Promotion of healthy ageing, welfare and social security

June, 3rd 2022, Office of the Nordic Council of Ministers

Impact of unpaid care (children and old age) on pension income, a comparison of 5 countries

Dr. Tanja Kirn, Ass.-Prof.
Center of Economics, University of Liechtenstein

Iceland Liechtenstein Norway grants

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Gender Pension Gap – key facts

- The more average pensions of women lag behind those of men, the higher the value of the GPG.

$$1 - \frac{pension\ women}{pension\ man}$$

- On average **29.5% for the EU27** in 2019 (2021 PAR). But high variation between 2% in Estonia to almost 44% in Luxembourg.
- The GPG is dependent on labour market history differentials; highly nonlinear and affected by compensating and redistributive elements in (public) pension systems.

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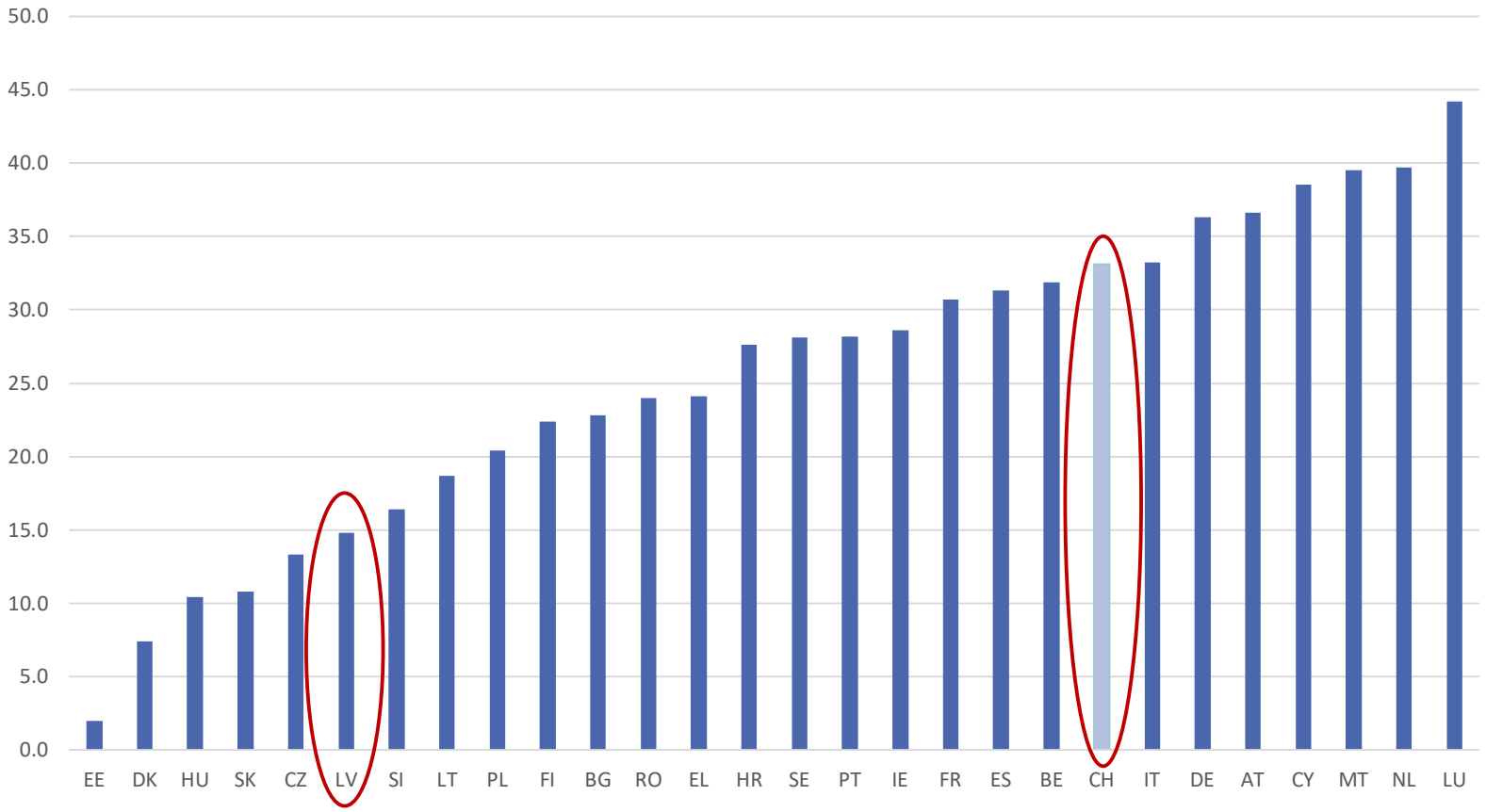
Gender Pension Gap –
How much are women's pensions lagging behind those of men?



Source: Eurostat, 2020, ilc_pnp13; data for 2019

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Motivation and research questions

However:

- The **GPG of today reflects** differences in **labour market participation** of men and women of the **last four decades**.

Some things have changed:

- **labour market participation** of women increased
- **part-time work** patterns have changed
- **wage gap** decreased

Research question 1:

- **How will the GPG be in 2070?**

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A simple question – which is complex to answer

Future Gender Pension Gap depends on:

- macroeconomic conditions, political factors, educational level, future wage gap, health status, life expectancy, fertility, migration, …

→ To model those complexities, a dynamic microsimulation model is required

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MIDAS_CH – general characteristics

- MIDAS_CH draws from MIDAS_BE (Dekkers et al. 2009, Dekkers & Van den Bosch 2016)
- Following O'Donoghue's (2001) taxonomy, MIDAS_CH presents the following features:
  - dynamic, cross-sectional aging model
  - discrete time model
  - ageing process is probabilistic
  - closed model
- database: CH-SILC 2018
- processed on platform LIAM2 (De Menten et al. 2014)
- dynamic weighting (Dekkers & Cumpston, 2012)

- MIDAS_CH was developed part of the MIGAPE project: www.migape.eu

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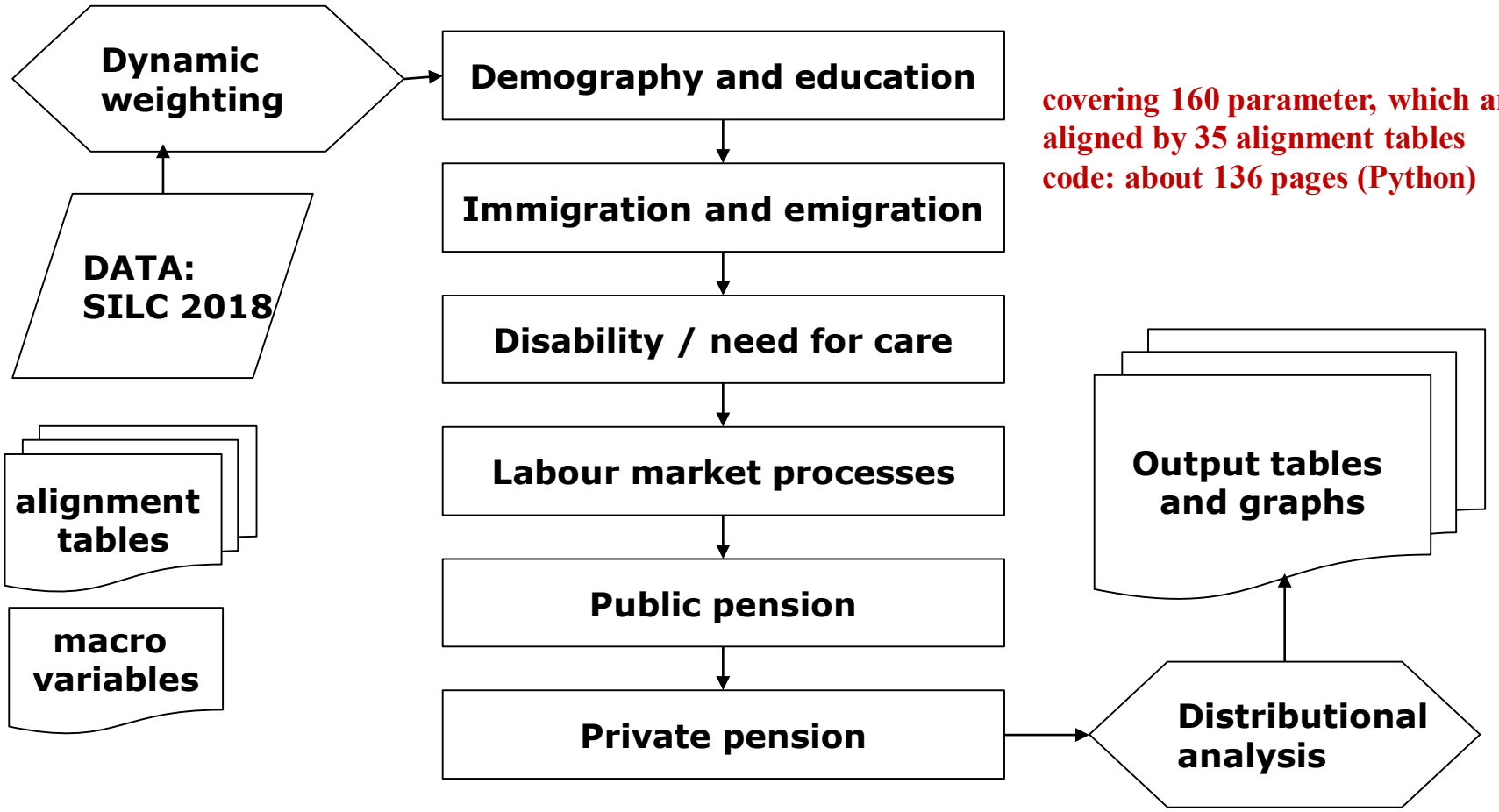
Structure of MIDAS_CH



covering 160 parameter, which are aligned by 35 alignment tables
code: about 136 pages (Python)

