Chaire de recherche Industrielle Alliance
sur les enjeux économiques
des changements démographiques
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Does Retirement Make you Happy?

A Simultaneous Equations Approach

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The potential effects of increasing working life on subjective wellbeing are not well known

- Continued improvements in life expectancy and fiscal insolvency of public pensions have led to an increase in pension entitlement ages in several countries, but its consequences for subjective well-being are largely unknown

    - Grip et al. (2012) found a strong and persistent negative effect on psychological well-being from a change in the Dutch civil servants' pension system that affected the pension age eligibility of some cohorts but not of others

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Labor force participation may affect subjective well-being

- Unemployment can adversely affect subjective well-being; How about retirement?
- In the U.S. evidence is mixed, finding both positive (Charles, 2004) and negative (Dave, Rashad, & Spasojevic, 2008; Szinovacz & Davey, 2004) effects
- Consistently positive effects are found in England (Johnston & Lee, 2009; Mein et al., 2004) and Finland (Okasanen et al., 2011; Salokangas & Joukamaa, 1991)
- No effect is found in the Republic of Korea or continental Europe for depression measures (Lee & Smith, 2009; Coe & Zamarro, 2011)

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Retirement may affect subjective well-being

- Retirement could have positive or negative effects on wellbeing depending on how the transition to retirement happens.
    - Clark and Fawaz (2009) using European and British data sets find that the type of job in which retirees were employed before retirement affects wellbeing after retirement.
    - Calvo and al. (2007) and Bonsang and Klein (2011) find that wellbeing is affected by whether the individual perceives the transition to retirement as voluntary or not.
- A different literature relates well-being and aging. Several papers find a U-shaped relationship between life satisfaction and age.
    - Blanchflower and Oswald, (2008), De Ree, J. and R. Alessie (2011) and van Landeghem (2012) among others.

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Retirement participation may affect subjective well-being

- Fonseca et al. (2014) examined the effect of retirement on subjective well-being within 12 countries
- We used panel data from the U.S. and Europe and exploited variations in eligibility ages for retirement pensions to account for potential reverse causation of poor subjective well-being on retirement
- In a reduced form analysis we found that retirement induced through eligibility to Social Security pensions does not have a negative effect on individual's well-being
- However, our previous work abstracted from the simultaneity and potential endogeneity of financial wellbeing.

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Data

- We examine the effect of retirement on subjective well-being within 12 countries, using panel data for 50+ population from
  - the U.S. Health and Retirement Study (HRS) and
  - the Survey of Health, Ageing, and Retirement in Europe (SHARE)
- Harmonized data: http://www.g2aging.org/

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Data: wellbeing

	HRS	SHARE
Life Satisfaction	Diener scale (2004-2010 Leave Behind Questionnaire) Single-item life satisfaction (2008-2010 Core interview)	A single-item overall life satisfaction question (2006-2010 Core interview)
Depressive symptoms	8 items CES-D (1994-2010 Core interview)	12 items EURO-D (2004-2010 Core interview)

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Life satisfaction definition

- The single-item overall life satisfaction question in SHARE reads as follows:

On a scale from 0 to 10 where 0 means completely dissatisfied and 10 means completely satisfied, how satisfied are you with your life?
[0..10]

- The single-item life satisfaction question included in HRS reads:

Please think about your life-as-a-whole. How satisfied are you with it?
Are you completely satisfied, very satisfied, somewhat satisfied, not very satisfied, or not at all satisfied?

1. Completely satisfied
2. Very satisfied
3. Somewhat satisfied
4. Not very satisfied
5. Not at all satisfied
8. Don't know; not ascertained
9. Refused

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[0..10]

- The single-item life satisfaction question included in HRS reads:

Please think about your life-as-a-whole. How satisfied are you with it? Are you completely satisfied, very satisfied, somewhat satisfied, not very satisfied, or not at all satisfied?

