Forecast of labor force replacement on the Slovak labor market

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Motivation

- By 2050, the total dependency ratio (ratio of population aged 0–14 and 65+ per 100 population 15–64) is projected to increase sharply in Europe (by 24.8 percentage points). The total dependency ratio for Africa is projected to decrease by 18.7 percentage points (UNDESA 2017)

- The labour supply is going to decline in all EU countries, with implications for the national states – negative demographic dividend? (Bloom and Canning 2000, 2003)

- Working immigration is already becoming an important source of economic growth (Kahanec and Zimmermann 2010)

- Slovakia is one of the fastest ageing countries in the EU
  - Are we going to be able to attract the amount of people?
  - What should be the structure of the inflowing persons?

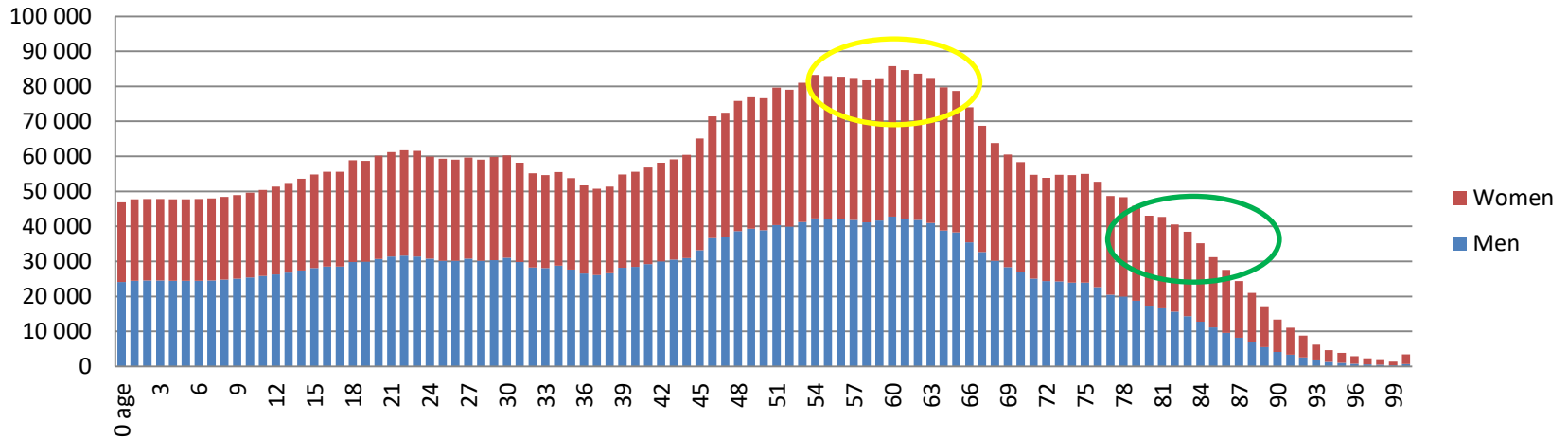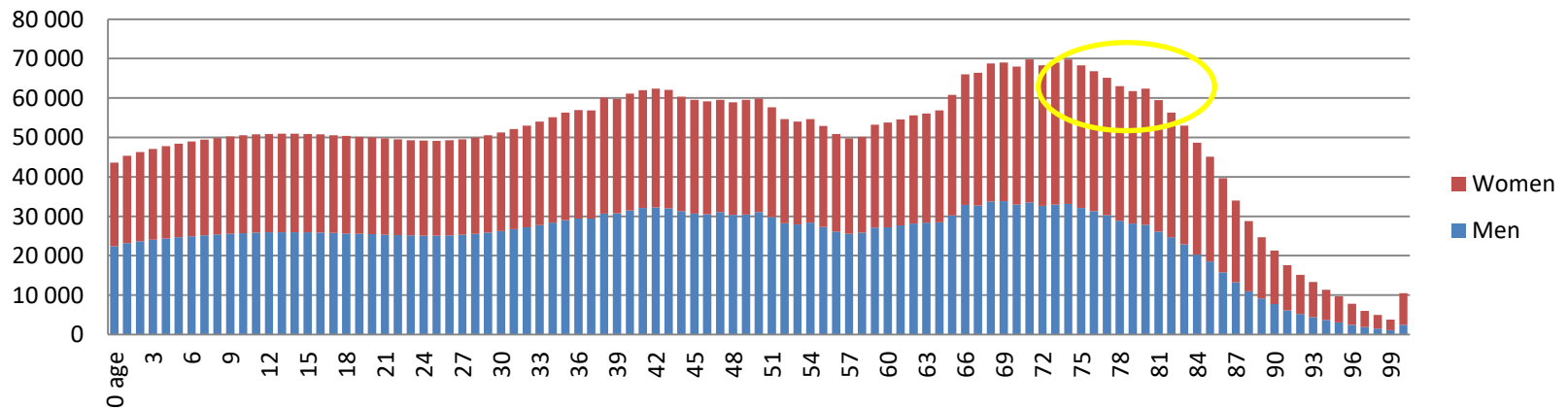- Use of the most comprehensive survey CENZUS 2021

