AGENTA Project

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

FP 7 Collaborative Research Project, no. 613247
http://www.agenta-project.eu

WWTF Summer School on “The Demography of Health and Education”

Alexia Fürnkranz-Prskawetz

Institute of Statistics and Mathematical Methods in Economics, Vienna University of Technology
Vienna Institute of Demography, Austrian Academy of Sciences
Wittgenstein Centre for Demography and Global Human Capital

Vienna Institute of Demography

ÖAW Austrian Academy of Sciences

TU WIEN SWM ECON Statistics and Mathematical Methods in Economics Economics

Wittgenstein Centre FOR DEMOGRAPHY AND GLOBAL HUMAN CAPITAL

Motivation

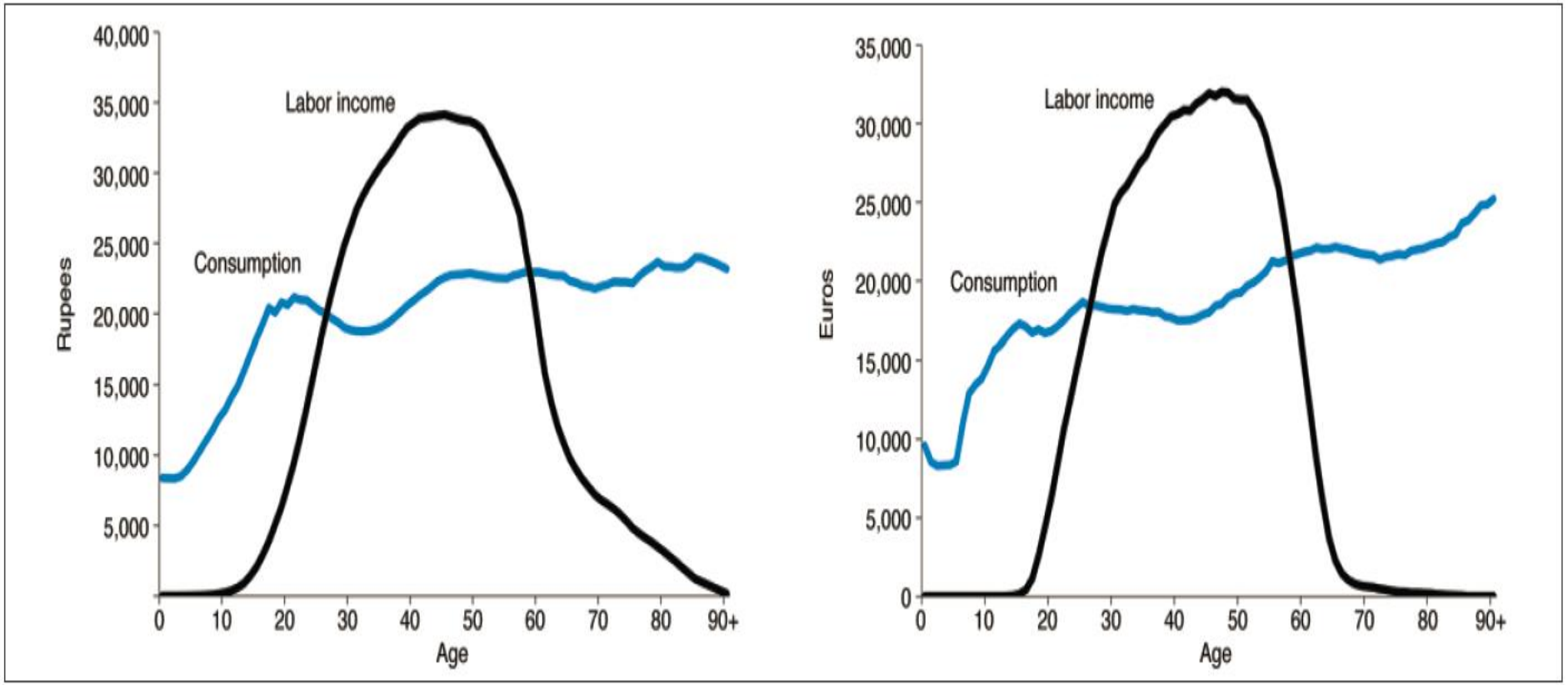

Figure 1. Per-capita labor income and consumption by age in India (left) in 2004 and in Germany (right) in 2003. *Source:* Lee and Mason forthcoming, Figure 1.3.

Motivation

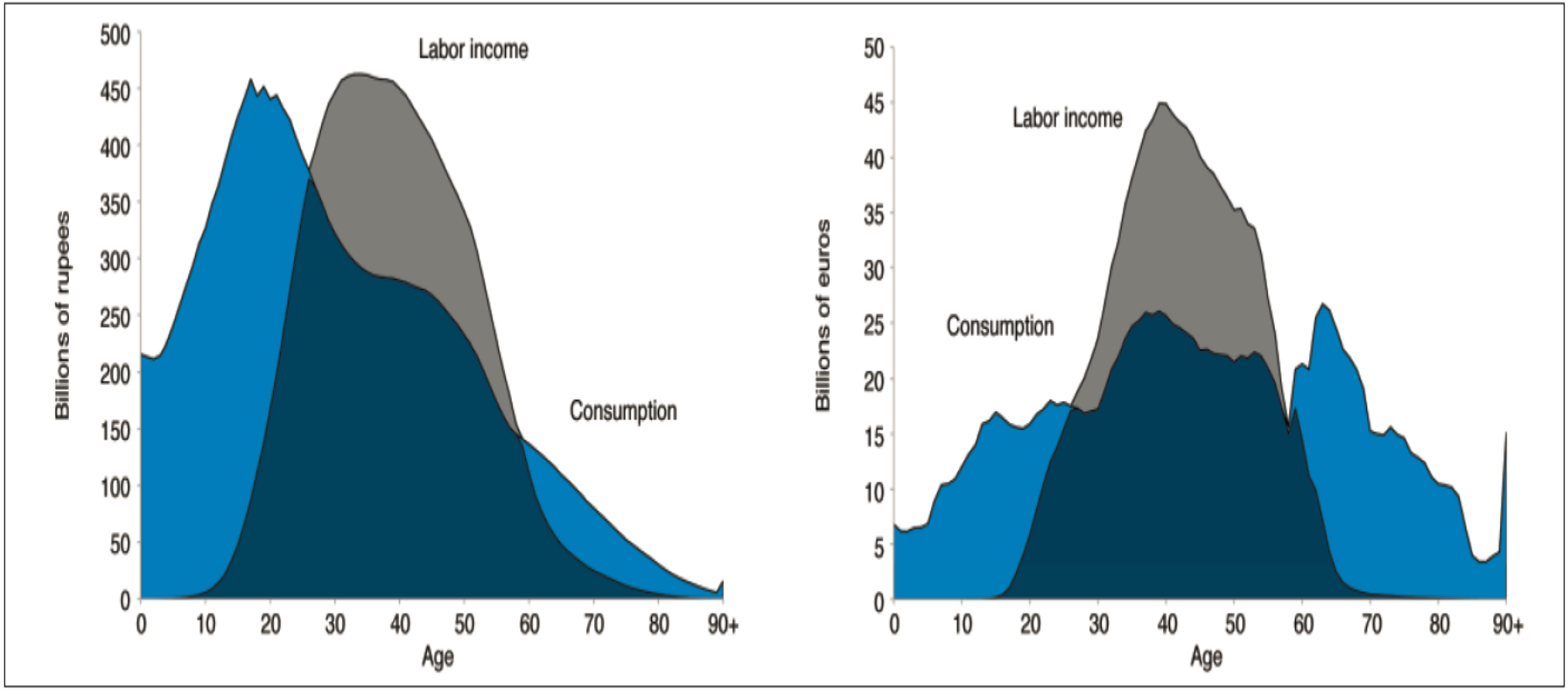

Figure 2. Aggregate labor income and consumption by age in India (left) in 2004 and in Germany (right) in 2003. *Source:* Lee and Mason forthcoming, Figure 1.3.

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

"To adequately **explain** and **project public finances** and derive evidence-based options for policy reforms we need to consider the **whole system of intergenerational transfers** (***private, public, market, non-market***)"

National Transfer Accounts (NTA):

SNA: flows between institutions (households, government, etc.)

NTA: including age into SNA → flows among **cohorts** in a given year

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Main objectives:

- Consider links between the **public** and **private sector** in providing resources for children and the elderly population
- Consider links between **different components of the public budget**
- Consider the definition of **stages of the life cycle** (childhood, active age and old age) + how these stages affect economic activity

NTA methodology

Flow ACCOUNT identity

Inflows

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

=

Outflows

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

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

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

age reallocation

(Source: Mason 2007)

NTA methodology

life cycle deficit can be financed through:

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

b) private transfers (parents financing consumption of children)

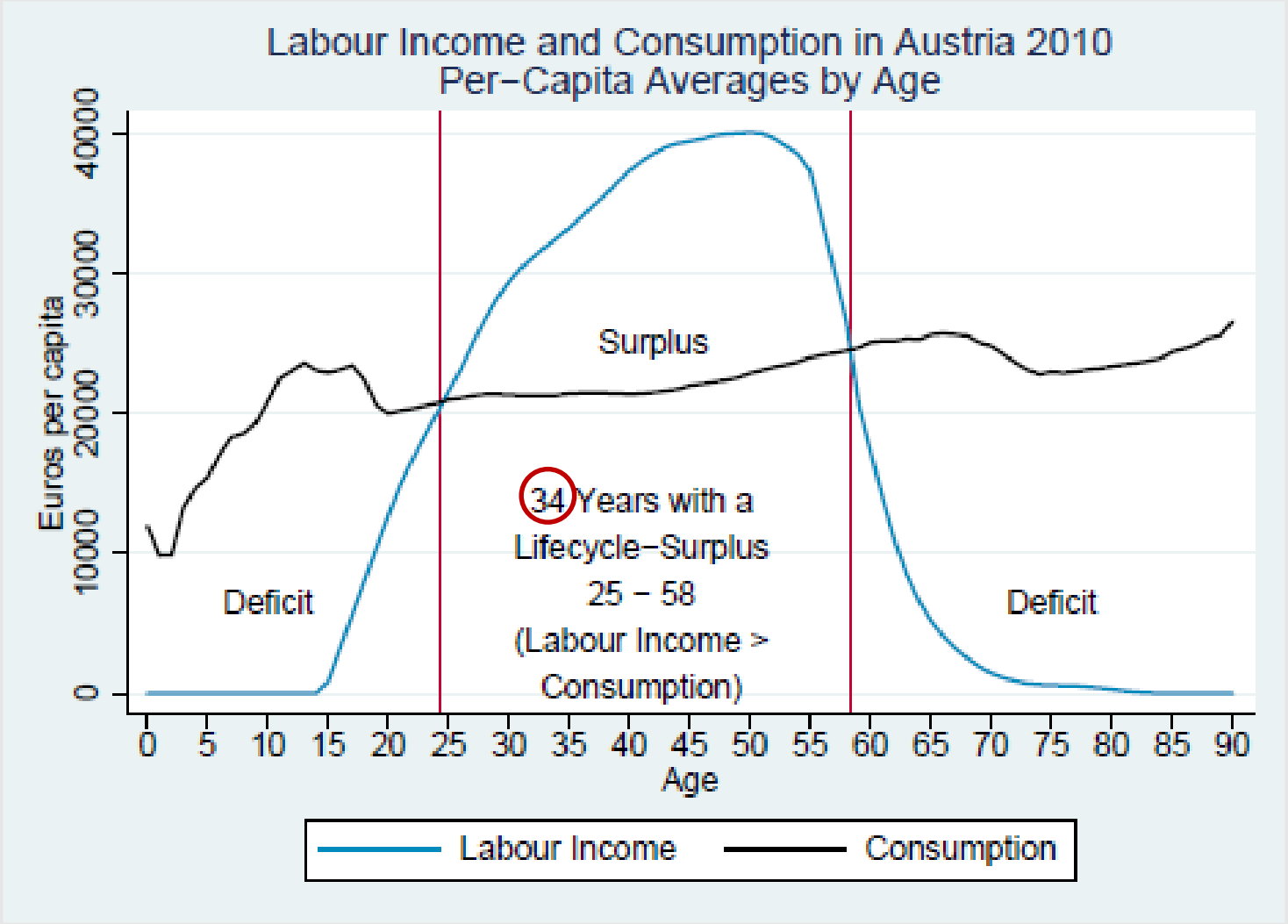
c) asset-based reallocation (savings, interests on bonds, dis-saving, selling house)