1. *Completely satisfied- (HRS- 5) (SHARE- 9,10)*
2. *Very satisfied-(HRS-4) (SHARE- 7,8)*
3. *Somewhat satisfied-(HRS-3) (SHARE- 5,6)*
4. *Not very satisfied-(HRS-2) (SHARE- 4,3)*
5. *Not at all satisfied-(HRS-1)(SHARE- 0,1,2)*

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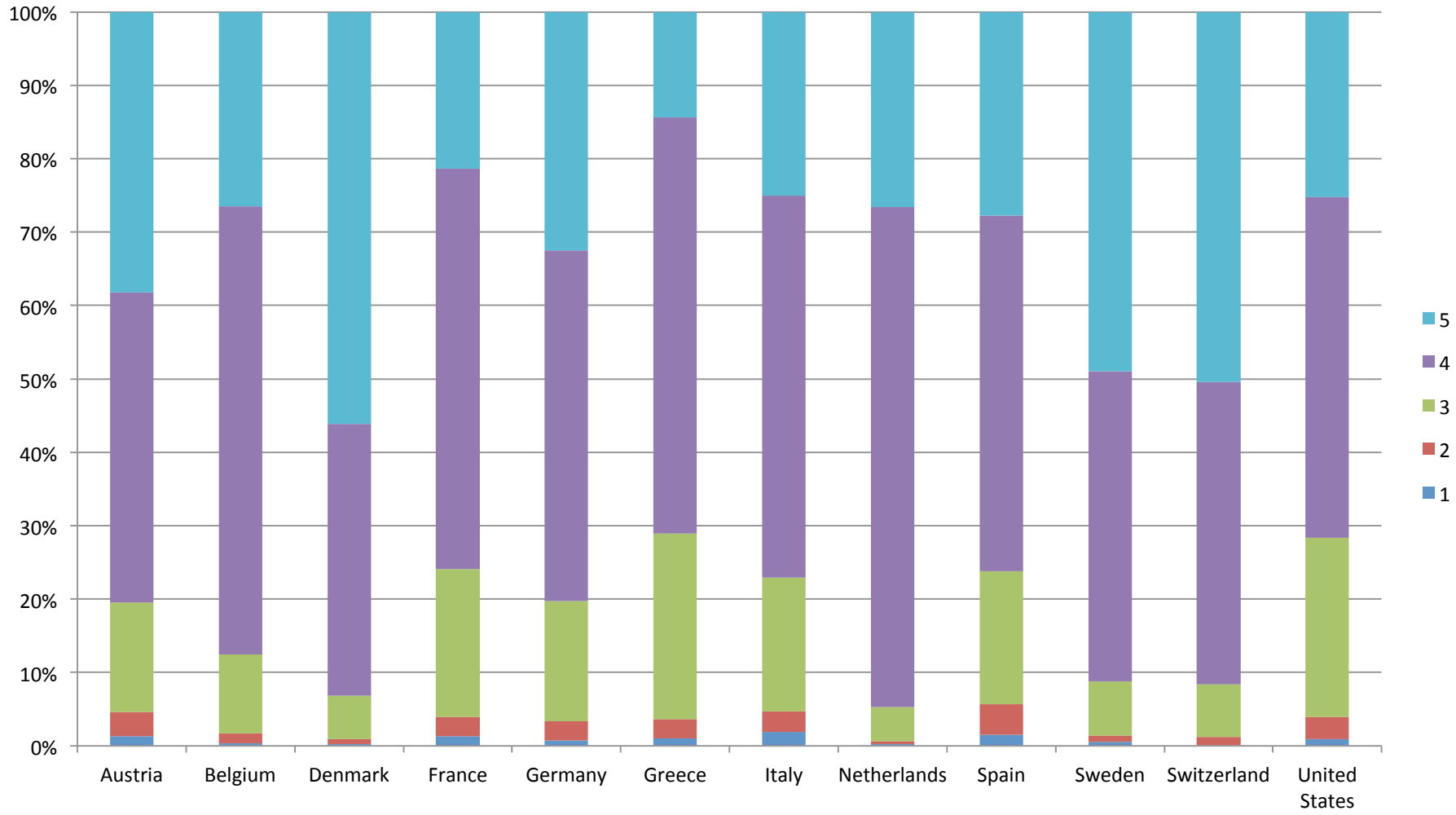
Life satisfaction by country (1=low; 5=high)



