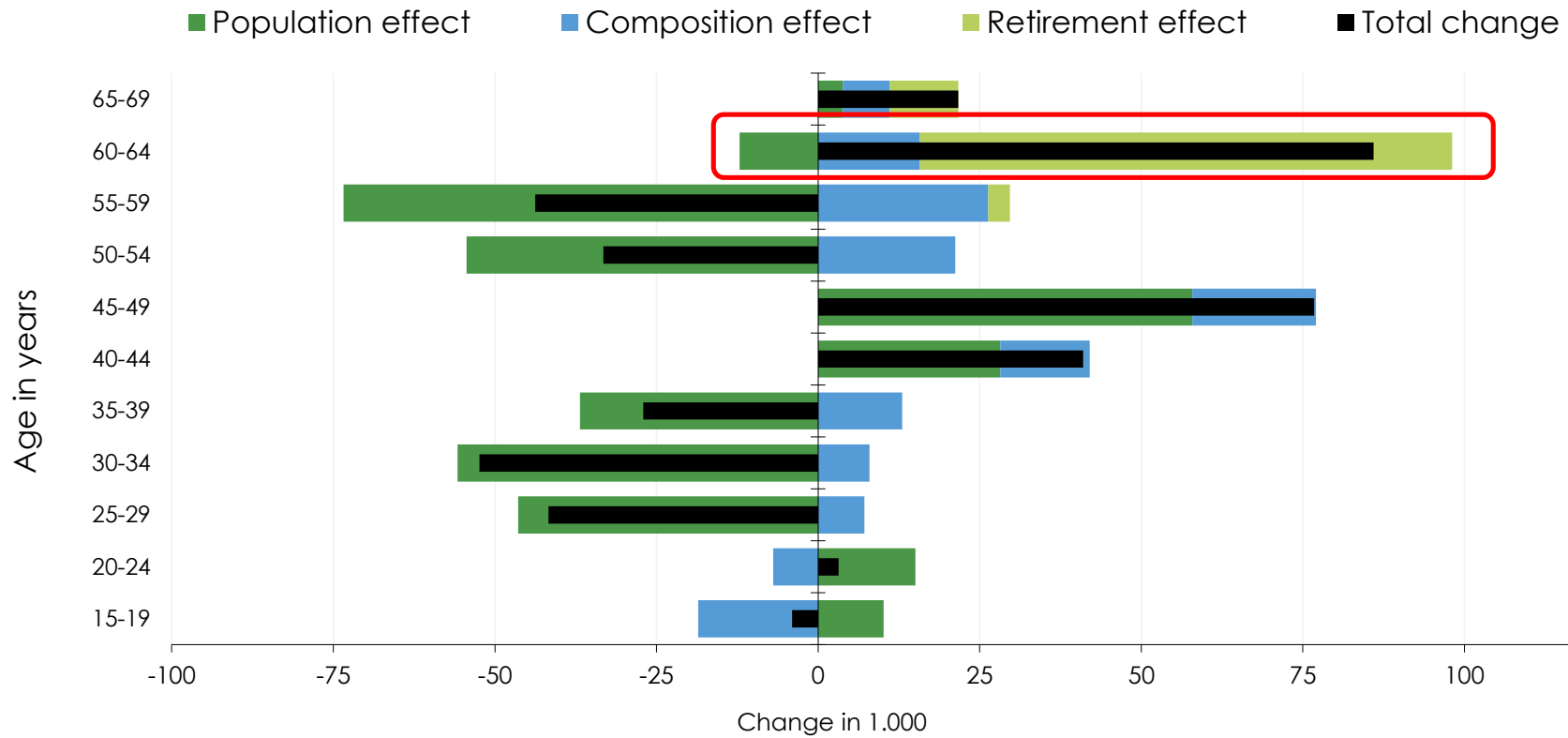


## Number of 2nd gen. migrants (third country) in the labor force abs. diff. to baseline scenario



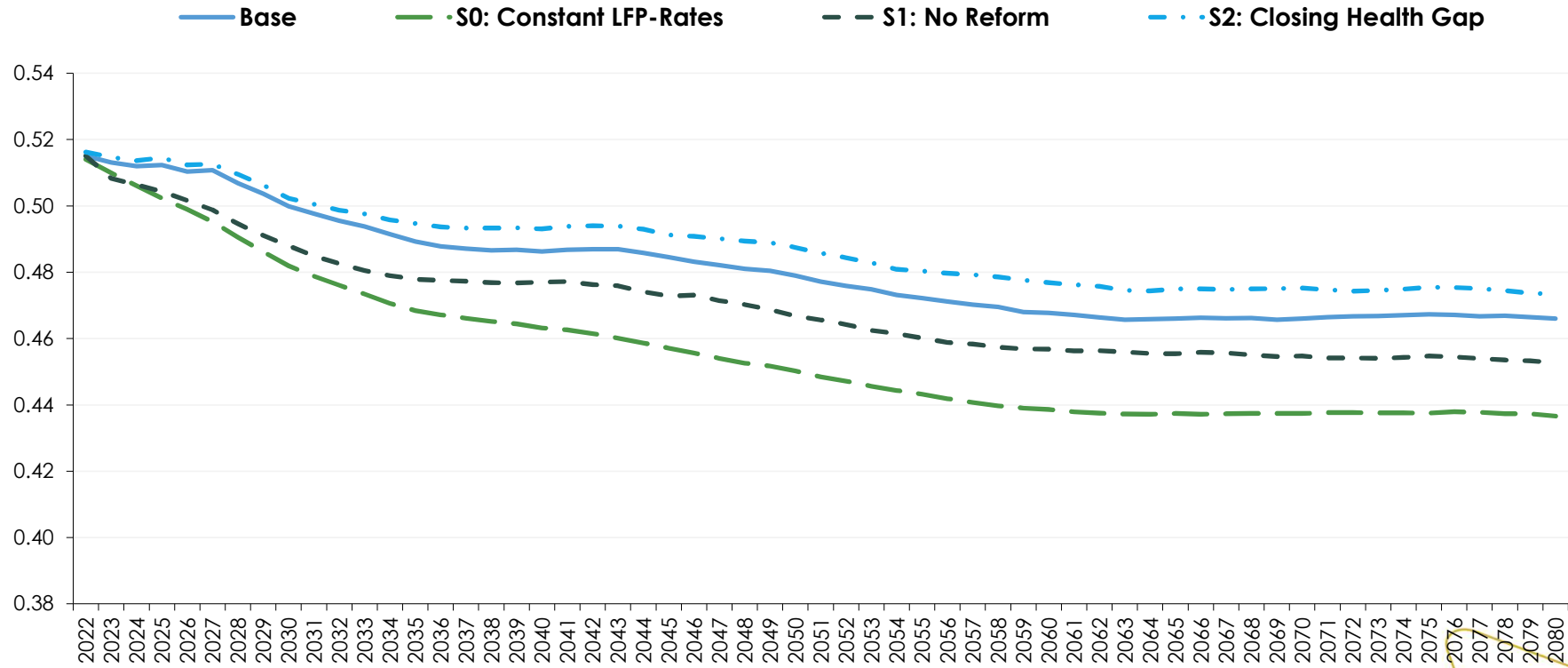
# Components of total change in labor force 2022 to 2040

## Baseline Scenario



# Active vs. Total population

## Base scenario and alternative scenarios



## Conclusions

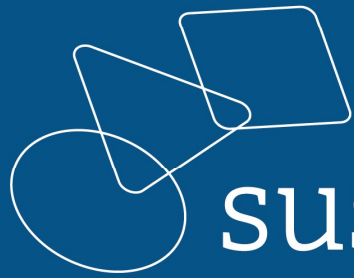
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- microDEMS models longitudinally consistent individual careers explicitly modelling cohort-specific retirement rules
  - Allows realistic full life time accounting (Pensions, Earnings,...)
  - Alignment supporting scenarios preserving relative risks by individual characteristics
- microDEMS allows to assess how changes in the underlying parameters affect results
- As an ex-ante policy tool our model empowers the evaluation of different policy measures on socio-economic outcomes in the medium and long term

