Quantifying Economic Dependency

Expert Group Meeting: "Measuring population ageing: Bridging Research and Policy", Bangkok, Thailand, 25-26 February 2019

Session 6: Case studies: SDG8 – Decent work and economic growth

Alexia Fürnkranz-Prskawetz

TU Wien, Institute of Statistics and Mathematical Methods in Economics

Wittgenstein Centre for Demography and Global Human Capital (VID/IIASA/WU)

Economic Dependency Measures

Characteristic feature of the economic life course:

- Periods of economic dependency: childhood and old age
- Differences in economic life course by socio-economic characteristics & institutional framework

Economic Dependency Ratios (DR):

- Measure the degree of economic dependency and their expected change due to population ageing.
- Provide information about economic consequences of population ageing and are used to guide and legitimate policy.
- Results depend strongly on the exact definition of dependency

Definition and Calculation of Dependency Ratios

$$DepRatio = \frac{\sum_{i=1}^{N} Dep(X_i)}{\sum_{i=1}^{N} Sup(X_i)}$$

$Dep(X_i)$ … measure of dependency as a function of the characteristics X_i of individual i

$Sup(X_i)$ … measure of the ability to support others as a function of the characteristics X_i of individual i

Examples:

	Dep(.)	Sup(.)	
Demographic dependency	1 if age<20 or age>59,	1 if age 20-59	Number of children and elderly per person in working age.
	0 otherwise	0 otherwise	
Employment based dep.	1 if non-employed,	1 if employed	Non-employed persons per employed person.
	0 otherwise	0 otherwise	

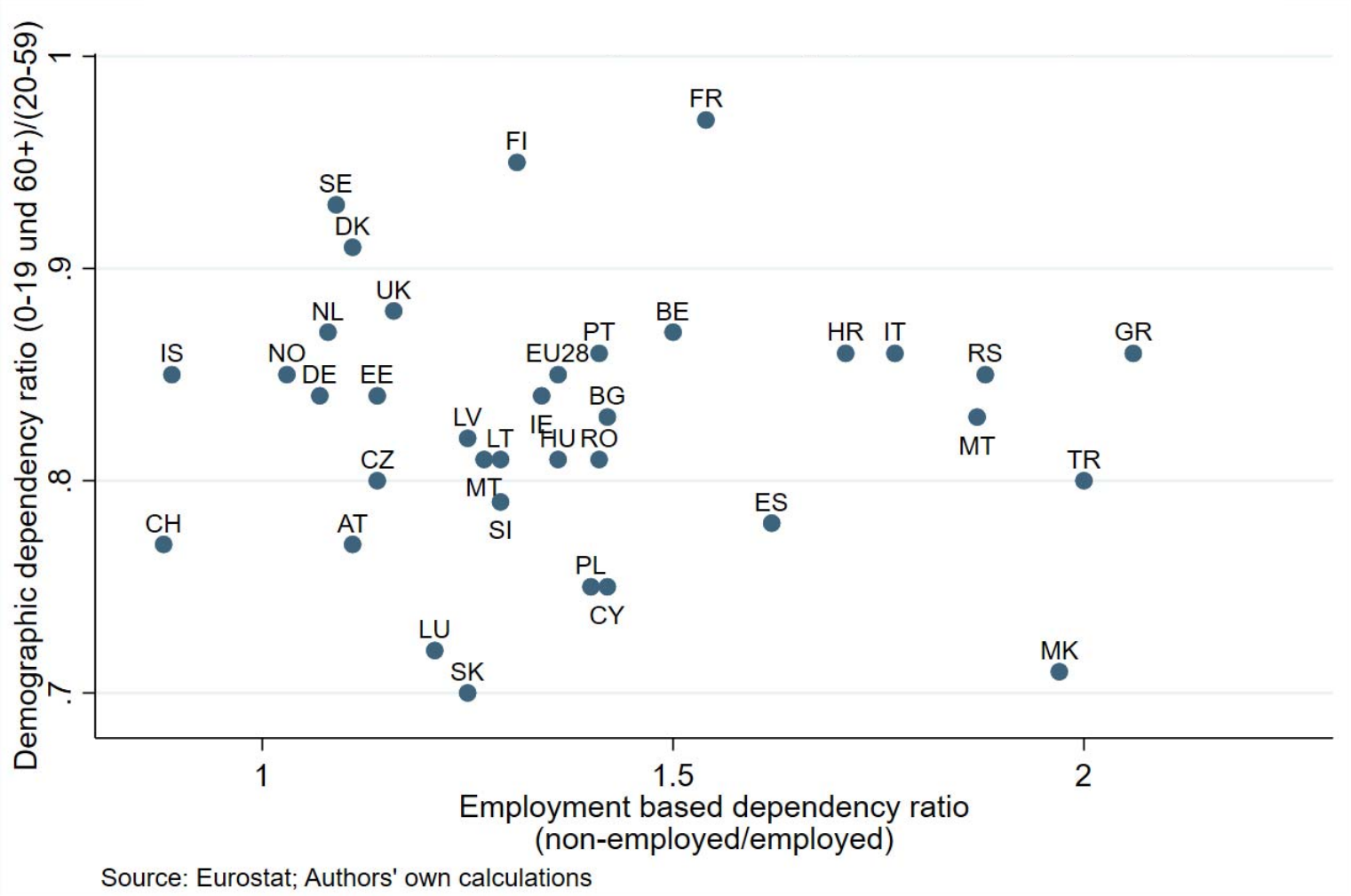
Employment Based Dependency Ratio (2015)