Depression definition

- Binary variable

- More than 3 symptoms in the CES-D and Euro-D depression indexes

Depression by Country

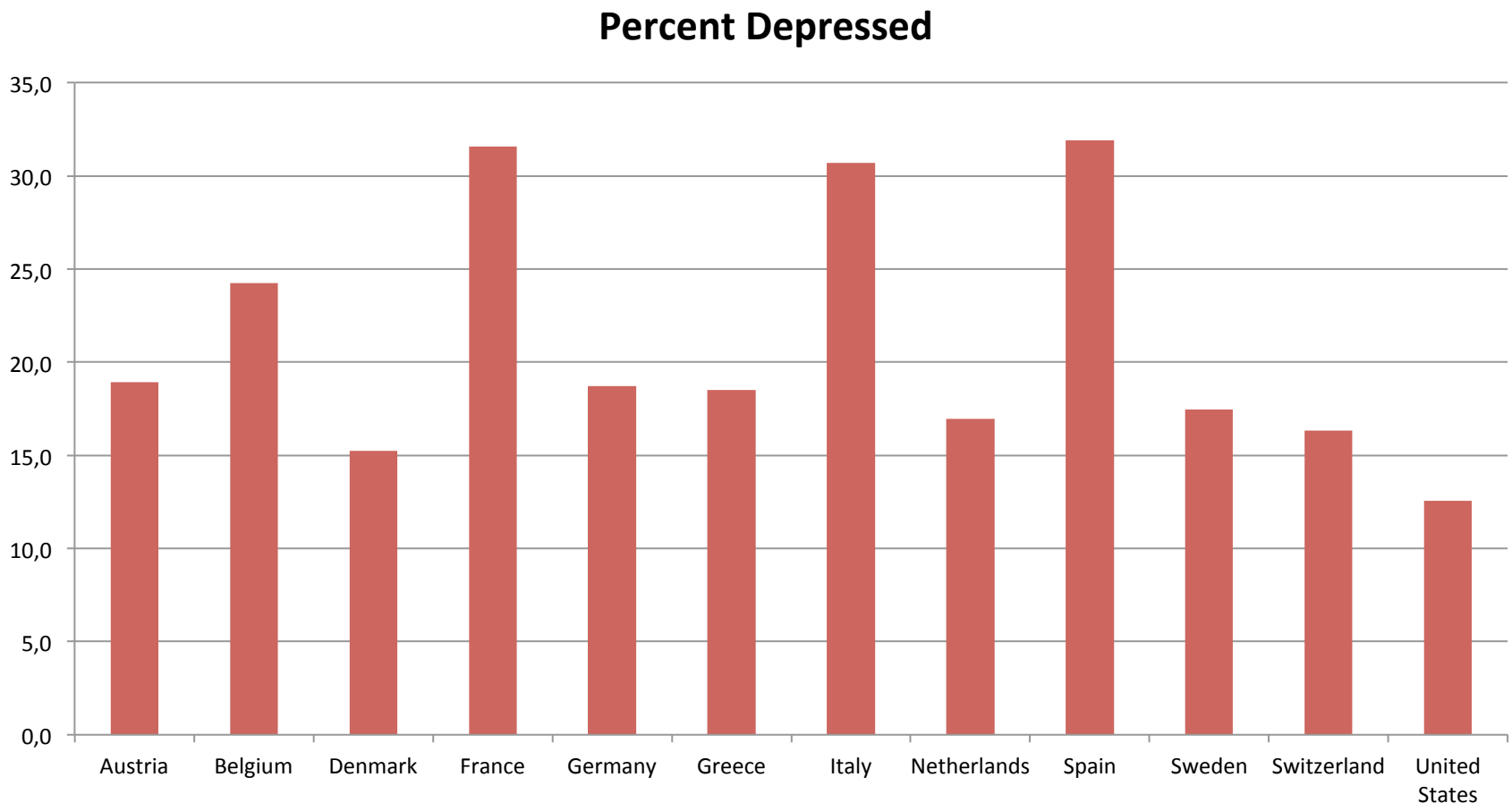


Table 4: Correlations Between Key Outcome Variables

	Retirement, Log-income	Retirement, Depression	Retirement, Life Satisfaction	Log-income, Depression	Log-income, Life Satisfaction	Depression, Life Satisfaction
Austria	-0.13	0.09	-0.05	-0.11	0.14	-0.41
Belgium	-0.11	0.04	-0.01	-0.07	0.11	-0.28
Denmark	-0.32	0.01	-0.04	-0.04	0.08	-0.29
France	-0.18	0.05	-0.08	-0.11	0.21	-0.30
Germany	-0.14	0.06	-0.07	-0.07	0.21	-0.32
Greece	-0.28	0.15	-0.15	-0.09	0.22	-0.26
Italy	-0.14	0.09	-0.09	-0.10	0.15	-0.35
Netherlands	-0.24	0.09	-0.04	-0.10	0.11	-0.26
Spain	-0.24	0.17	-0.07	-0.10	0.13	-0.38
Sweden	-0.22	0.08	-0.04	-0.08	0.04	-0.28
Switzerland	-0.16	0.07	-0.04	-0.11	0.13	-0.31
United States	-0.35	0.08	0.02	-0.16	0.13	-0.34
Total	-0.28	0.10	-0.03	-0.15	0.18	-0.31

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Correlations

- In the raw data (and across all countries) correlations are
  - Positive between retirement and depression
  - Negative between retirement and life satisfaction (with the exception of the U.S.; all correlations are small)
  - Positive between income and life satisfaction
  - Negative between income and depression

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Four outcome variables: Retirement; Income; Depression; Life Satisfaction

- All four equations include the following explanatory variables:
  - Household wealth
  - Year dummies
  - Age
  - Gender
  - Marital Status
  - Education
  - Health (major condition; ADLs)
  - Country dummies (and regional dummies for US)

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Institutions (OECD data)

- Above full retirement age
- Above early retirement age
- Both variables interacted with replacement rates

Labour market

- Retirement status
- Interaction with replacement rate
- Whether unemployed
- Interaction with unemployment replacement rate (OECD data)

Model: Simultaneous equations

- **The Labor Supply Equation:** $$R_{ict} = \rho_0 + \rho_1 X_{ict} + \rho_2 I^L_{ict} + \rho_{ci} + e_{ict}$$

- **The Income Equation:** $$\ln Y_{ict} = \gamma_1 X_{ict} + \gamma_2 R_{ict} + \gamma_3 I^Y_{ct} + \gamma_{ci} + \varepsilon_{ict}$$