→ Capturing the heterogeneity of individual life courses enhances the accuracy, detail, and policy relevance of population and labor force projections



<https://www.microWELT.eu>



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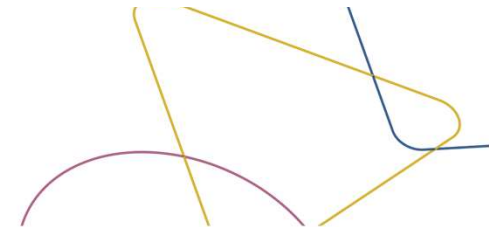
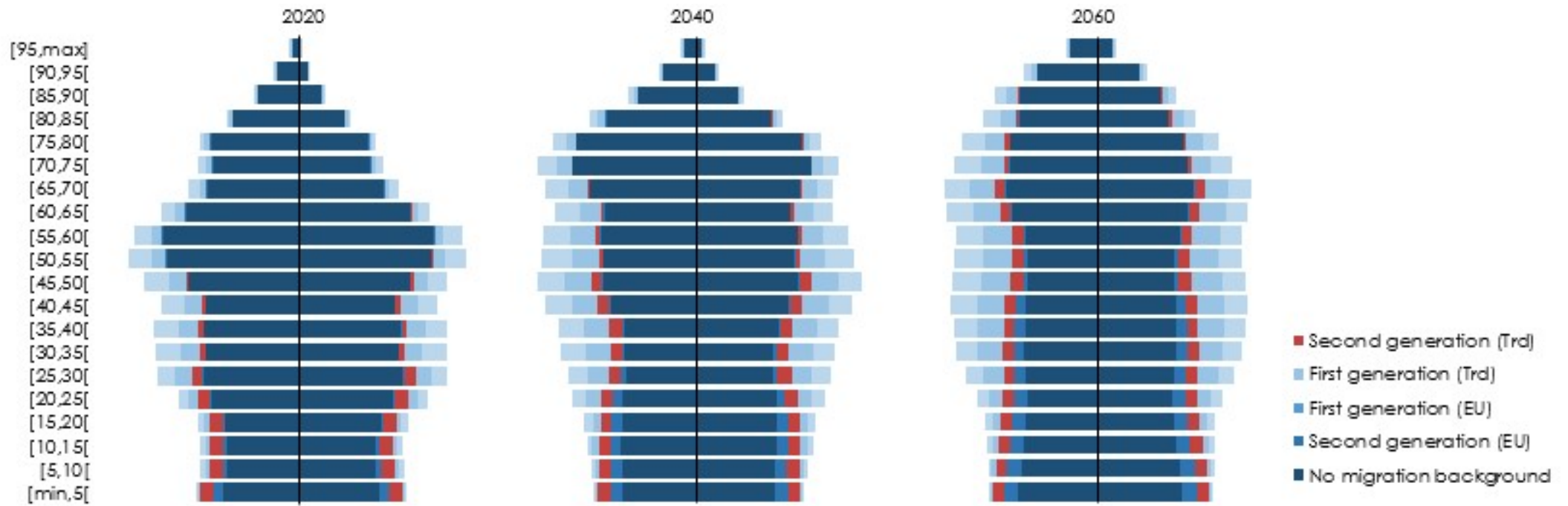
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[www.ub.edu/sustainwell-eu-project](http://www.ub.edu/sustainwell-eu-project)