$$DR_{empl} = \frac{Child. + Unempl. + Domestic + Retirees + Other\ inact.}{Employed\ persons}$$

Country	Demographic DR	Employment based DR	
AT	0.77	1.11	
DE	0.84	1.07	
ES	0.78	1.62	high unemployment
FI	0.95	1.31	
FR	0.97	1.54	
HU	0.81	1.36	
IT	0.86	1.77	unemployment, low female LFP, retirees
SE	0.93	1.09	
SI	0.79	1.29	
UK	0.88	1.16	

Employment Based vs. Demographic DR (2015)

$$\frac{Age < 20 \; or \; Age > 59}{Age \; 20 - 59} \neq \frac{non - employed}{employed}$$



National Transfer Accounts (NTA)

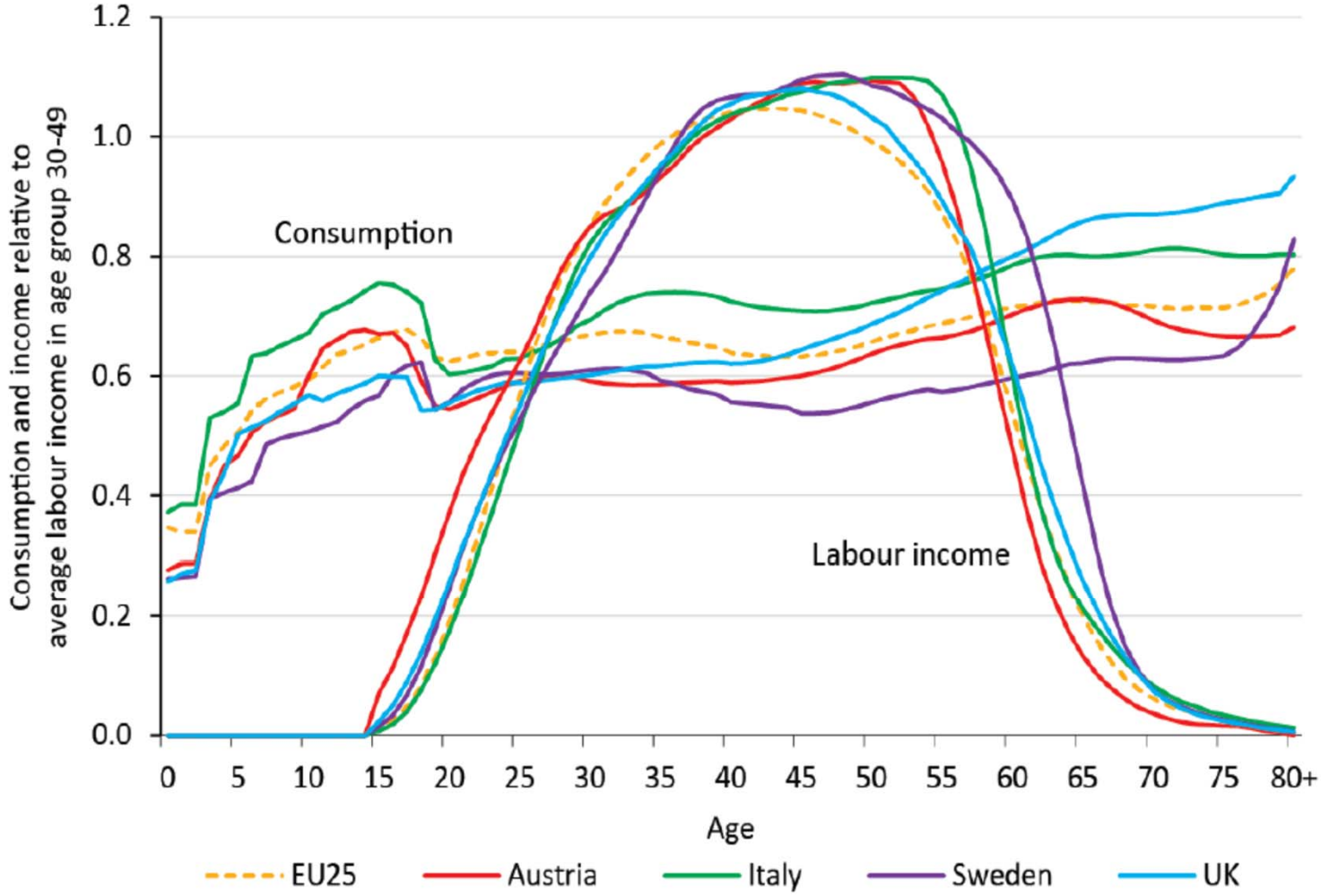
NTA introduce demographic information into National Accounts