- **The Subjective Well-being Equations:** For both life satisfaction and depression, we will estimate linear models of the form:

$$SW_{ict} = \alpha_1 \ln Y_{ict} + \alpha_2 X_{ict} + \alpha_3 R_{ict} + \alpha_4 I^{SW}_{ct} + \alpha_{ci} + \upsilon_{ict}$$

$\ln Y_{ict}$ is the logarithm of current per capita household income of an individual i, who lives in country c, at time t; SW_{ict} denotes a given measure of subjective well-being, and R_{ict} takes the value one if the individual is retired at time t and zero otherwise

- X_{ict} is the set of individual socio-economic variables: gender, age, time effects, ethnicity, education, marital status, and health and disability measures
- I^Y represents institutional variables that affect income: net pension replacement rates; unemployment benefits replacement rates
- I^L contains variables denoting retirement incentives: eligibility for retirement benefits pensions and net retirement replacement rates
- I^{SW}_{ct} denotes institutional variables that may affect subjective well-being directly (i.e. social safety nets).

Table 8: Estimation Results

VARIABLES	Retired	Log HH-Income	Depressed	Life Satisfaction
Retired		-0.978***	-0.061*	0.179**
		(0.067)	(0.032)	(0.086)
Pension rr*(Retired)		0.008***		
		(0.000)		
Unemployed		-0.881***	0.106	-0.596*
		(0.210)	(0.105)	(0.305)
Unemployed*unempl. rr		1.073***	-0.167	0.893*
		(0.350)	(0.175)	(0.511)
Above full ret age	0.103***			
	(0.014)			
Above early ret age	0.154***			
	(0.014)			
Pension rr*(above full ret. age)	0.000			
	(0.000)			
Pension rr*(above early ret. age)	-0.001***			
	(0.000)			
Log-household income			0.011	-0.016
			(0.008)	(0.016)
Constant	-3.726***	10.777***	-0.379	5.371***
	(0.101)	(0.354)	(0.295)	(0.727)
Observations	120,775	120,775	116,254	63,661
Number of groups	52,028	52,028	51,006	40,429

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1
Other control variables: year dummies, log-hh net wealth, age, square age divided by 100, gender, marital status, interaction marital status and female, education, education*US, adl and major health conditions and their interactions with US, country dummies, US regional dummies and coefficients for the individual means of all time varying variables (Mundlak specification).