Population on Slovakia
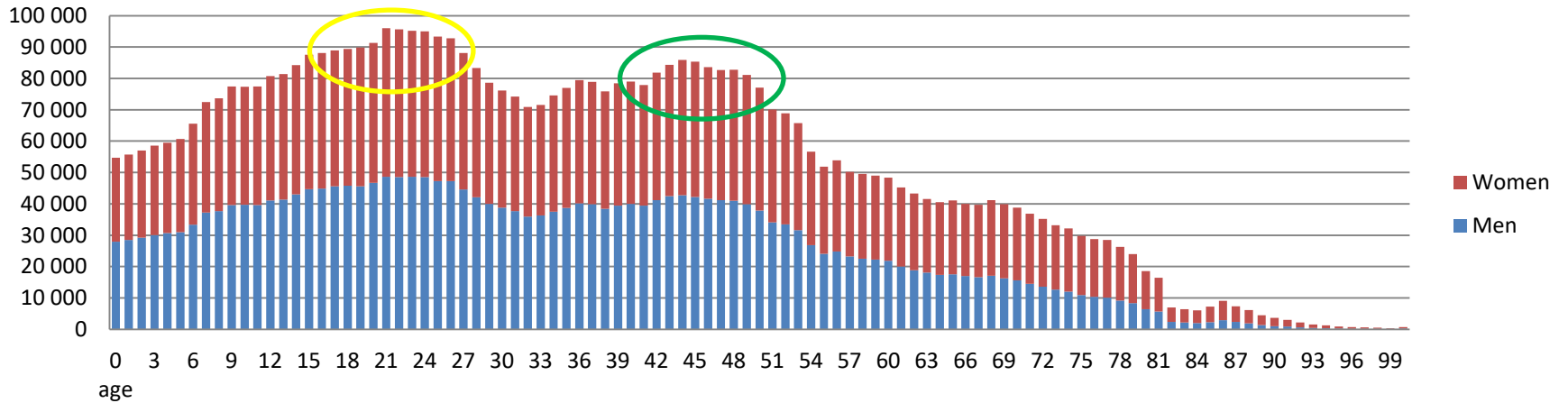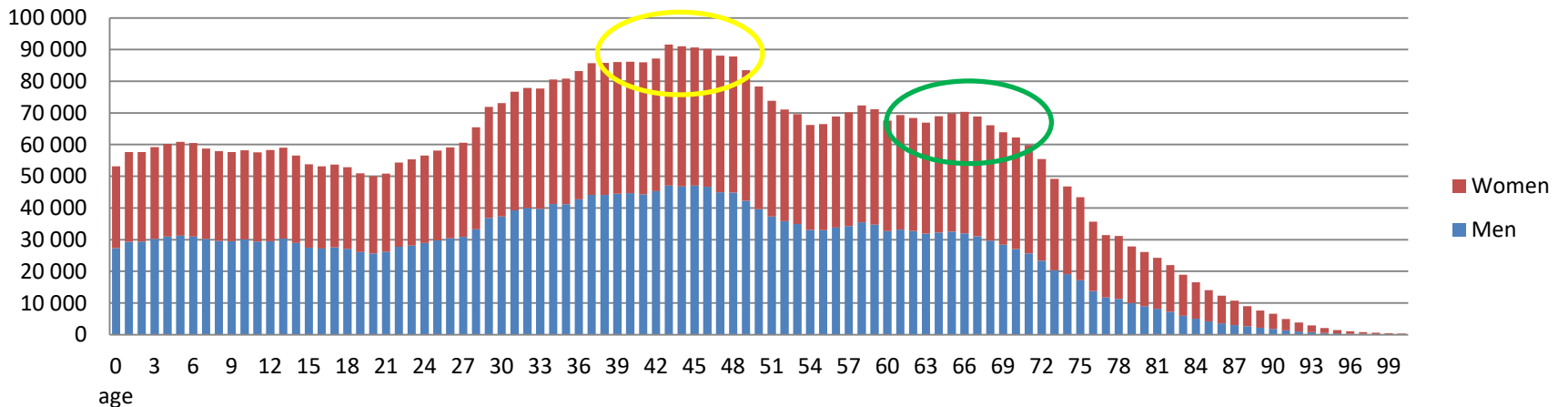
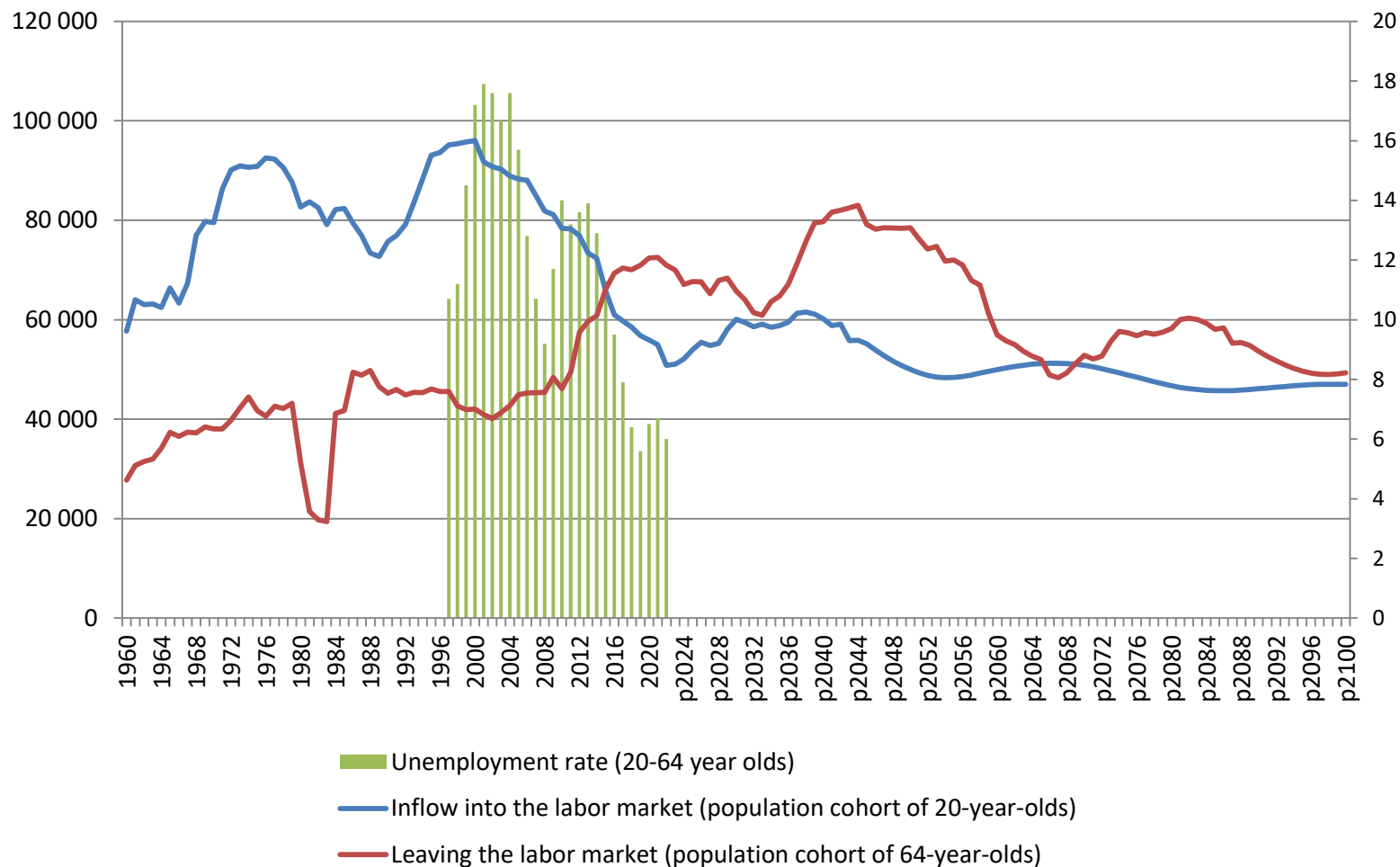

Source: SO SR

Projection of the Slovak population

Source: Eurostat [PROJ_23NP]

Situation on the labor market

Unemployment rate (20-64 year olds)

Inflow into the labor market (population cohort of 20-year-olds)

Leaving the labor market (population cohort of 64-year-olds)

Source: SO SR, EUROSTAT

Structure of SLAMM_microsim

| DEMO (Demographics)	EDU (Educational attainment)	EA (Economic activity)	EMPL (Employment)
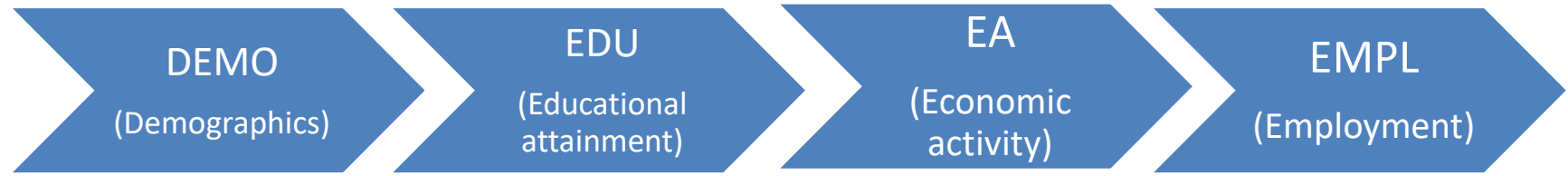
DEMO (Demographics)
- Provides simulations of basic demographic processes producing endogenous demographic projections.