These flows are mediated by

public and private institutions

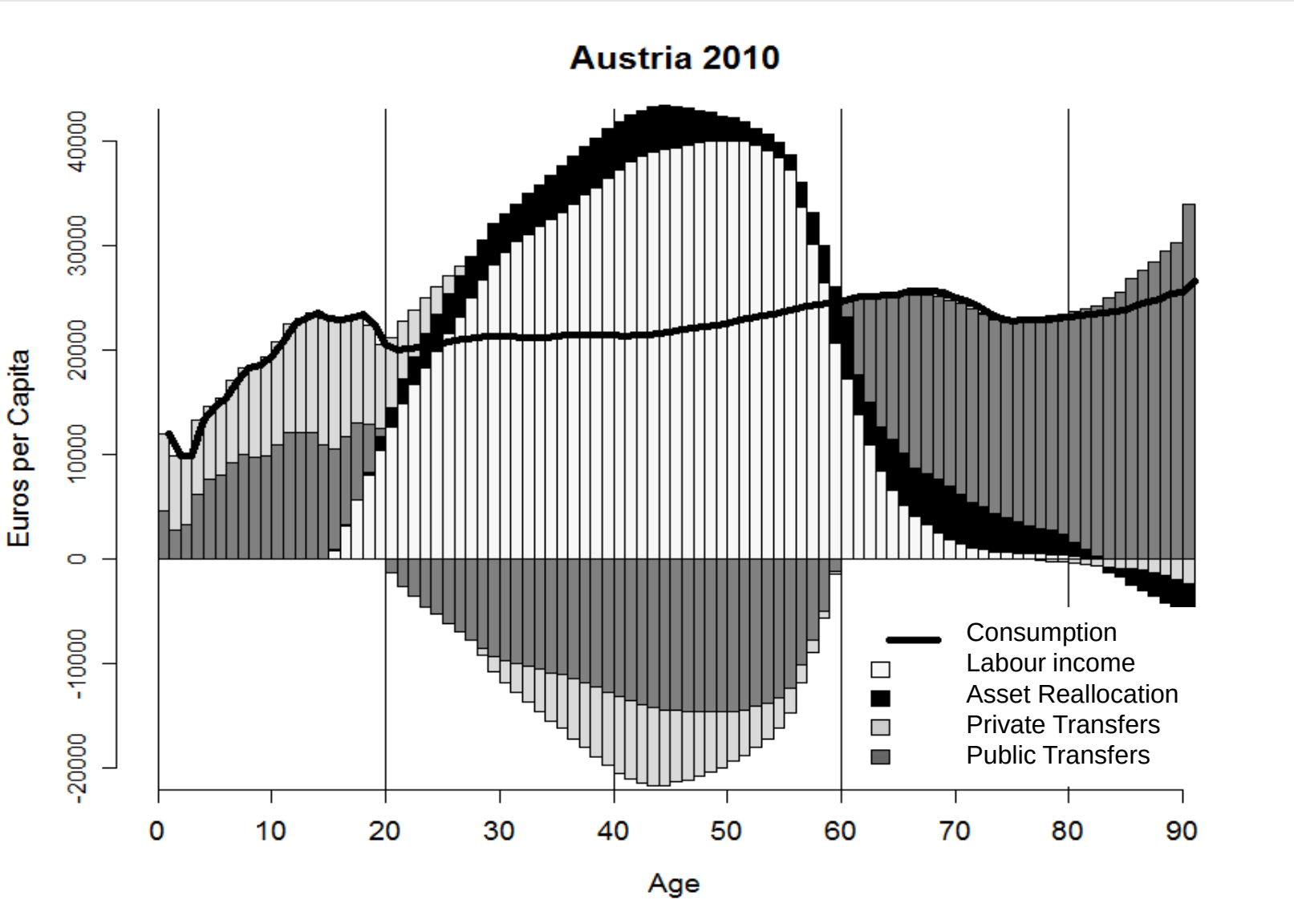
"The mechanisms by which assets are shifted across age groups is important because it determines whether population ageing leads to accumulation of assets or to the expansion of public and private transfer programs." (Mason and Lee 2006)

Age profile of consumption and income
Austria 2010

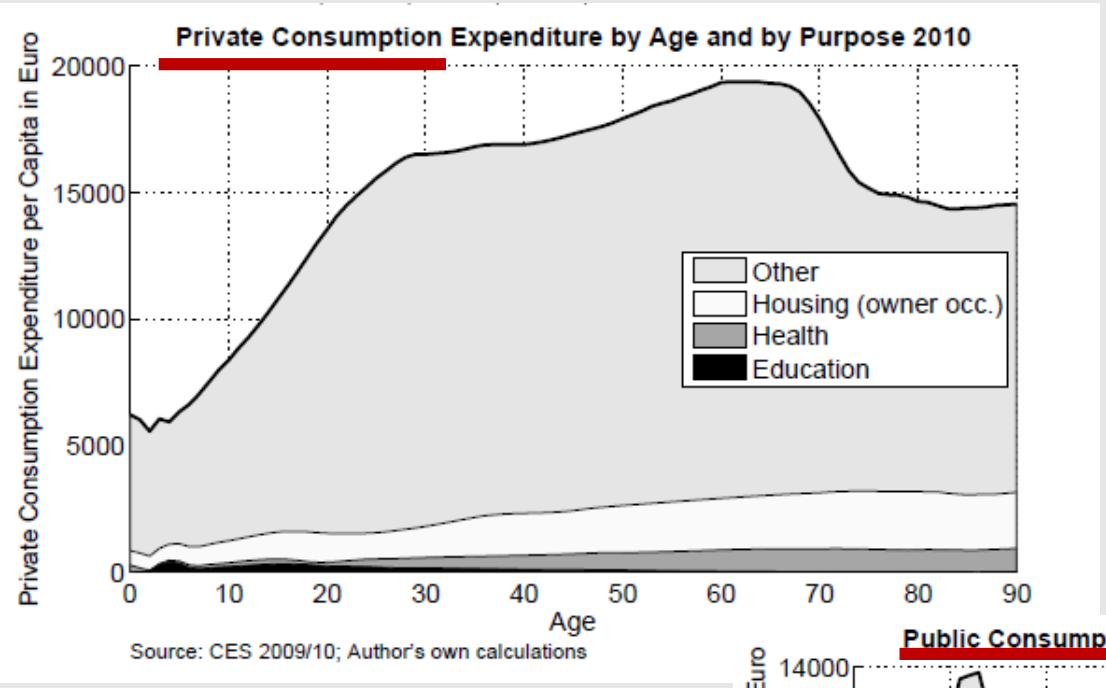


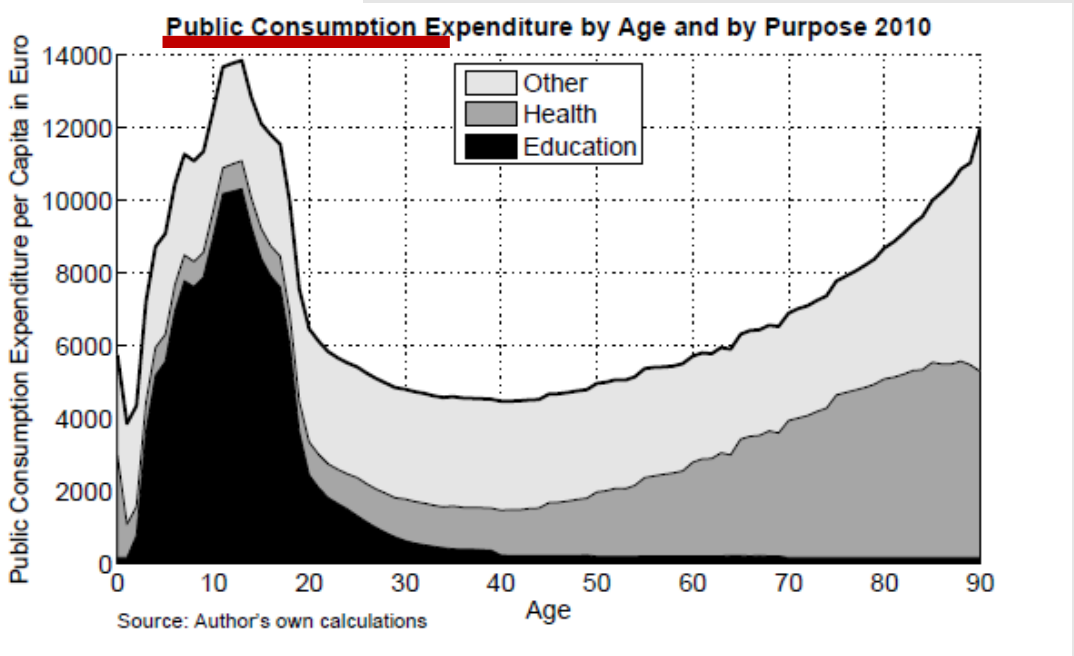
Quelle: Bernhard Hammer (2014) The Economic Life Course: An Examination Using National Transfer Accounts. PhD thesis, TU Wien

NTA Austria


Austria 2010
Euros per Capita
40000
30000
20000
10000
0
-10000
-20000
0
10
20
30
40
50
60
70
80
90
Age
Consumption
Labour income
Asset Reallocation
Private Transfers
Public Transfers

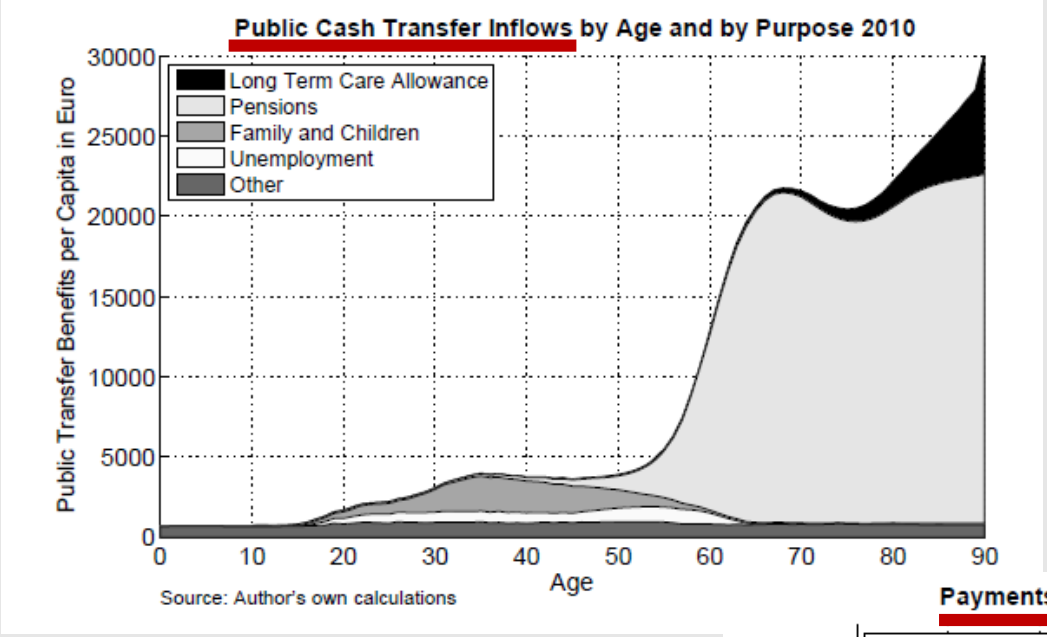
NTA Austria

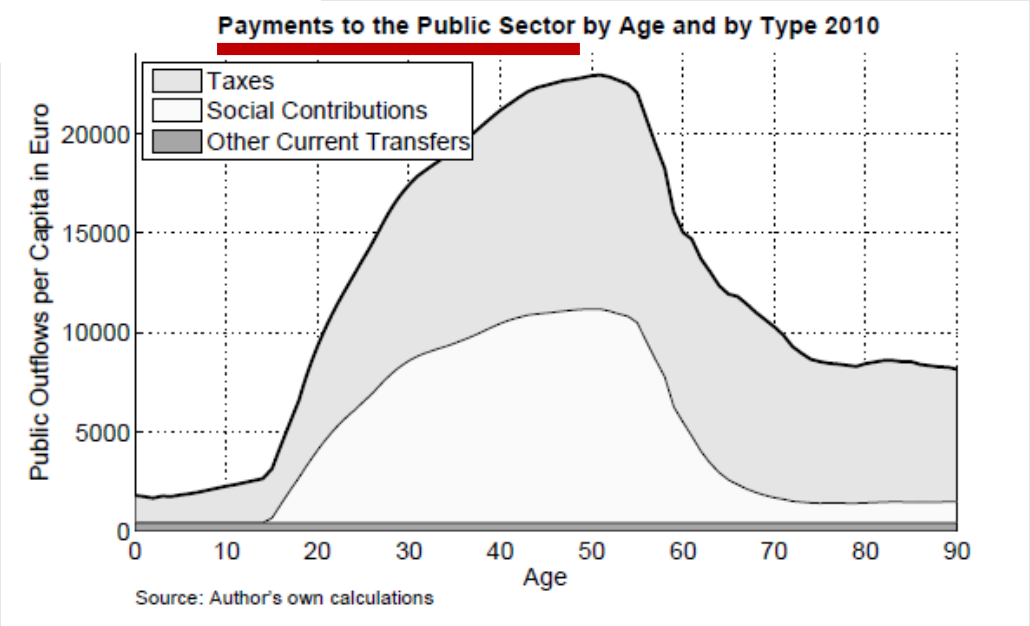




Source: Bernhard Hammer (2014) The Economic Life Course: An Examination Using National Transfer Accounts. PhD thesis, TU Wien