National Transfer Accounts (NTA) measure by demographic groups:

- **Production and the generation of income**
- **Distribution of income**: public and private transfers
- **Use of income**: consumption and saving

The dataset contains **per-capita averages** of income, transfers contributions, transfer benefits, consumption and saving by demographic group => age-profiles of extent of economic activity

Consumption and Income across age (~2010)

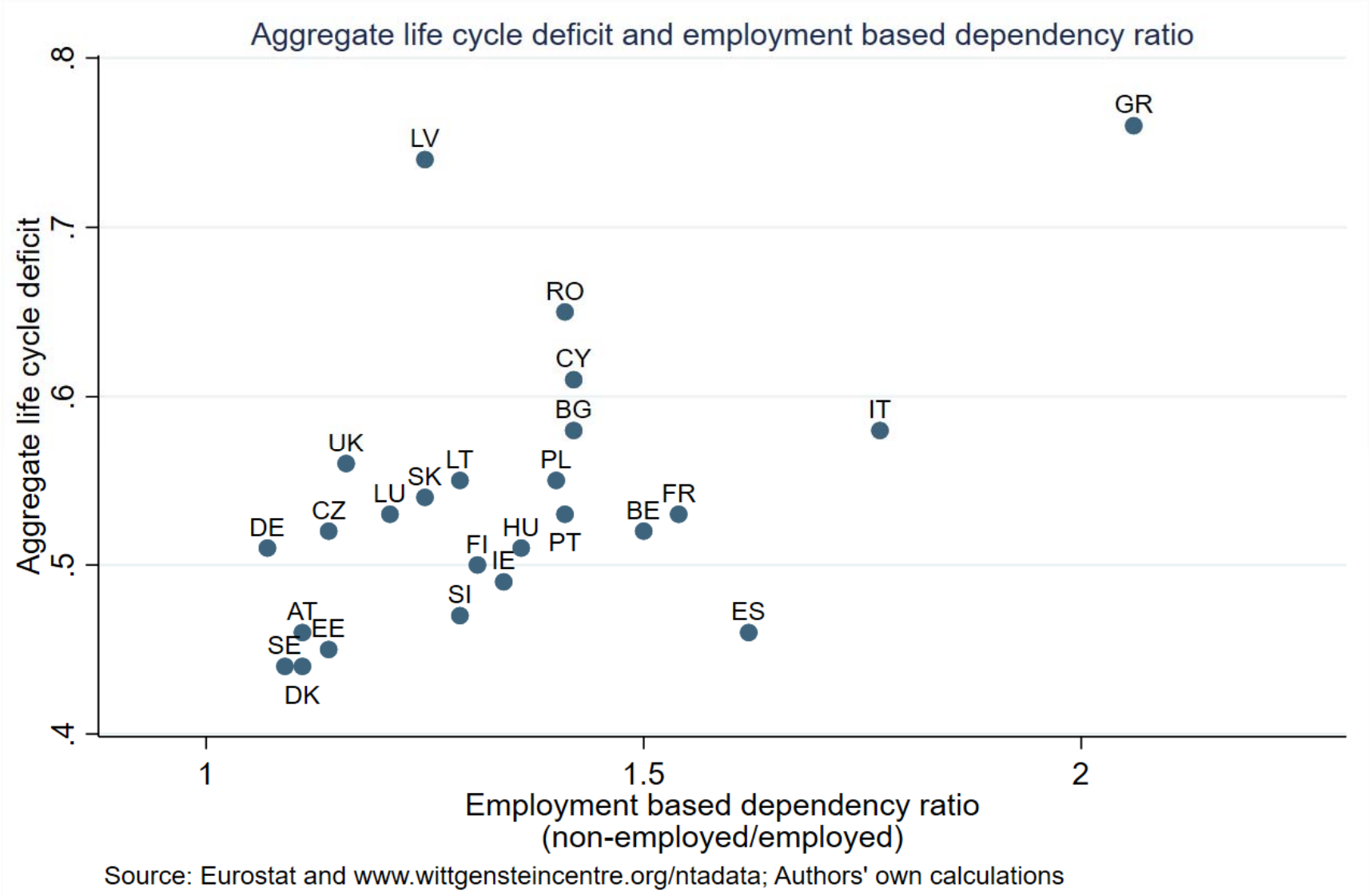


Aggregate Life Cycle Deficit (LCD) (~2010)

