Decomposition of regional convergence in population ageing across Europe

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European Population Conference 2016
Mainz, Germany, 2016-09-02
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We apply the methodological framework of **convergence analysis**.
INTRO: 2 CONCEPTS OF CONVERGENCE

sigma

value

0 1 2 3 4

time

t1   t2

beta

growth

0 0.1 0.2

initial level

0 1 2 3 4
INTRO

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Measure variable is Total Support Ratio (working-age to non-working-age ratio, inverse of Total Dependency Ratio, 15-64).
DATA
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EU-28, 263 NUTS-2 regions
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Observed period: 2003-2012 (Eurostat + nat.)
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METHODS 1 - DECOMPOSITION

TSR
change
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Two-step decomposition of the changes in WR

TSR change
Two-step decomposition of the changes in WR

1. TSR change
   - Change in non-working age population
   - Change in working-age population
Two-step decomposition of the changes in WR

\[ TSR_2 - TSR_1 = \frac{W_2}{NW_2} - \frac{W_1}{NW_1} = \]

\[ = \left[ \frac{1}{2} \times (W_2 + W_1) \times \left( \frac{1}{NW_2} - \frac{1}{NW_1} \right) \right] + \left[ \frac{1}{2} \times \left( \frac{1}{NW_2} + \frac{1}{NW_1} \right) \right] \times (W_2 - W_1) \]

Two-step decomposition of the changes in WR

1. TSR change
   - Change in non-working age population
     - Mortality age 15-64
     - Migration age 15-64
     - Cohort turnover

2. Change in working-age population
**METHODS 1 - DECOMPOSITION**

Two-step decomposition of the changes in WR

\[ W_2 = W_1 + CT + M_W - D_W \]
A. Change in TSR
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B. Non-working age

C. Working age

D. Cohort turnover

E. Migration (15-64)

F. Mortality (15-64)
METHODS 2 – BETA-CONVERGENCE
Classical linear regression model specification
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\[ TSR_2 - TSR_1 = \alpha + \beta TSR_1 + \varepsilon \]
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A separate beta-convergence model for each effect and each year
DECOMPOSED EFFECTS

First step

Cumulative beta-coefficient

2003 2008 2013 2018 2023 2028 2033 2038 2042

Working age
Non-working age
Overall model
DECOMPOSED EFFECTS

First step

Second step

- Cohort turnover
- Migration
- Mortality
- Working age
CONCLUSIONS

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The effects of changes in NW and W on TSR are comparable.
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The effect of working-age population’s dynamics on convergence in ageing is mainly driven by mortality.
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The effect of working-age population’s dynamics on convergence in ageing is mainly driven by mortality; the impact of cohort turnover is expected to rise.
CONCLUSIONS

Convergence in aging took place only in recent years; the prior lack of convergence is mainly explained by the demographic development of East-European regions.

The effects of changes in NW and W on TSR are comparable.

The effect of working-age population’s dynamics on convergence in ageing is mainly driven by mortality; the impact of cohort turnover is expected to rise; the effect of migration is notable in the observed period and is almost non-existent in the projected period.
thank you

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