

# Financing long-term care through housing in Europe

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# Context

■ **Introduction** ■ Data ■ Method ■ Results ■ Discussion

- Population aging (European Commission 2015)
  - Proportion of 80+ = 5% in 2013, 12% 2060
- Increasing financial pressure on public/LTC systems  
→ private financing arrangements?
  - Decreasing public pension replacement rates
  - Private LTC insurance?
    - Very small market (Brown and Finkelstein 2007, 2008)
  - **Home equity** (Davidoff 2010)
    - How to extract equity from housing? → Reverse mortgage

# Objective

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- Explore to what extent home ownership is an insurance against the risk of **LTC expenses**, by simulating the lump-sum payments that could be extracted from **reverse mortgages**
  - RM = credit operation which consists in borrowing on the value of the home and repaying interests at the end of the contract (death, sale of the house)
    - Means to access illiquid housing wealth
    - "Aging in place"
    - RM have been developed in the US and the UK + growing interest in Europe (OECD, 2013)

# Literature – aging and housing

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- Housing wealth not used to support consumption during retirement (Venti and Wise 2000, 2001; Angelini et al 2011)...
  - ▣ ...except **sometimes** when precipitating shocks occur (Venti and Wise 2000, 2001)
- RM may be interesting at old age (Venti and Wise 1991; Sinai and Souleles 2007)
  - ▣ Coda Moscarola et al (2015): RM could represent a powerful tool against income vulnerability in old age

# Literature – LTC and housing

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- Little has been done on LTC expenses and housing
  - Mayhew et al (2010), ELSA data:
    - "Few households are able to pay for LTC based on income and savings but the number increases if housing assets are included"
    - + Stucki (2006), Masson (forth.)
  - Bockarjova et al (2015):
    - "Individuals with higher wealth enjoy a lower incidence rate of using LTC"

# Database

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## □ SHARE data

- Wave 4 and 5

- Focus on **65+**

- AT, DE, SE, NL, ES, IT, FR, DK, BE

## □ Information on:

- Limitations with instrumental and basic activities of daily living (IADLs and ADLs)

- Income, financial and housing assets

# Home ownership in Europe

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□ SHARE data : wave 5, 65+ (23,841 obs)

	% owners	Mean value of main residence (- mortgages) if >0	Median if >0
Austria	49	284,734	200,000
Germany	58	224,286	195,000
Sweden	53	236,888	173,028
Netherlands	59	242,756	215,000
Spain	92	216,782	120,000
Italy	82	231,670	200,000
France	78	281,924	240,000
Denmark	67	213,076	160,901
Belgium	74	286,565	250,000

# Methodology

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- To answer our question, we need 4 steps:
  - ▣ 1. Estimation of the periods of LTC needs
  - ▣ 2. Estimation of LTC cost
  - ▣ 3. Simulation of reverse mortgages
  - ▣ 4. Ability to pay for LTC



# 1. Periods of LTC needs (1)

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- We assume that an individual is dependent if he reports **difficulties** with at least 2 ADLs
  - ▣ ADLs: dressing, walking across a room, bathing, eating, getting in/out of bed, using the toilet
  - ▣ Triggers Medicaid and private policies benefits
- LTC risk? Number of periods of LTC needs?
  - ▣ **Microsimulation → year 2061**

# 1. Periods of LTC needs (2)

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- Multinomial logit models on waves 4-5 (balanced panel 65+, n=12,942) to estimate the effect of age, sex, income and education on **probabilities of transitions** between 3 states
  - ▣ No disability (< 2 ADL limitations), disability, death
    - One model for non-dependent individuals in w4 (n=11,828)
    - One model for dependent individuals in w4 (n=1,061)
- We then simulate disability trajectories of individuals who are 65+ in wave 5 until they die (n=23,769)

# Transitions (1)

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## □ Non-dependent individuals in wave 4 (n=11,828)

Probability of being [...] in w5	1. Non-dependent	2. Dependent	3. Dead
Age	-0.009***	0.005***	0.004***
Female	ns	0.012***	-0.021***
Income (country level)			
- 1st quintile	Ref	Ref	Ref
- 2 <sup>nd</sup> quintile	0.018**	-0.010*	ns
- 3rd quintile	0.019**	-0.014**	ns
- 4th quintile	0.020**	-0.014**	ns
- 5th quintile	0.034***	-0.028***	ns
Education			
- Primary	Ref	Ref	Ref
- Secondary	ns	-0.011**	ns
- Terriary	0.026***	-0.024***	ns

Average marginal effects.