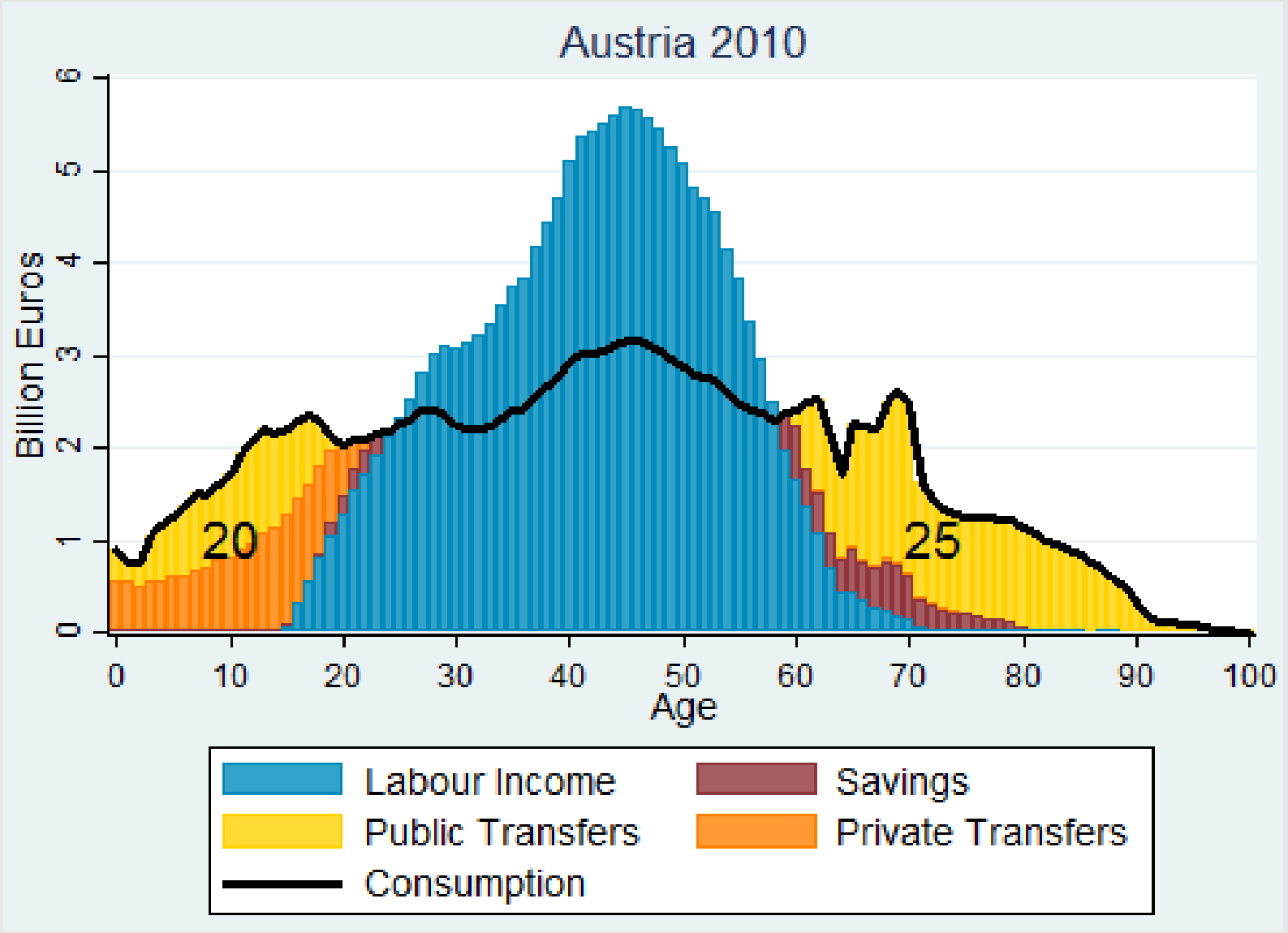
NTA Austria

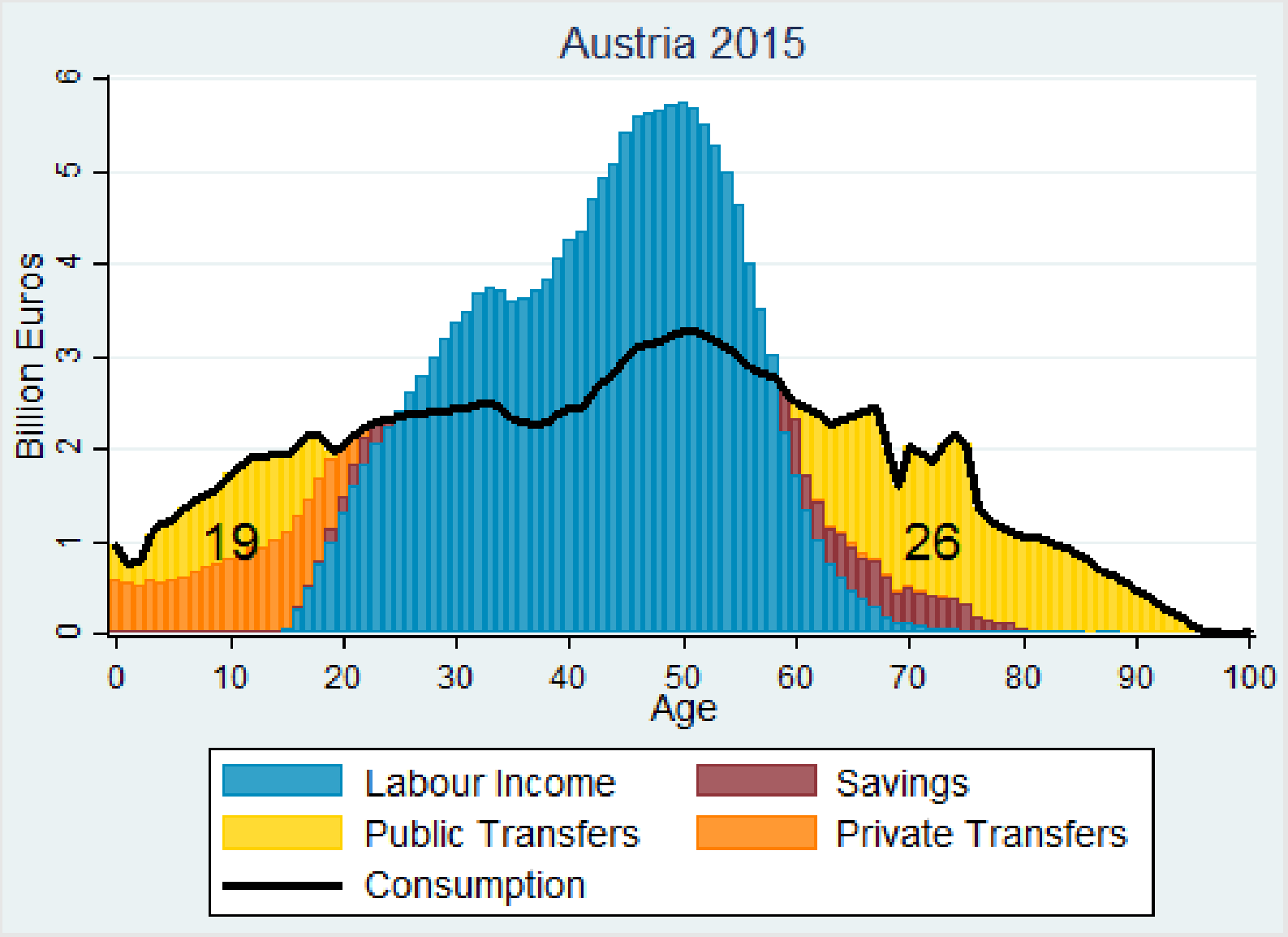


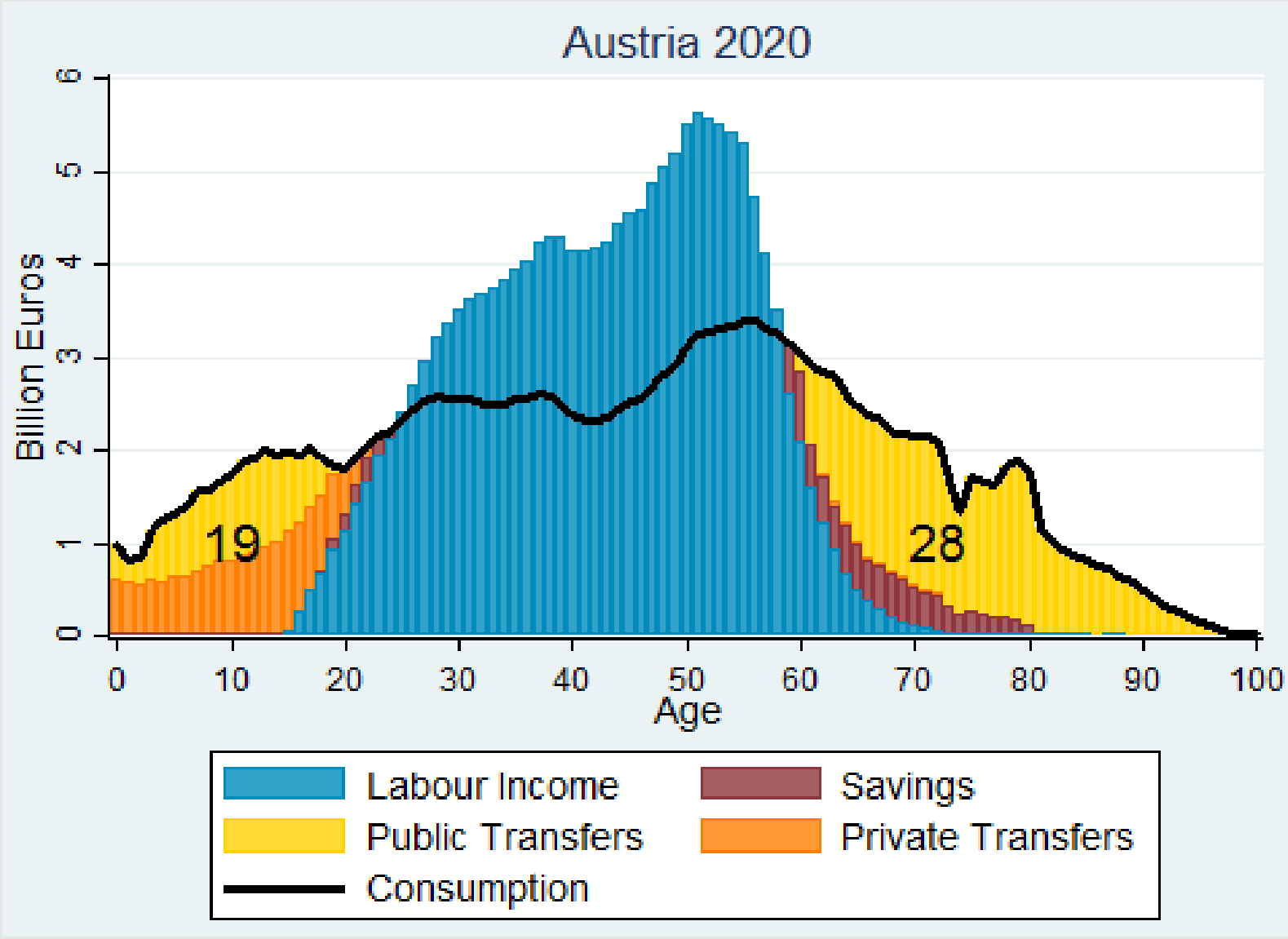


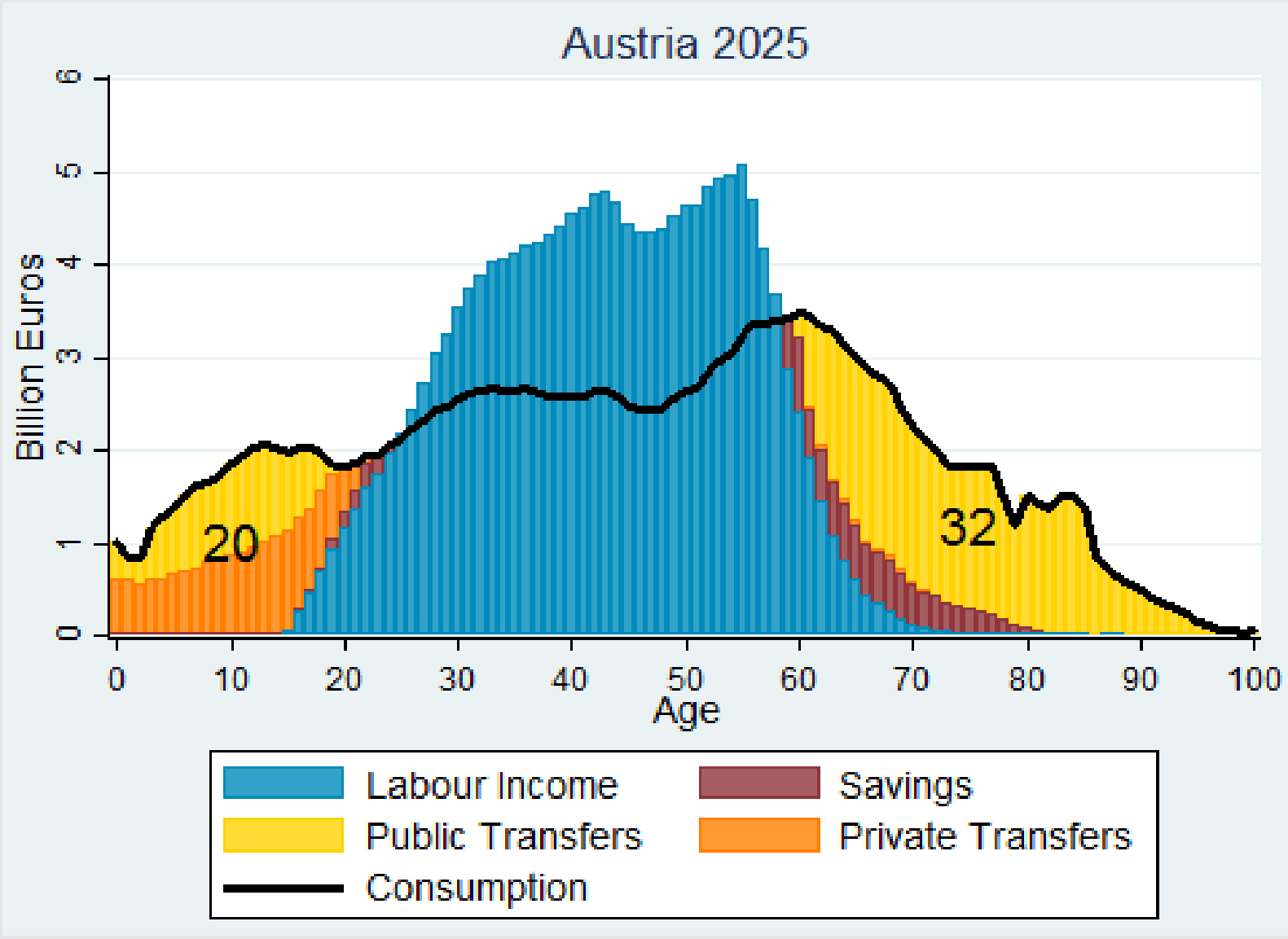
Source: Bernhard Hammer (2014) The Economic Life Course: An Examination Using National Transfer Accounts. PhD thesis, TU Wien