According to the Model Estimates, there is

- A (marginally significant, 10%) negative effect of retirement on depression
- A significant positive effect of retirement on life satisfaction
- No effect of income on either depression or life satisfaction.
- A strong effect of unemployment replacement rates on the life satisfaction of the unemployed.
- Retirement does not respond very strongly to replacement rates, but it does respond to eligibility ages.

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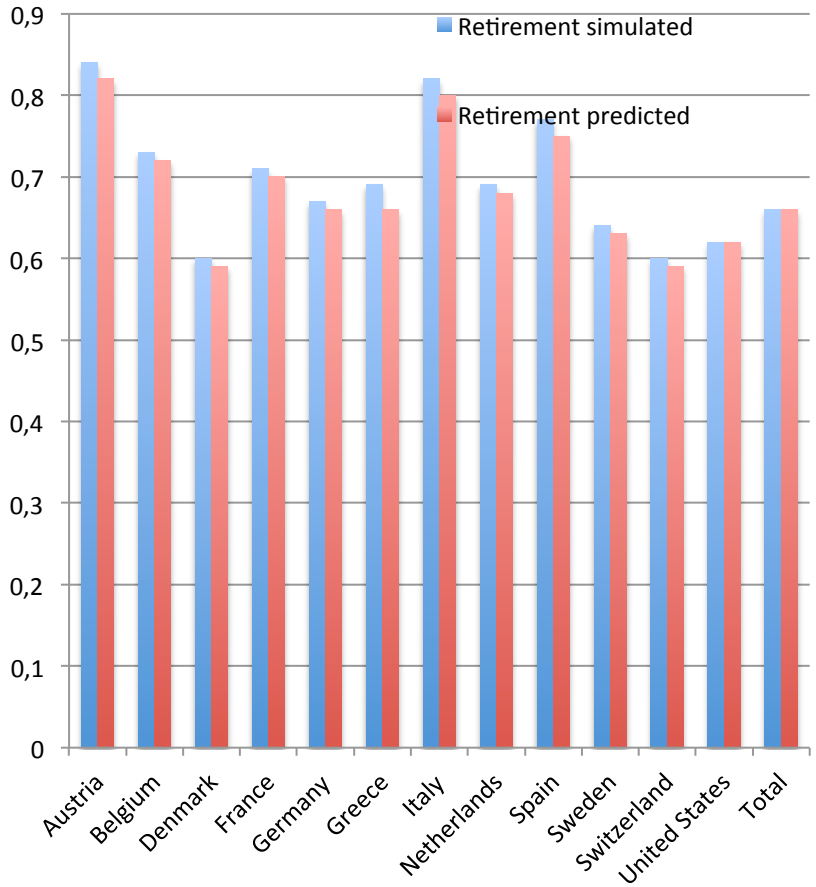
Model Simulations

Table 11: Simulated outcomes with 40% replacement rates

Country	Retirement simulated	Retirement predicted	log-income simulated	log-income predicted	Depression simulated	Depression predicted	Life Satisfaction simulated	Life Satisfaction predicted
Austria	0.84	0.82	10.13	10.48	0.19	0.19	4.12	4.11
Belgium	0.73	0.72	10.50	10.65	0.25	0.25	4.12	4.11
Denmark	0.60	0.59	10.84	11.05	0.14	0.14	4.50	4.50
France	0.71	0.70	10.48	10.64	0.32	0.32	3.91	3.91
Germany	0.67	0.66	10.45	10.59	0.18	0.19	4.08	4.08
Greece	0.69	0.66	10.51	10.89	0.19	0.20	3.80	3.79
Italy	0.82	0.80	10.43	10.72	0.31	0.32	3.93	3.93
Netherlands	0.69	0.68	10.56	10.88	0.17	0.18	4.20	4.20
Spain	0.77	0.75	10.34	10.63	0.33	0.33	3.95	3.94
Sweden	0.64	0.63	10.66	10.78	0.16	0.16	4.40	4.40
Switzerland	0.60	0.59	10.67	10.80	0.16	0.16	4.41	4.41
United States	0.62	0.62	10.28	10.33	0.12	0.13	3.92	3.92
Total	0.66	0.66	10.4	10.54	0.18	0.18	4.05	4.05