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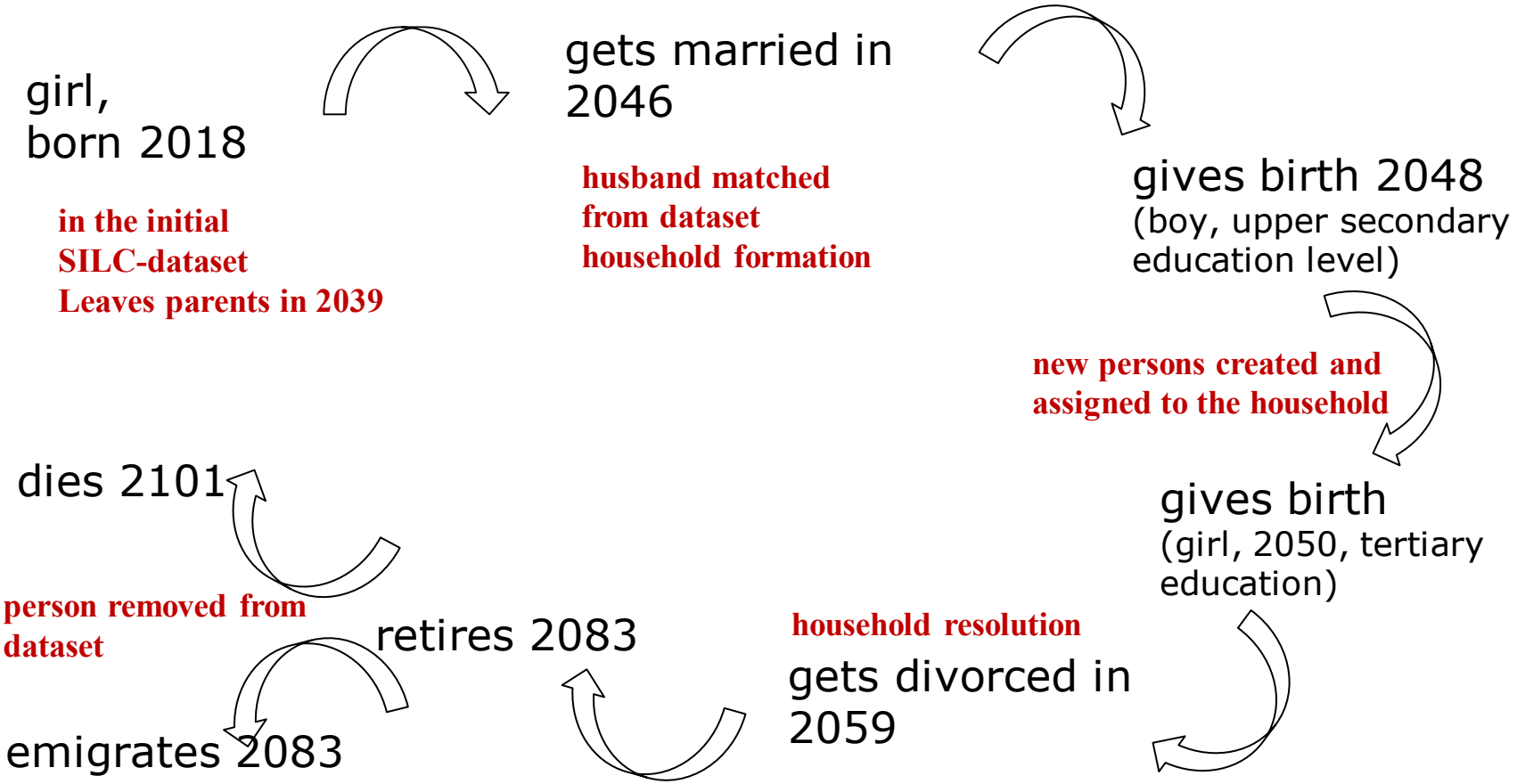
Illustration:
The simulation of the life cycle



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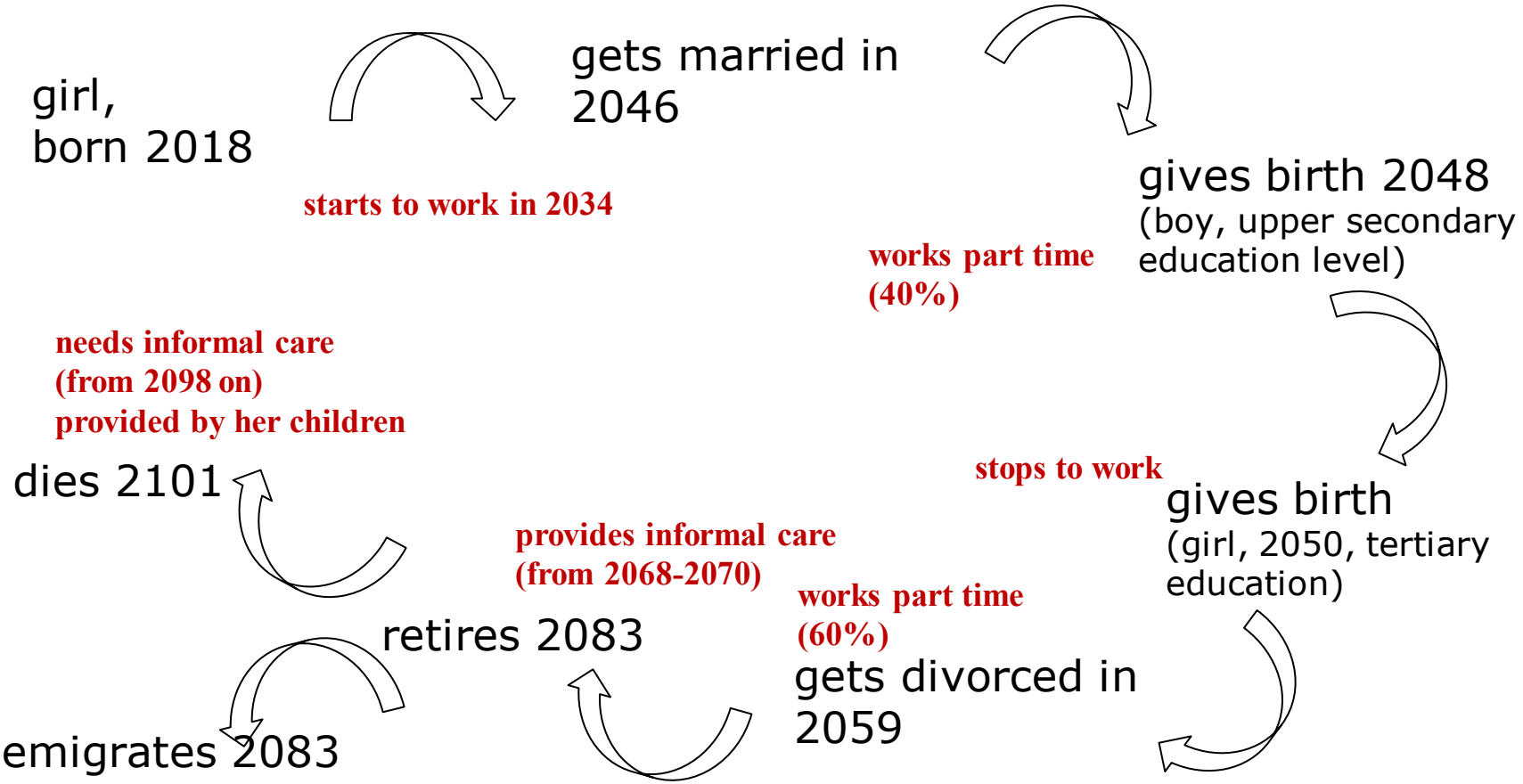

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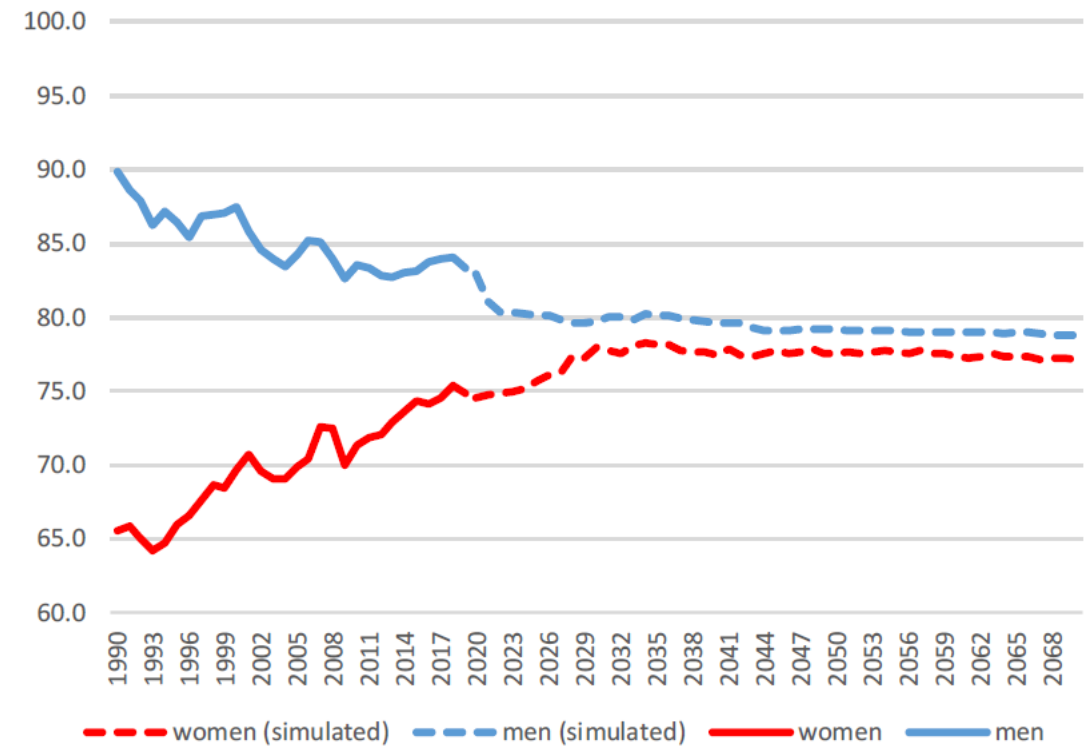
Actual and projected labour market participation

Figure 1: Actual and projected labour market participation of men and women



Source: FSO (2021c), own simulations.