# Population by migration background

## Baseline Scenario



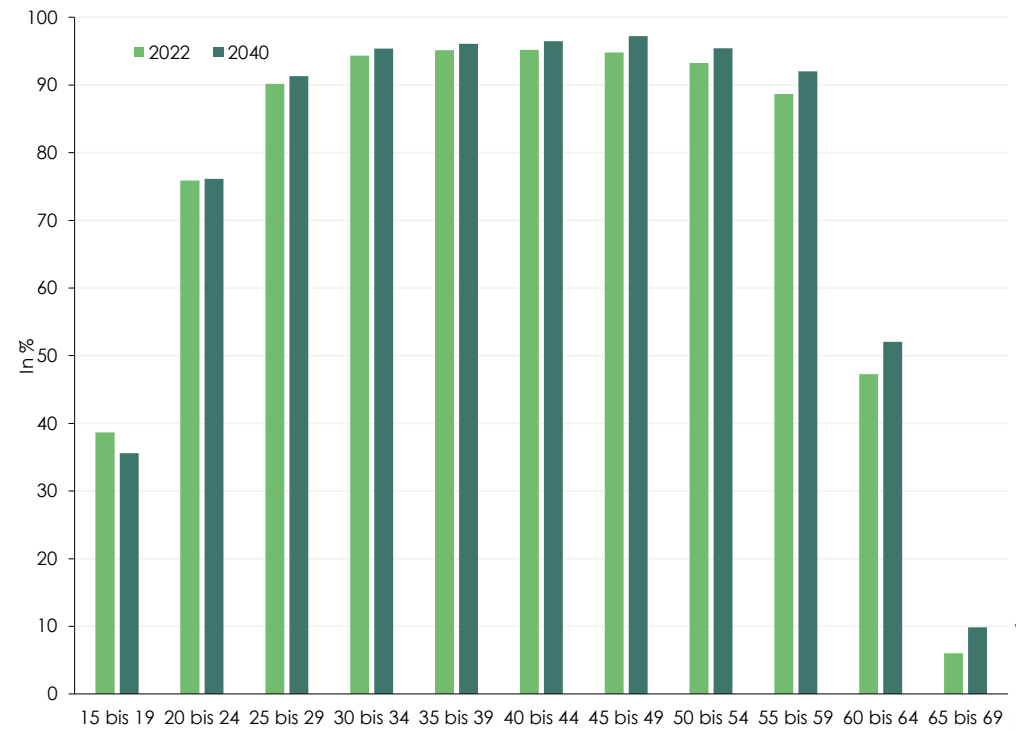
# Labor force participation rates

## Baseline Scenario

### Women

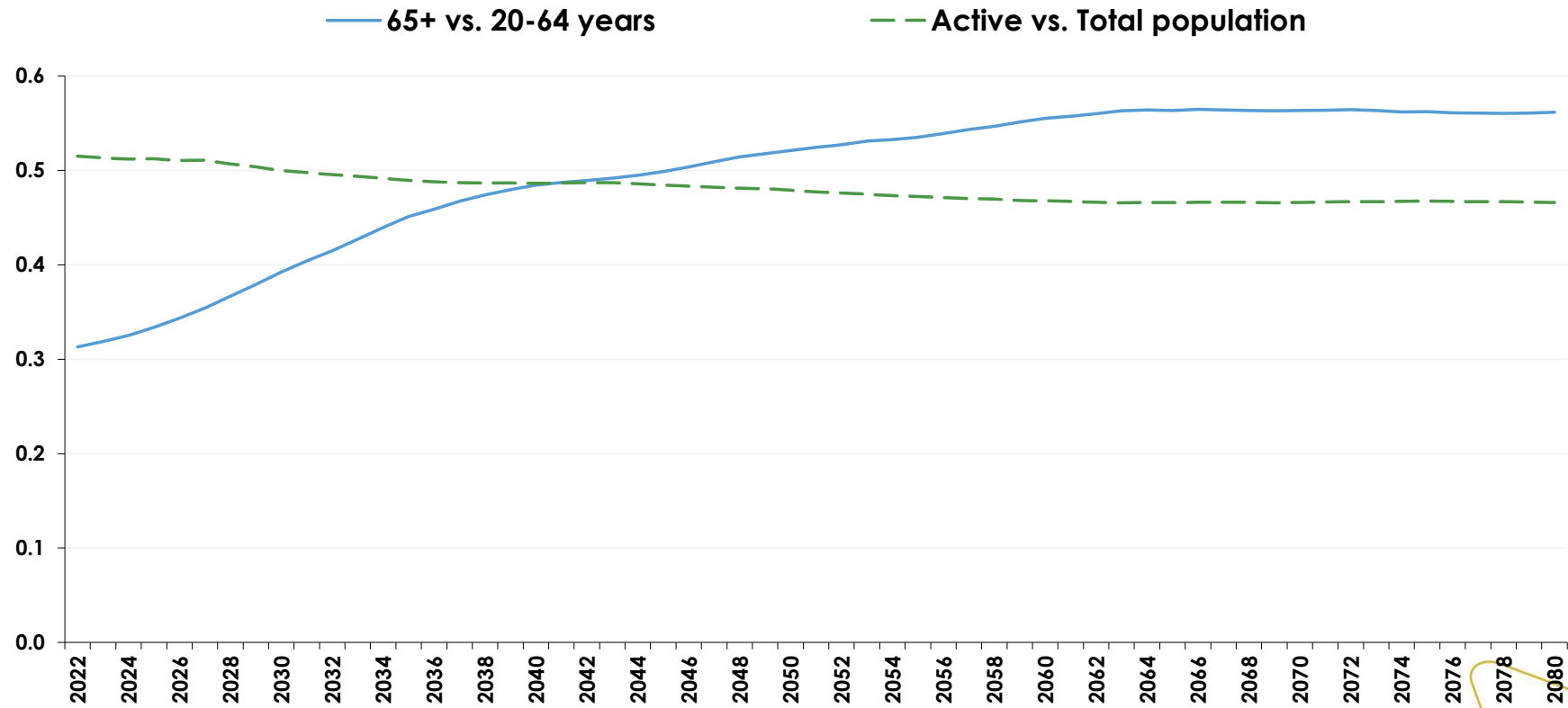


### Men



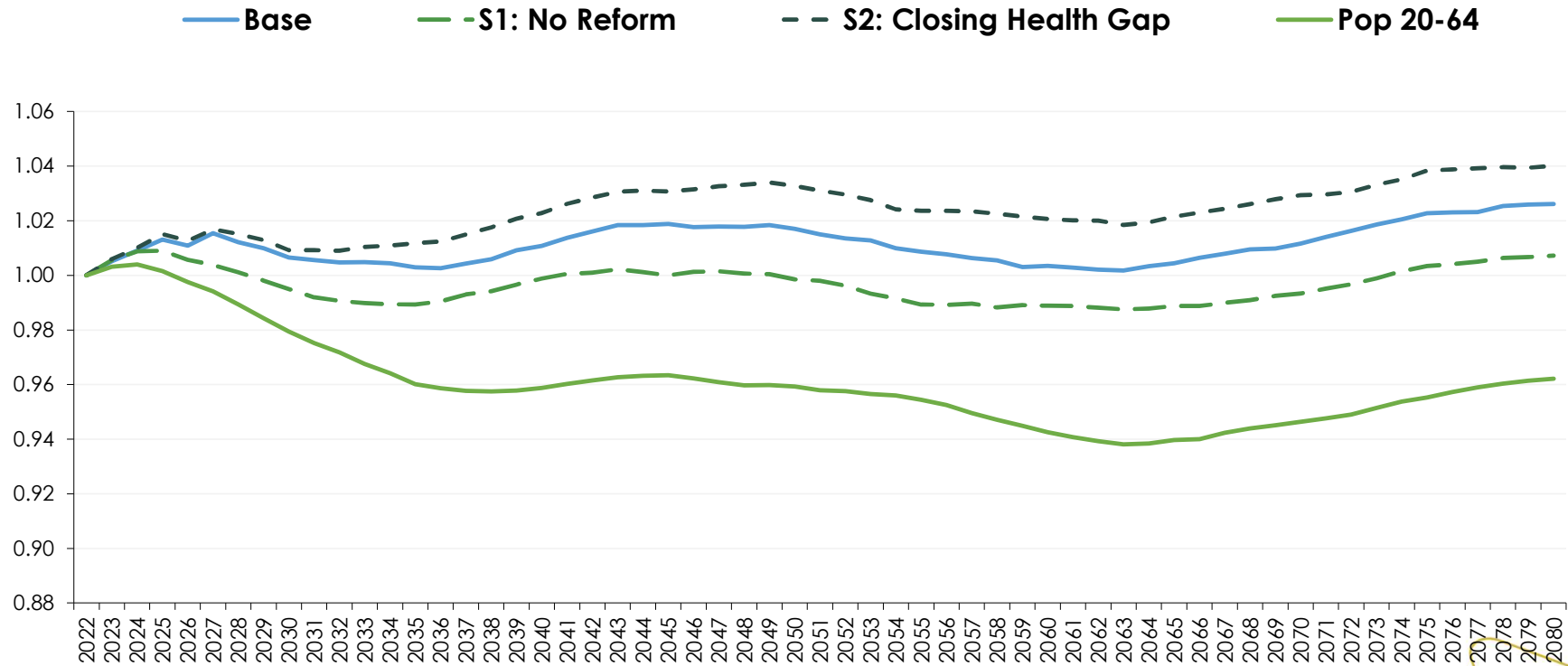


# Demographic and economic dependency Baseline Scenario



# Change in size of the labor force

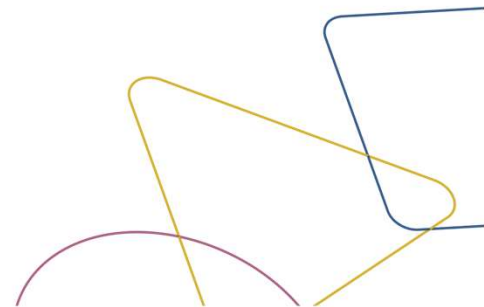
## Baseline and alternative scenarios



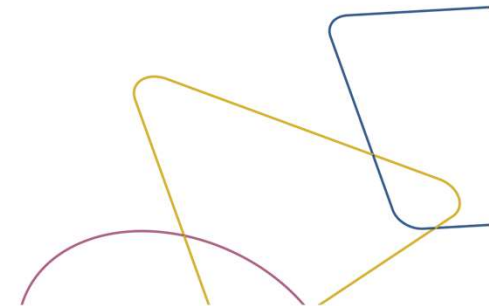
# Case Studies for Austria

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- 3.4. Explicit modeling of pensions for Austria
  - Contrasting stylized NTA-based pension benefit model (3.3.)
  - Based on admin data / longitudinal employment careers