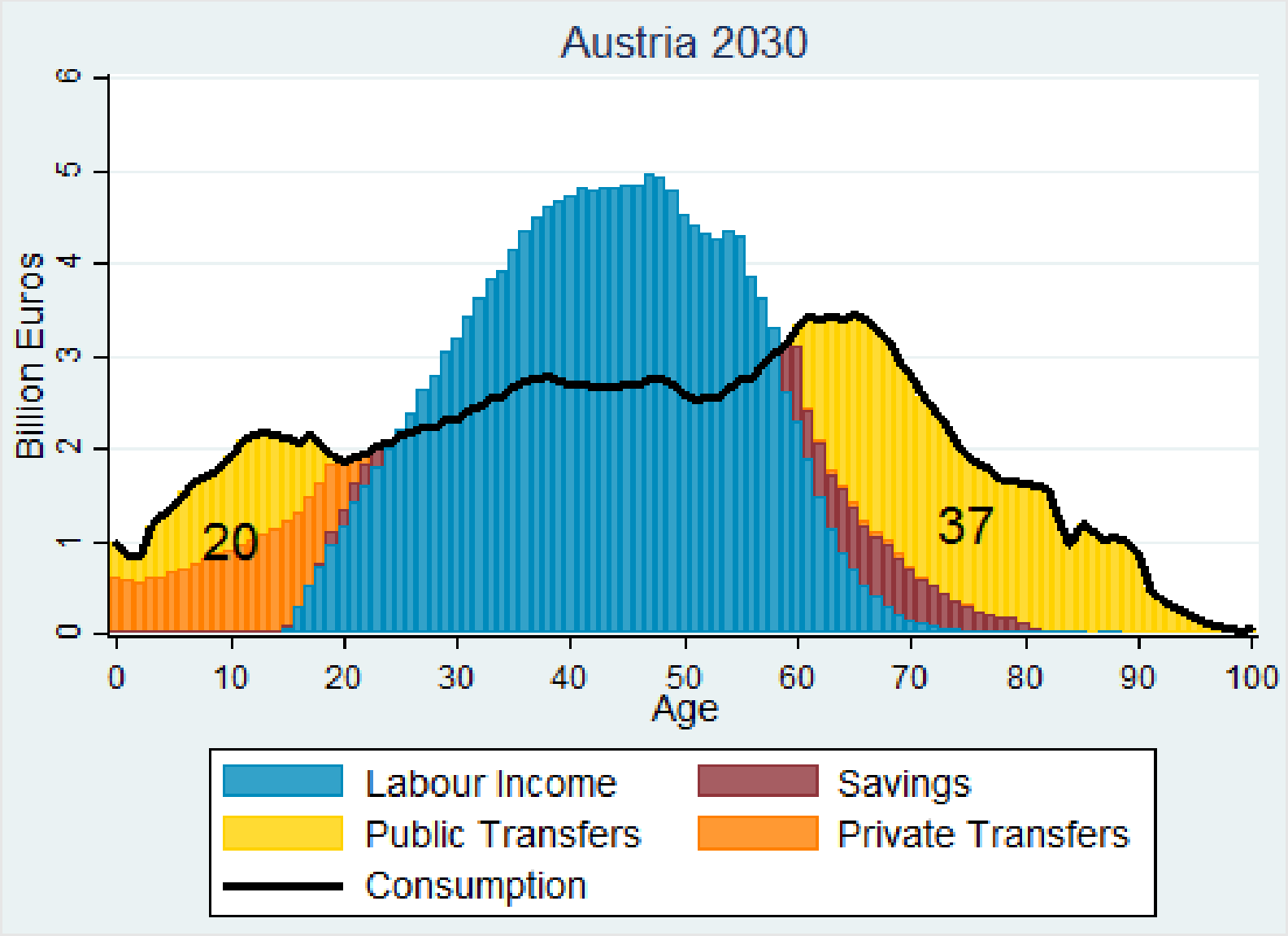
NTA Austria – Demographic Change

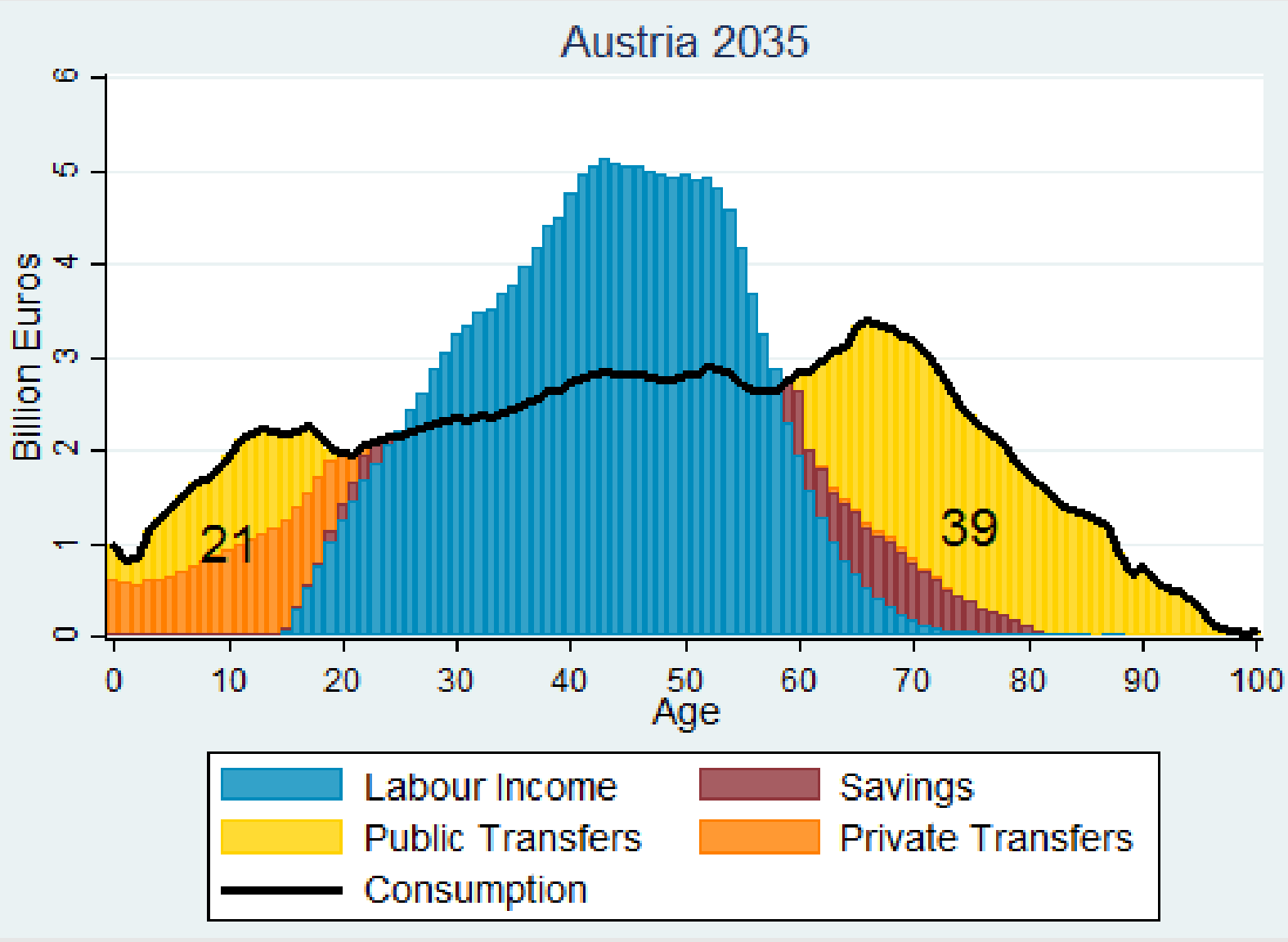


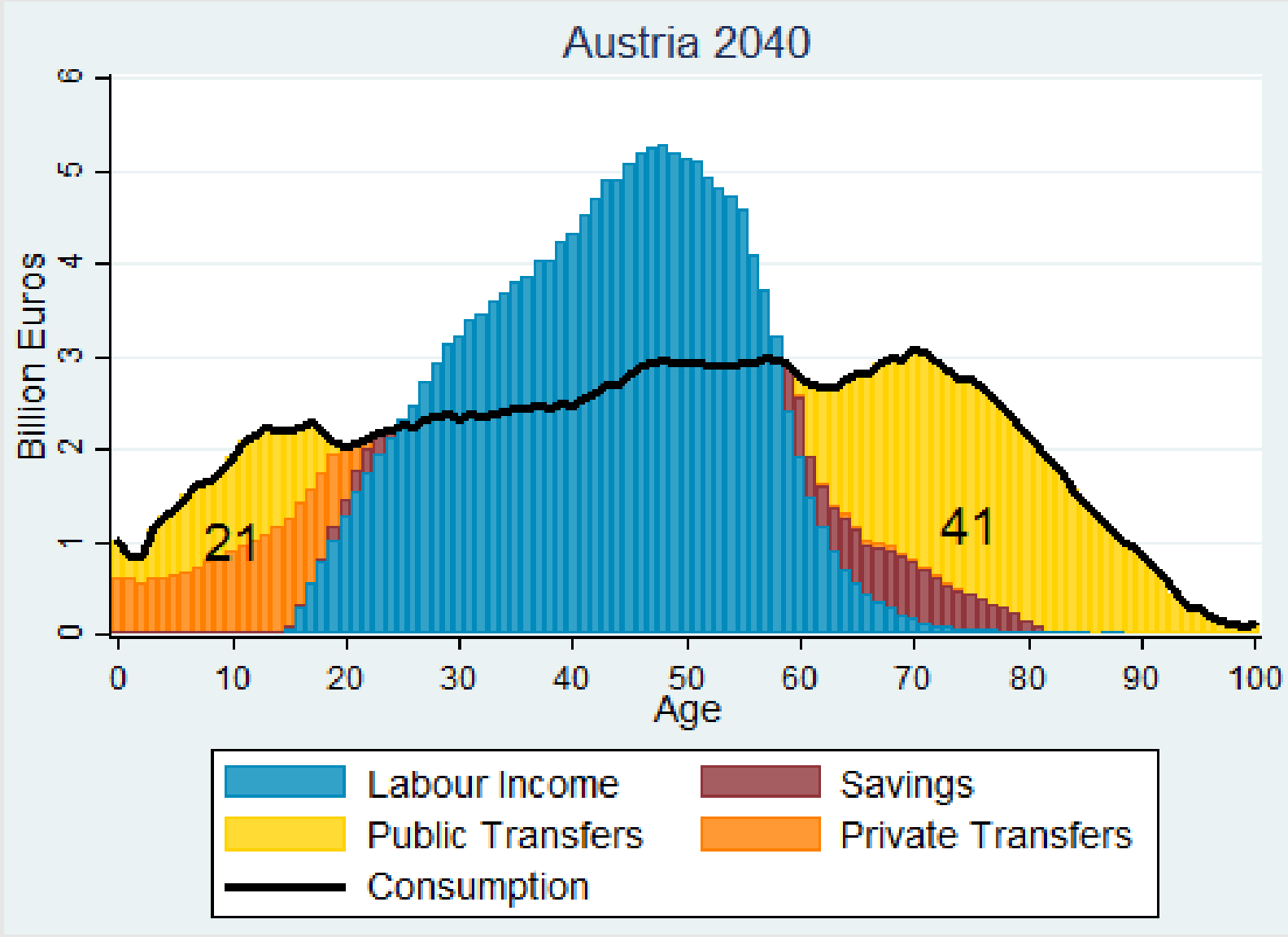

Austria 2015
Billion Euros
0
1
2
3
4
5
6
19
26
0
10
20
30
40
50
60
70
80
90
100
Age
Labour Income
Savings
Public Transfers
Private Transfers
Consumption