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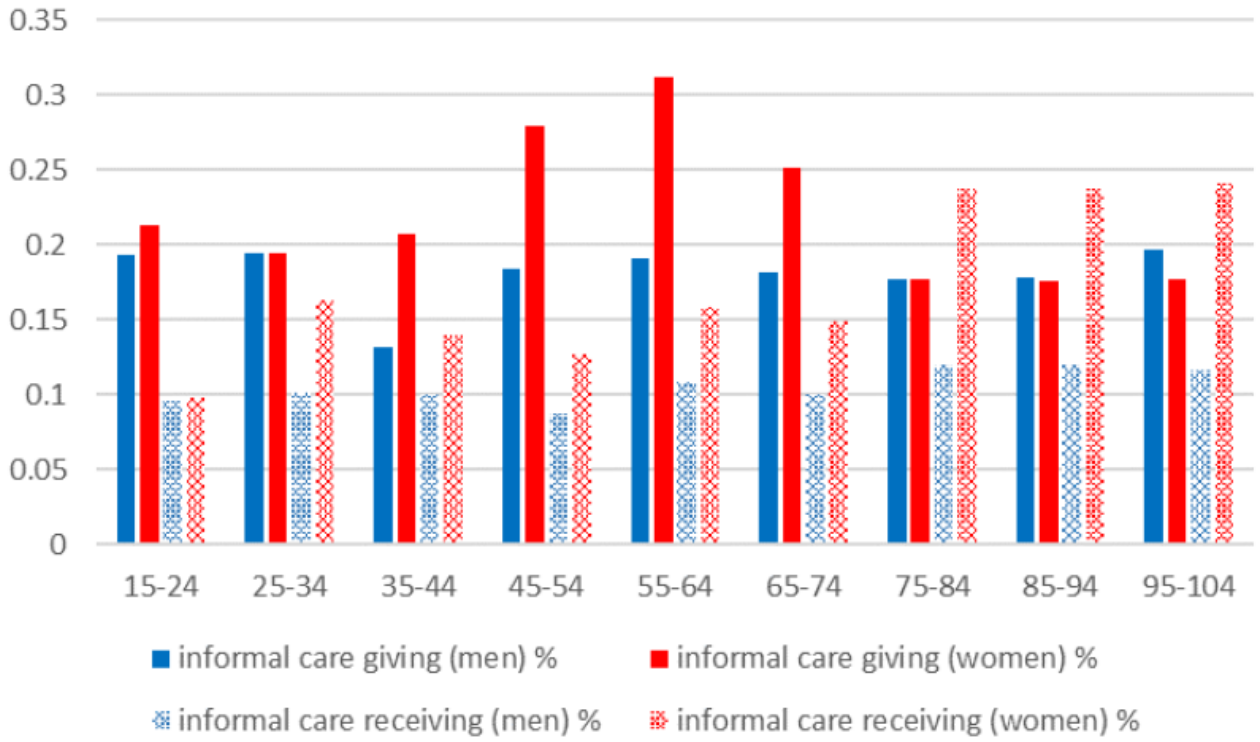
Need and provision of informal care

Figure 7: Need and provision of informal care (in %, 2025)



Source: Own simulations.

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Illustration:
The marriage market

The marriage market:

- candidates for marriage are selected
- ranked according to their difficulties to match according to the "order of decreasing differences algorithm" (Bouffard et al. 2001; Dekkers et al., 2009)
  - ranking is based on age differences and work status of potential partners
- matrix is constructed where for each woman, all candidate men are assigned a score which represents the assumed likelihood of the match
- men candidate with the highest score is selected
- "alignment by sorting" approach is applied, whereas the cases of "actual marriages" are aligned with the projected figures (Dekkers et al., 2009).

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Example:
interplay between probability of birth giving and alignment tables

```
birth():
    # get the relevant vaariables
    - age_2: ((age-40)*(age-40))/10
    - nch011: household.get(persons.count(age <= 11))
    # logit regression and alignment
    - to_give_birth: logit_regr(-.4033119*age - -.1938885*age_2
                                +.6214106*civilstate+.4164071*education_level+.9052192*nch011
                                +8.842617,
                                filter=ISFEMALE and (age >= 15) and (age <= 50),
                                align='al_p_birth.csv')
    - new('person', filter=to_give_birth,
          mother_id = id,
          father_id = partner.id,
          hh_id = hh_id,
          partner_id = UNSET,
          civilstate = SINGLE,
          education_level = choice([LOWER_SECONDARY_EDU,
                                    UPPER_SECONDARY_EDU,
                                    TERTIARY_EDU],
                                   [0.11, 0.44, 0.45]),
```

Simulated numbers of birth are aligned with projected numbers of birth (by age)

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Modelling immigration and emigration

- Difficulties:
  1. immigrating HH have no panel history (→ difficult to implement shared weights)
  2. characteristics of immigrants are unknown
  3. immigrants often enter country as HH and not as individuals
- 1st and 2nd difficulty could be solved by "donor approach" (Duleep & Dowha, 2008)
- 3rd difficulty by an alignment task, such as the Pageant algorithm (Chénard, 2000; Dekkers, 2015)
- Since sociodemographic characteristics differ by country of origin, we have grouped individuals by areas of country of birth (Dekkers, 2015; Schokaert et al., 2021).

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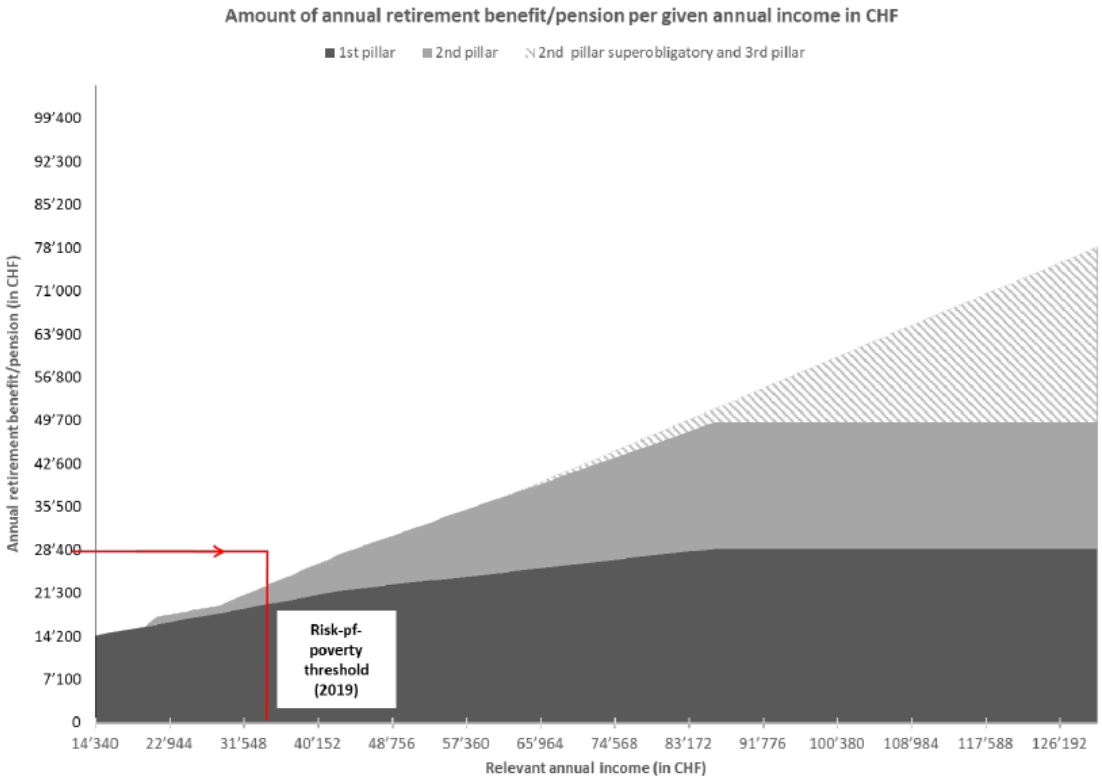
Swiss Pension system: Beveridge System



Three-tier pension system:

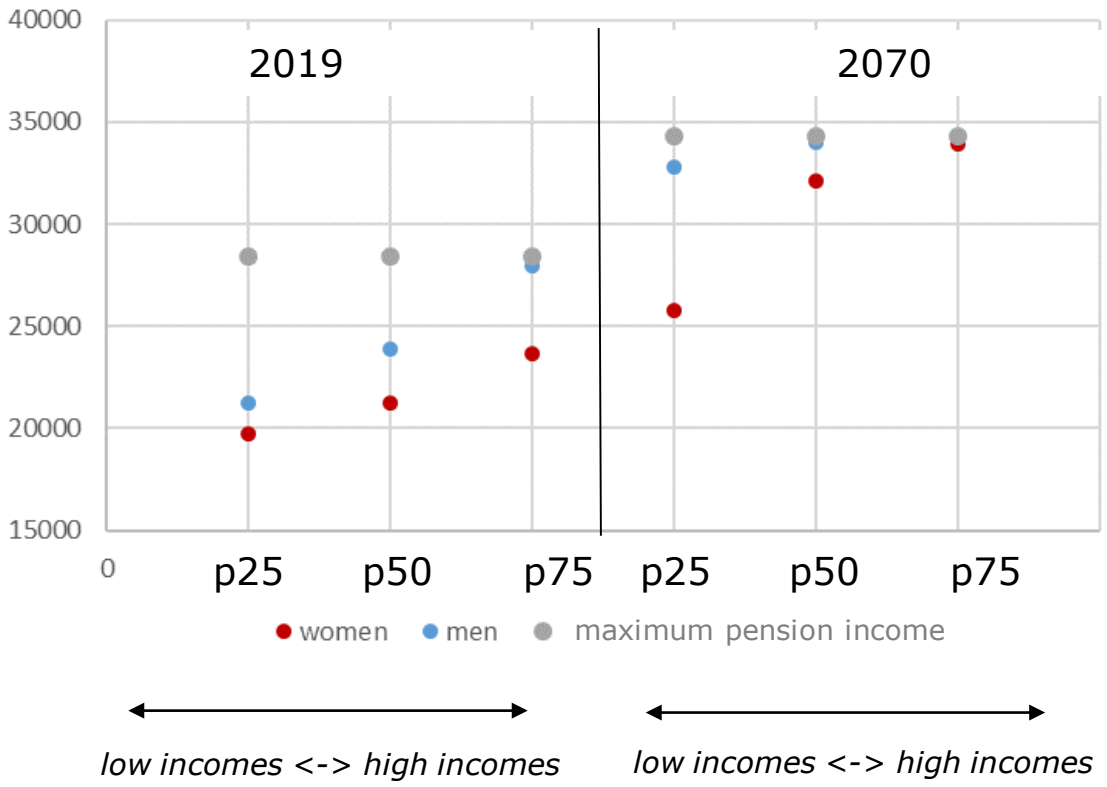
- First pillar: publicly financed PAYG system
- Second pillar: occupational pension system, DC/DB hybrid
- Third pillar: private savings (tax privileged)

Socio-political benefit objective

- replacement ratio of 60% of salary

Main simulation results – first pillar pension

Percentiles of **first pillar pension income**



- GPG increases at p25 and decreases at p50 and p75.
- However, relative pension income level of women at p25 increases.