Other controls: country dummies, time between waves 4 and 5.

# Transitions (2)

■ Introduction ■ Data ■ **Method** ■ Results ■ Discussion

## □ Dependent individuals in wave 4 (n=1,061)

Probability of being [...] in w5	1 Non-dependent	2 Dependent	3 Dead
Age	-0.014***	ns	0.011***
Female	0,067**	ns	-0.066**
Income (country level)			
- 1st quintile	Ref	Ref	Ref
- 2 <sup>nd</sup> quintile	ns	0.083**	ns
- 3rd quintile	ns	ns	-0.070*
- 4th quintile	ns	ns	ns
- 5th quintile	ns	ns	ns
Education			
- Primary	Ref	Ref	Ref
- Secondary	0.104***	-0.077*	ns
- Tertiary	ns	ns	ns

# Probabilities of transitions

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## □ Mean estimated probabilities

	Total	Male	Female
P11	0.906	0.908	0.905
P12	0.055	0.044	0.065
P13	0.039	0.048	0.031
P21	0.271	0.243	0.289
P22	0.504	0.511	0.500
P23	0.224	0.246	0.211

	1st income quintile	2 <sup>nd</sup> quintile	3rd quintile	4th quintile	5th quintile
P11	0.854	0.898	0.915	0.922	0.941
P12	0.092	0.063	0.050	0.045	0.030
P13	0.054	0.039	0.038	0.033	0.029

## 2. Estimation of LTC cost

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- We use 6 ADLs and 3 IADLs
  - ▣ LTC needs in hours (Pampalon et al 1991)
    - E.g., eating = 14 h/week, dressing = 4.67 h/week...
  - ▣ Monetary valuation using hourly labor costs in "Human health, social work activities" (Eurostat 2015)
  - ▣ **Assumption: no public coverage, no informal care**

Annual LTC cost (€) (average on 65+ with limitations in 2+ ADLs)

Austria	41,006
Germany	38,714
Sweden	51,431
Netherlands	44,505
Spain	38,820
Italy	41,320
France	40,463
Denmark	48,722
Belgium	42,619

# 3. Simulation of reverse mortgages

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- $LS \text{ payment} = H \times \frac{(1+g)^{life\_exp}}{(1+m)^{life\_exp}}$ 
  - ▣ H: value of main residence owned - mortgage
  - ▣ g: growth rate of housing prices
    - Assumption = 0%
  - ▣ m: interest rate of the reverse mortgage
    - Assumption = 8% (commonly used in the literature)
  - ▣ Life tables from the Human Mortality Database
- Ex: if H=200,000 euros and age=80 in France (life expectancy=10 years), LS=92,710 euros today

## 4. Ability to pay for LTC (1)

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- We study the ability of individuals to pay for their periods of LTC needs depending on:
  - ▣ HH income – (home expenditure + food consumption)
  - ▣ + HH net financial assets
  - ▣ + Value of other real estate: holiday homes, land...
  - ▣ + Value of main residence (.% owned) – (mortgages)



## 4. Ability to pay for LTC (2)

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- Income and assets are known in wave 5
- What about their evolution in time?
  - ▣ Inflation, labor costs, interest rates, trend in housing prices, widowhood
- Simplifying assumptions:
  - ▣ Income, assets and LTC costs increase at the same rate
  - ▣ After one spouse's death, income and housing assets remain unchanged