EDU (Educational attainment)
- Simulates educational attainment of the population.
- Simulates education in foreign.

EA (Economic activity)
- Simulates economic status of individuals based on their life situation, history and individual characteristics. Distinguished statuses are: economically active, student, retired, disabled and other inactive.

EMPL (Employment)
- Provides simulations of the matching processes linking individuals to jobs (based on the number of jobs in sectors predicted by the IO model).
- Divides economically active into employed and unemployed

Structure of SLAMM_microsim
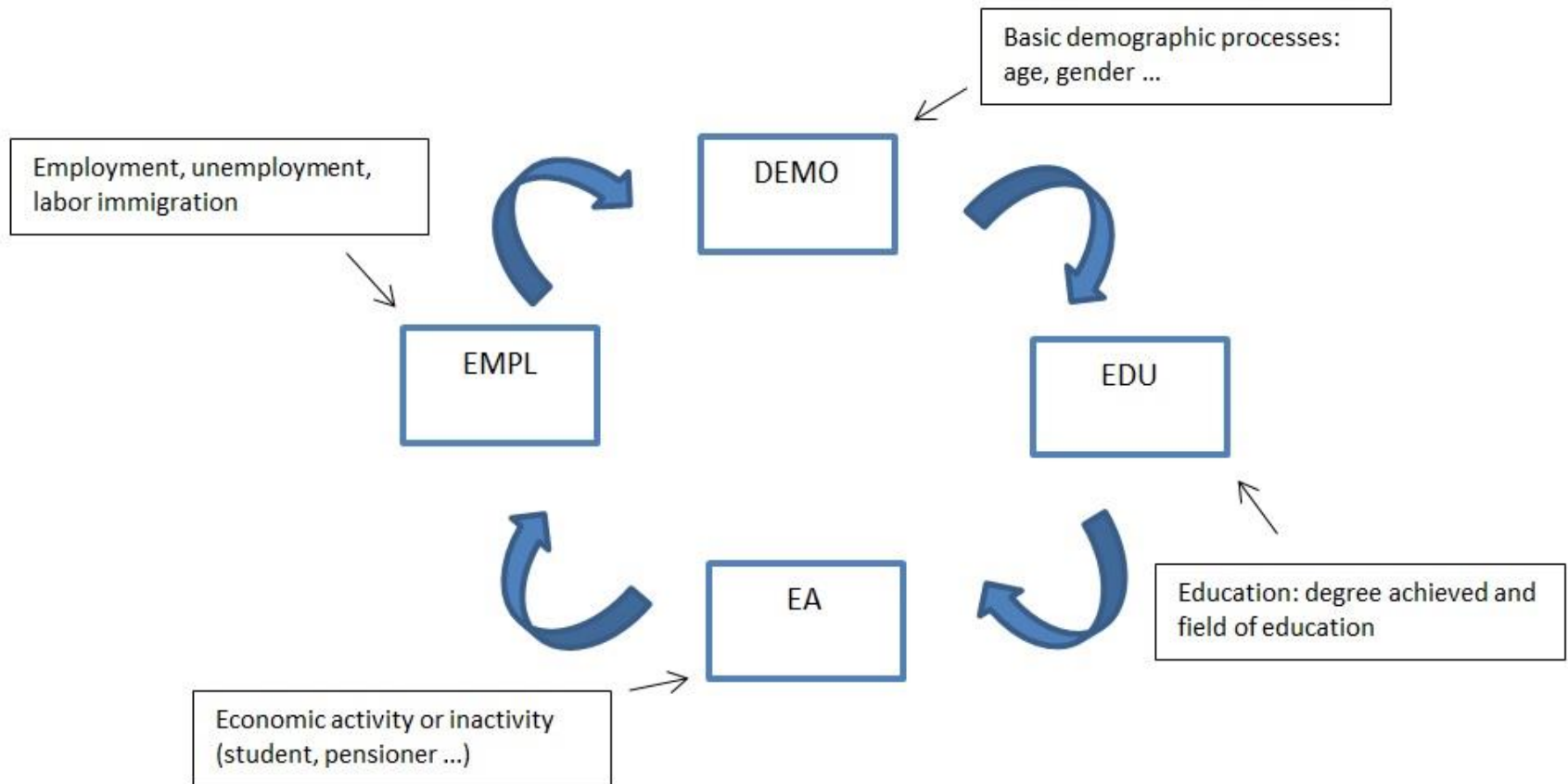
Source: SLAMM_microsim

SLAMM_microsim module

- **Module DEMO**
  - Birth: age-specific fertility rates
  - Death: age and sex-specific mortality rates
  - Length of stay of immigrants
  - No immigration or emmigration is modelled in the demographics
- **Module EDU**
  - Education level: 5 levels
  - Education field: up to 10 fields within each level
  - Reproduces educational structure of the age-group 30-34 in the initial simulation period
  - Simulates the decisions of Slovaks/Foreigners: to leave/come to the country to study abroad/in Slovakia and to return to their home country after study
- **Module EA**
  - Students (under the level-specific graduation age)
  - Retired (split into three type of group)
  - Age old retired (Older than retirement age): not working retired
  - Early retired: probit on early retired aligned by age and gender
  - Working retired: probit on working retired aligned by age and gender
  - Other inactivity: probit on other inactivity aligned by age and gender
  - Economically active: Not in any identified form of inactivity

SLAMM_microsim module

- **Module EMPL**
  - Those who are economically active and were employed in the previous period are re-assigned to the same sector (branch of economic activity*occupation) where they were employed in the previous period
  - Graduates from Slovak schooling, returning Slovaks and the unemployed are allocated to vacant jobs based on their education, sectoral wage and their individual characteristics
  - All the unmatched „jobs" are being filled in with immigrants (foreign workers)

- Attributes of immigrants:
  - Economic sector and occupation is known from the „clone" immigrant
  - Gender and education is „cloned" from existing immigrants in the segment
  - Age and probability of leaving to home is imputed based on administrative data

