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## Redistribution and the UK state pension

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# Motivation

- **The state pension represents a high proportion of public spending in many developed countries**
- **How does the state pension redistribute?**
  - Over people's lifetimes
  - Between people of a given generation
  - Between generations
- **How do pension reforms affect the type of redistribution done?**
  - UK is an interesting example, having undergone substantial reform over the past few decades, away from an earnings-related pension and towards a flat-rate pension

# Literature

- **Most state spending reflects redistribution across people's lifetimes, rather than redistribution between people:**  
Falkingham and Harding (1996); O'Donoghue (2001); Bovenberg, Hansen and Sorenson (2008)
- **State pension systems redistribute from men to women and from rich to poor:** Nelissen (1995); Borsch-Supan and Reid-Held (2001); Coronado et al. (2002)
- **Assuming pooling reduces progressivity of the system:**  
Coronado et al. (2011)
- **Existing evidence from the UK uses microsimulation:**  
Creedy, Disney & Whitehouse (1993); Falkingham and Harding (1996)

# Contributions

- We compare lifetime contributions with lifetime state pension benefits to calculate measures of redistribution
- We focus on intra- rather than inter-generational redistribution
  - We study the cohort born in the 1930s
- Use 'real' data on individuals in the UK
  - Can easily include women
- We can link couples together
  - Can explore the implications of intra-household pooling for redistribution
- We show the implications of alternative systems for redistribution

# Key findings

- Lifetime state pension income more equally distributed than annual state pension income
- Most spending reflect redistribution over people's lifetimes
- There is some redistribution between people...
  - towards women
  - towards low earners
- But much less if we assume that couples pool income
- Reforms in the UK towards a flat-rate pension and away from earnings-replacement will increase emphasis on redistribution *between people...*
- ...Although by how much depends on what we assume about household pooling

# The UK state pension system

- ‘Beveridgean’ in principle - flat-rate component since 1948
- Earnings-related component since 1978
- **Key trends:**
  - Away from earnings replacement (as the cost became apparent)
  - Towards greater crediting of women in their own right
- For those reaching the state pension age after April 2016:
  - No more accruals to the earnings-related state pension
  - No more ‘derived rights’ (state pension based on spouse’s contributions)
- We consider three systems:
  1. Realised system
  2. Earnings-related system
  3. Flat rate system

# Data

- English Longitudinal Study of Ageing (ELSA)
  - Survey data on the household population aged 50 and over
  - Contains detailed information on demographics, socio-economic characteristics, income, wealth, health
- National Insurance (NI) records up to 2003-04
  - These are what DWP use to calculate state pension entitlements
  - For 1948-75, data contains the number of (flat rate) NI contributions made (i.e. number of weeks worked)
  - From 1975, we have cash NI contributions made – used to back out annual earnings between the LEL and the UEL
- Linked data is crucial – allows matching of state pension entitlement, lifetime earnings and people's characteristics (including partner information)

# Sample

- We focus on the 1930s cohort
  - All over the SPA by 2004-05, so no need to make assumptions about future activity
- ELSA sample contains 3,627 individuals born in the 1930s
  - We condition on survival to 2002-03
- 68% of ELSA respondents in this age range successfully matched to their NI records
- We focus on the employed, complete households, and those seen with positive earnings
- Our final sample consists of 1,296 individuals
  - 709 men, 587 women
  - 93% in couples



# Methodology

- We compare lifetime contributions with lifetime benefits to get measures of redistribution
- Focus on the *distribution* of contributions/spending
- Therefore normalise total spending (and contributions) for the cohort to be equal under all systems
- **Lifetime earnings:**
  - We use the NI data to estimate lifetime earnings

$$LTearn = \sum_{t=year16}^{yearSPA-1} \delta^{2014-t} Y_t$$

- Discount rate of 2% (long-run growth rate of UK average earnings)