# LTC risk

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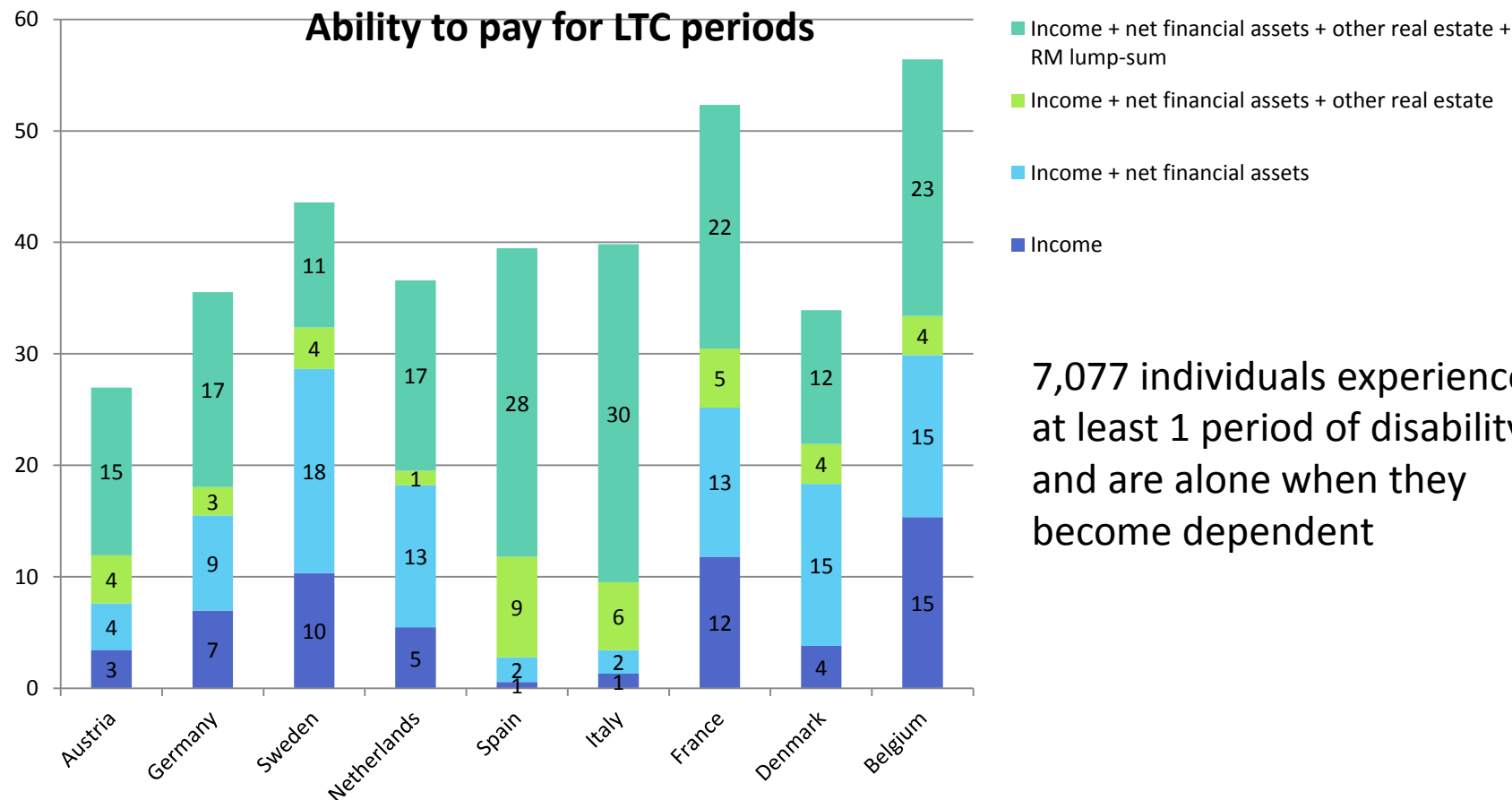
## □ Risk and duration of disability

▣ Sample: all individuals 65+ in wave 5, n=23,769

	Total	Male	Female	1st income quintile	5th income quintile
At least 1 period of disability, %	59.6	47.1	69.0	67.8	51.1
Average number of years of disability if >0	4.9	4.4	5.1	4.7	4.4