	Dep(.)	Sup(.)	Interpretation
Aggregate LCD	Consumption of children and elderly that is not financed by their own labour income	Labour income	Amount of consumption of children and elderly relative to labour income

Country	LCD positiv until	LCD negativ until	Aggregate LCD
AT	24	59	0.46
DE	26	60	0.51
ES	26	60	0.46
FI	26	60	0.50
FR	23	59	0.53
HU	24	58	0.51
IT	26	59	0.58
SE	26	64	0.43
SI	25	58	0.47
UK	25	58	0.56

Aggregate LCD vs. Employment Based DR



Financing of life cycle deficit

life cycle deficit can be financed through:

a) public transfers (health, pensions, education, …)

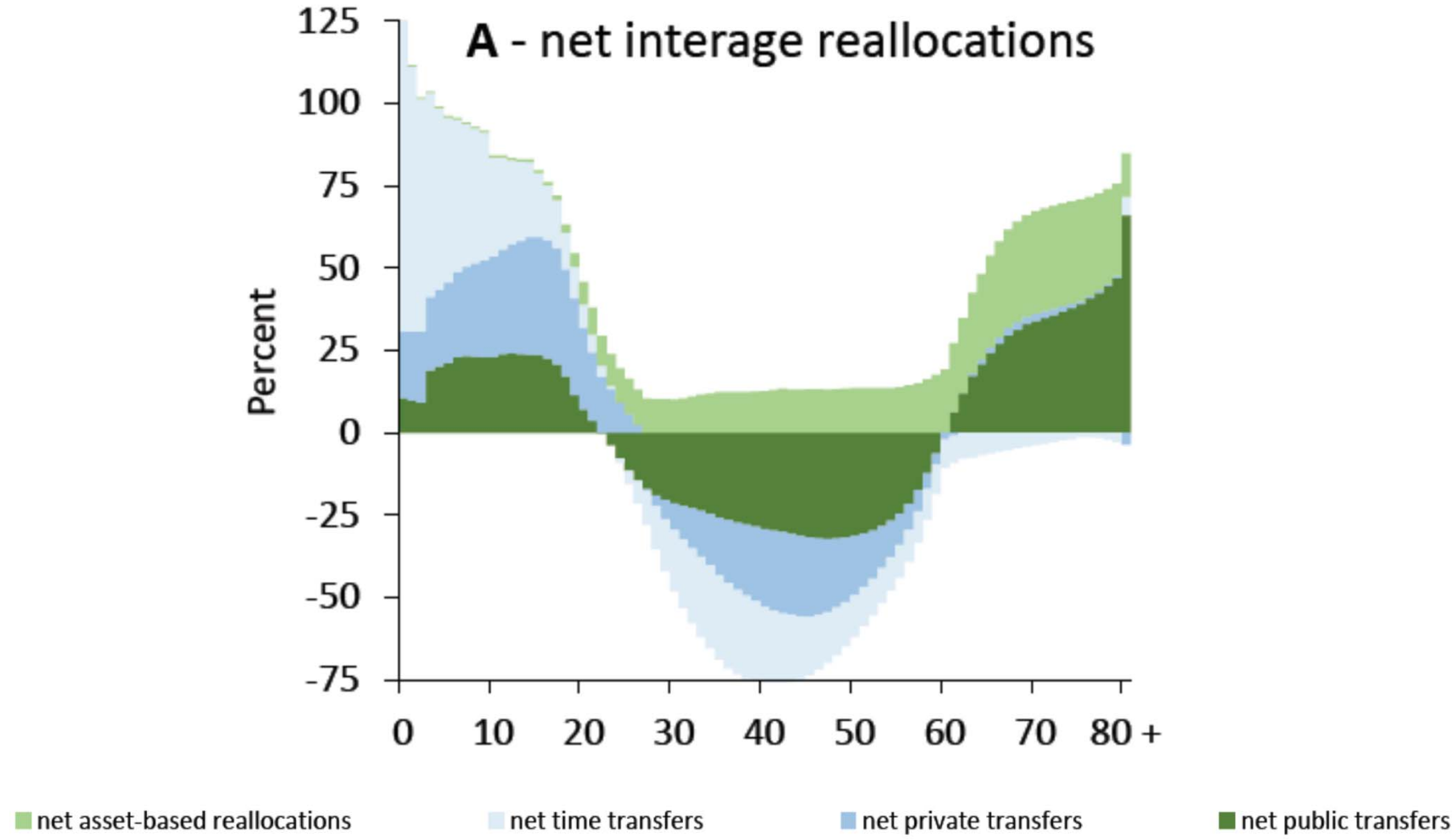
b) private transfers (parents financing the consumption of children)

c) asset-based reallocation (during working age to receive asset income or to sell the assets later in life)