## Methodology: Lifetime contributions

- **National Insurance Contributions:**

$$LTNIC_i = \sum_{t=year16}^{yearSPA-1} \delta^{2014-t} (y_{it1}\tau_{t1} + y_{it2}\tau_{t2} + y_{it3}\tau_{t3})$$

- Different tax rates on income between different thresholds
- $\tau_2 > \tau_3 > \tau_1$

- **Proportional tax:**

$$LTC_i = \sum_{t=year16}^{yearSPA-1} \delta^{2014-t} \tau Y_{it}$$

## Methodology: Lifetime state pension benefits

$$LTSP_i = \sum_{t=yearSPA}^{yearDeath_i} \delta^{2014-t} P_t$$

- We calculate the expected value of state pension entitlement, conditional on reaching the state pension age
- We assign life expectancy based on cohort, sex and socioeconomic classification

# Methodology: Redistribution indicators

## 1. Fraction of spending that represents interpersonal transfers

a) 
$$INTER = \sum_i (LTSP_i - LTC_i | LTSP_i - LTC_i > 0)$$

b) 
$$PROPORTION\_INTER = \frac{INTER}{\sum_i LTSP_i}$$

## 2. Inequality of gross and net lifetime income

$$Gini(LTearn_i) - Gini(LTearn_i + LTSP_i - LTC_i)$$

## 3. Benefit-contribution ratios

$$Benefit\_Contribution\_ratio = \frac{LTSP_i}{LTC_i}$$

## Results: Inequality in earnings & state pension

Gini coefficient (1= perfect inequality, 0 = perfect equality)	Men	Women	All	All (pooled)
Lifetime earnings	0.28	0.49	0.47	0.26
Annual state pension income	0.13	0.30	0.30	-
Lifetime state pension income, assuming sex-specific SPA, sex- and social-class-specific life expectancies	0.15	0.26	0.24	0.14

# Results: Redistribution indicators

	Individual
<b>Percentage <i>interpersonal</i> redistribution</b>	20.0%

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<b>Percentage <i>interpersonal</i> redistribution</b>	20.0%
<b>Gini coefficient</b>	
<b>Gross lifetime earnings</b>	0.47
<b>Net lifetime earnings</b>	0.43
<b><i>Difference</i></b>	-0.03

## Results: Redistribution indicators

	Individual	Pooled
<b>Percentage <i>interpersonal</i> redistribution</b>	20.0%	13.7%
<b>Gini coefficient</b>		
<b>Gross lifetime earnings</b>	0.47	0.26
<b>Net lifetime earnings</b>	0.43	0.25
<b><i>Difference</i></b>	-0.03	-0.02



## Results: benefit-contribution ratios

<b>Group benefit-contribution ratios</b>	<b>Individual</b>
<b>Men</b>	0.8
<b>Women</b>	2.0
<b><i>Quintile of lifetime earnings</i></b>	quintiles based on individual earnings
<b>Bottom</b>	5.2
<b>2<sup>nd</sup></b>	1.9
<b>3<sup>rd</sup></b>	1.1
<b>4<sup>th</sup></b>	0.9
<b>Top</b>	0.7

## Results: benefit-contribution ratios

Group benefit-contribution ratios	Individual	Pooled
<b>Men</b>	0.8	-
<b>Women</b>	2.0	-
<b><i>Quintile of lifetime earnings</i></b>	quintiles based on individual earnings	quintiles based on pooled earnings
<b>Bottom</b>	5.2	1.4
<b>2<sup>nd</sup></b>	1.9	1.2
<b>3<sup>rd</sup></b>	1.1	1.1
<b>4<sup>th</sup></b>	0.9	1.1
<b>Top</b>	0.7	0.7

# Alternative state pension systems

- We use their contribution histories to simulate entitlement under alternative rules
  1. 'Earnings related' system
    - Two-tier
    - Earnings-related component replaces 25% of 'best' years of earnings
    - State Pension Age of 60 for women, 65 for men
  2. Flat-rate system
    - Only one tier
    - Entitlement individual-based
    - Equal state pension age (65) for men and women