Austria 2020
Billion Euros
0
1
2
3
4
5
6
19
28
0
10
20
30
40
50
60
70
80
90
100
Age
Labour Income
Savings
Public Transfers
Private Transfers
Consumption

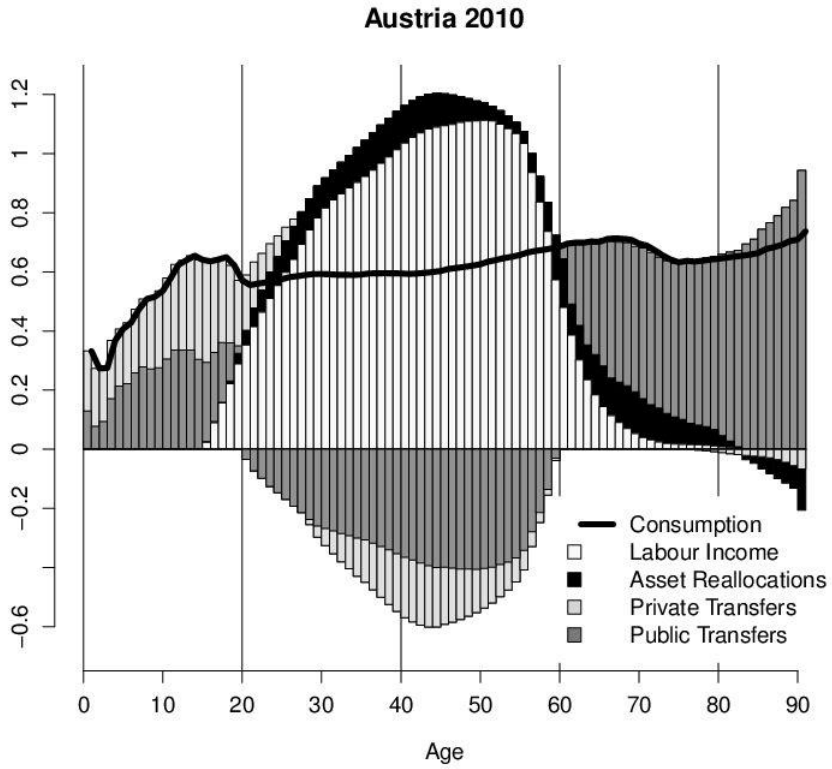

Austria 2025
Billion Euros
0
1
2
3
4
5
6
0
10
20
30
40
50
60
70
80
90
100
Age
20
32
Labour Income
Savings
Public Transfers
Private Transfers
Consumption

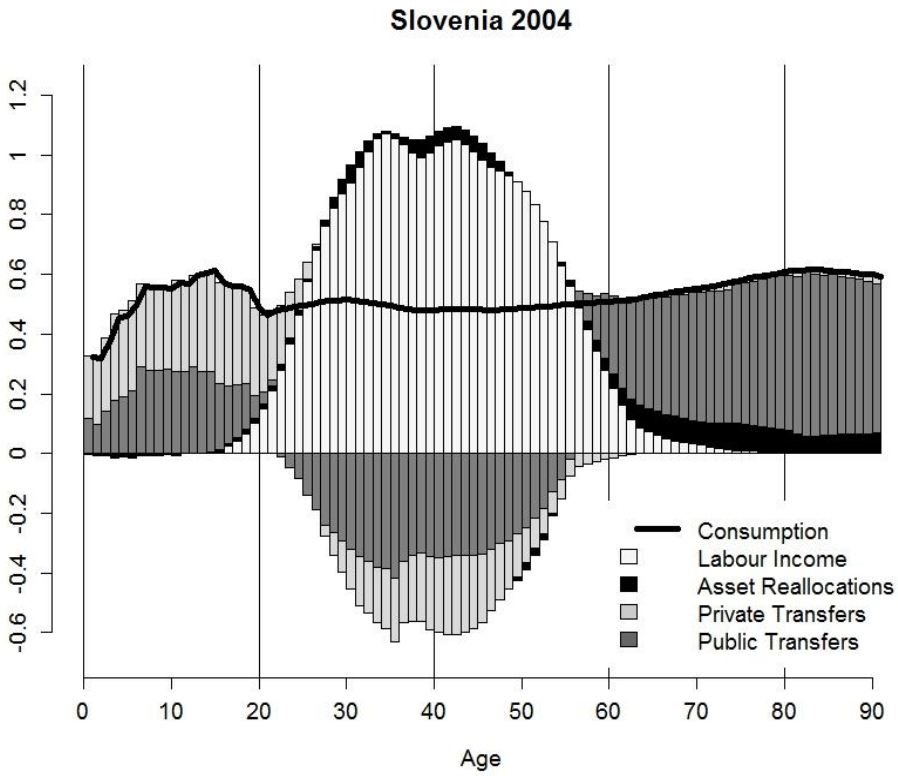

Austria 2030
Billion Euros
0
1
2
3
4
5
6
0
10
20
30
40
50
60
70
80
90
100
Age
20
37
Labour Income
Savings
Public Transfers
Private Transfers
Consumption


Austria 2035
Billion Euros
0
1
2
3
4
5
6
0
10
20
30
40
50
60
70
80
90
100
Age
21
39
Labour Income
Savings
Public Transfers
Private Transfers
Consumption


Austria 2040
Billion Euros
0
1
2
3
4
5
6
0
10
20
30
40
50
60
70
80
90
100
Age
21
41
Labour Income
Savings
Public Transfers
Private Transfers
Consumption

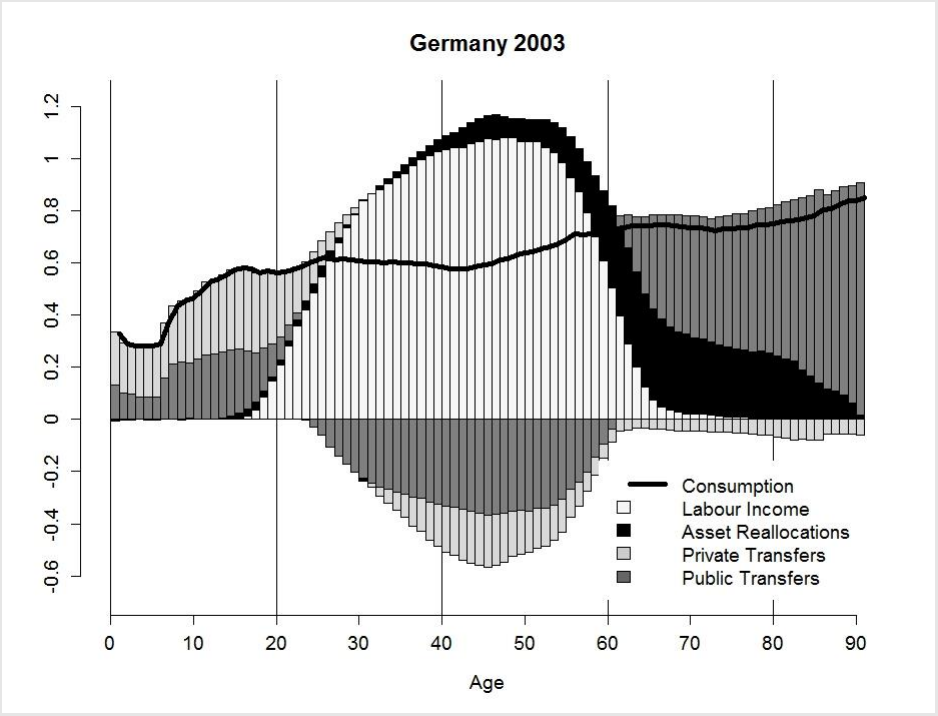
Financing the life cycle – Austria, Slovenia

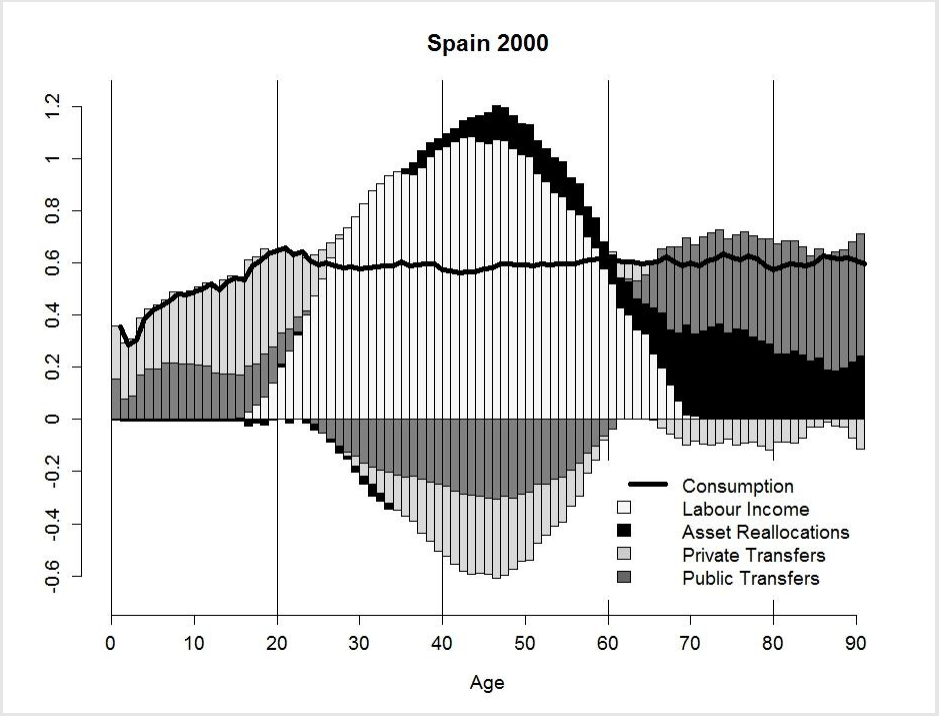




Quelle: Bernhard Hammer (2014) The Economic Life Course: An Examination Using National Transfer Accounts. PhD thesis, TU Wien

Financing the life cycle – Germany, Spain





Quelle: Bernhard Hammer (2014) The Economic Life Course: An Examination Using National Transfer Accounts. PhD thesis, TU Wien

Financing the life-cycle deficit – Europe vs. World

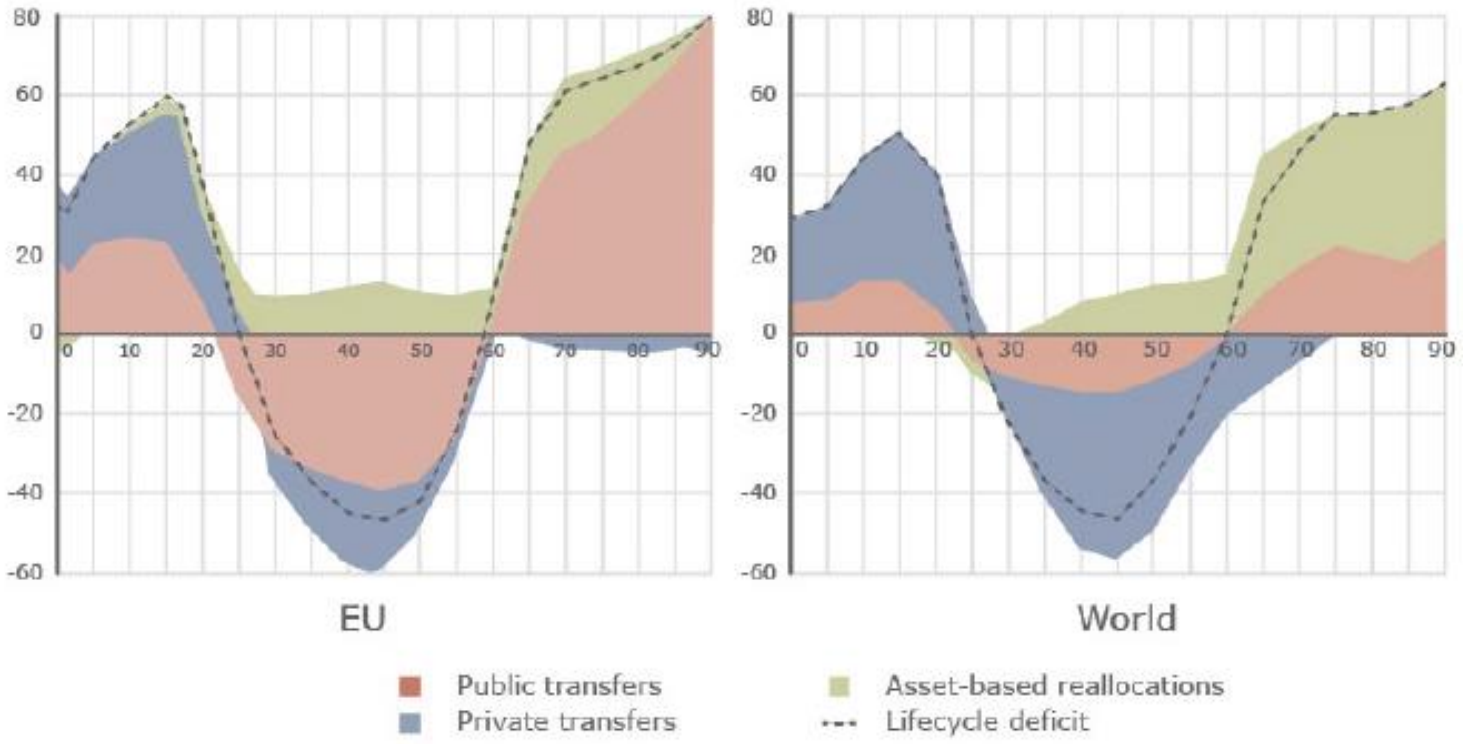


Figure 1: Financing the life cycle deficit in the EU (10 countries, 70% of people living in the EU) and around the world (29 countries, 67% of mankind), per capita figures, 2000