# LTC financing

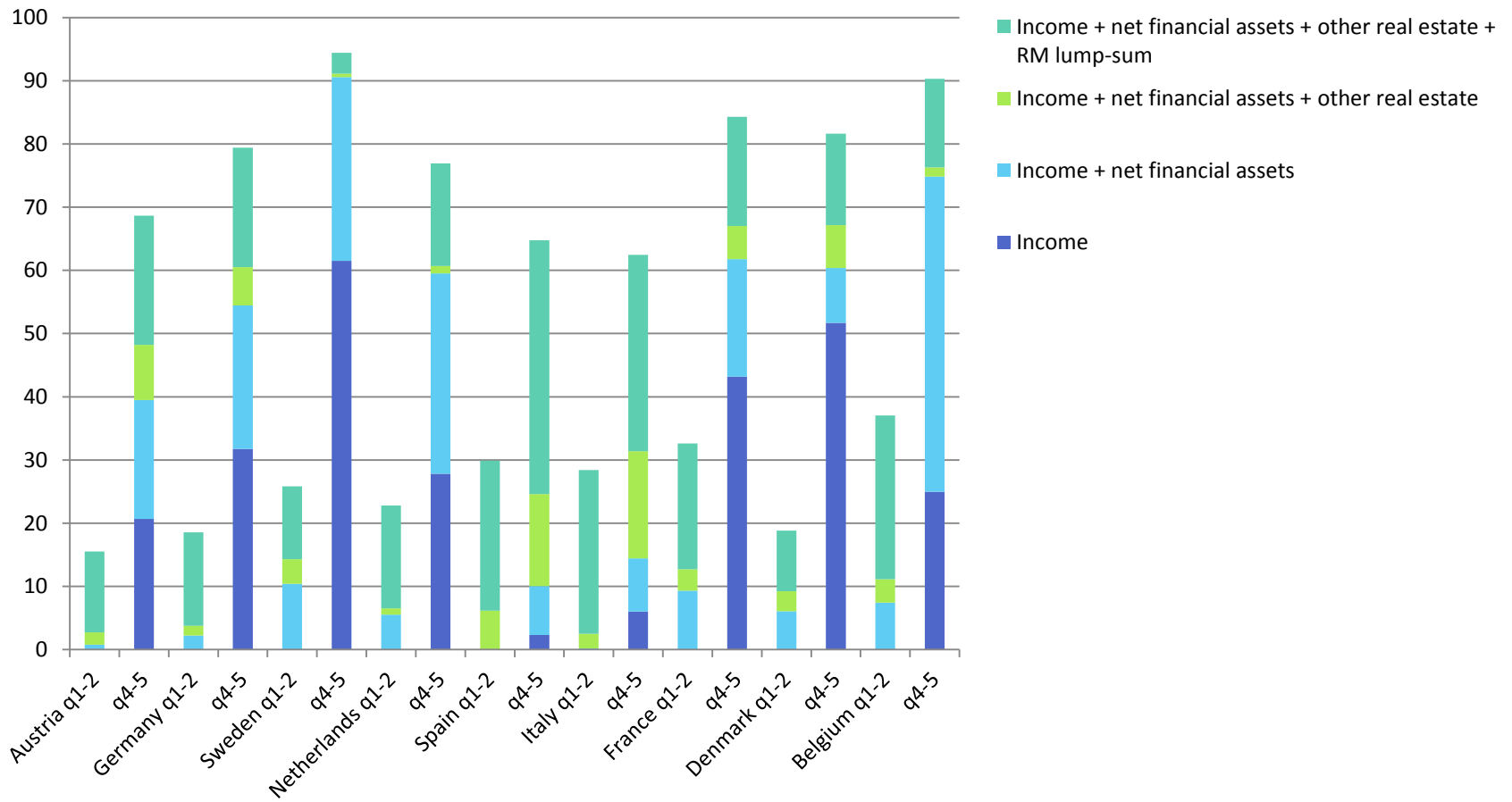
■ Introduction ■ Data ■ Method ■ **Results** ■ Discussion



7,077 individuals experience at least 1 period of disability and are alone when they become dependent

# Low vs high incomes

■ Introduction ■ Data ■ Method ■ **Results** ■ Discussion



# (Preliminary) conclusion

■ Introduction ■ Data ■ Method ■ Results ■ Discussion

- RM increase the proportion of individuals able to pay for their LTC expenses
- Low-income individuals face a higher risk of disability and have less housing wealth → RM products may not be adequate for those with the higher needs
  - Design of public policies?
- On average, 58% of individuals cannot pay for their LTC expenses even if they use all their income and assets
  - Need for public coverage

# Discussion

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## □ Further work remains to be done

- Probability of transitions are estimated using the balanced panel w4-w5
  - Attrition (22%) is probably not random (underestimation of deaths?)
- Some assumptions can be relaxed
  - Introduction of public coverage
  - RM on a fraction of the home < 100% (bequest motive)
  - Decrease in income after the death of the spouse
- Sensitivity tests: different RM interest rates

Thanks for your attention!