## Results: Redistribution – individual and pooled

	Flat-rate pension	Earnings-related pension	Realised system
<b>Percentage <i>interpersonal</i> redistribution</b>			
Individual level			20.0%
Pooled			13.7%
<b>Gini net earnings less gini gross earnings</b>			
Individual level			-0.03
Pooled			-0.02

## Results: Redistribution – individual and pooled

	Flat-rate pension	Earnings-related pension	Realised system
<b>Percentage <i>interpersonal</i> redistribution</b>			
Individual level	32.8%	19.5%	20.0%
Pooled			13.7%
<b>Gini net earnings less gini gross earnings</b>			
Individual level			-0.03
Pooled			-0.02

## Results: Redistribution – individual and pooled

	Flat-rate pension	Earnings-related pension	Realised system
<b>Percentage <i>interpersonal</i> redistribution</b>			
Individual level	32.8%	19.5%	20.0%
Pooled	16.5%	13.6%	13.7%
<b>Gini net earnings less gini gross earnings</b>			
Individual level			-0.03
Pooled			-0.02

## Results: Redistribution – individual and pooled

	Flat-rate pension	Earnings-related pension	Realised system
<b>Percentage <i>interpersonal</i> redistribution</b>			
Individual level	32.8%	19.5%	20.0%
Pooled	16.5%	13.6%	13.7%
<b>Gini net earnings less gini gross earnings</b>			
Individual level	-0.07	-0.03	-0.03
Pooled	-0.03	-0.02	-0.02

## Results: Group benefit-contribution ratios under alternative systems

		<b>Flat-rate pension</b>	<b>Earnings- related pension</b>	<b>Realised system</b>
<b>Individual level benefit- contribution ratios</b>	Men	0.7	0.8	0.8
	Women	2.7	2.0	2.0
<b>Pooled B-C ratios by quintiles of pooled lifetime earnings</b>	Bottom	1.7	1.4	1.4
	2 <sup>nd</sup>	1.3	1.2	1.2
	3 <sup>rd</sup>	1.2	1.1	1.1
	4 <sup>th</sup>	1.0	1.1	1.1
	Top	0.6	0.7	0.7



# Summary

- The UK state pension system redistributes between people and over their lifetimes (seems to be more emphasis on the latter)
- Redistribution *between* people happens from men to women, and from high to low earners
- Reforms in the UK towards a flat-rate pension and away from earnings-replacement will increase emphasis on redistribution *between people*
- Though both of these results are sensitive to household pooling assumptions
- **Further work:**
  - More data/later cohorts
  - Trends in matching and women's labour market outcomes and state pension entitlement

