PROJECTING FUTURE BIRTHS IN EU28
with fertility differentials reflecting women's educational and migrant characteristics

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Objective:

- Multi-dimensional modelling of fertility in population projection models needed as a result of an increasing diversity of European populations
- Fertility modelling should capture educational as well as migrant characteristics
- How much does it matter for the projection results?
Multistate projections vs. microsimulation

- Adding new states to multistate projections challenging due to increasing complexity and data limitations

- Microsimulation:
  - More flexible – different components can be modelled with different number of parameters
  - Easy to handle many dimensions
  - Employs life-course perspective to modeling of life events

- CEPAM microsimulation model fertility module: educational (student, completed educational level) and migrant characteristics of women
Data & methods

Data: EU- Labour Force Survey (LFS) 2011-2016
5 300 110 women 15-49
203 113 had a coresident child age 0

1. Matching children age 0 with the mother
2. Dependent variable: had a child age 0 yes/no
3. Logit regression model to estimate the effect of migration characteristics (region of birth, duration of stay, generation) and student status
   Controls: educational attainment, age and country
   Contrast option (reference is the population average)

4. In the projection, the control parameters are replaced by the age- and education- specific fertility rates by country (SSP2 scenario assumptions)
Fertility differentials: migration

Migration variable
Region of birth
Duration of stay
Generation (G1 – arrived as adults, G1.5 arrived by age 15)

Data: LFS 2011-2016
How should we model fertility by education?

- In a typical multistate model fertility differentials are applied as if women completed that level of education.
- Following life-course perspective, the ultimate level of fertility is paramount and making a distinction between women who are still enrolled in fulltime education and those who completed their education is important...
- ... and even more so given that future educational expansion is assumed.

**Student** variable:
Women in education gave low propensity to have a child
Odds ratio 0.12*

**Fertility differentials of women with completed education** (low, middle, high)
Projected births in the EU

- EDU
- EDU+STUD
- EDU+STUD+IMMIG

Millionen

Projected births in the EU

- EDU
- EDU+STUD
- EDU+STUD+IMMIG
- EDU+STUD+IMMIG High Migration
- EDU+STUD High Migration
- EDU High Migration

Millionen

Projected % births to foreign-born mothers

SSP2, EDU only  | EDU+STUD+IMMIG  | EDU High Migration
Conclusion and outlook

- When education is assumed to expand, ....
  - **Women that will get high education should be modelled with a rate of low educated ones before completion of education**

- Migration differentials matter, specifically in a context of increasing diversity of migrants
Thank you

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Convergence to the host society’s fertility?

Source: Statcan (2002)
Composition of immigrants in EU28

NUMBER OF MIGRANTS BY REGION OF BIRTH
\[ \text{logit}(P) = \beta_0 + \beta_1 \text{AGE} + \beta_2 \text{EDU} + \beta_3 \text{CNTRY} + \beta_4 (\text{AGE} \times \text{EDU}) + \beta_5 (\text{AGE} \times \text{CNTRY}) + \beta_6 (\text{EDU} \times \text{CNTRY}) + \beta_7 (\text{AGE} \times \text{EDU} \times \text{CNTRY}) + \beta_8 \text{IMMIG} + \beta_9 \text{(STUDENT)} \]

\( \beta_0 \) to \( \beta_7 \) capture age- and education- specific fertility rates by country, net from the immigration (\( \beta_8 \)) and student (\( \beta_9 \)) variables.

The option contrast gw is used on \( \beta_8 \) and \( \beta_9 \) to have parameters compared to the observation-weighted grand mean rather than a reference category.

In the projection, \( \beta_0 \) to \( \beta_7 \) are then replaced by the age- and education-specific fertility rates by country (SSP2 scenario).