Source: Gál (2015), data from www.ntaccounts.org

Economic Life Cycle

Demographic Dependency ≠ Economic Dependency

$$\frac{< 20 \; + \; 65+}{20\text{-}64} \neq \frac{\text{non-working}}{\text{workers}}$$

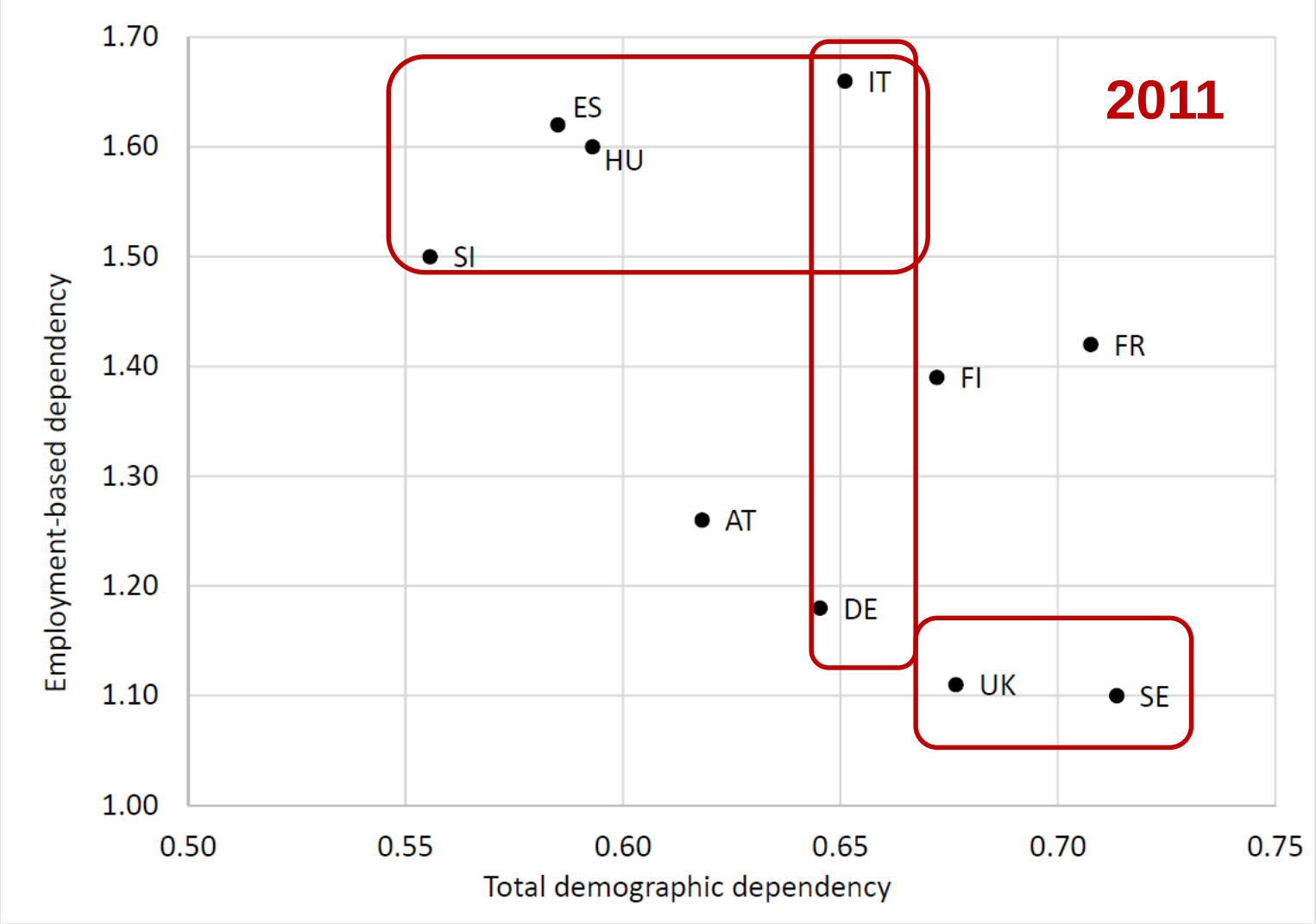
Non-working:

children + unemployed + housewives/-men + retirees + other inactive

Working:

full-time, part-time, compulsory military or civil services

Employment based dependency



Source: EU-Silc 2011, EUROSTAT

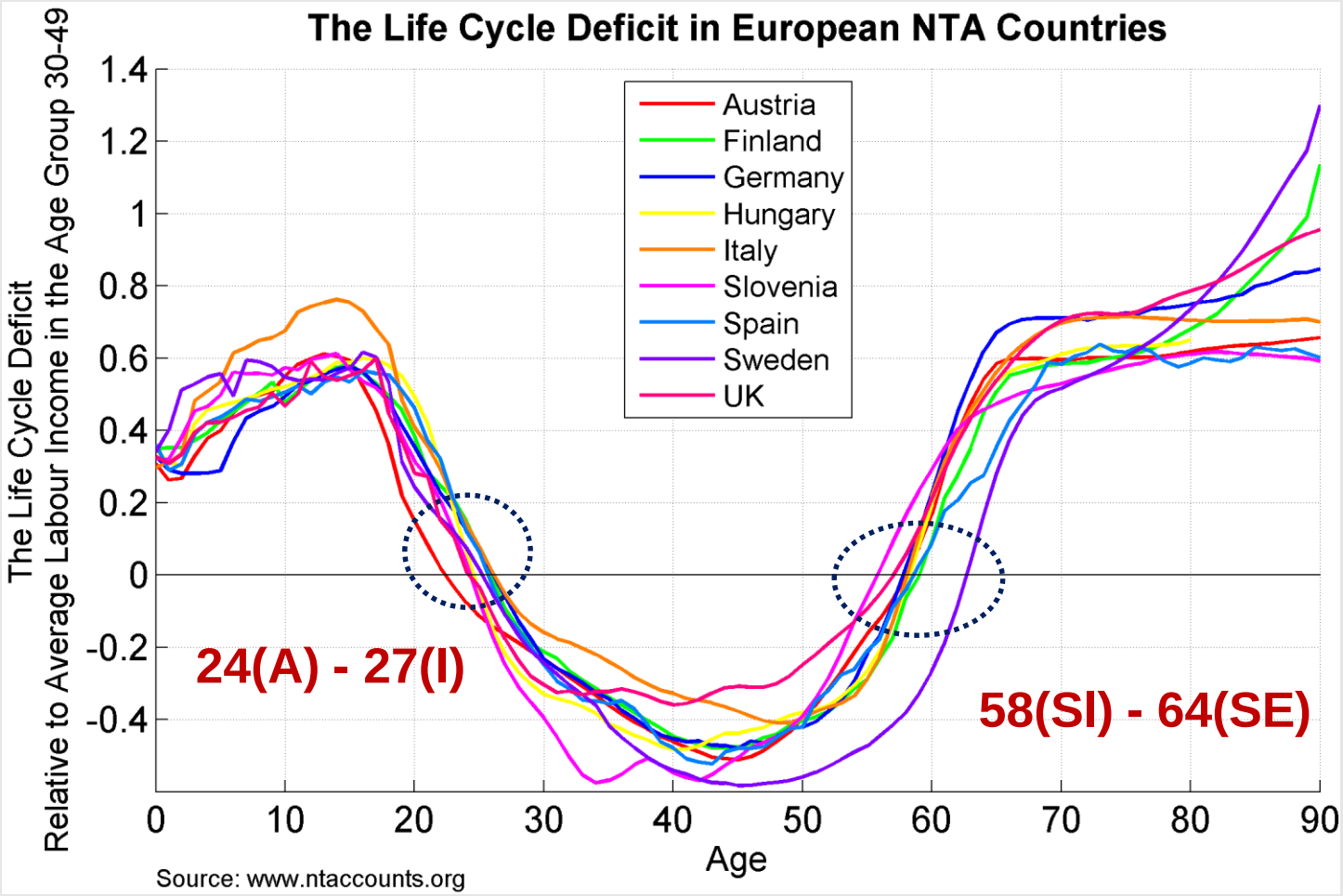
Economic Dependency from a Life Cycle Perspective: NTA dependency ratio

Need to consider also

- **degree of dependency** within dependent population
- **degree of economic ability** of those who support others

age-specific difference of average consumption and income based on NTA

Life Cycle Deficit – comparative European setting



An NTA based Economic Dependency Ratio

Table 1: The Life Cycle Deficit in European Countries

	Aggregate Life Cycle Deficit/Surplus in % of Labour Income			Age Borders LCD		Standard Demographic Dependency Ratio	
Country	Young	Working Age	Old	pos. until	pos. from	Young	Old
Austria	20	32	25	24	59	34	29
Finland	26	28	25	26	60	38	28
France	29	31	24	23	59	42	28
Germany	18	31	30	26	60	31	34
Hungary	22	32	27	24	58	33	27
Italy	26	24	32	27	60	31	33
Slovenia	24	39	24	25	58	30	26
Spain	25	27	23	26	60	31	27
Sweden	25	39	23	26	64	40	31
UK	27	23	25	26	59	40	28

Sources: EUROSTAT (Population); EU-SILC 2011 (Labour income); www.ntaccounts.org (Consumption)

Organization of intergenerational transfers

Financing the consumption of elderly (65+)

	Labour income	Private transfers	Public transfers	Asset based reallocations	Total
Austria (2010)	6	-1	84	11	100
Germany (2003)	3	-7	69	35	100
Italy (2008)	8	-5	74	23	100
Japan (2004)	12	1	51	37	100
Slovenia (2004)	4	3	80	14	100
South Korea (2000)	23	13	28	36	100
Spain (2000)	7	-12	59	46	100
US (2003)	16	-7	32	58	100
Hungary (2005)	7	5	93	-4	100
Sweden (2006)	9	-12	98	5	100

Source: www.ntaccounts.org international database

Financing the consumption of children (< 19)

	Labour income	Private transfers	Public transfers	Asset based reallocations	Total
Austria (2010)	9	48	42	42	100
Germany (2003)	3	55	39	39	100
Italy (2008)	3	55	42	42	100
Japan (2004)	1	52	46	46	100
Slovenia (2004)	3	57	40	40	100
South Korea (2000)	6	73	28	28	100
Spain (2000)	4	63	35	35	100
US (2003)	2	54	42	42	100
Hungary (2005)	1	39	56	56	100
Sweden (2006)	4	48	49	49	100

Source: www.ntaccounts.org international database

Public transfers
to children (0-19) and elderly (65+)

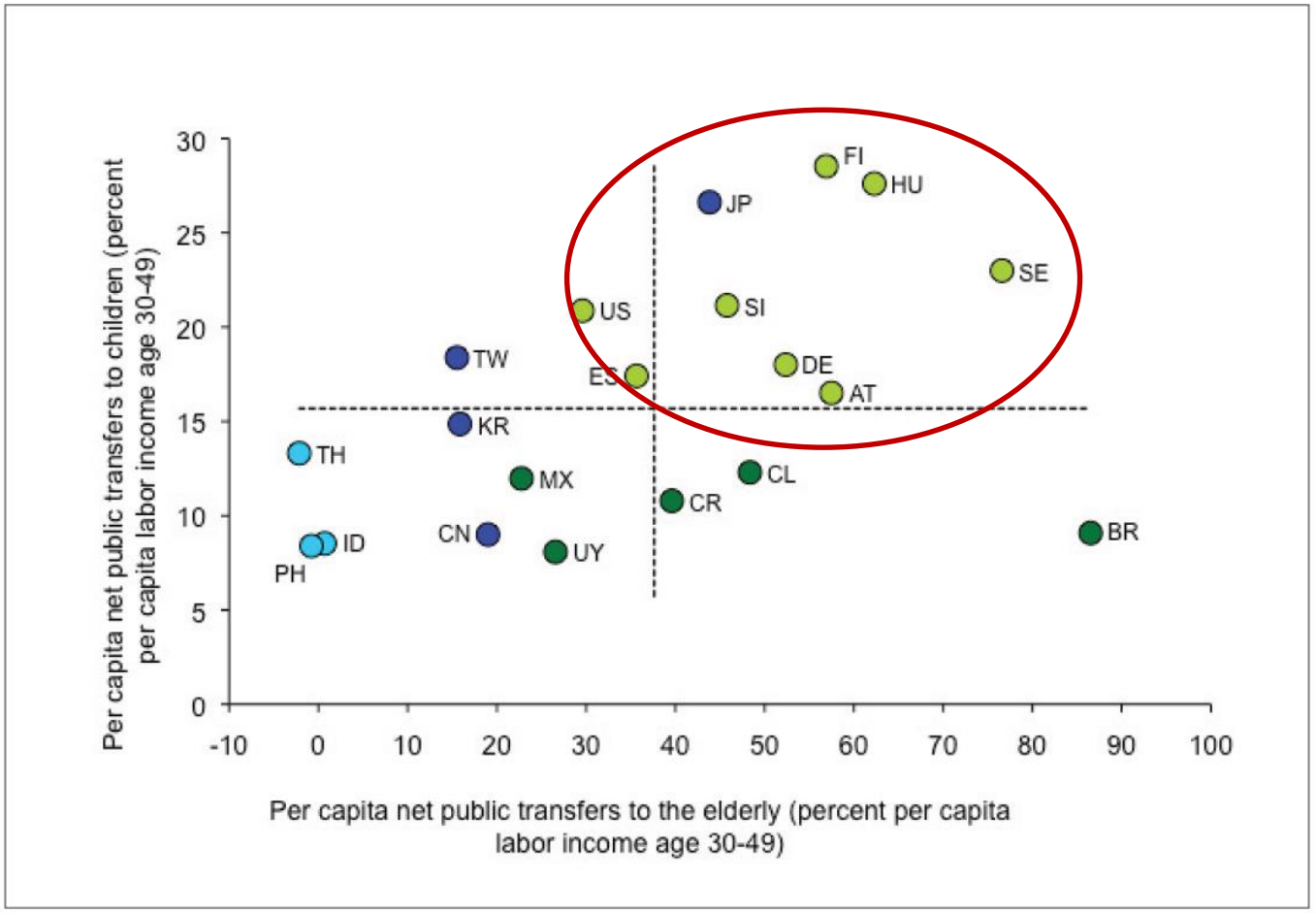


Figure 2. Per capita net public transfers to children and the elderly: 20 economies around 2000.