SLAMM_microsim

- Supply side is a dynamic microsimulation model built in LIAM2:
  - CENZUS (2011)
  - EU-Labour Force Survey (EU-LFS; different years)
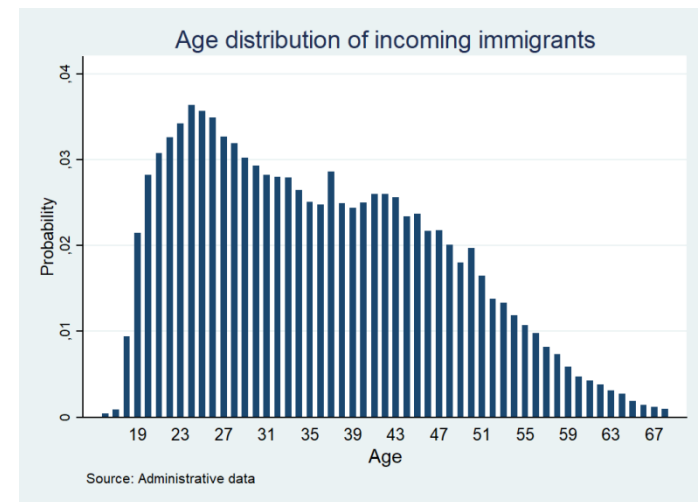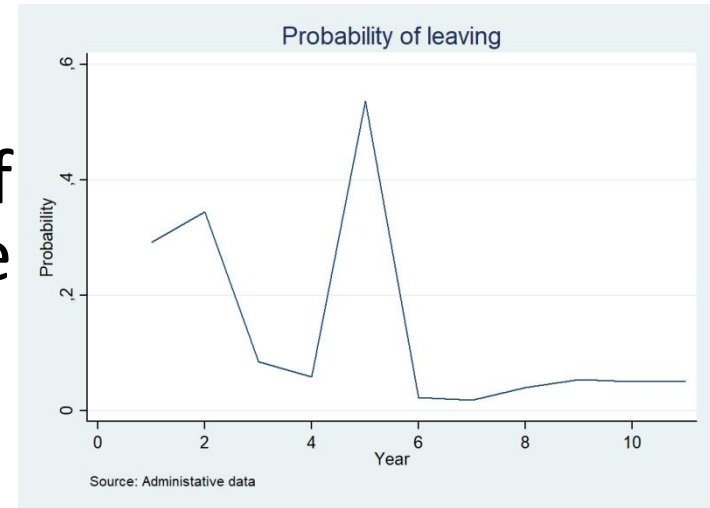 - **CENZUS (2021)**

Main assumption

- Employment growth is 0 during forecast period (no expansion demand for labour).
- Every year, 0.08% of the economically active population emigrates abroad.
- On the other hand, 2% of Slovaks abroad return home every year.
- The probability of studying abroad is differentiated by education level.
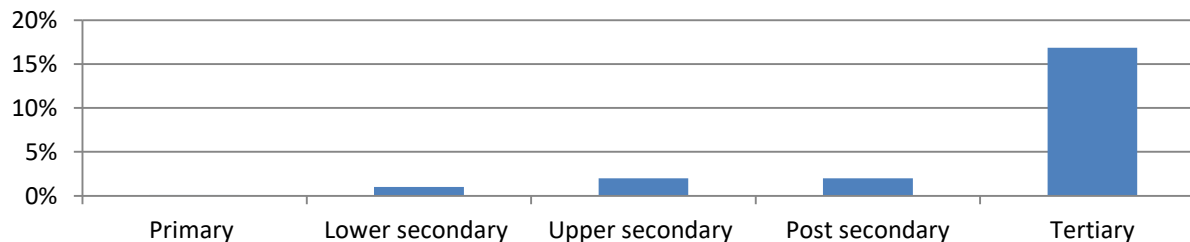
- 50% of Slovak graduates abroad return home.

Main assumption

- Probability of immigrants leaving the country by years of stay is based on administrative data from the Foreign police department, only 18% of immigrant stay more than 5 years.

- The age structure of inflowing immigrants is set by registered to be employed by COLSAF (UPSVaR).

Probability of leaving

Source: Administative data

Age distribution of incoming immigrants

Source: Administrative data

CENZUS 2021

- Census 2021 is the most comprehensive survey of the population, houses and apartments in Slovakia carried out every 10 years.
- The results of the last round are gradually published on the website of the Statistical Office of the Slovak Republic (SO SR).
- The data was provided to IER SAS for the purpose of creating the model.
- Include sex, age, country of birth, economic activity, education level, sector (NACE Rev.2), occupational level (ISCO).

CENZUS 2021 - descriptive statistics

		Number	Percentage
	All	5 497 881	100
Sex	Men	2 697 619	49.07
	Women	2 800 262	50.93
Age	0-18	1 082 718	19.69
	19-35	999 764	21.66
	36-64	2 294 456	41.75
	65-80	628 074	14.06
	81+	158 150	2.88
Economic activity	Employed	2 517 136	45.78
	Unemployed	231 826	4.22
	Student, child	1 175 722	21.4
	Retiree	1 057 297	19.23
	Other	399 573	7.27
	Not detected	116 327	2.12
Country of birth	Slovakia	5 225 334	95.04
	Czech republic	109 182	1.99
	EU 27 (except for the Czech republic)	64 578	1.18
	Other	73 700	1.33
	Not detected	25 087	0.46
Education level	Basic and no education	1 571 756	28.59
	High school	2 670 706	48.57
	University	1 009 592	18.36
	Not detected	245 827	4.47

CENZUS 2021

Ten occupational groups with the highest proportion of workers in the 65+ age category