Simulated and predicted outcomes with 40% replacement rates



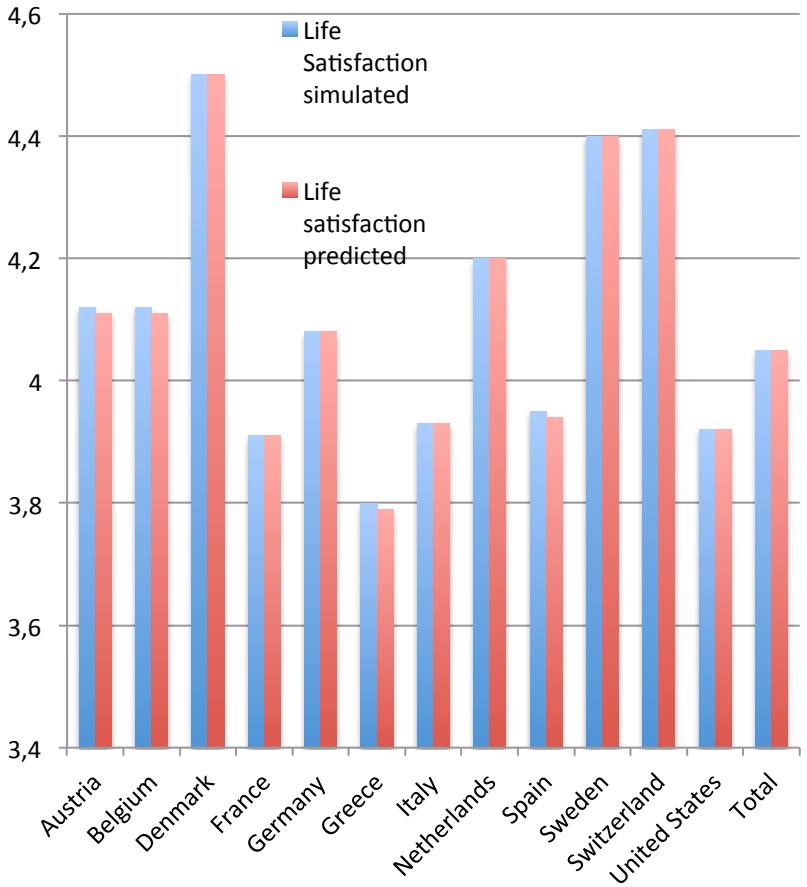
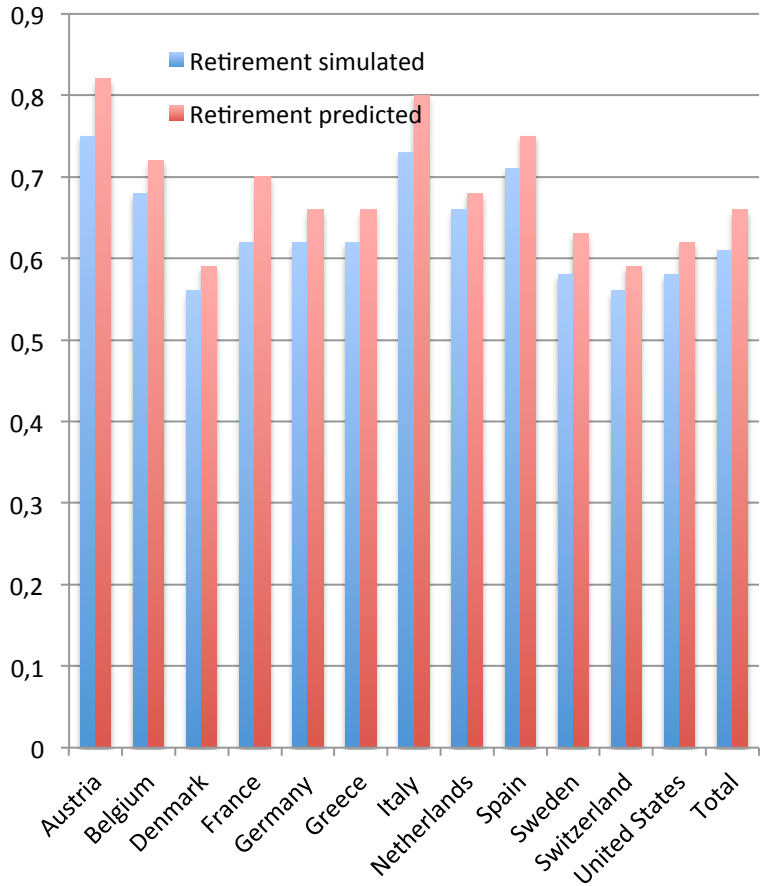