These flows are mediated by

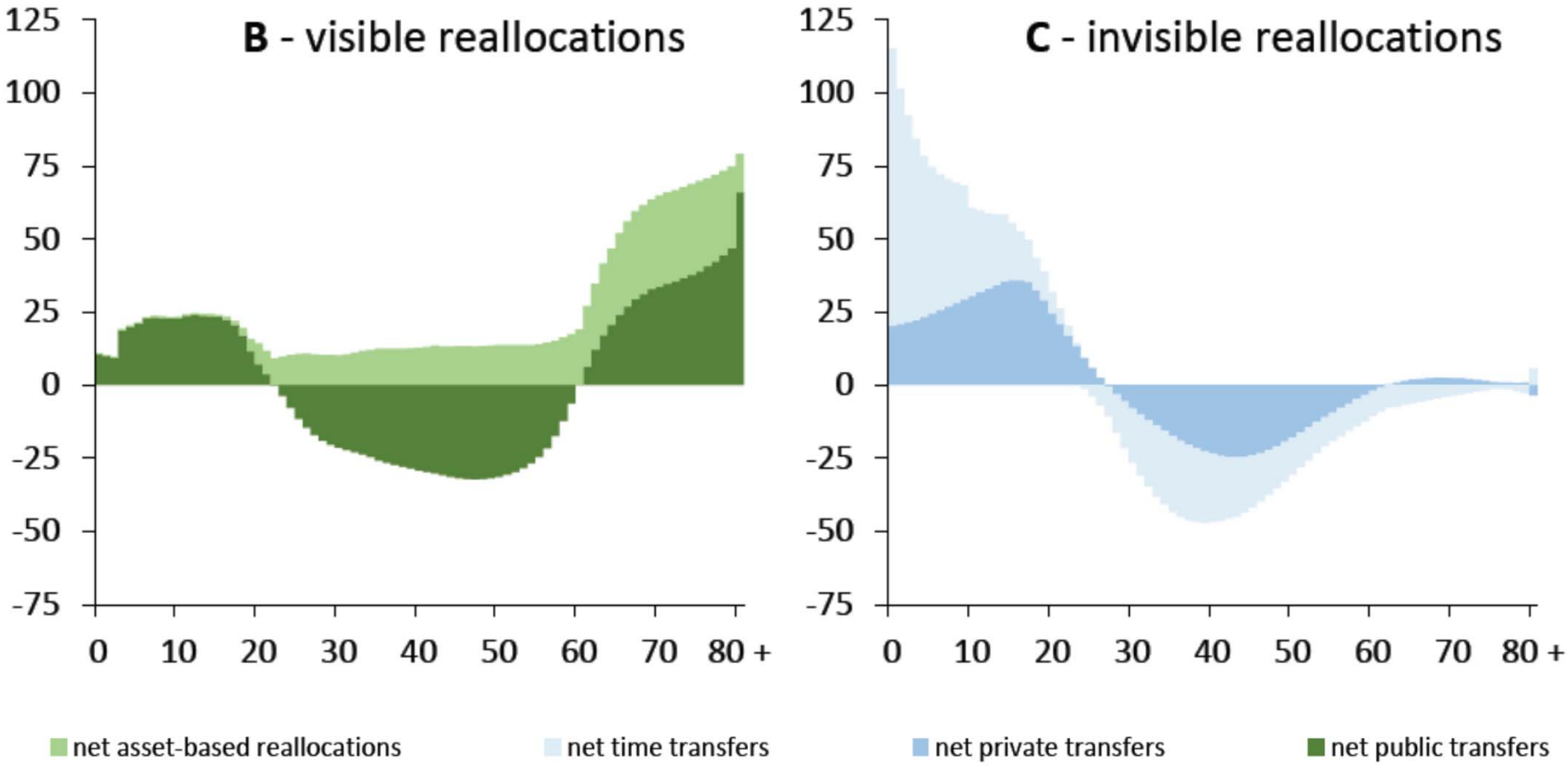
public and private institutions

Inter-age reallocations



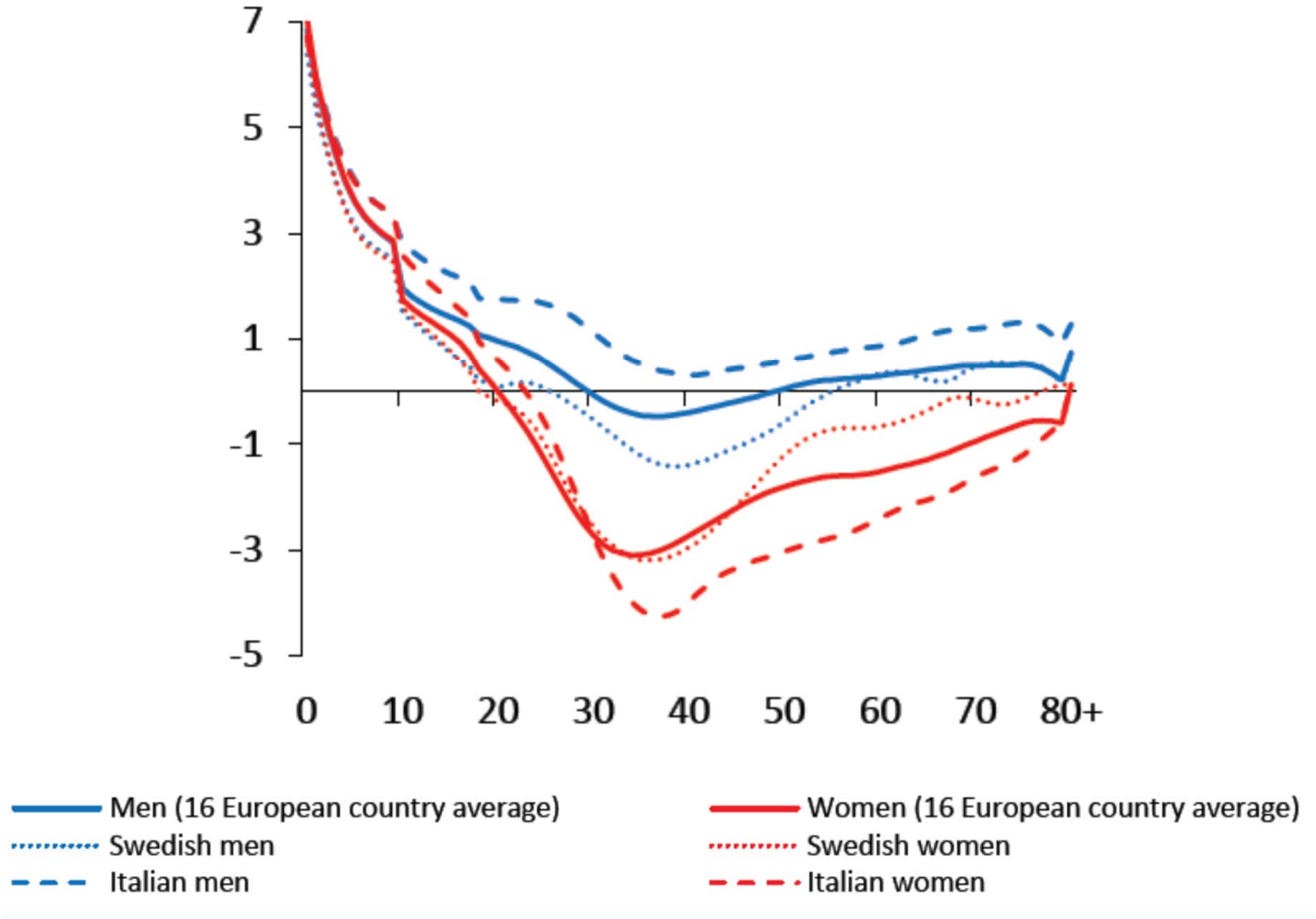
Source: Gal and Varga (2017)

Inter-age reallocations by visibility in Europe



Source: Gal and Varga (2017)

Net time transfers by gender



Source: Gal and Varga (2017)

Conclusions

Economic dependency determined by:

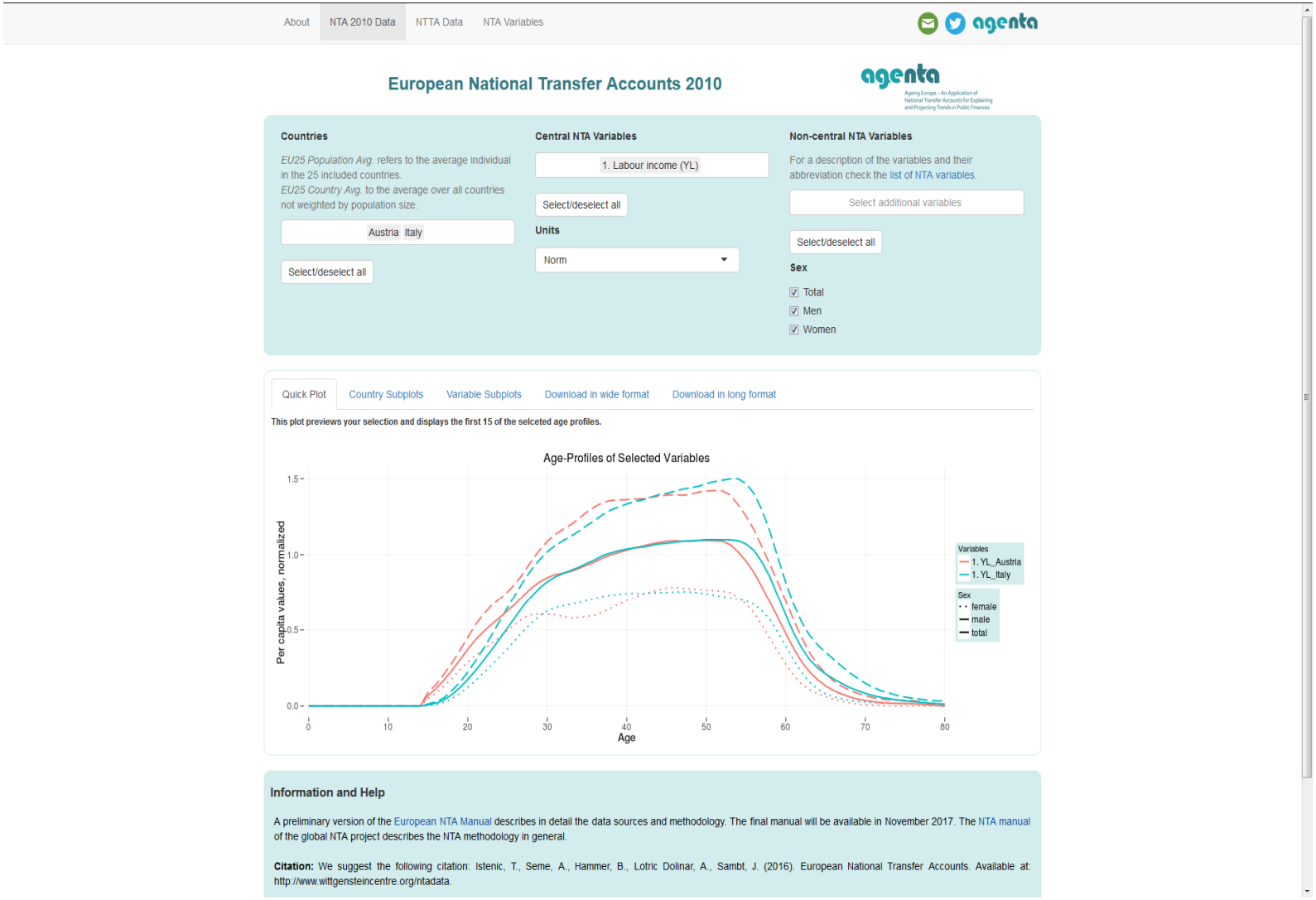
- demography
- age-specific type and intensity of economic activity
- definition of dependency

Effective ways to decrease economic dependency

- use of labour force potential in working age (including increase in retirement age)
- investment in human capital as the source of future benefits!
- use of assets for old age provision

How dependency rates are defined plays a crucial role in how we measure and think about the dependency.

Data Explorer



www.wittgensteincentre.org/ntadata

References

Loichinger, E., Hammer, B., Prskawetz, A., Freiberger, M. and J. Sambt (2017) **Quantifying Economic Dependency**, European Journal of Population 33, 351-380.

Prskawetz, A., and B. Hammer (2018) **Does education matter? – economic dependency ratios by education**, Vienna Yearbook of Population Research 16

Zanella, M., Hammer, B., Prskawetz, A. and J. Sambt (2018) **A Quantitative Assessment of the Rush Hour of Life in Austria, Italy and Slovenia**, European Journal of Population 33, 351-380.

