European Commission
Joint Research Centre

Wittgenstein Centre
FOR DEMOGRAPHY AND GLOBAL HUMAN CAPITAL
A COLLABORATION OF IIASA, VID/ÖAW, WU

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

Michaela Potančoková *JRC – European commission*
Guillaume Marois *Wittgenstein Centre - IIASA*

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

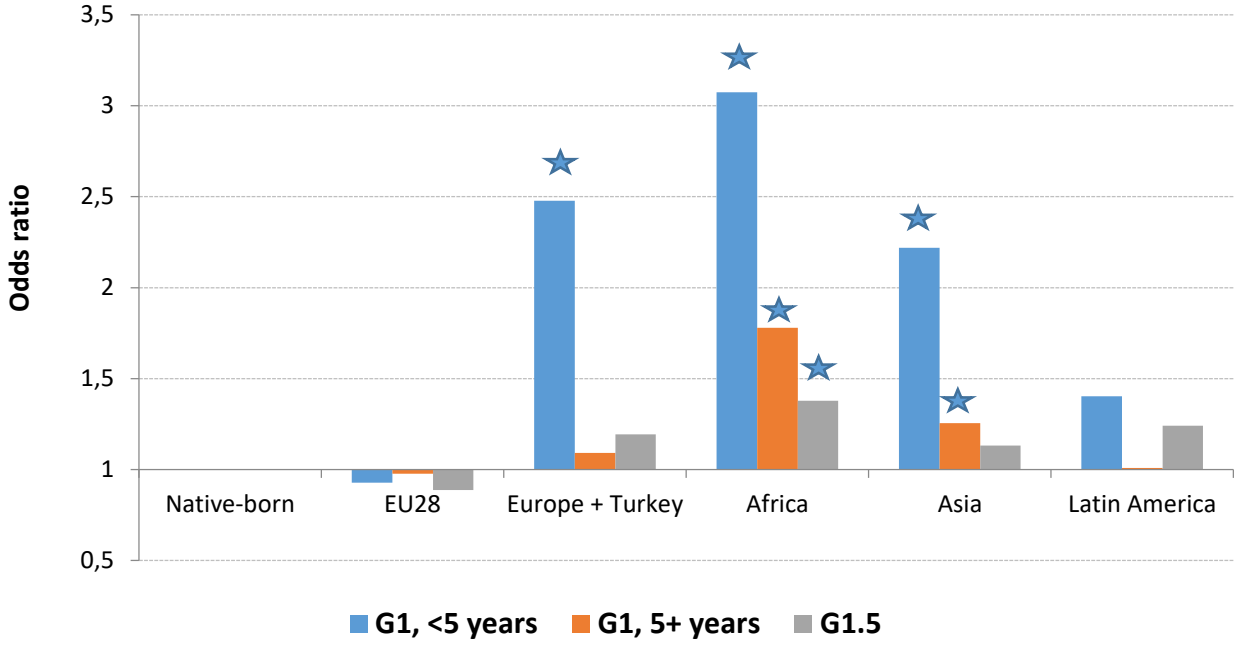
1. Matching children age 0 with the mother
2. Dependent variable: had a child age 0 yes/no
3. Logit regression model to estimate the effect of migration characteristics (region of birth, duration of stay, generation) and student status
    Controls: educational attainment, age and country
    Contrast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