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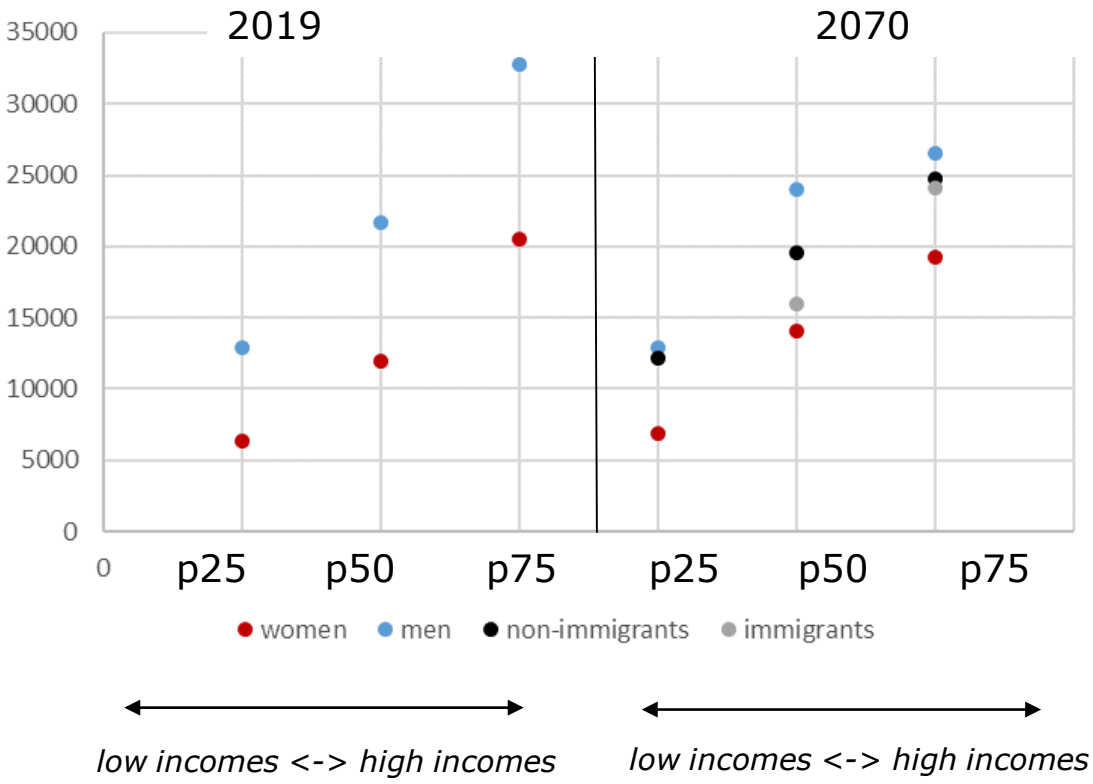
Main simulation results – second pillar pension

Percentiles of **second pillar pension income**



- GPG decreases over the entire income distribution.
- Relative small differences between immigrants and non-immigrants, esp. at p75.
- Variance is reduced, which is driven by an assumed lower return on accumulated pension wealth.

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What if…

Some things have changed:

- **labour market participation** of women increased
- **part-time work** patterns have changed
- **wage gap** decreased

Research questions:

- **What if, labour market participation of men and women would be equal?**
- **What if, part-time work of of men and women would be equal?**
- **What if, the wages of men and women would be the same?**

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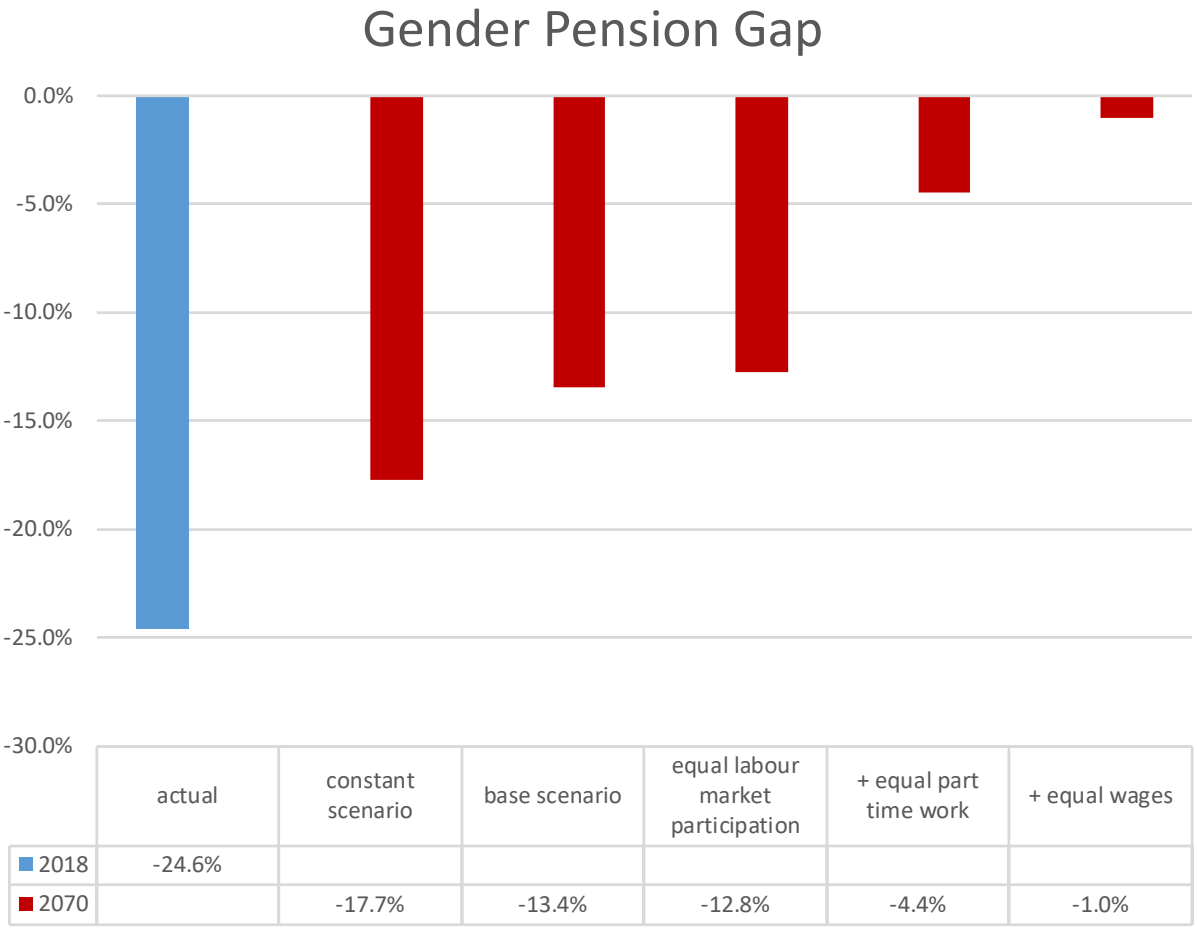
What happens in other countries?



	actual	constant scenario	base scenario	equal labour market participation	+ equal part time work	+ equal wages
2018	-24.6%					
2070		-17.7%	-13.4%	-12.8%	-4.4%	-1.0%

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Conclusions - Switzerland

- **Gender pension gap** in Switzerland will **significantly decline to 13.4%** in 2070**.**
- **However:** Decline is driven by higher income groups, **vulnerable, low income groups still lack behind.**
- Equalisation of **part-time work** and **wages** has **strongest impact.**
- **No** significant **differences between immigrants- and non-immigrants** (at the upper income brackets)
- We assume, that the **conversion factor of the second pillar pension** income **has to be decreased**, given the **increase in life expectancy**.
- We tentatively conclude that a **reduction of the conversion factor** from currently 6.8% to 5.2% would result in a **decline in 2nd pillar** median pension income **of 24%**.

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An international perspective

Some things have changed:

- **labour market participation** of women increased
- **part-time work** patterns have changed
- **wage gap** decreased

Research question:

- **How will the GPG be in 2070 in countries with currently low [SL], middle [BE, PT, CH] and high [LU] GPG?**

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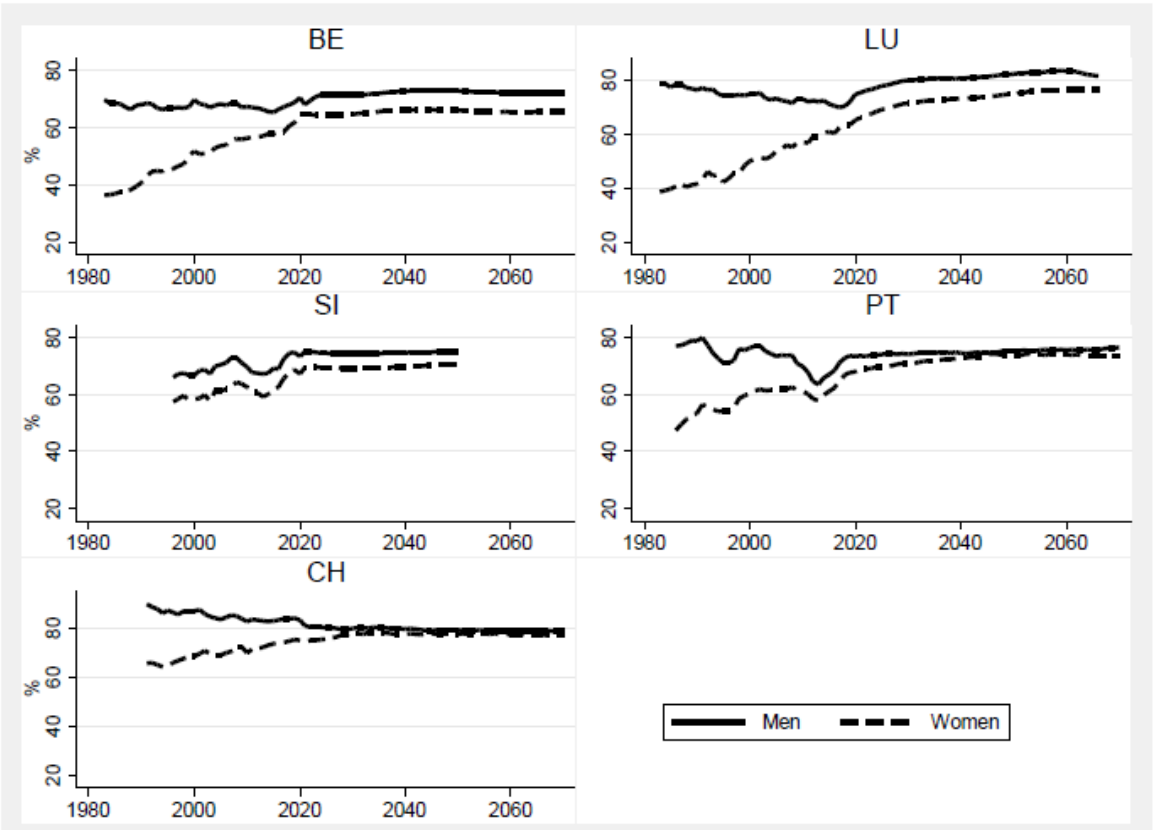
What happens in other countries?

Figure 1. Employment rates for men and women (15-64, 1983-2070).