http://agewell.eu/ **AWA – Age Well Accounts**

http://www.agenta-project.eu/en/index.htm **AGENTA**

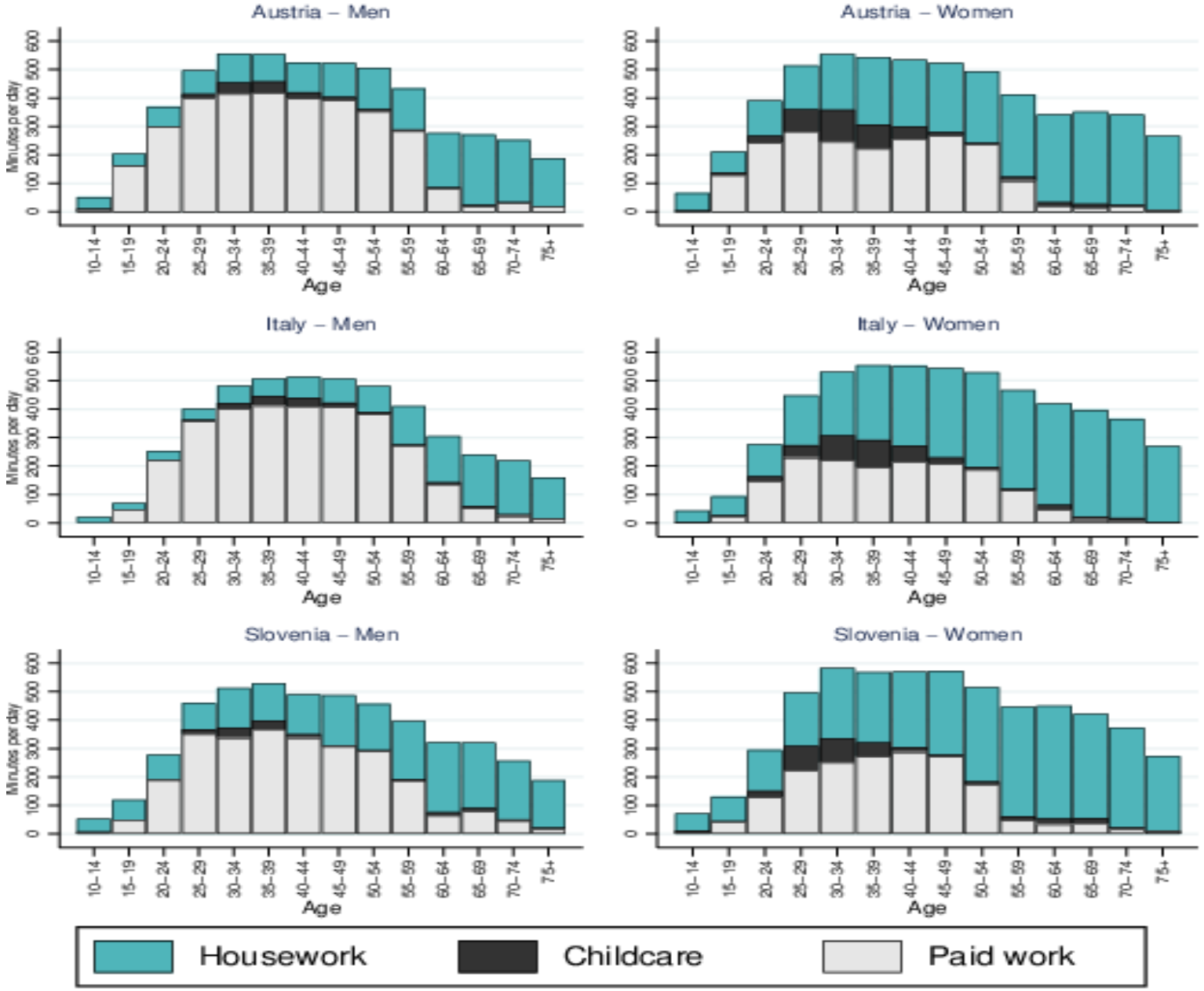
Many thanks

Change in various support ratios

applying todays age structure to the projected population structutre in 2060

Source: Gal and Monostori (2017) Agenta

Rush hour of life



Sources: Statistik Austria, Italian National Institute of Statistics: time use surveys 2008/09; Statistical Office of Slovenia: time use survey 2000/01

Flow Account identity

Inflows

- $Y^l(a)$ …labor income
- $Y^a(a)$ …asset income
- $\tau^+(a)$ …transfers received

=

Outflows

- $C(a)$ …consumption
- $S(a)$ …saving
- $\tau^-(a)$ …transfers paid

$$\underbrace{Y^l(a) + Y^a(a) + \tau^+(a)}_{\text{inflows}} = \underbrace{C(a) + S(a) + \tau^-(a)}_{\text{outflows}}$$

$$\underbrace{C(a) - Y^l(a)}_{\text{lifecycle deficit}} = \underbrace{Y^a(a) - S(a)}_{\text{asset-based reallocations}} + \underbrace{\tau^+(a) - \tau^-(a)}_{\text{net transfers}}$$

$$\underbrace{\qquad\qquad\qquad\qquad}_{\text{age reallocation}}$$

(Source: Mason 2007)

AGENTA Project

AGENTA project:

www.agenta-project.eu

agenta

Ageing Europe – An Application of National Transfer Accounts for Explaining and Projecting Trends in Public Finances

- Joint research project of 9 European partners funded by the European Union's FP7 framework programme (grant agreement no 613247.) 2014-2017
- Explaining and forecasting public transfers in the light of demographic change
- Important part of the project: **gender-specific NTA and NTTA for European countries**
- Use of harmonized and publicly available data from Eurostat (ESA, EU-SILC, HBS…)
- NTA for almost all EU countries
- Using exactly the same methodology

NTA - Project

NTA-Project: www.ntaccounts.org

- Founders and coordinators: Ronald D. Lee (University of Berkley), Andrew Mason (East West Center Hawaii)
- Teams from 50 countries
- Development of methodology and collection of data

Lee, R. and Mason, A., editors (2011). *Population Aging and the Generational Economy: A Global Perspective*.

UN (2013). *National Transfer Accounts Manual: Measuring and Analysing the Generational Economy*. United Nations