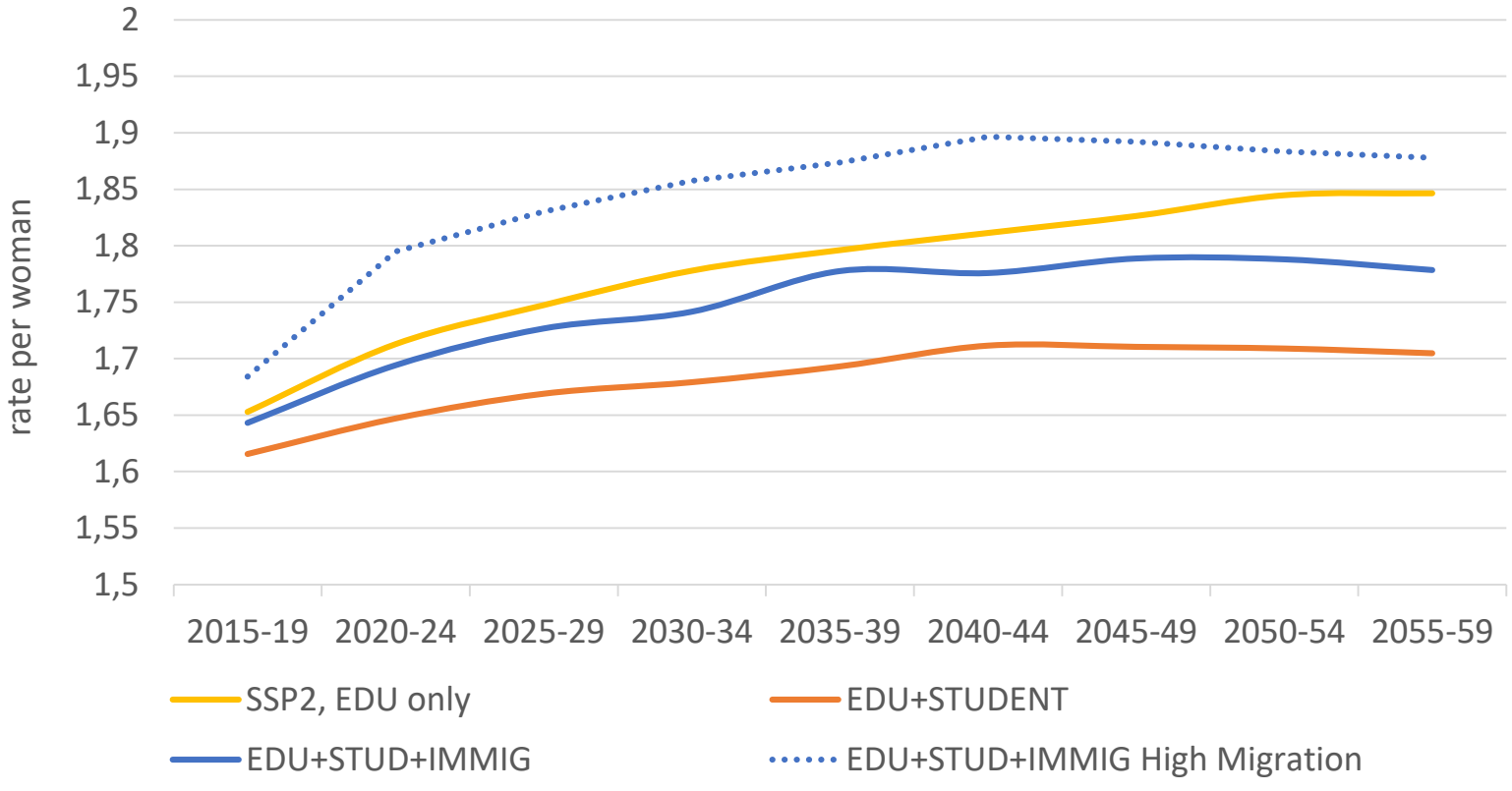
How should we model fertility by education?