Sources: EU-LFS ; Swiss Federal Statistical Office, AWG projections ; national reports

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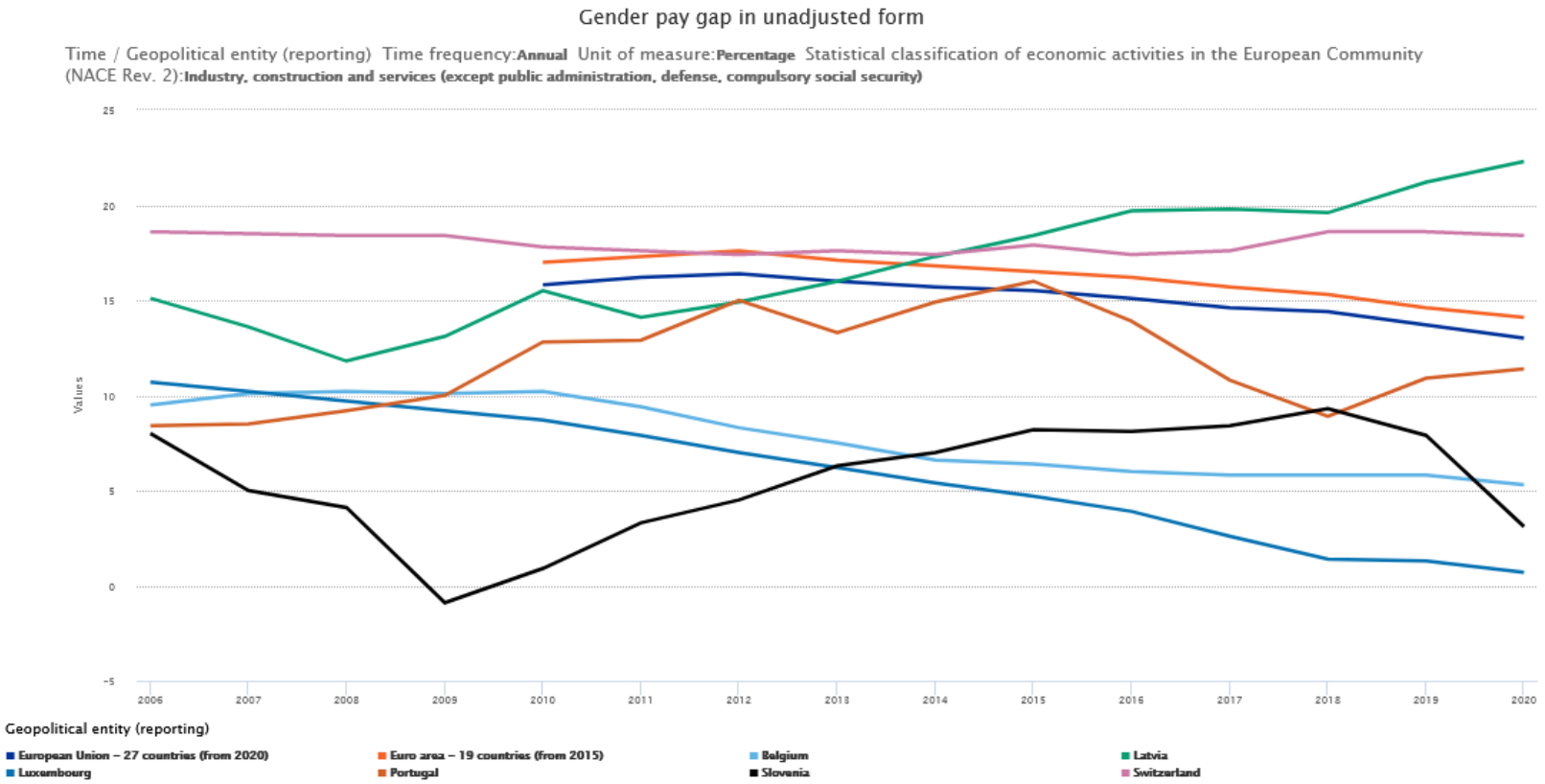
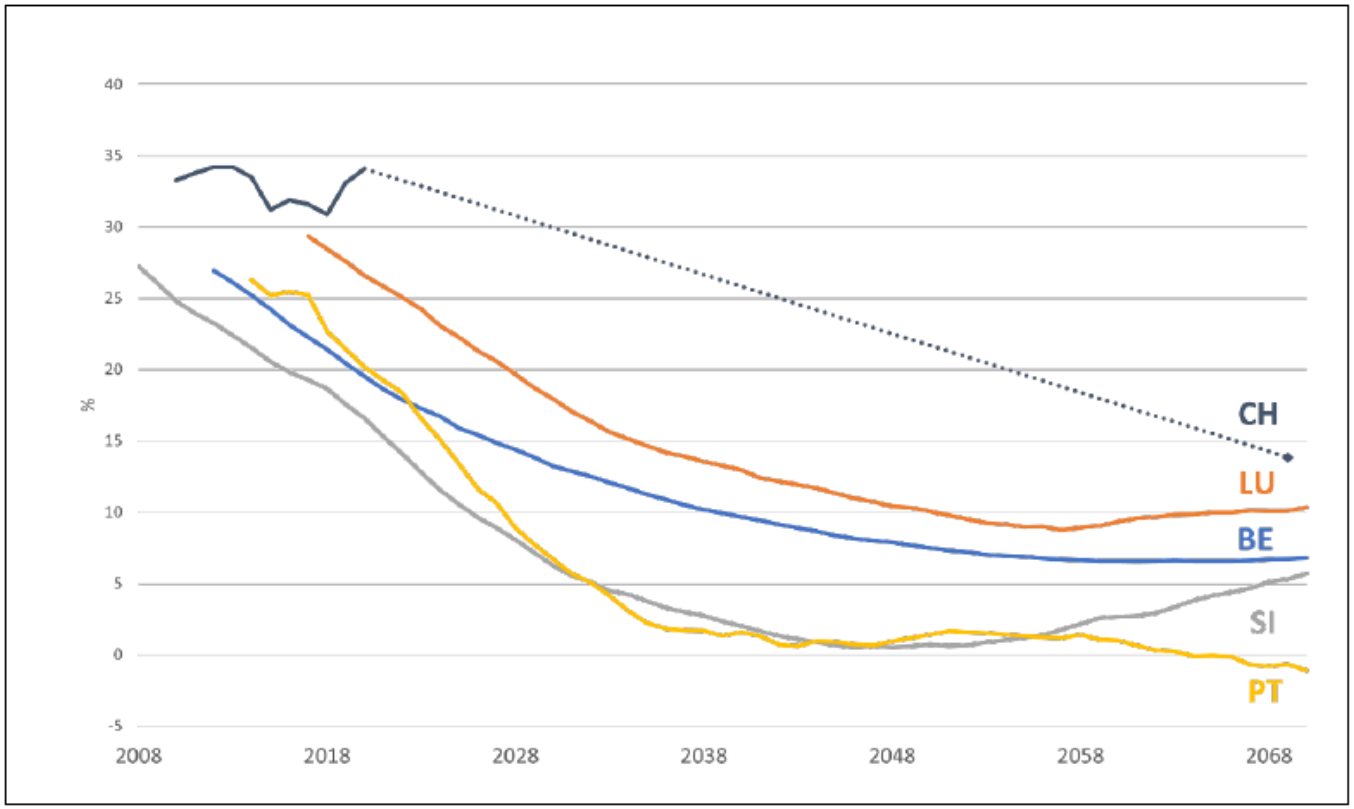
What happens in other countries?



What happens in other countries?

Figure 6. Gender Pension Gap under Ageing Working Group assumptions and projections (2008-2070).



Source: Projections by MIGAPE country teams, Eurostat

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Conclusions – cross country comparison

- The **GPG will fall significantly in all five countries over the coming decades.**
- In **SL** and **PT**, the gender pension gap will be reduced to close to 5 per cent already in 2030 and will have essentially disappeared in 2040. In **BE** and **LU**, the gap is reduced to 7 and 5 per cent in 2050, respectively, less than one-third of their 2020 levels. In **CH**, the reduction will be smaller.
- **LU** and **BE**, as well as in **CH** a more **equal distribution of part-time work and** the **eradication of the gender pay gap is required** to completely eliminate the Gender Pension Gap.
- **Currently**, in **BE**, **LU** and **PT** the **Gender Pension Gap would be much larger without survivors' benefits**, and in the two latter countries, this impact will persist over time. **Only in SL** the **impact of survivors' pensions** on the Gender Pension Gap already **is small today**.
- Our results suggest that, **a more equal distribution of part-time work rates** and the **eradication of the gender pay gap would be required to eliminate the Gender Pension Gap in statutory pensions**.
- Mūsu rezultāti liecina, ka, **lai likvidētu dzimumu pensiju atšķirību likumā noteiktajās pensijās, būtu nepieciešams vienlīdzīgāks nepilna darba laika darba likmju sadalījums un dzimumu darba samaksas atšķirību izskaušana.**

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Relevance and implications of informal caregiving

- **12% of the adult population** in the EU[1] **frequently care** for a disabled or infirm family member (Eurofound, 2020)
- **59% of adult informal carers are women**, the gender difference is especially large in the group aged 45-64 (European Union, 2021)
- because informal **care often occurs over a long period of time and is a demanding activity**, it is often accompanied by
  - **a reduction or abandonment of professional activity by the caregiver**
  - **a lower probability to re-enter employment**
  - **lower earnings and lower status occupations**

[1] 44 million adults in the EU

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Caring, pensions and the gender pension gap

- As pension income is a function of the previous career, **caregiving might be associated with a greater risk of poverty and lower retirement income** compared to people without care obligations (Fasang, Aisenbrey, & Schömann, 2013; Möhring, 2015, 2018)
- Therefore, **gender difference in informal care-responsibilities adds to the Gender Pension Gap** (Bettio et al., 2013; Burkevica et al., 2015; Ginn & MacIntire; 2013, Halvorsen & West Pedersen, 2019; Frericks et al., 2008)
- Continuing **demographic ageing is likely to exacerbate these issues** (Eurofund, 2020)

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Research question and research design

- Many countries have **"care credit" schemes to dampen the impact of caregiving on pension income**.
- However, little is known about the impacts of these compensating care credits within pension systems and how they may vary between countries with different pension systems.
- **We analyse, how different types of pension system acknowledge informal care and how care activities impact pension income.**
- We use **standard simulations** (i.e. of hypothetical female individuals of different educational attainment levels) to simulate the impact of **taking up care tasks for a child** (at age 30) or an **older relative** (at age 54) and **distinguish scenario with and without wage scarring**.

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Selection of countries: low – high GPG, Bismarck vs. Beverdige

- Since **GPG reflects reflects the tightness between labour market outcomes and pension incomes**, we compare the impact of care activities in countries with
  - a high (Luxembourg),
  - middle (Liechtenstein, Belgium, Portugal) and
  - low (Slovenia) gender pension gap.
- The country selection also provides a system **comparison between countries with Bismarckian type pension systems** (Luxembourg, Belgium, Portugal, Slovenia) and **Beveridge systems** (Liechtenstein/Switzerland).