Table 12: Simulated outcomes: Full Retirement Age is 79; Early Retirement age is 67

Country	Retirement simulated	Retirement predicted	log-income simulated	log-income predicted	Depression simulated	Depression predicted	Life Satisfaction simulated	Life Satisfaction predicted
Austria	0.75	0.82	10.50	10.48	0.20	0.19	4.10	4.11
Belgium	0.68	0.72	10.66	10.65	0.25	0.25	4.10	4.11
Denmark	0.56	0.59	11.06	11.05	0.15	0.14	4.49	4.50
France	0.62	0.70	10.67	10.64	0.33	0.32	3.89	3.91
Germany	0.62	0.66	10.61	10.59	0.19	0.19	4.07	4.08
Greece	0.62	0.66	10.90	10.89	0.20	0.20	3.78	3.79
Italy	0.73	0.80	10.74	10.72	0.32	0.32	3.91	3.93
Netherlands	0.66	0.68	10.89	10.88	0.18	0.18	4.19	4.20
Spain	0.71	0.75	10.65	10.63	0.33	0.33	3.93	3.94
Sweden	0.58	0.63	10.8	10.78	0.17	0.16	4.39	4.40
Switzerland	0.56	0.59	10.82	10.8	0.16	0.16	4.40	4.41
United States	0.58	0.62	10.35	10.33	0.13	0.13	3.92	3.92
Total	0.61	0.66	10.56	10.54	0.18	0.18	4.04	4.05