- 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

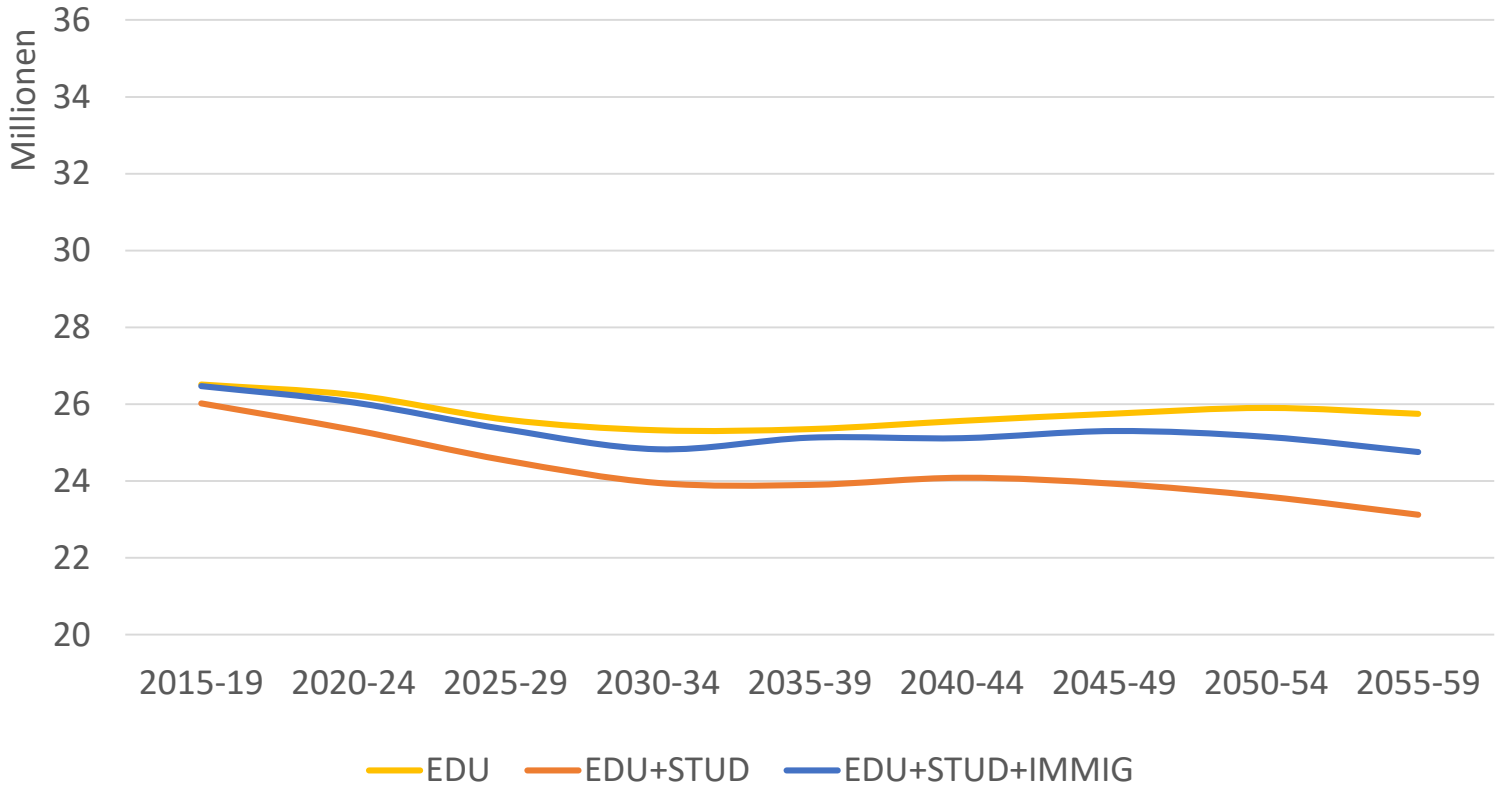
Student variable:
Women in education gave low propensity to have a child
Odds ratio 0.12*

Fertility differentials of women with completed education (low, middle, high)