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Pension system designs

	type of pension system	SRA	childcare credit	care credit for older relatives	minimum pension	Base for pension assesment	bonus for extending working life
LU	Bismarck	65	✓	✓	✓	all	✓
LI	Beveridge	65	✓	✓	✓	all	✓
PT	Bismarck	development of life expectancy	✓	✗	✓	40 yrs	✓
BE	Bismarck	67-69	✓	✓	✓	all	✓
SI	Bismarck	65	✓	✗	✓	24 yrs	✓

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Theoretical aspects of the methodology

Care activities impact pension entitlements through two effects:

1. They may lead to fewer working hours or an interruption of employment
   i. This may lead to reduced contribution payments or contribution gaps, which result in lower pensions.
   ii. Care credits compensate to varying degrees for the loss of earnings due to care.
   iii. As wages vary over the life course, opportunity costs of care giving also vary..
2. Caregivers may earn a lower wage compared to men and women without care responsibilities
   i. Wage differences are driven by a loss of job related skills during interruptions and a lower accumulation of experience.
   ii. Empirical evidence shows, that women's wages are markedly lower than that of men following the birth of the first child; and this effect is lasting beyond 10 years after birth (Angelov et al., 2017; Kleven et al., 2019).

   → This wage penalty – which we model as persistent over life course – results in lower pension accrual.

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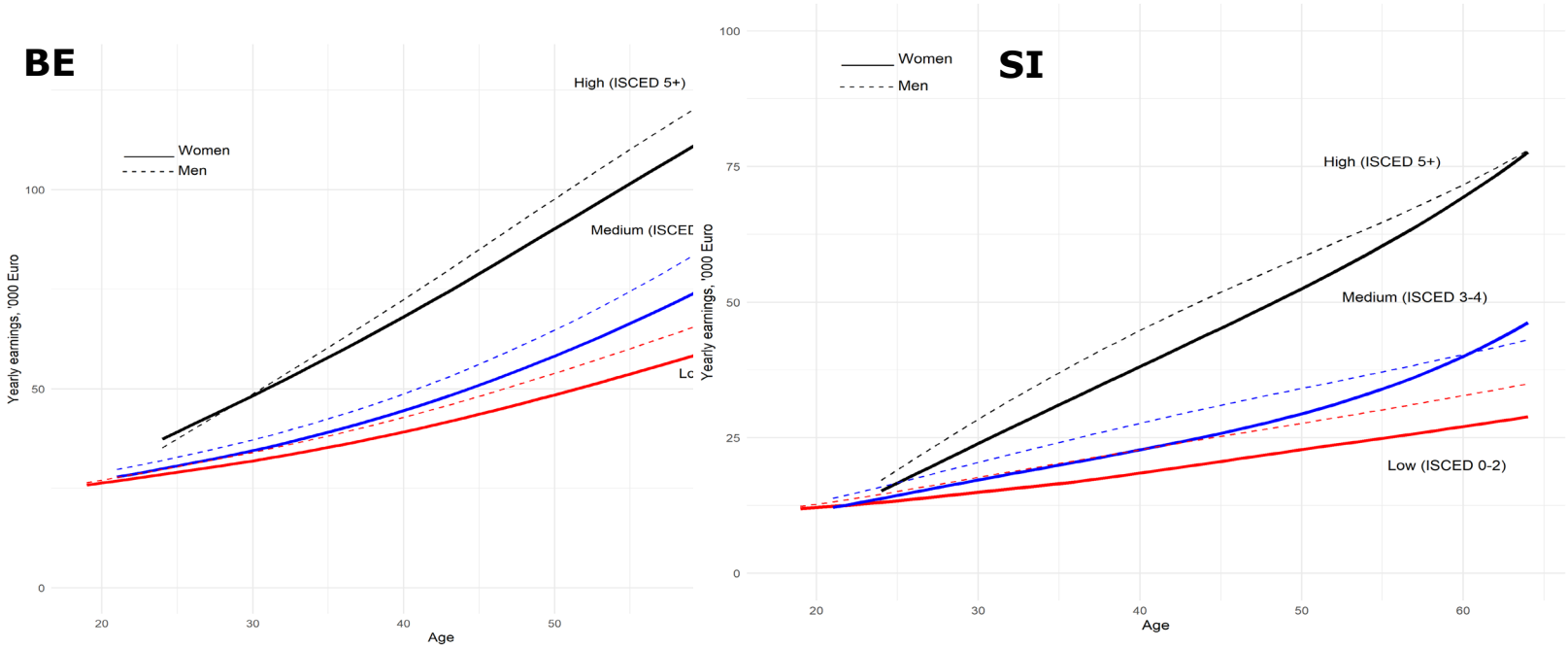
Simulation is based on projected wage curves

Projected wage curves by gender and level of education



Source: Own projections based on estimates on the data listed in footnote 10 and the Ageing Working Group's projection of future wage growth.
Note: The figures show projected real earnings trajectories for men and women born in the year 2000 (19 years old in 2019) by level of educational attainment for each Belgium and Slovenia.

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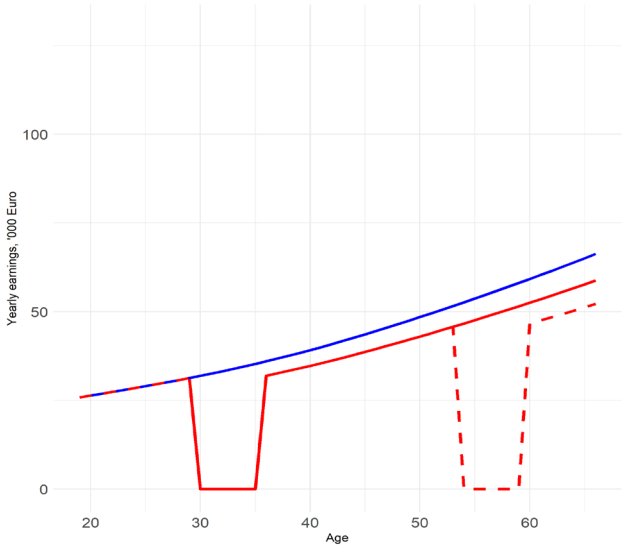
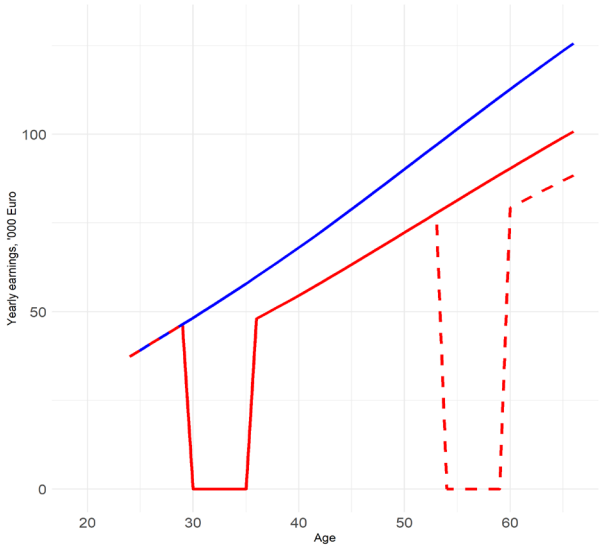
Simulation of wage penalty

Illustration of wage penalty with a low and high educational level (BE)





Source: Own calculations based on estimated earnings trajectories for Belgium.
Note: The figure shows the estimated full-time earnings trajectories (blue line) for a woman with low (ISCED 0-2) (LHS) and high educational attainment (ISCED 5+) (RHS). The full red line shows the impact on the earnings trajectory of full-time child care from age 30 to age 35 when an earnings penalty is applied (see main text). The dashed red line shows the impact on the earnings trajectory of full-time child care from age 30 to age 35 and full-time caring for an older relative from age 54 to age 59 when an earnings penalty is applied.

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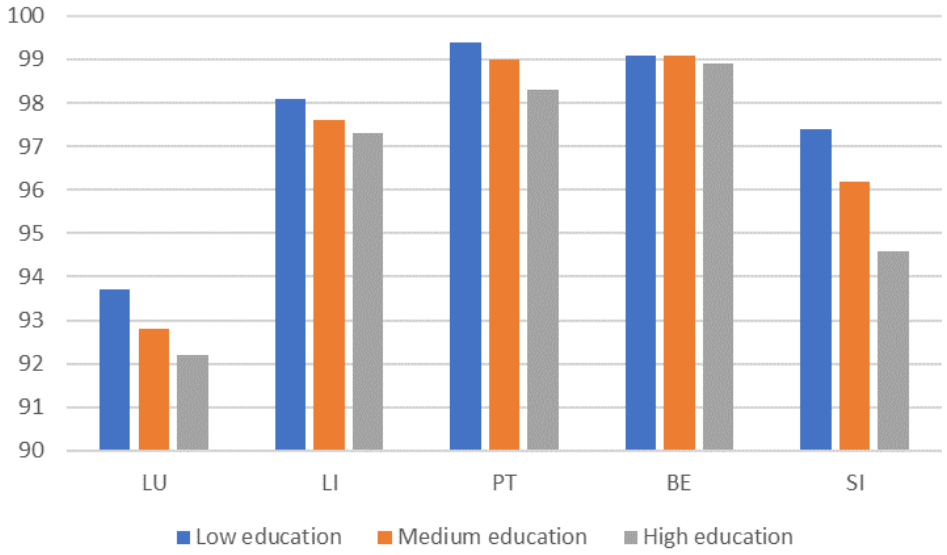
Results – child care scenario (50% part time)

Pension outcomes in case of PT work (50%) due to child care from age 30 to 35 (% of full-time work outcomes)



Impact of working PT is quite small in BE, PT, LI. It is larger in SI and highest in LU.

Drivers:
LU:
Short period of care credits.

SI:
Additional accrual and care credit have a little compensating impact.

In most countries, the compensation effect is (strongly) degressive with regard to educational level.

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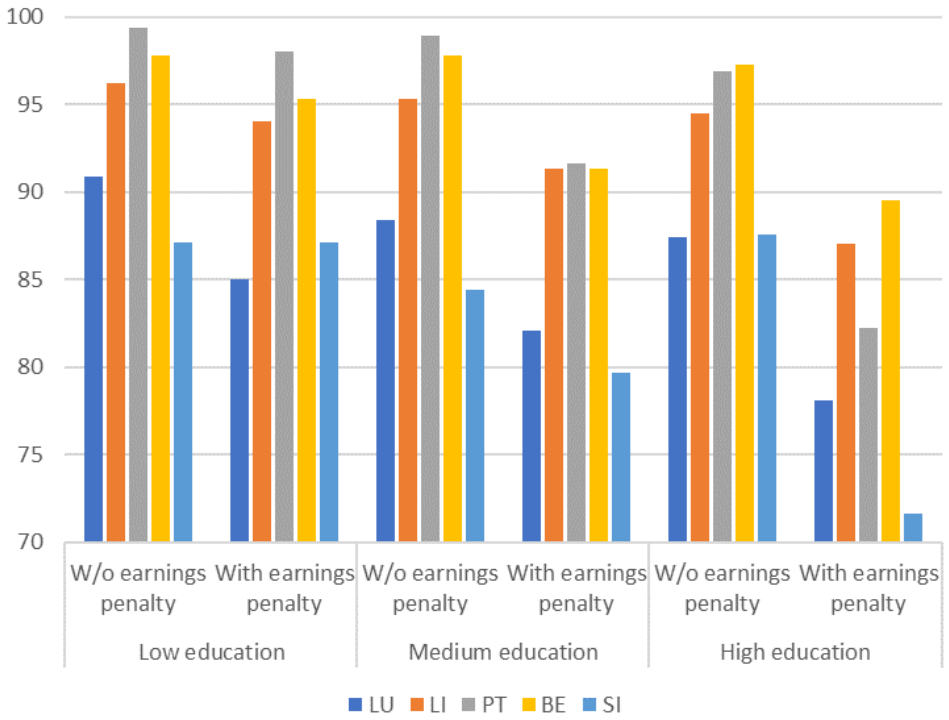
Results – child care scenario (full time interruption)

Pension outcomes in case full time interruption due to child care from age 30 to 35 (% of full-time work outcomes)



Again, impact is smaller in BE, PT, LI. It is larger in LU and highest in SI.