ISCO code	Name	Number of employees	Average age	Median age	Ratio 50+	Ratio 55+	Ratio 60+	Ratio 65+
231	University teachers	9 656	47	45	0.387	0.306	0.214	0.127
221	Doctors	23 497	45	43	0.353	0.266	0.200	0.126
962	Other support staff	11 798	49	53	0.573	0.452	0.262	0.103
521	Street vendors and market vendors	1 789	48	49	0.483	0.334	0.150	0.057
211	Specialists in the field of physical and natural sciences	3 041	43	41	0.323	0.230	0.124	0.051
262	Specialists in librarianship, archivists and curators	2 022	46	46	0.408	0.295	0.160	0.045
111	Legislators, senior civil servants	6 439	49	49	0.479	0.332	0.169	0.043
226	Other specialists in healthcare	14 110	39	36	0.209	0.152	0.093	0.042
232	Vocational training masters and lecturers	3 535	49	50	0.518	0.389	0.197	0.042
322	Nursing and midwifery professionals	19 672	48	48	0.436	0.289	0.142	0.042
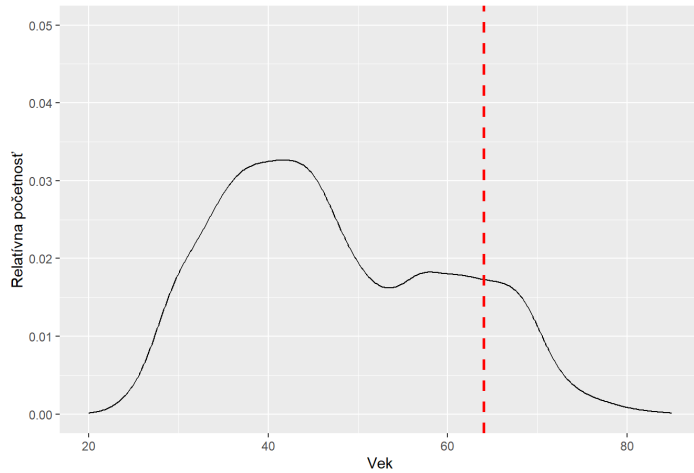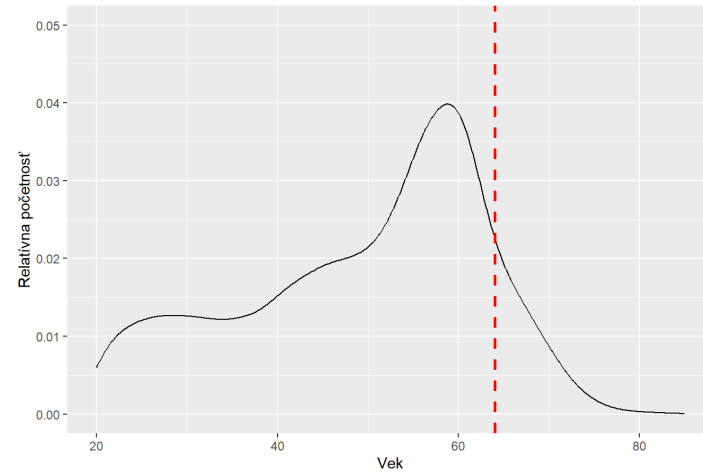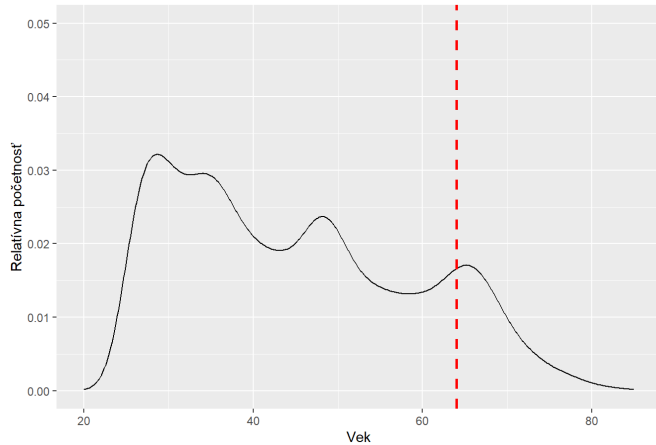
CENZUS 2021
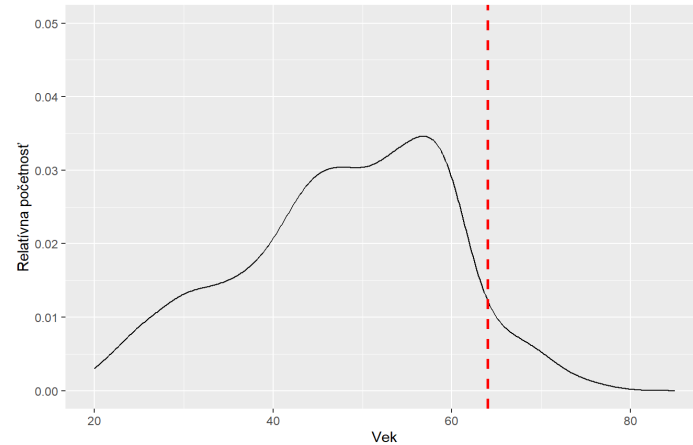
CENZUS 2021