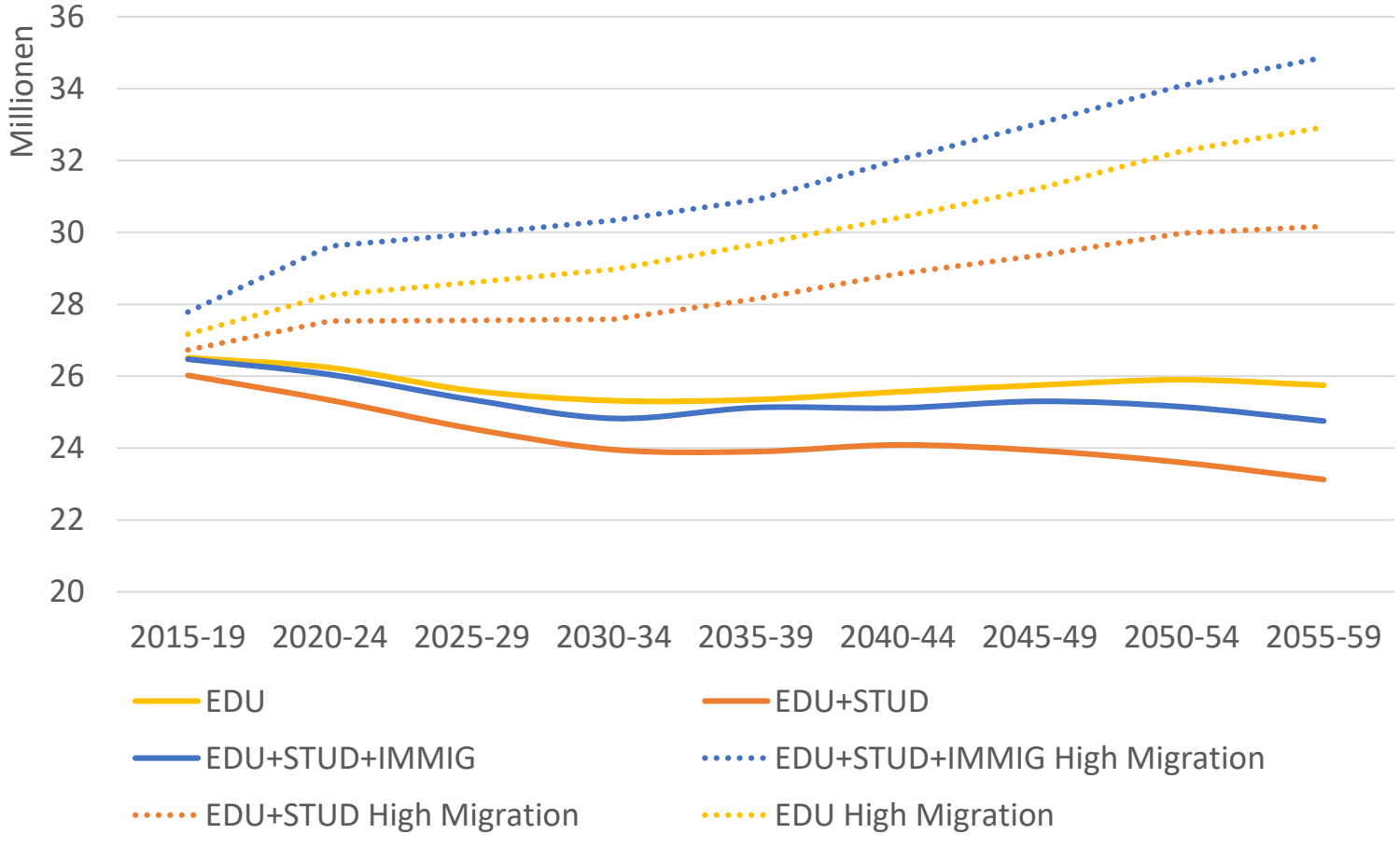
TFR in the EU 28 by scenario



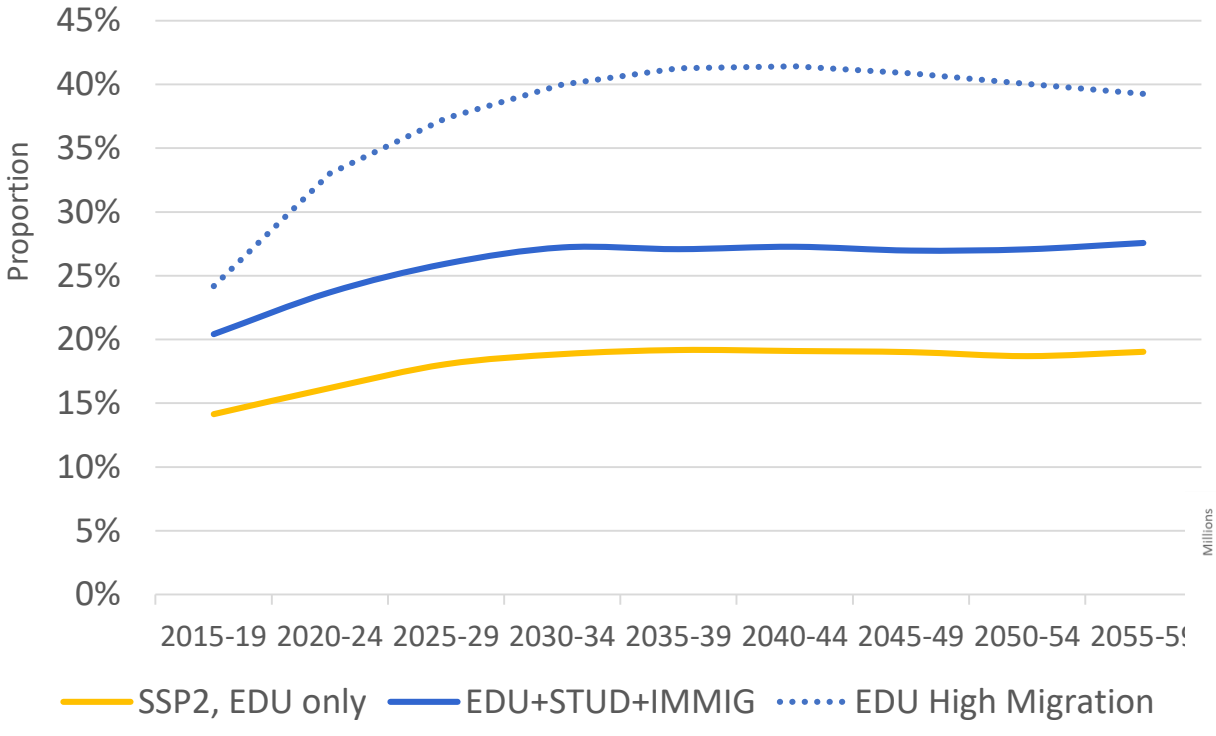
Projected births in the EU