In SI, the impact of **earnings penalty** is highest.

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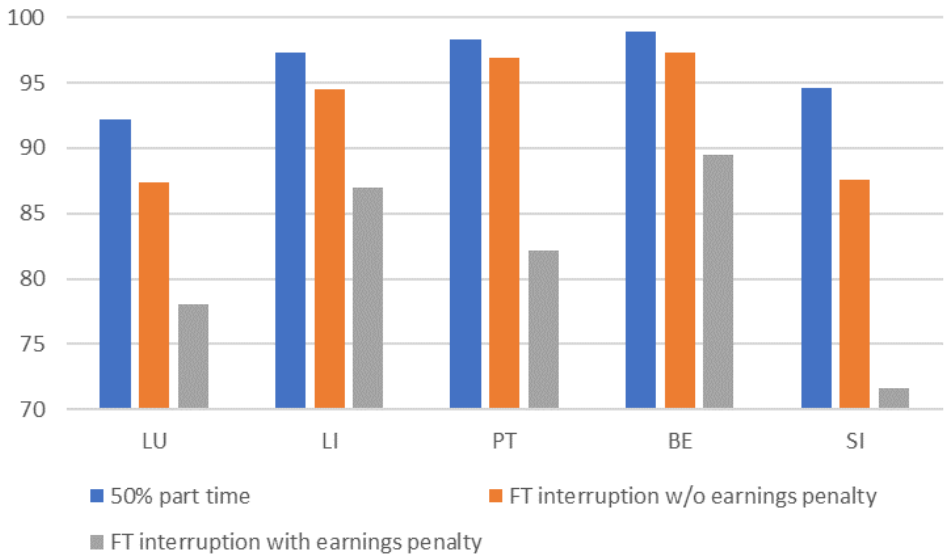
Results – child care – PT vs full time interruption

Comparison of pension outcomes in case of part time and full time interruption due to child care from age 30 to 35



Pilnas slodzes pārtraukuma ietekme visās sistēmās ir lielāka nekā darba uz pilnu slodzi ietekme.

Tomēr ienākumu soda ietekme ir spēcīgāka nekā ietekme, ko rada darba samazināšana no 50 % līdz pilnas slodzes pārtraukumam.

Impact of full time interuption is in all systems higher than that of PT work.

Impact of earnings penalty is however stronger than impact of reducing work from 50% to full time interruption.

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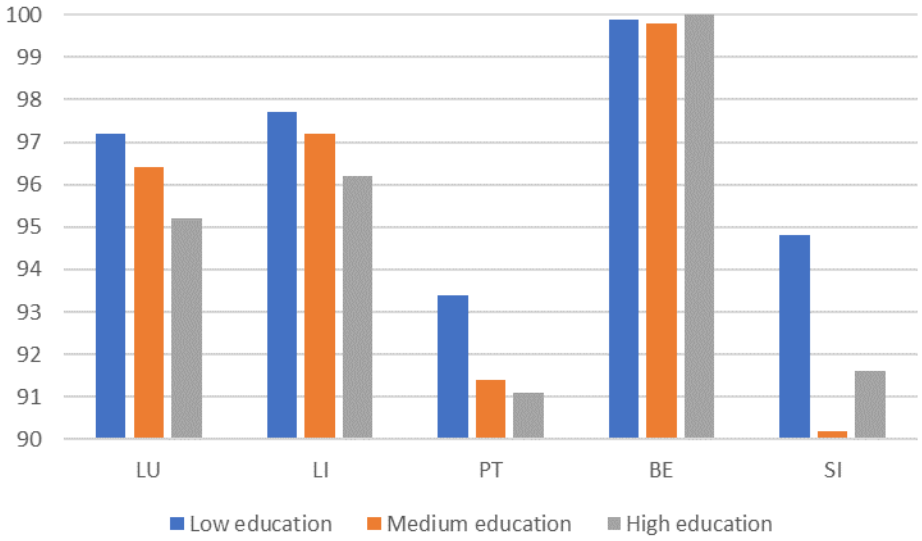
Results – **care for older relative** (50% part time)

Pension outcomes in case of PT work (50%) due to care for an older relative from age 54 to 59 (% of full-time work outcomes)



Impact of working PT is quite small in BE, It is larger in LI and LUS and highest in PT and SI.

Drivers:
PT and SI:
Lack of care credits for elderly care.

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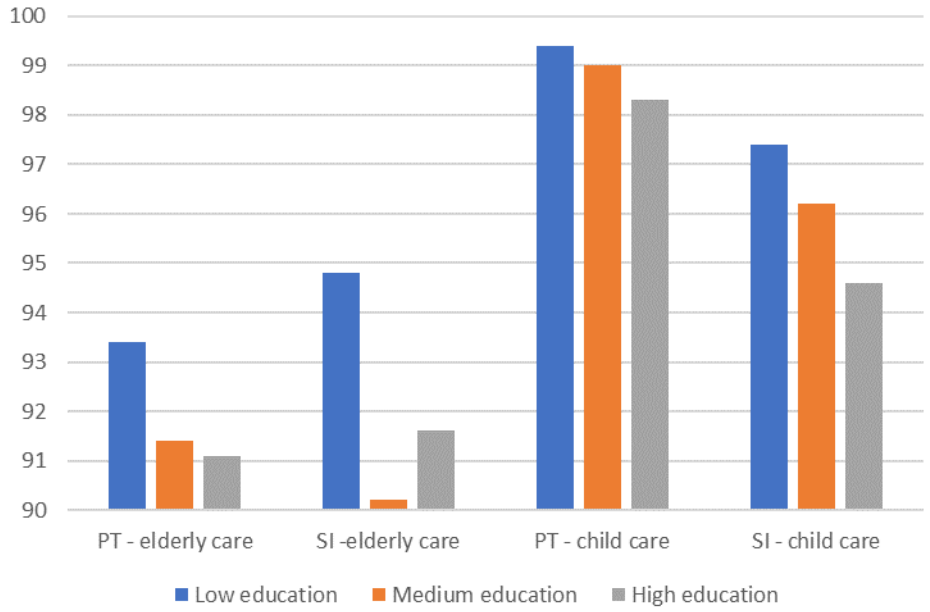
Results – childcare and care for older relative (50% part time)

Pension outcomes in case of PT work (50%) due to care for an older relative and care for a child (% of full-time work outcomes)



Care credits reduce significantly the impact of care activities.

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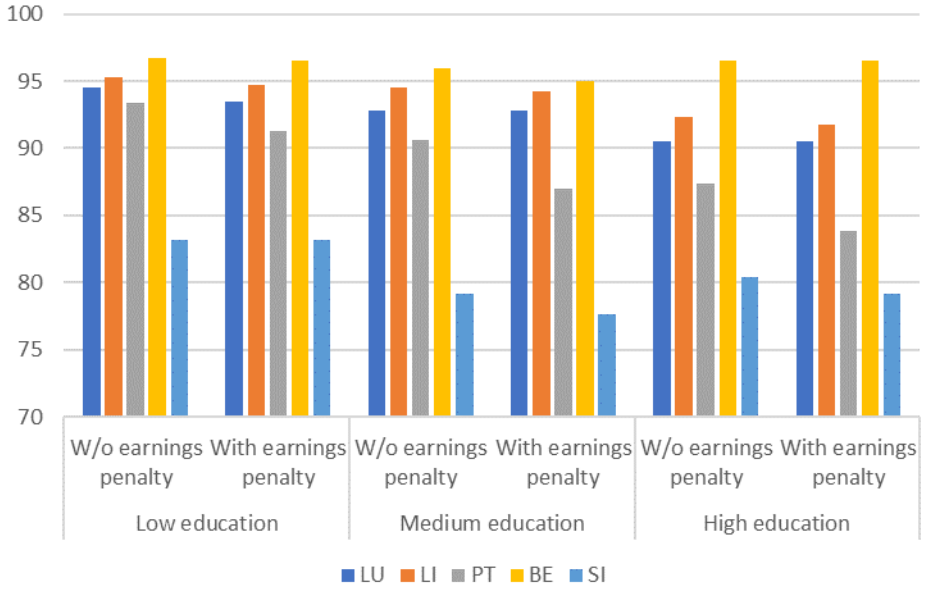
Results – elderly care scenario (full time interr.)

Pension outcomes in case full time interruption due to elderly care from age 54 to 59 (% of full-time work outcomes)



Ar algas sodu pensijas ienākumu zaudējums ir lielāks bērnu aprūpes gadījumā nekā vecāka gadagājuma cilvēku aprūpes gadījumā, jo algas soda ietekme ir ierobežota līdz atlikušajai karjerai.

Izņēmums ir SI un PT, kas neattaisno vecāka gadagājuma cilvēku aprūpes kredītus.

With wage penalty, the loss in pension income is higher in case of child care than in case of elder care, since the impact of the wage penalty is limited to the remaining career.
Exceptions are SI and PT, which do not warrant elderly care credits.