Source: http://www.ntaccounts.org/doc/repository/Bulletin_2_2011.pdf

Public transfers to elderly vs. children

Table 1. Public-sector transfers in 20 economies around 2000: Balance between transfers to children and to the elderly.

Economy	Aggregate net public transfers to the elderly relative to transfers to children	Elderly population relative to child population	Average net public transfers to an elderly person relative to transfers to a child
Germany	2.56	0.88	2.91
Sweden	2.38	0.72	3.33
Austria	2.32	0.67	3.48
Japan	1.67	1.02	1.65
Hungary	1.65	0.73	2.26
Spain	1.62	0.79	2.05
Slovenia	1.58	0.73	2.16
Uruguay	1.39	0.42	3.29
Finland	1.34	0.67	1.99
Brazil	1.21	0.13	9.53
Chile	0.79	0.20	3.93
United States	0.63	0.44	1.42
Costa Rica	0.55	0.15	3.67
China	0.45	0.22	2.11
South Korea	0.26	0.25	1.07
Mexico	0.23	0.12	1.90
Taiwan	0.22	0.27	0.84
Indonesia	0.01	0.15	0.08
Philippines	-0.01	0.07	-0.09
Thailand	-0.03	0.21	-0.16

Source: Miller forthcoming. Author's calculations based on population estimates and projections from the United Nations (2009) and age profiles of public transfers from data on the NTA website (www.ntaccounts.org).

Source: http://www.ntaccounts.org/doc/repository/Bulletin_2_2011.pdf

Fiscal Support Ratio

Table 2. Fiscal support ratios for 20 economies, 1950–2050.

Economy	Fiscal support ratio (percent)					Year of most favorable age structure
	1950	2010	2020	2030	2050	
Brazil	100	100	94	86	69	2000
Chile	94	100	93	83	72	2004
Slovenia	101	100	91	81	72	2002
Spain	94	100	96	87	73	2010
Austria	108	100	93	83	74	1950
Japan	91	100	92	87	74	1976
Germany	111	100	94	84	75	1950
Costa Rica	89	100	97	91	76	2012
Hungary	106	100	97	93	77	1950
Taiwan	68	100	99	92	79	2014
South Korea	76	100	97	89	80	2008
China	90	100	96	89	81	2011
Finland	108	100	92	87	83	1991
Mexico	85	100	102	99	86	2019
Sweden	115	100	96	90	86	1950
United States	99	100	96	92	89	2006
Uruguay	108	100	100	98	90	1959
Thailand	66	100	104	104	104	2039
Indonesia	79	100	106	110	108	2033
Philippines	87	100	106	111	116	2050

Source: See Table 1.
Note: Economies are ordered by the severity of the projected fiscal impact in 2050. Revenues and expenditures are projected assuming that per capita taxes and public expenditures by single year of age remain constant at base-year values. Thus, values that differ from 100 percent are the result of changes in population age structure. Values less than 100 percent indicate a decline in tax revenues relative to expenditures.

Fiscal support ratio:

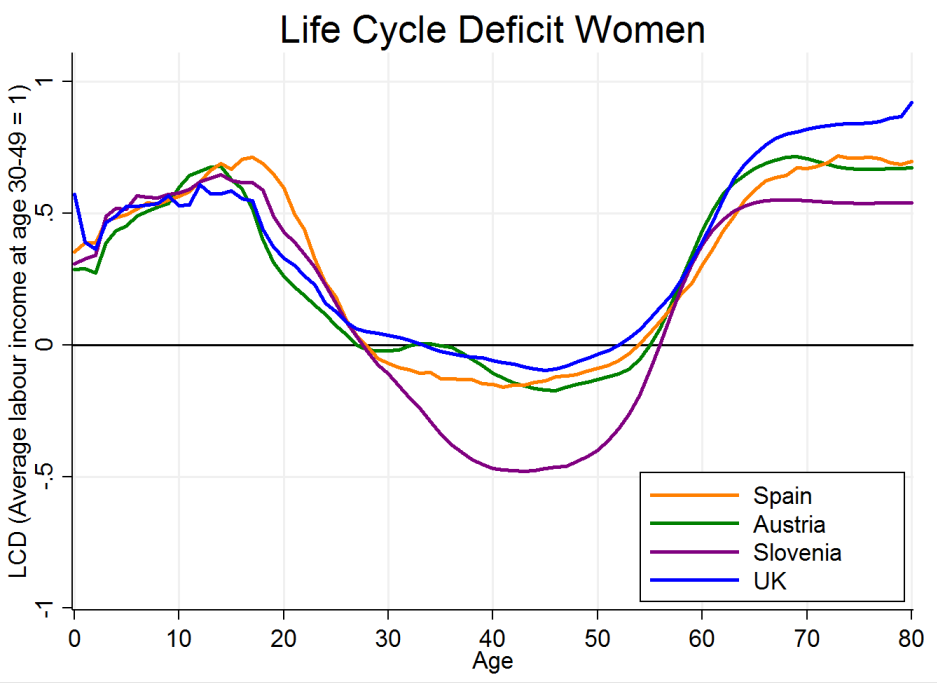
Ratio of **tax revenues** received to **public transfers** paid out for education, pensions, and healthcare.

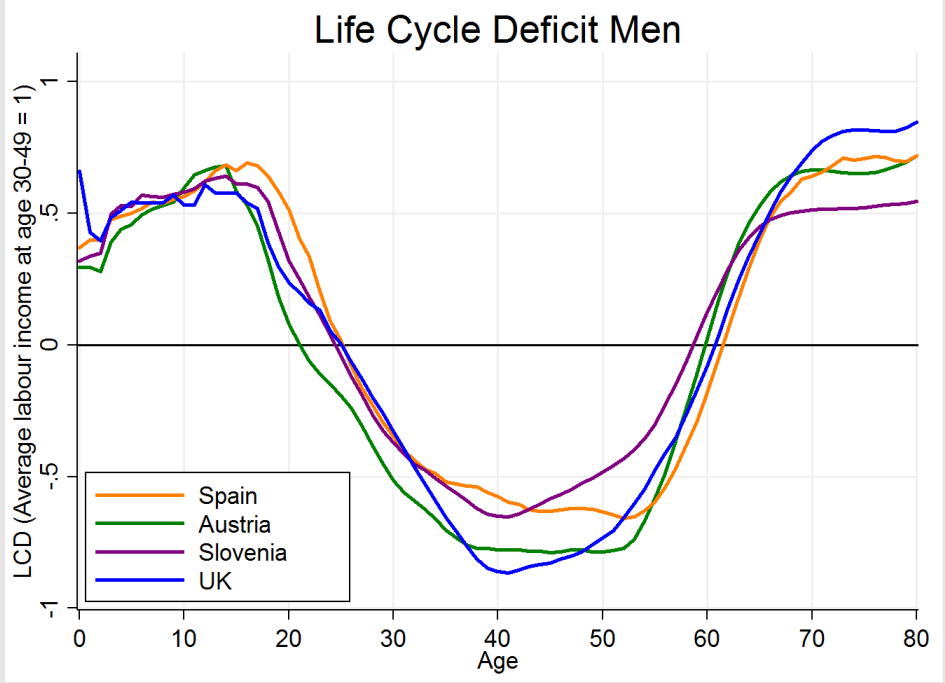
Source: http://www.ntaccounts.org/doc/repository/Bulletin_2_2011.pdf

Adding time transfer accounts to NTA = NTTA

Gender specific NTA

Females generate a lower life cycle surplus compared to males

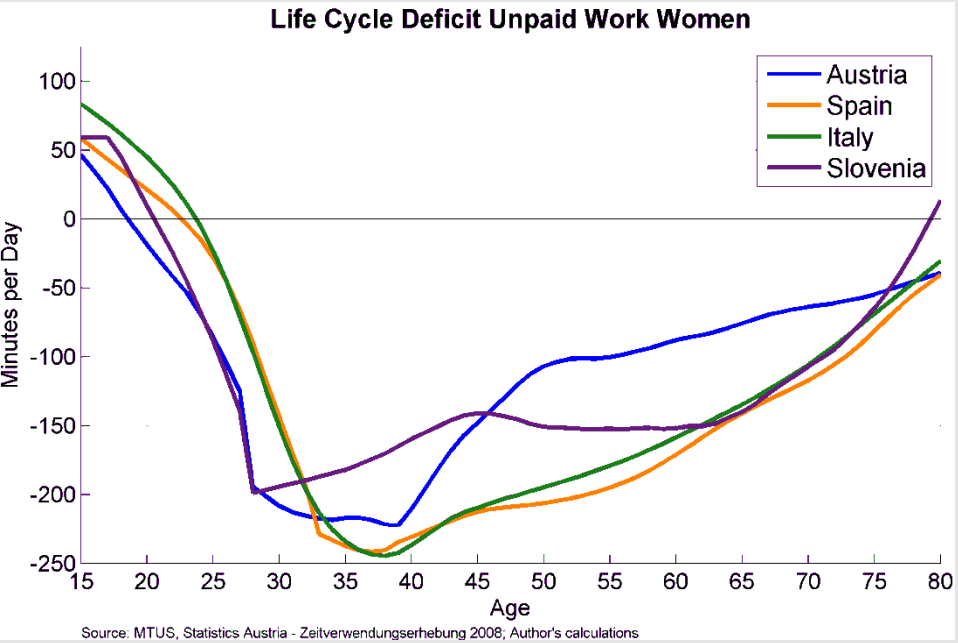


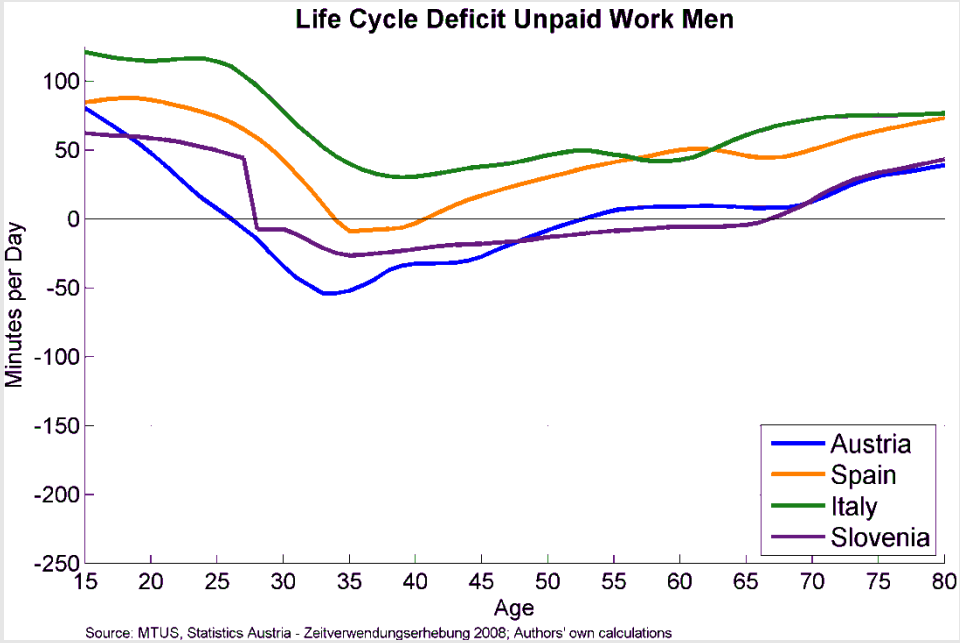


Are **males** supporting the life cycle deficit of females **?**

Adding non market work- time transfer accounts

Females produce more than they consume of unpaid work (with the exception of the young age groups)