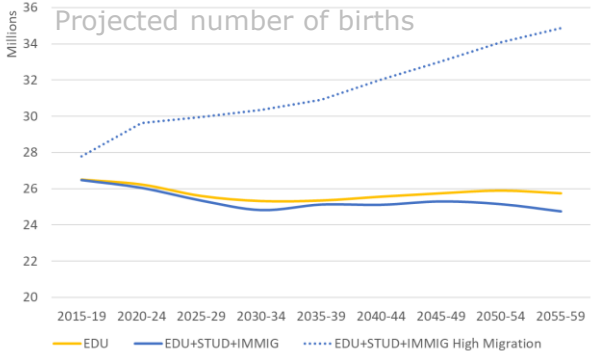


Projected births in the EU



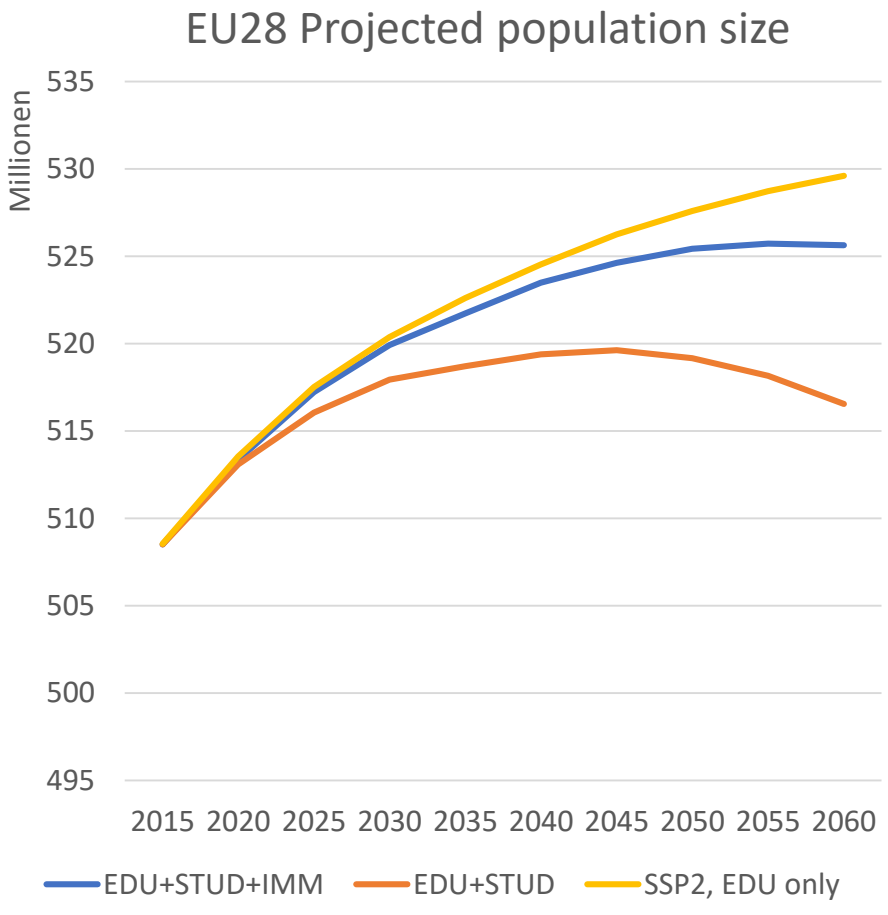
Projected % births to foreign-born mothers