ICT service managers
ISCO - 133
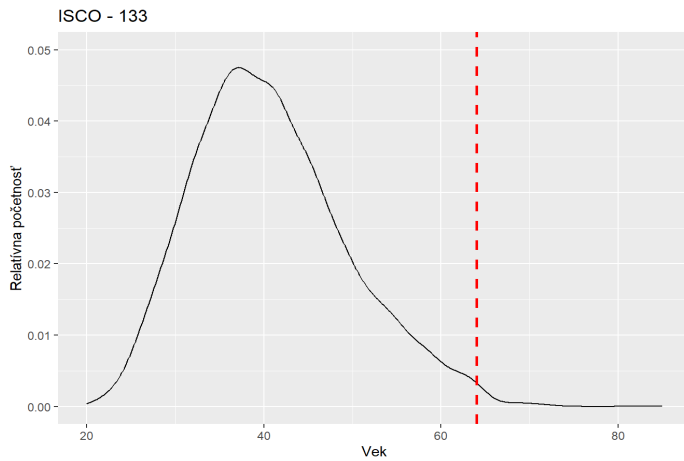
Waiters and bartenders
ISCO - 513
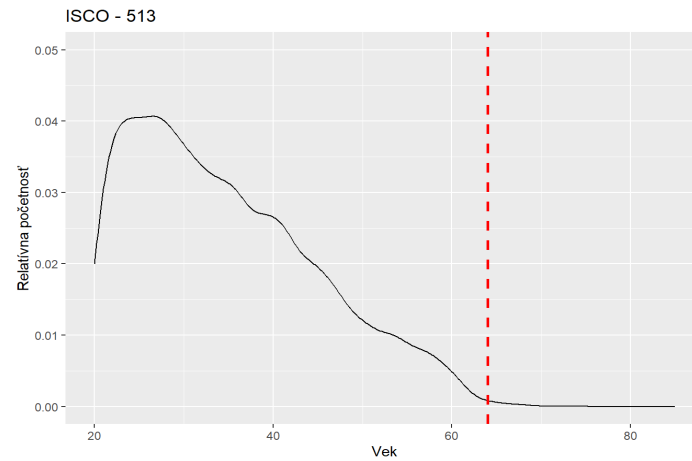
Other teaching professionals
ISCO - 235
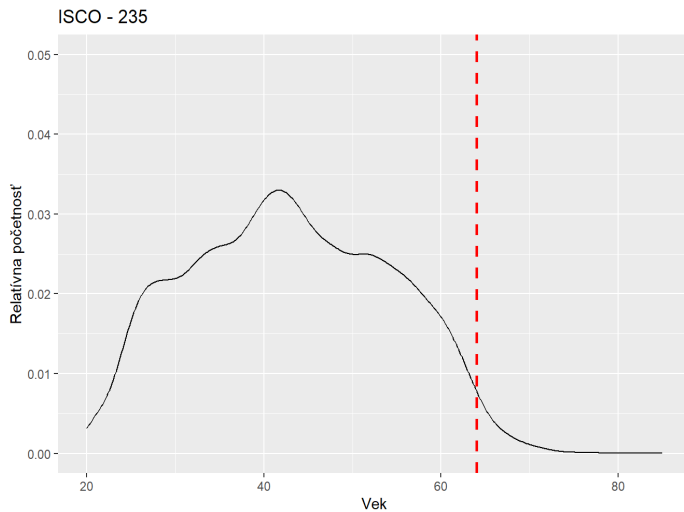
Vocational education teachers
ISCO - 232
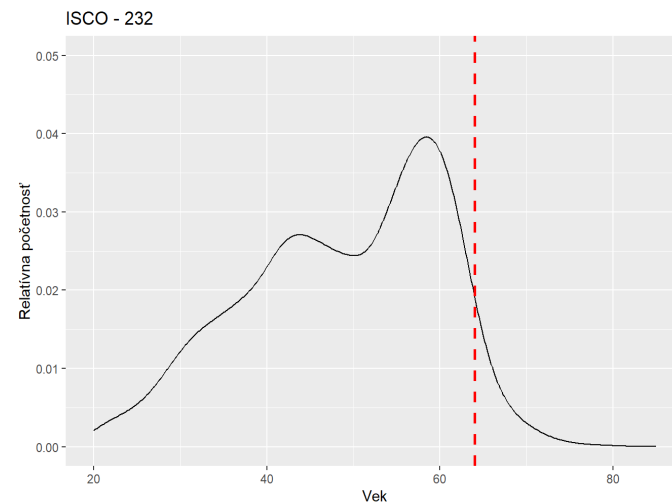
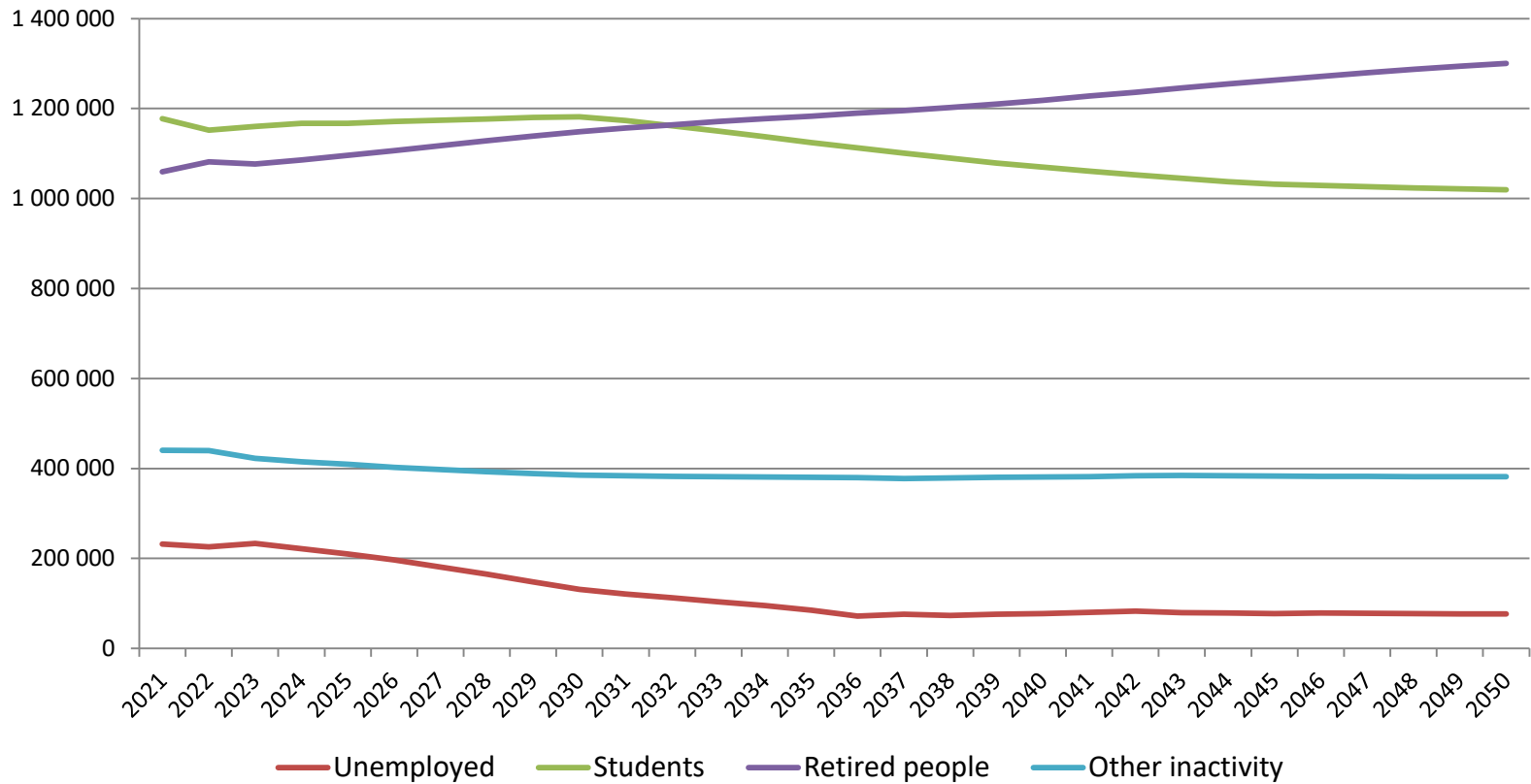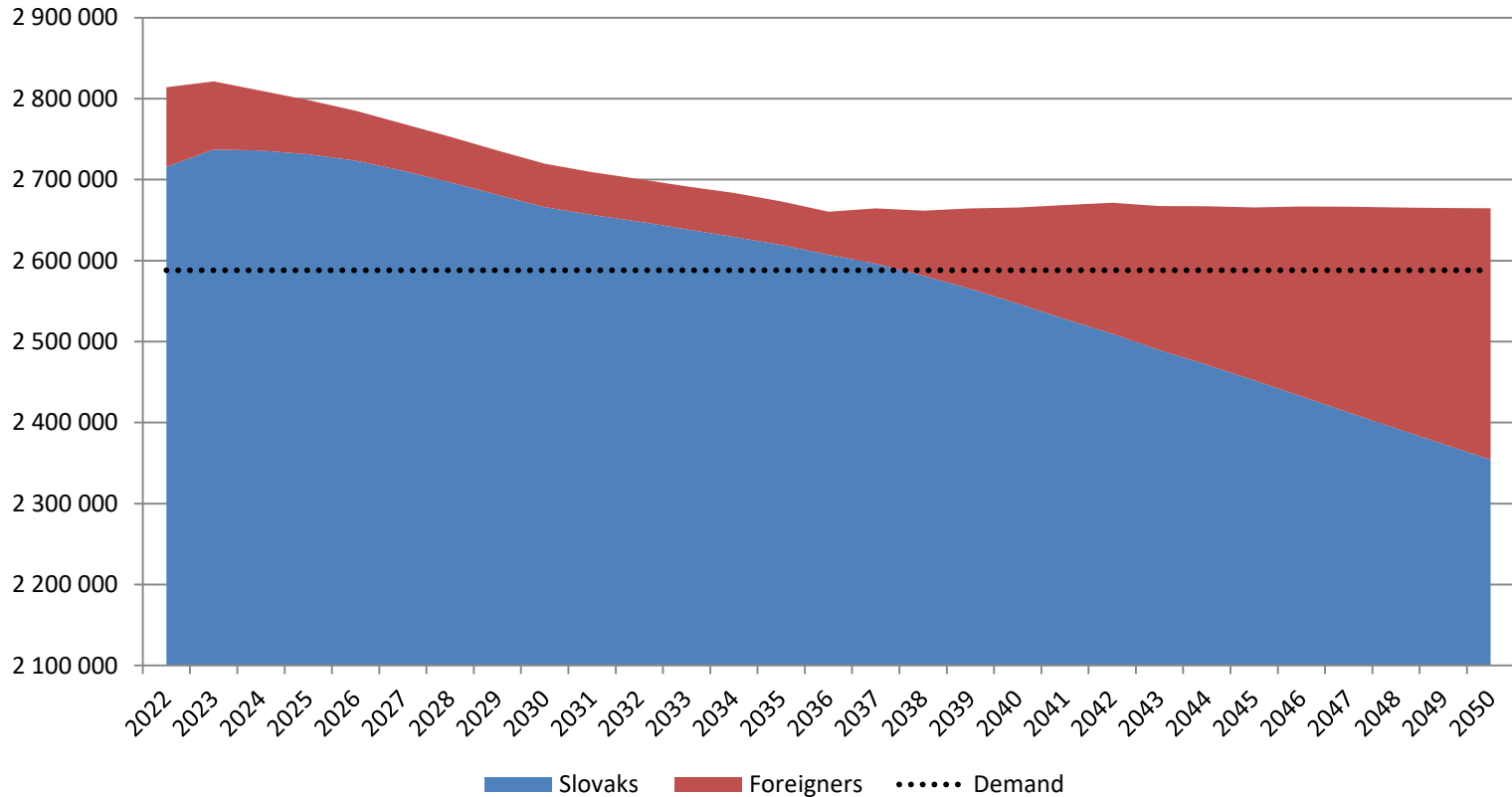# CENZUS and LFS
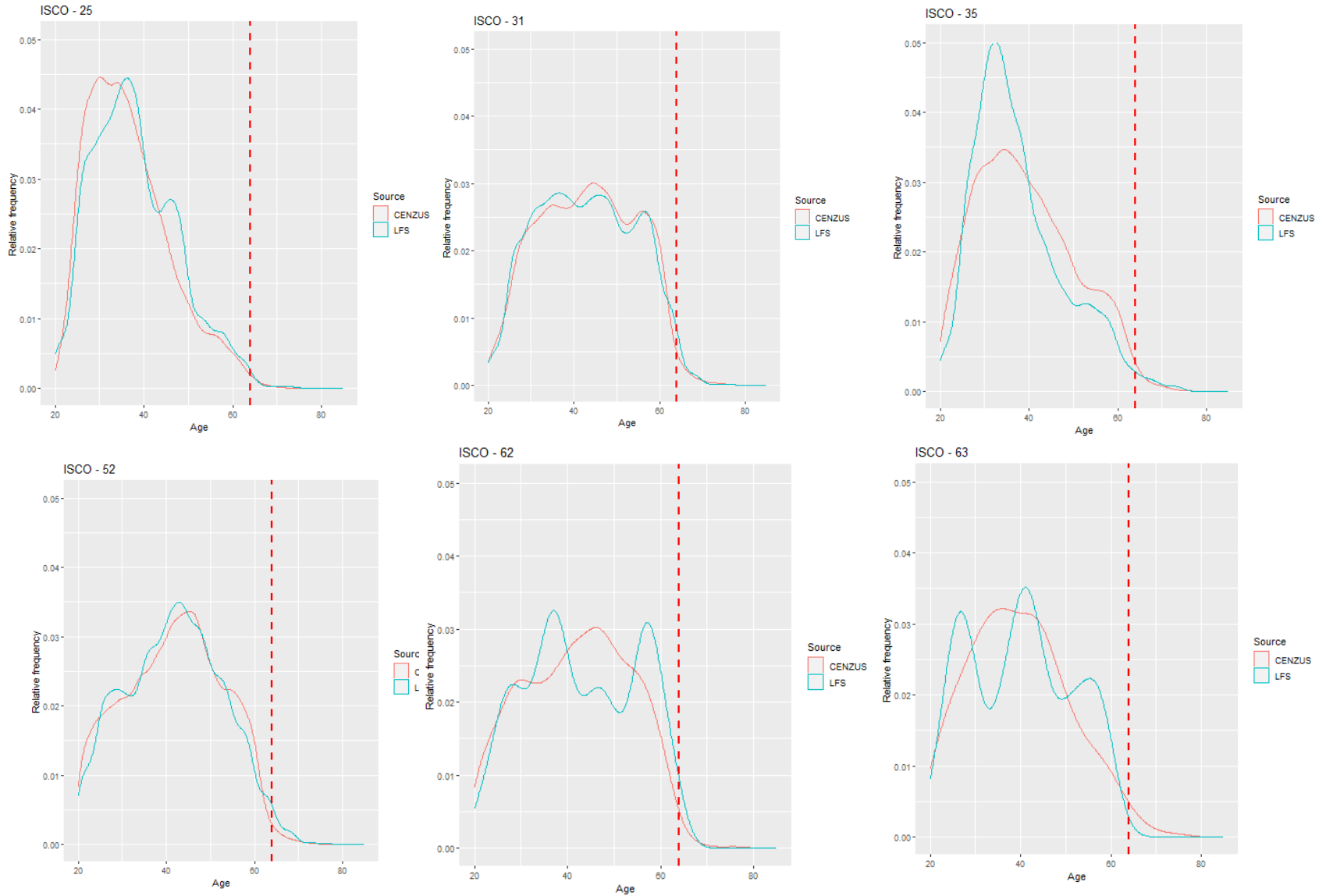
Results