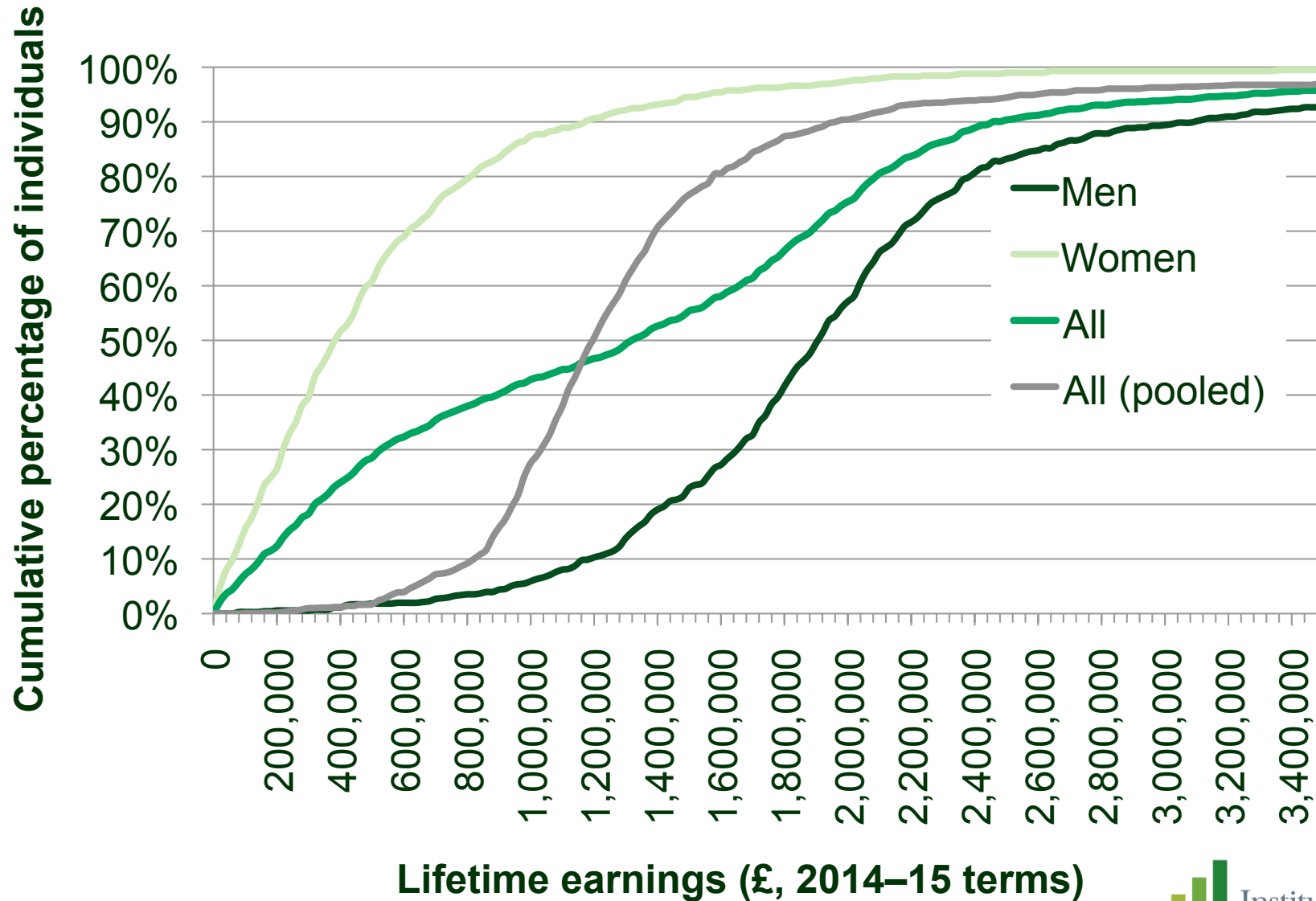


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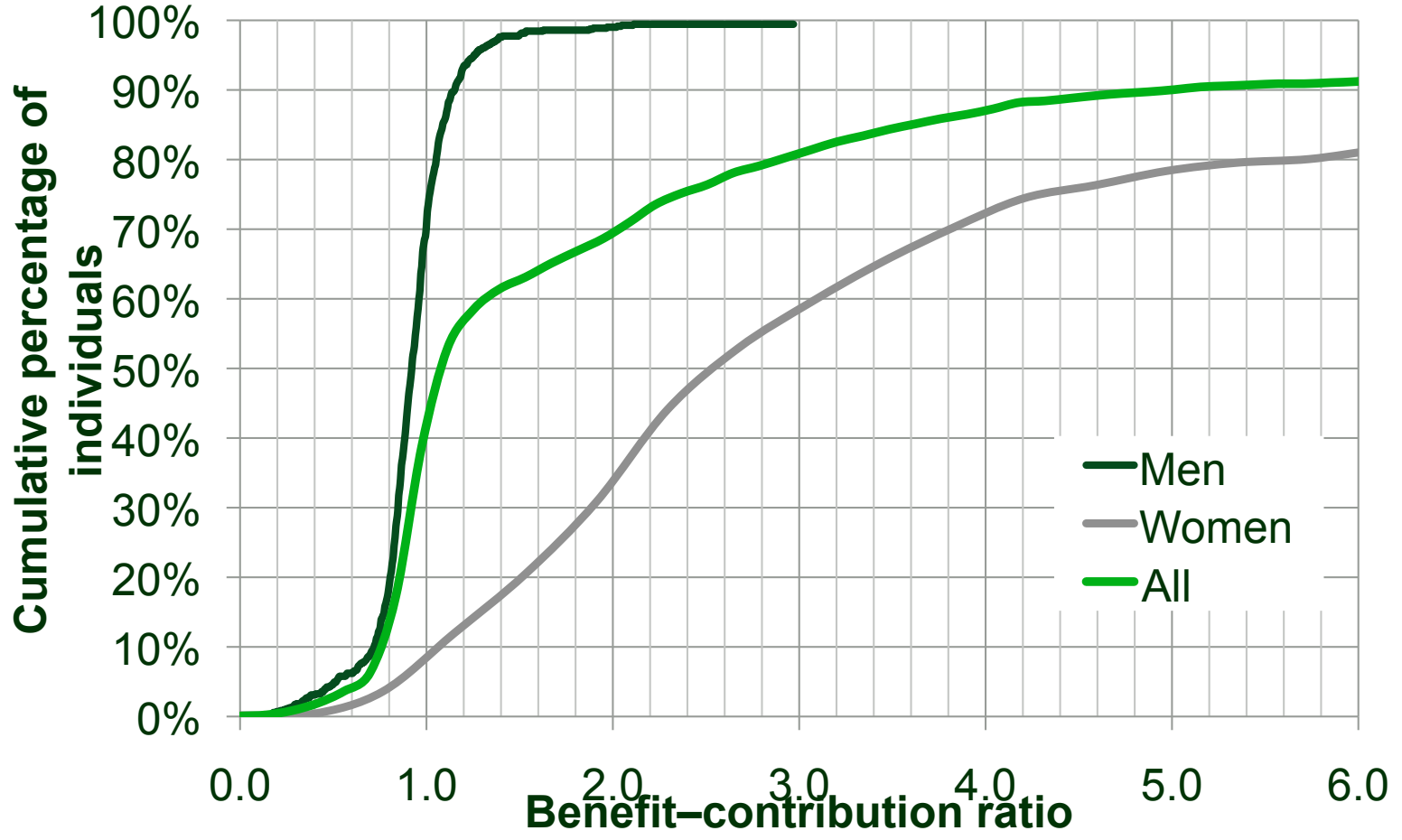
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# Results: Distribution of lifetime earnings



# Results: Benefit-contribution ratios



## Results: Pooling assumption

- Comparing positions in the individual earnings distribution and positions in the distribution of pooled lifetime earnings:

	<b>Of which: % in quintile of pooled earnings distribution:</b>					N
	Lowest earnings	2	3	4	Highest earnings	
<b>Individual earnings quintile:</b>						
Lowest earnings	30	27	21	10	13	260
Quintile 2	26	19	22	22	10	259
Quintile 3	37	18	13	18	14	259
Quintile 4	7	34	24	21	14	259
Highest earnings	0	1	20	29	49	259

## Results: Group benefit-contribution ratios under alternative systems

		Flat-rate pension	Earnings-related pension	Realised system
<b>Individual level benefit-contribution ratios</b>	Men	0.7	0.8	0.8
	Women	2.7	2.0	2.0
<b>Individual level B-C ratios by quintiles of individual-level lifetime earnings</b>	Bottom	8.7	4.5	5.2
	2 <sup>nd</sup>	2.8	1.9	1.9
	3 <sup>rd</sup>	1.1	1.2	1.1
	4 <sup>th</sup>	0.8	1.0	0.9
	Top	0.4	0.6	0.7
<b>Pooled B-C ratios by quintiles of pooled lifetime earnings</b>	Bottom	1.7	1.4	1.4
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	Top	0.6	0.7	0.7