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



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Thank you

Michaela.Potancokova@ec.europa.eu

marois@iiasa.ac.at

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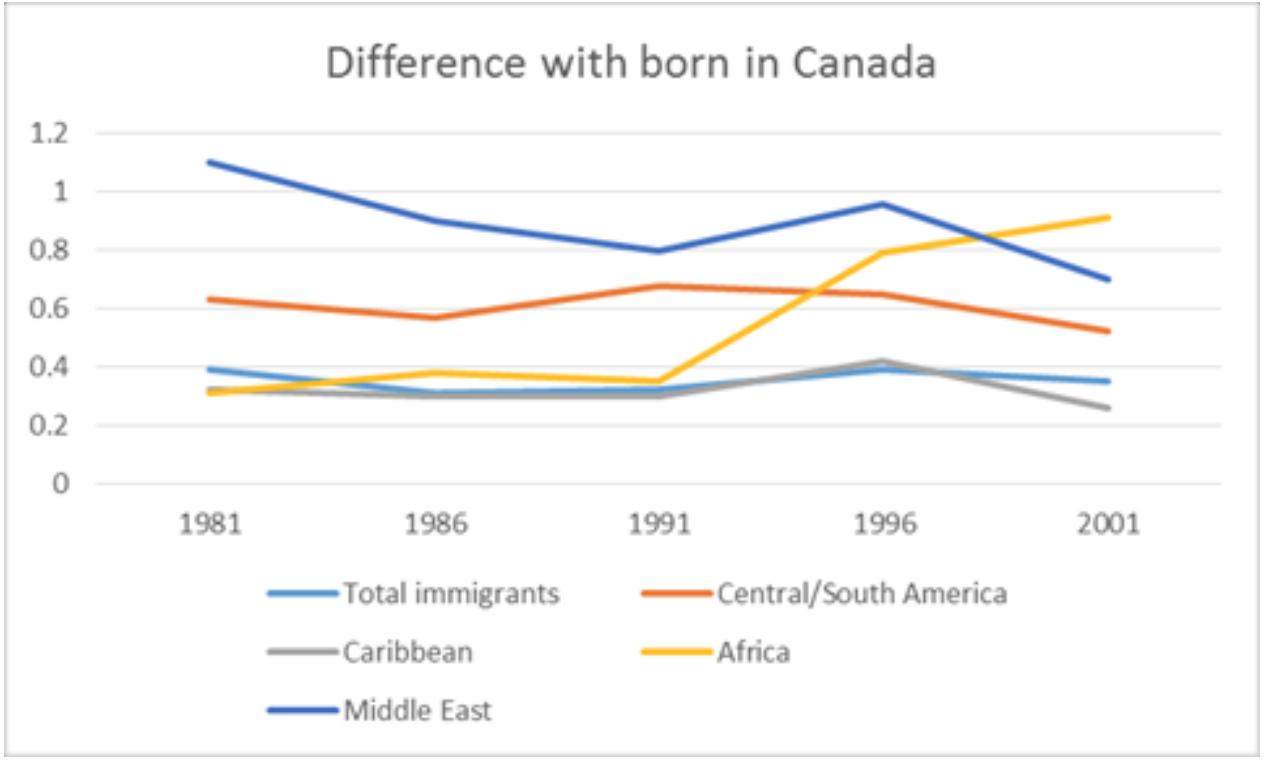
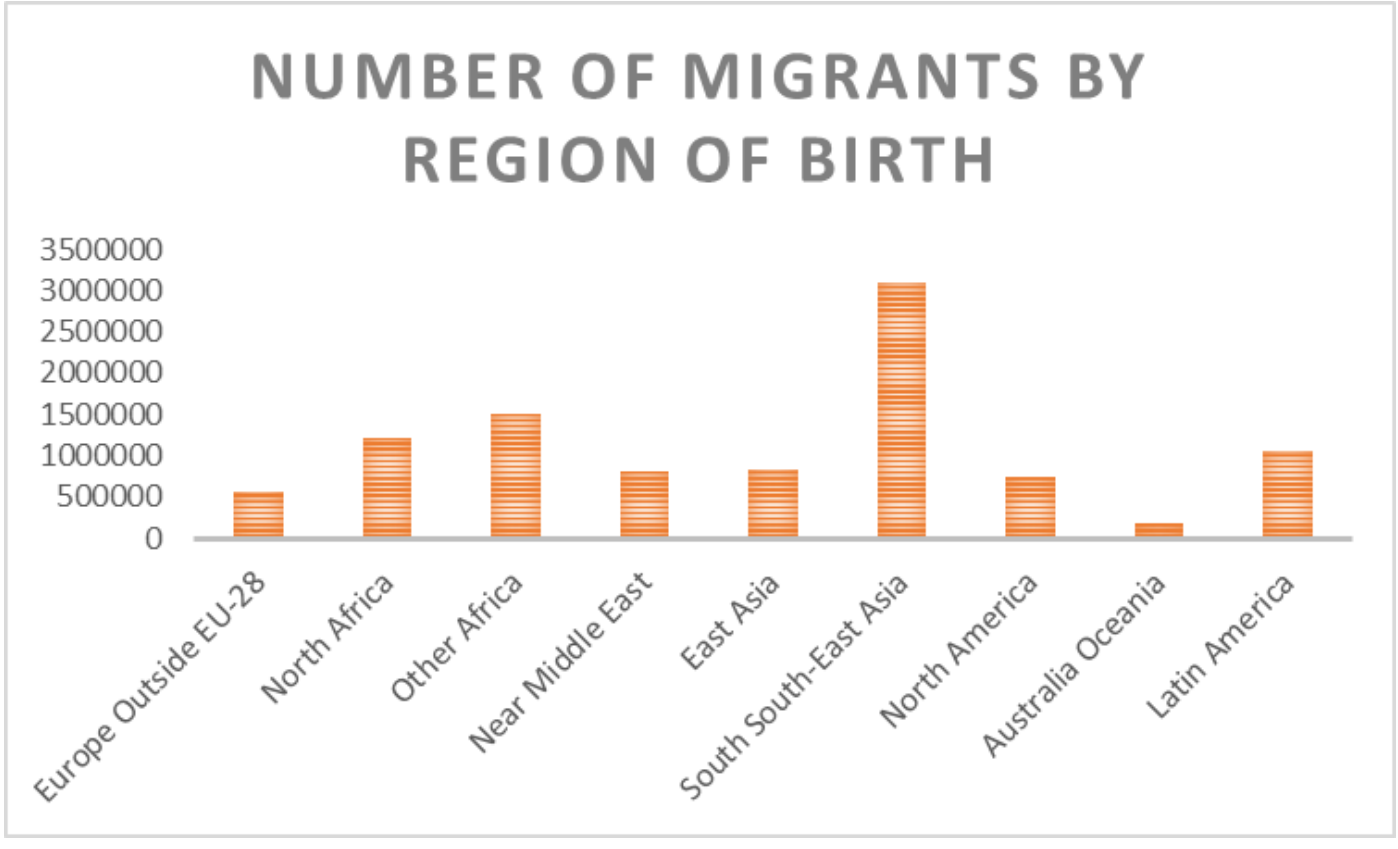
Convergence to the host society's fertility?



Source: Statcan (2002)

Composition of immigrants in EU28



$$\text{logit}(P) = \beta_0 + \beta_1 AGE + \beta_2 EDU + \beta_3 CNTRY + \beta_4 (AGE * EDU) + \beta_5 (AGE * CNTRY) + \beta_6 (EDU * CNTRY) + \beta_7 (AGE * EDU * CNTRY) + \beta_8 IMMIG + \beta_9 (STUDENT)$$

β_0 to β_7 capture age- and education- specific fertility rates by country, net from the immigration (β_8) and student (β_9) variables

The option contrast gw is used on β_8 and β_9 to have parameters compared to the observation-weighted grand mean rather than a reference category

In the projection, β_0 to β_7 are then replaced by the age- and education-specific fertility rates by country (SSP2 scenario)