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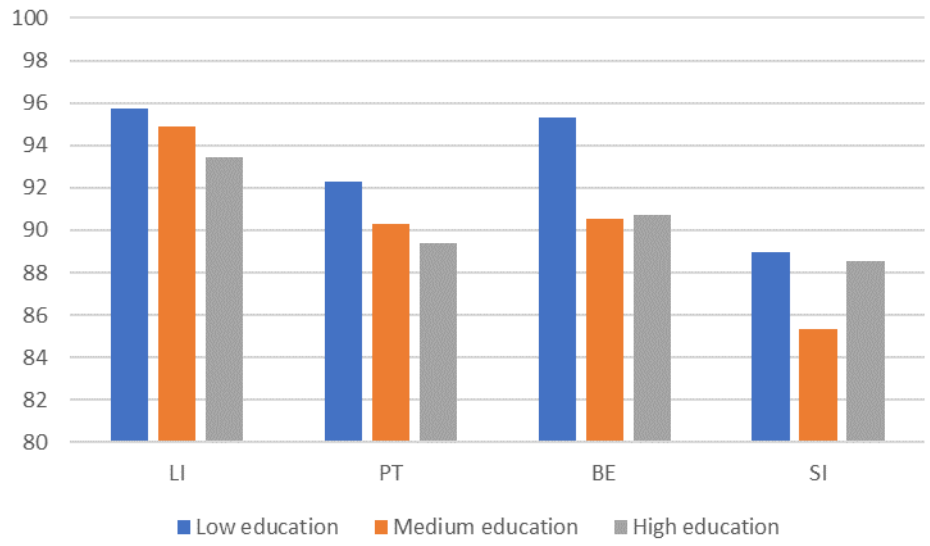
Results – dual care brakes (PT 50%)

Pension outcomes in case of PT work (50%) due child care and due to care for an older relative (% of FT work outcomes)



In case of dual care brakes, the impact differs from the previos scenarios.

BE:
Leave credits are to a largerly extent used up.

SI:
Careers become to short too benefit from the bonus accrual in the last year of work.

PT:
As 40 yrs are considered, the impact of using contribution yrs. is limited.

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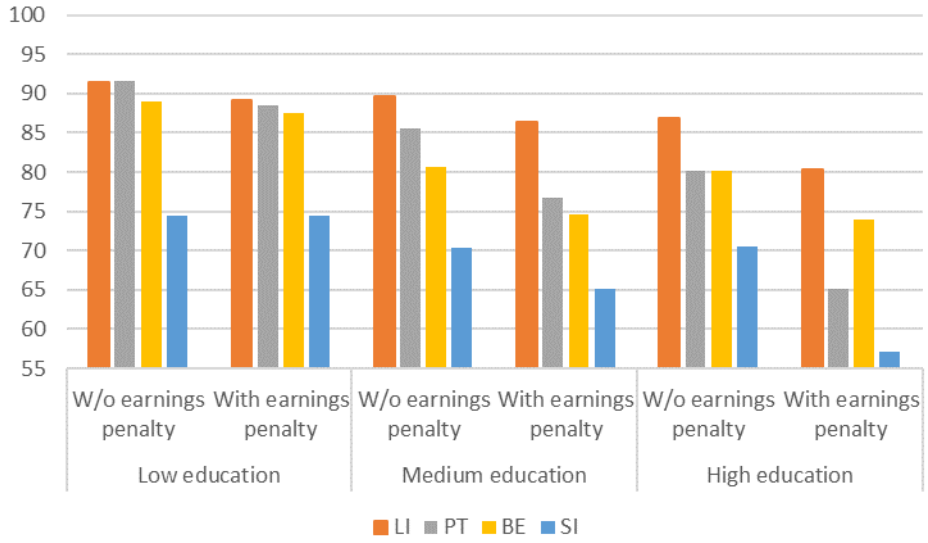
Results – dual care brakes (full interruption)

Pension outcomes in case of full interruption due child care and due to care for an older relative (% of FT work outcomes)



In case of dual care brakes, the impact differs from the previos scenarios.

BE:
Leave credits are to a largerly extent used up.

SI:
Careers become to short too benefit from the bonus accrual in the last year of work. Earnings penalty is strong.

PT:
As 40 yrs are considered, the impact of using contribution yrs. is limited.

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Conclusions / Secinājumi

With regard to care credits, two factors are critical:

- **The duration of time.** The shorter the duration, the stronger the implications of longer (and multiple) interruptions.
- **The amount of credit.** The lower the equivalent value, the stronger the regressive effect. This effect is aggravated, if the wage penalty is persistent over life course and occurs early, or if the wage increases strong with experience (and age).
- There is an **interplay between the duration and the amount of the care credit**. A longer duration could compensate for a smaller amount of care credit and vice versa.

→ Care credits should be linked as much as possible to the actual duration of caregiving activities and should correspond to the opportunity costs of caregiving.

Attiecībā uz aprūpes kredītiem izšķiroši ir divi faktori:

- **Laika ilgums.** Jo īsāks ilgums, jo spēcīgākas ir ilgāku (un vairākkārtēju) pārtraukumu sekas.
- **Kredīta summa.** Jo zemāka ekvivalenta vērtība, jo spēcīgāka regresīvā ietekme. Šis efekts pastiprinās, ja darba samaksas sods ir pastāvīgs mūža garumā un iestājas agri vai ja darba samaksa strauji pieaug līdz ar pieredzi (un vecumu).
- **Pastāv mijiedarbība starp aprūpes kredīta ilgumu un summu.** Garāks ilgums varētu kompensēt mazāku aprūpes kredīta summu, un otrādi.

→ Aprūpes kredītiem jābūt pēc iespējas vairāk saistītiem ar faktisko aprūpes darbību ilgumu un tiem jāatbilst aprūpes alternatīvajām izmaksām.

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Conclusions / Secinājumi

With regard to "trunctation" of career length:

- If for example, the best 40 years of a career are selected to determine the pension income, years of reduced or interrupted work can be replaced by other years. However, case of several interruptions, this may not be sufficient.
- However, is this is combined with accrual incentives to foster longer careers (as in SI), this could have a massive negative impact on pension income.

→ Interplay between incentives to foster longer careers and caregiving activities should be taken into consideration when designing pension systems.

Attiecībā uz karjeras ilguma "saīsināšanu":

- Ja pensijas ienākumu noteikšanai izvēlas, piemēram, karjeras labākos 40 gadus, tad gadus, kad darbs ir samazināts vai pārtraukts, var aizstāt ar citiem gadiem. Tomēr vairāku pārtraukumu gadījumā ar to var nepietikt.
- Tomēr, ja tas tiek kombinēts ar uzkrāšanas stimuliem, kas veicina ilgāku karjeru (kā SI), tas var būtiski negatīvi ietekmēt pensijas ienākumus.

→ Izstrādājot pensiju sistēmas, būtu jāņem vērā mijiedarbība starp stimuliem, kas veicina ilgāku karjeru, un aprūpi.

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Policy measures at European level
Politikas pasākumi Eiropas līmenī

European Commission's '**Agenda for Adequate, Safe and Sustainable Pensions**'

"Addressing pension adequacy and sustainability therefore requires a **mix of pension and employment policies** aimed at tackling gender differences in pension incomes (p. 12)."

Eiropas Komisijas "**Programma atbilstīgām, drošām un ilgtspējīgām pensijām**»

«Tādēļ, lai risinātu pensiju atbilstības un ilgtspējas jautājumu, ir nepieciešams **pensiju un nodarbinātības politikas** pasākumu kopums, kas vērsts uz dzimumu pensiju ienākumu atšķirību novēršanu.»

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Policy measures at European level
Politikas pasākumi Eiropas līmenī

Key findings of the project have been published in:

EU Commission (2021): Pension Adequacy Report

EU Commission (2021): Ageing Report

Project website:

http://www.migape.eu/

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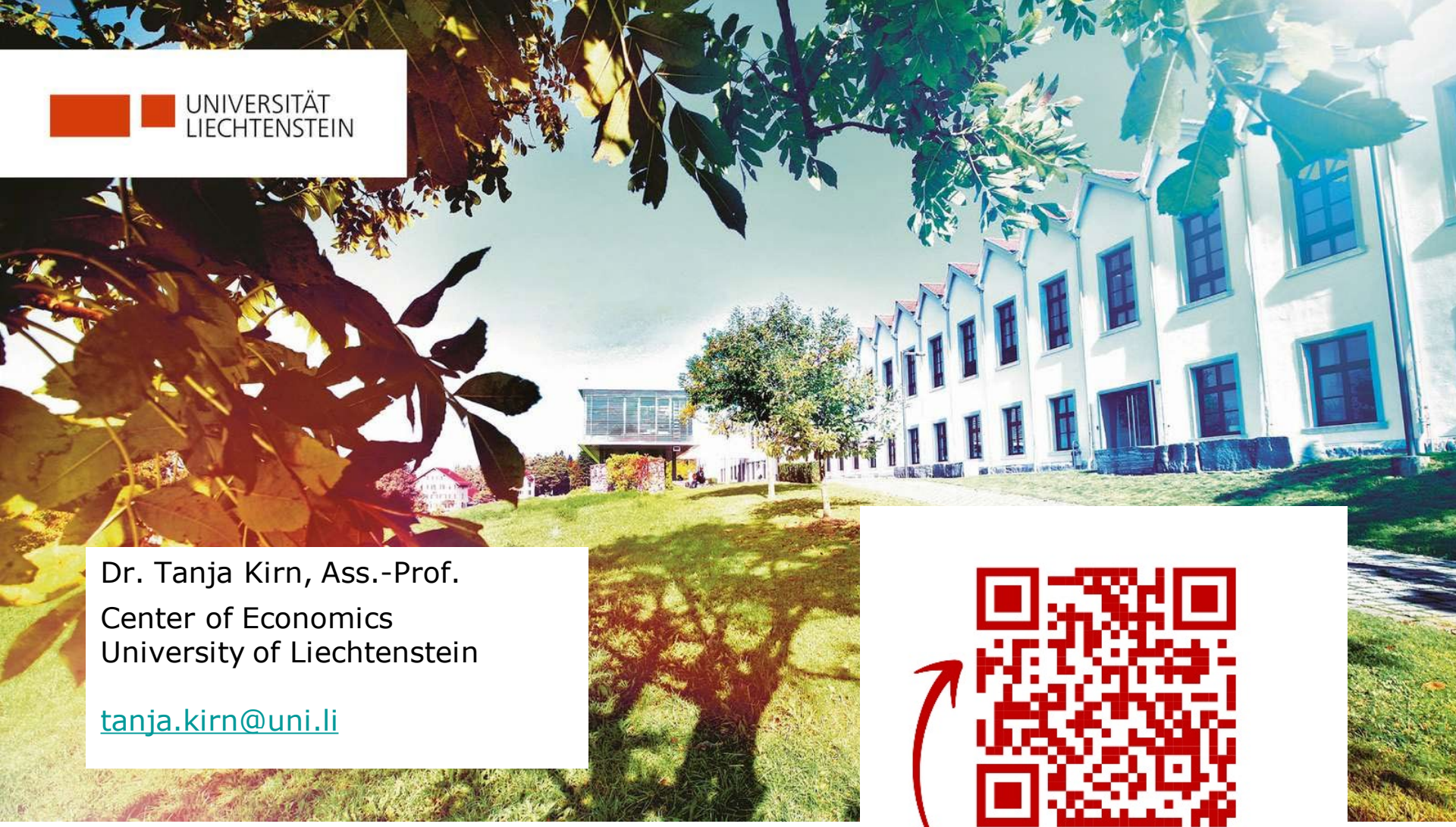

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www.migape.eu

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