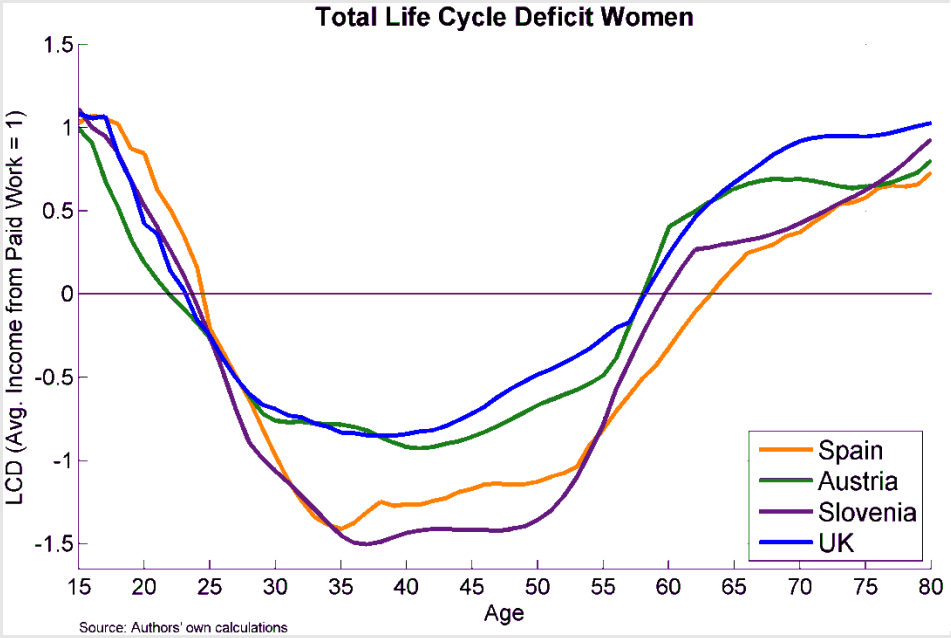


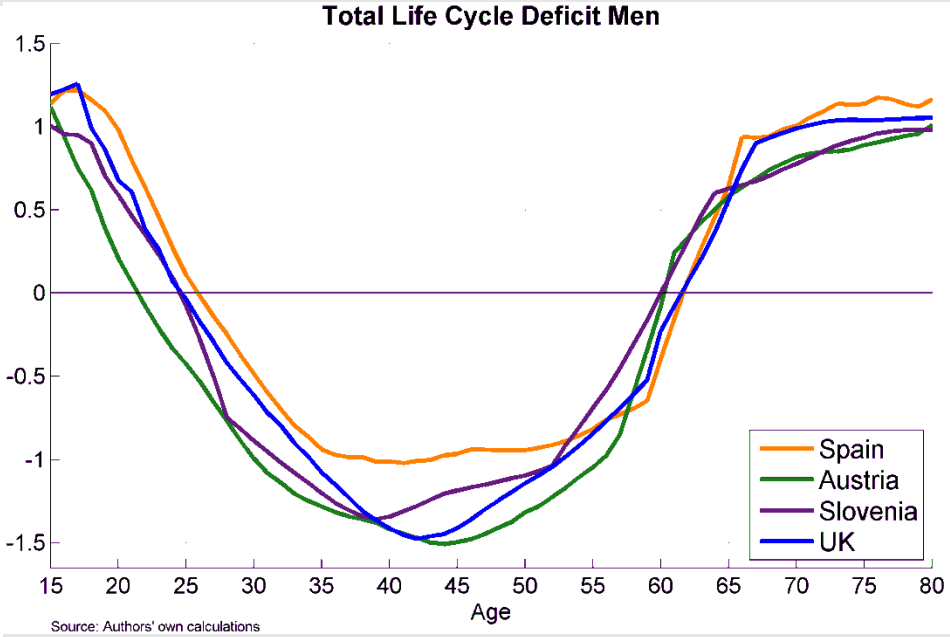


The life cycle deficit for **males** is higher and it is always positive in case of Italy.

NTTA by gender

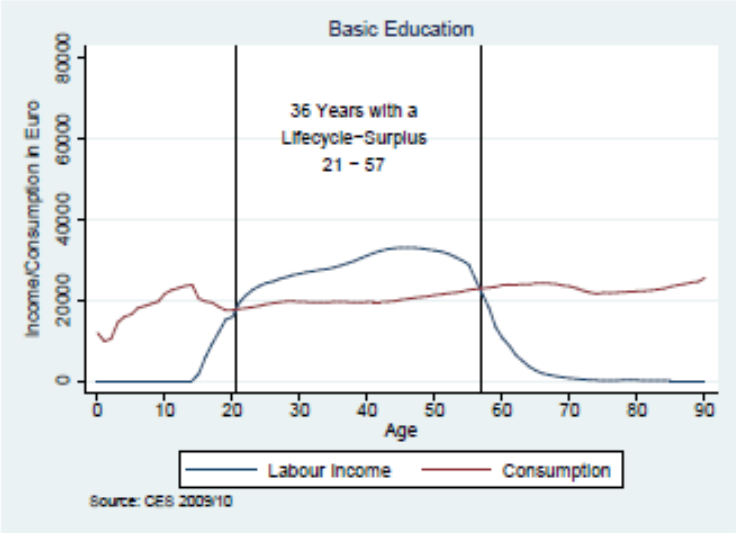
Gender differences are lower compared to NTA

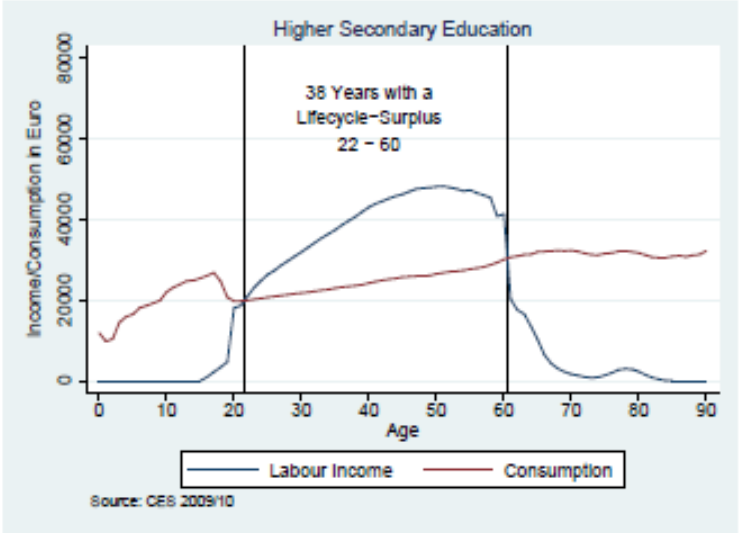


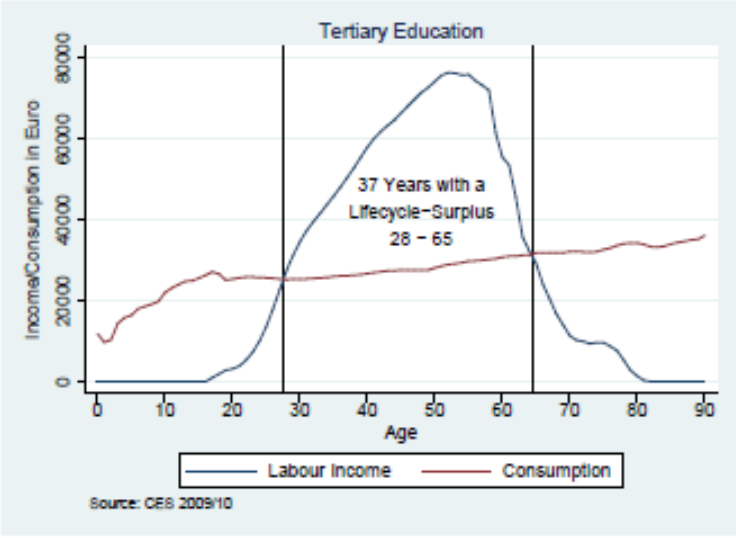


NTA by education

Labour income & consumption by education - Austria







Quelle: Bernhard Hammer (2015) National Transfer Accounts by Education: Austria 2010, AGENTA Working paper 2/2015

Discussion

- Economic consequences of population ageing are shaped not only by demographic change but to a large extend by the **economic life cycle**.
- LCD as a **new indicator of economic dependency**
- To guarantee **sustainability of our transfer system** we need changes in the economic life cycle and the system of reallocations of resources across ages.
- **Reforms of the transfer system** need to consider not only public, but also private transfers.

Discussion

Most likely solution to population ageing:

(a) increase overall level of employment

(b) longer working life / raise retirement age

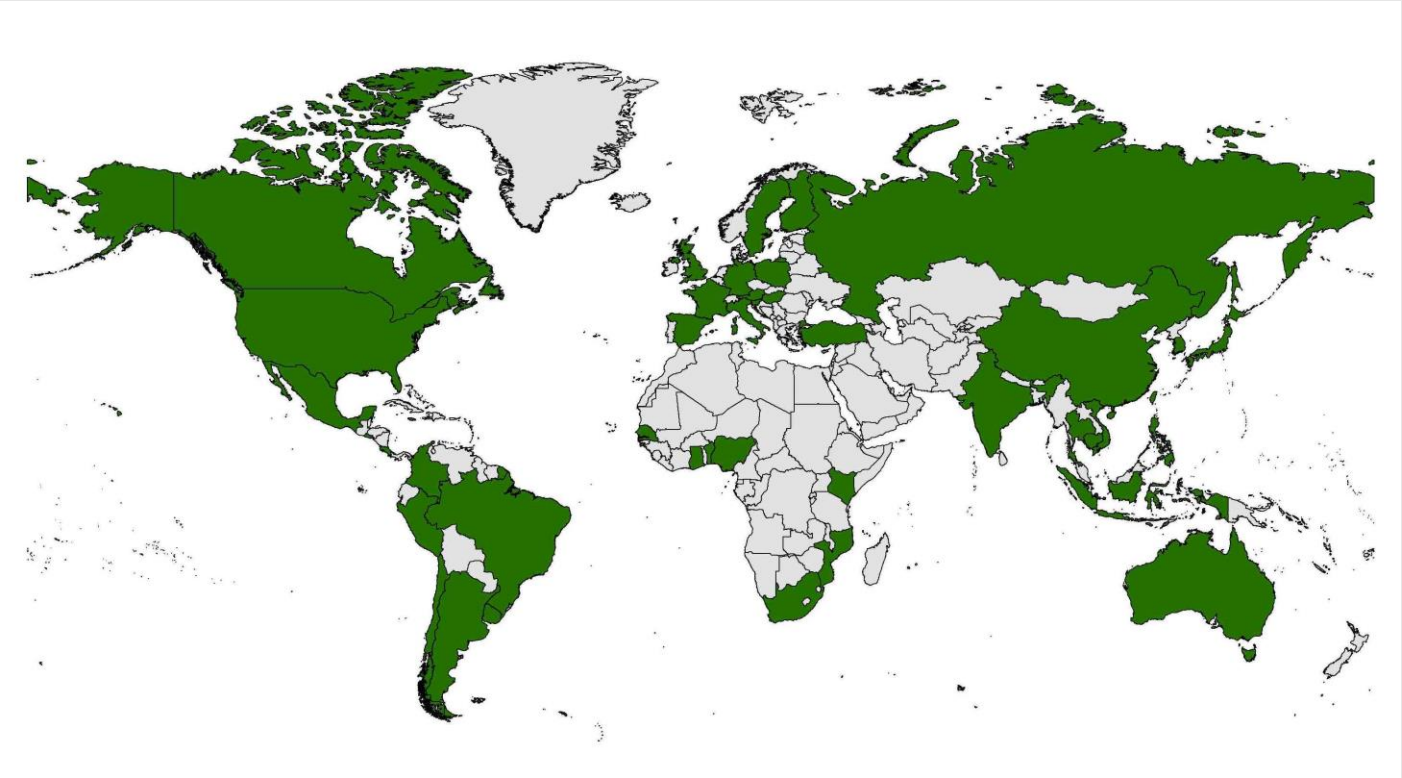
(c) increase productivity (investment in human capital)

Need to **take into account paid and unpaid work**

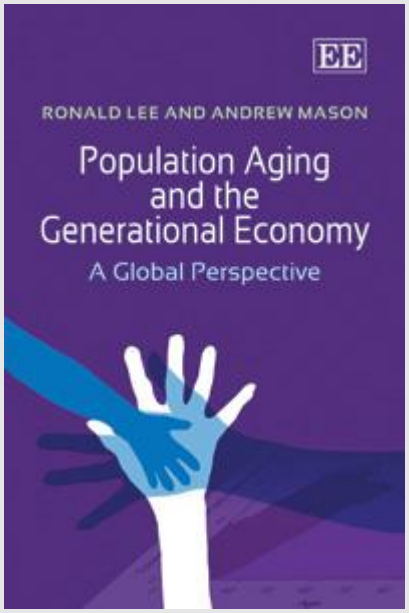
Time transfers (from parents to children) constitute a fundamental part of the welfare system – investment in human capital of children is the source of future benefits!

However household labour is not recognized by society & creates no eligibility to public services.

NTA countries



http://www.ntaccounts.org/web/nta/show



"Over coming decades, changes in population age structure will have profound implications for the macroeconomy, influencing **economic growth**, **generational equity, human capital, saving and investment, and the sustainability of public and private transfer systems**. How the future unfolds will depend on key actors in the generational economy: governments, families, financial institutions, and others. This path-breaking book provides a comprehensive analysis of the macroeconomic effects of changes in population age structure across the globe."

Thank You