Simulated and Predicted outcomes: Full Retirement Age in 79; Early age is 67



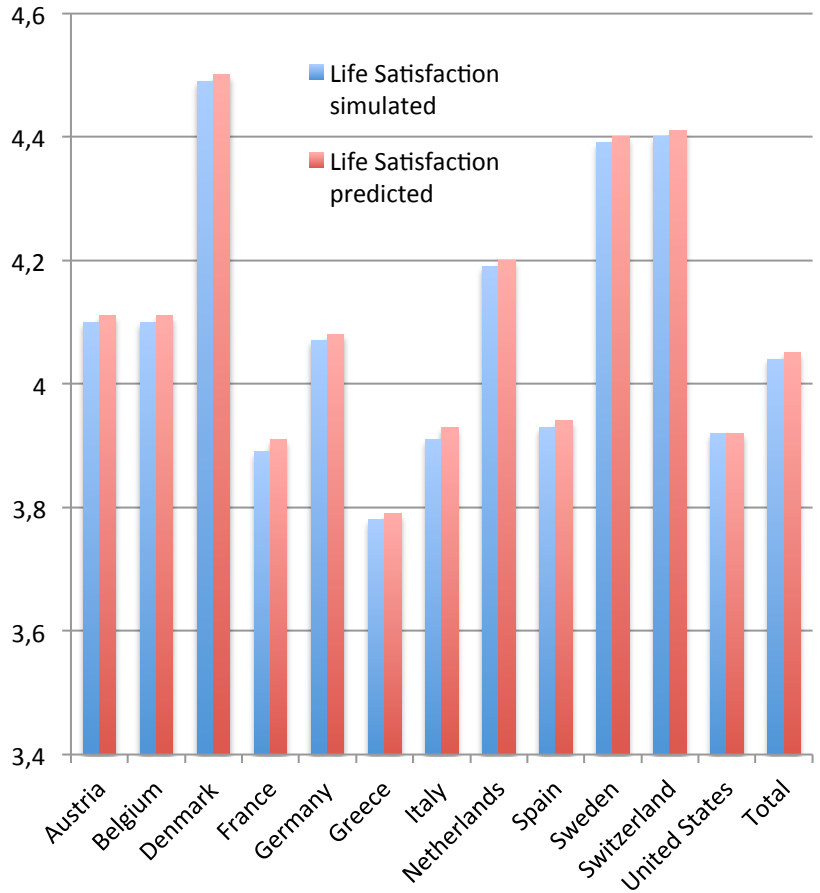


Table 16: Simulated Life Satisfaction by Age

Country		<=54	55-59	60-64	65-69	70-74	>=75	Total
Austria	Simulated	4.14	4.11	4.10	4.11	4.13	4.05	4.10
	Predicted	4.14	4.12	4.13	4.14	4.13	4.05	4.11
Belgium	Simulated	4.10	4.10	4.10	4.09	4.13	4.10	4.10
	Predicted	4.10	4.10	4.12	4.12	4.13	4.10	4.11
Denmark	Simulated	4.50	4.49	4.49	4.50	4.51	4.48	4.49
	Predicted	4.50	4.49	4.49	4.53	4.51	4.48	4.50
France	Simulated	3.91	3.91	3.89	3.88	3.92	3.87	3.89
	Predicted	3.91	3.93	3.93	3.91	3.92	3.87	3.91
Germany	Simulated	4.06	4.06	4.06	4.07	4.13	4.06	4.07
	Predicted	4.06	4.06	4.07	4.10	4.13	4.06	4.08
Greece	Simulated	3.81	3.80	3.79	3.75	3.77	3.73	3.78
	Predicted	3.81	3.80	3.81	3.78	3.77	3.73	3.79
Italy	Simulated	3.96	3.94	3.91	3.91	3.91	3.89	3.91
	Predicted	3.96	3.95	3.94	3.94	3.91	3.89	3.93
Netherlands	Simulated	4.18	4.19	4.19	4.20	4.20	4.18	4.19
	Predicted	4.18	4.19	4.19	4.23	4.20	4.18	4.2
Spain	Simulated	3.92	3.92	3.92	3.93	3.95	3.95	3.93
	Predicted	3.92	3.92	3.93	3.96	3.95	3.95	3.94
Sweden	Simulated	4.41	4.41	4.40	4.40	4.39	4.35	4.39
	Predicted	4.41	4.41	4.42	4.43	4.39	4.35	4.40
Switzerland	Simulated	4.39	4.40	4.40	4.40	4.42	4.40	4.40
	Predicted	4.39	4.40	4.41	4.43	4.42	4.40	4.41
United States	Simulated	3.84	3.85	3.88	3.91	3.95	3.95	3.92
	Predicted	3.84	3.85	3.89	3.94	3.95	3.95	3.92
Total	Simulated	4.07	4.03	4.04	4.04	4.04	4.03	4.04
	Predicted	4.07	4.03	4.06	4.06	4.04	4.03	4.05

Model Simulations

- In view of the estimation results, it is not surprising that retirement replacement rates don't have strong effects on retirement and hence also not on depression or well-being
- Higher eligibility ages imply later retirement and hence a modest fall in life satisfaction for ages 60-69 in countries where currently workers retire early.

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Conclusions

- Depressive symptoms are negatively related to retirement. In other words retirement reduces the probability of depression
- Life satisfaction is positively related to retirement.
- Household wealth, being married, educational attainment, are all positively related to life satisfaction and reduce the probability of depression.
- Major health conditions increase the probability of depression and reduce life satisfaction.
- Remarkably, income does not seem to have a significant effect on depression or life satisfaction.
  - This is in contrast with the correlations in the raw data that show significant relations between income and depression and life satisfaction.
  - This suggests that accounting for the endogeneity of income in equations explaining depression or life satisfaction is important.

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Caveats/Extensions

- Due to data limitations, we could not yet estimate a dynamic model; this will be done when the 2012 SHARE wave is available
- The incentive measures by country need to be refined
- The specification of the effect of retirement on depression or on life satisfaction needs to be improved, e.g. by taking into account time since retirement.

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