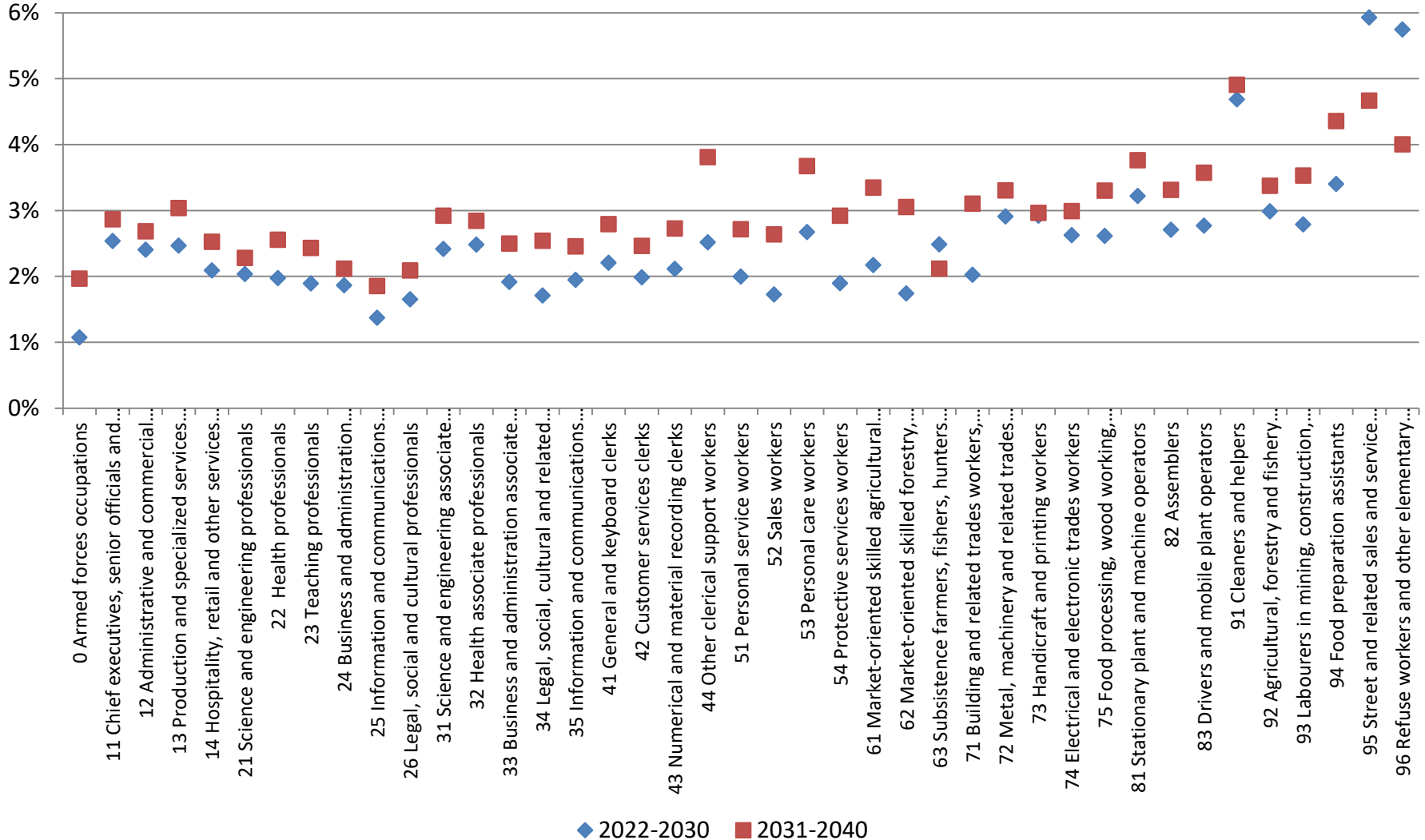Number of people by economic status (except employed)