- 3.6. Projections for selected policy counterfactuals
  - Austria - “Detailed simulations concerning the characteristics of migrants”



- **microDEMS:** Detailed Austrian version of comparative model microWELT
- **Detailed modelling of migration:** In- and outmigration by origin, sex and age (in line with current population projection of Statistics Austria which are as well produced by microsimulation)
- **Integration of immigrants** in education and labor market
- **Public health costs** by education
  - Horvath, Leoni, Reschenhofer, Spielauer (2023) Socio-economic Inequality and Healthcare Costs Over the Life Course – A Dynamic Microsimulation Approach. Public Health, (219), pp.124-130
- **Longitudinal employment careers** accounting for education and health
- Detailed modeling of Austrian **Pension Law** (cohort specific retirement rules, diverse pension types)
- “Cleaned up consolidated” starting version for SustainWELL project



## Pensions

### ■ Wages:

- Consistent implementation from longitudinal and cross-sectional perspective
- Replacement incomes (parental leave, unemployment, sick-leave)

### ■ Pension accounts:

- Imputation of starting values
- Updating accounts in simulation according to Pension Law

### ■ **Overlap to Slovenian Pension Model (Dypensi)**

## International migration

- Consistency with new Statistics Austria Approaches and projections
- Nationals living abroad and back migration: **Overlap to Slovenian model**