Source: SLAMM_microsim

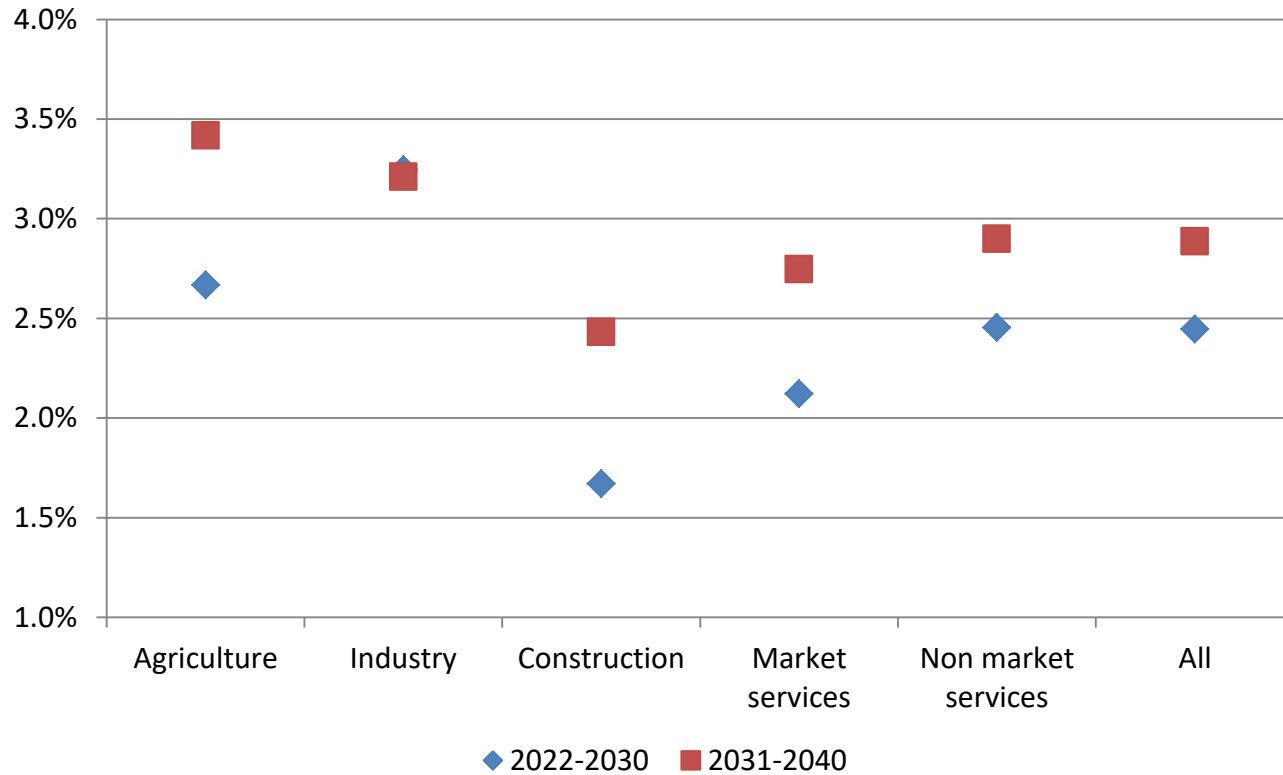# Results

Number of economic active people by country of birth

Source: SLAMM_microsim

Replacement demand by ISCO

Replacement demand by NACE

Conclusions

- The Slovak labour supply is going to decline in the future.

- Ageing societies have limited options in preventing the decline of their labour force.

- Steering the inflow of immigrants is one of the policy measures mitigating the impact of ageing.

- In this context, the structure of occupations takes on a specific meaning.

- In connection with the aging of the population, we will be forced to change our thinking about the growth of the economy, the management of public finances, or unemployment.

Conclusions

- Less complex occupations, requiring lower qualifications, are also more open to mobility. At the same time, we observe a higher need for replacement of workers in these professions.

- A large number of older workers work in closed occupations where specific expertise is needed.

- The use of CENZUS 2021 survey is unique in terms of complexity and timeliness.

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Thank you

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