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The dynamics of social assistance receipt: measurement and modelling issues, with an application to Britain

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The background: a commission

"[t]o prepare a paper on the Dynamics of Receipt of Social Assistance Benefits in the United Kingdom. The analysis is to be based on panel data for the UK. One purpose of the paper is to serve as a basis for similar, but independent, studies for other countries. It is expected that this objective will be taken into account in setting out the modelling approach and discussing conceptual and data-related issues."

Report (70 pp.) available soon as a Working Paper from OECD, ISER, IZA

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Outline of this talk

- Focus on the substantive results for GB, with
- some discussion of definitional issues
- hardly any discussion of implications for applications to other countries
- no discussion at all of various econometric issues

- British Household Panel Survey, waves 1–15 (survey years 1991–2005)
- Individuals in families with all adults of 'working age'
  - family dropped if any adult aged < 25 or > 59 years or any adult who is a full-time student
  - About 72,400 person-year observations for almost 9,000 adults

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Why analyze the *dynamics* of SA receipt rather than the proportion receiving at a point in time?

- The former is a means to the latter, and of intrinsic interest
- Aim to increase understanding by examining the component processes (exits and entries), each of which may have different determinants

\# of persons receiving SA this year =

> \# persons receiving SA last year

+ \# starting receipt (SA entries)

– \# ending receipt (SA exits)

In a 'steady state' (\# entries = \# exits):

$$\text{Proportion receiving SA} = \frac{\text{entry rate}}{\text{entry rate} + \text{exit rate}}$$

Proportion receiving increases if exit rate falls and/or entry rate rises

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How to define 'SA receipt'?

What are …

1. the income sources included in 'SA'?
2. the benefit-receiving unit?
3. the time period over which SA is received?

- Definitions not always clear cut even when defined with reference to the administration of the benefit system

- Definitions need modification anyway when applied to the datasets available, and/or to take account of changes in the system over time

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1. the income sources included in 'SA'

- Classic definition: *social assistance* = cash benefits paid to raise incomes to some minimum income level
  - Means-tested income maintenance, to be contrasted with income replacement provided by *social insurance* benefits (with receipt subject to having a suitable contribution record)

The principal social assistance benefits in the UK today	
Benefit	**Eligibility conditions (main)**
Income Support (IS)	Income less than a specified minimum level, and unavailable for full-time work (e.g. lone parent, registered sick or disabled, caring for someone who's sick or elderly)
Job Seekers Allowance (JSA) (income based)	Income less than a specified minimum level, and unemployed but able to work and available to work
Housing Benefit (HB)	Income less than a specified minimum level, and needing financial help to pay all or part of one's housing costs
Council Tax Benefit (CTB)	Income less than a specified minimum level, and needing financial help to pay all or part of one's Council Tax bill
Notes: Income Support was introduced in 1988 (its predecessor was called Supplementary Benefit). Housing Benefit was introduced in 1983 and Council Tax Benefit in 1993. Job Seekers Allowance was introduced in 1996. See the main text for discussion.	

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Complications in definition of 'SA'

- Should tax credits be included?
  - Working Families Tax Credit (WFTC) introduced in October 1999 (replacing Family Credit); became Working Tax Credit 2003 and extended eligibility to single adults
  - Contribution record not required (but requires at least one adult working 16+ hrs p.w.); eligibility depends on income being below a minimum level
- So define SA in terms of benefits for those not in work?
  - HB/CTB are means-tested but don't depend on employment status, so exclude from definition of SA (as we do)?
  - But perhaps there are merits to the classic definition especially in a cross-national comparative context?
  - In any case, overlap between IS/JSA and HB/CTB populations is large, so whether HB/CTB included of little practical importance?

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Complications in definition of 'SA' (ctd.)

Before 1996:

- unemployed individuals with appropriate NI contribution record could claim Unemployment Benefit (UB) when unemployed; flat-rate benefit; not means-tested …

- but if family income less than social minimum, could claim means-tested Income Support (IS)

1996 onwards:

- Job Seekers Allowance (JSA) aimed to unify benefits for unemployed people seeking work:
  - Contribution-based JSA for those with NI records
  - Income-based JSA replaced IS

- But severe practical problems, especially in surveys, of distinguishing receipt of the two types of JSA (and most claimants get both)

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Definition of 'SA' used in analysis

Receipt of IS, with or without receipt of UB or JSA (depending on survey year), or UB/JSA without IS receipt

but not including

- Means-tested housing benefits (HB or CTB)

- Tax credits (FC / WFTC / TC)

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2. the unit of receipt of SA

- Assessment of eligibility for benefits is based on the income of the 'benefit unit' (BU) = nuclear family
  - BU = a single person or a couple living together with or without dependent children (dependent child is aged less than 16 years, or more than 16 years but under 19 years and unmarried, in full-time non-advanced education and living with his/her parents)

- One person in a BU is the *claimant* but effectively all persons in a BU are *recipients*

- But one can't follow BUs consistently over time – families form and dissolve

$\Rightarrow$ follow individual adults over time, and count one as a recipient at t if anyone in his/her BU was receiving at t

3. the time period over which SA received

- Spells may start/end on any day, though for spells in progress, payments are made fortnightly

- In any given calendar year, an individual may have no receipt, a single spell of receipt, or multiple spells of receipt, and any of these spells may overlap calendar years

- With household panel survey data, modelling *spells* (possibly multiple) raises challenging issues

  – measurement errors in recall between interviews

  – 'seam' effects in respondent's reports for overlapping periods

$\Rightarrow$ we focus on whether receiving at the time of the annual interview for year t (as done in a number of studies of unemployment)

$\Rightarrow$ 'entry' to SA: not receiving at t–1 but receiving at t

$\Rightarrow$ 'exit' from SA: receiving at t–1 but not receiving at t

$\Rightarrow$ miss short spells

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Figure 1. Trends in receipt of SA, SAHA, and TC: all adults
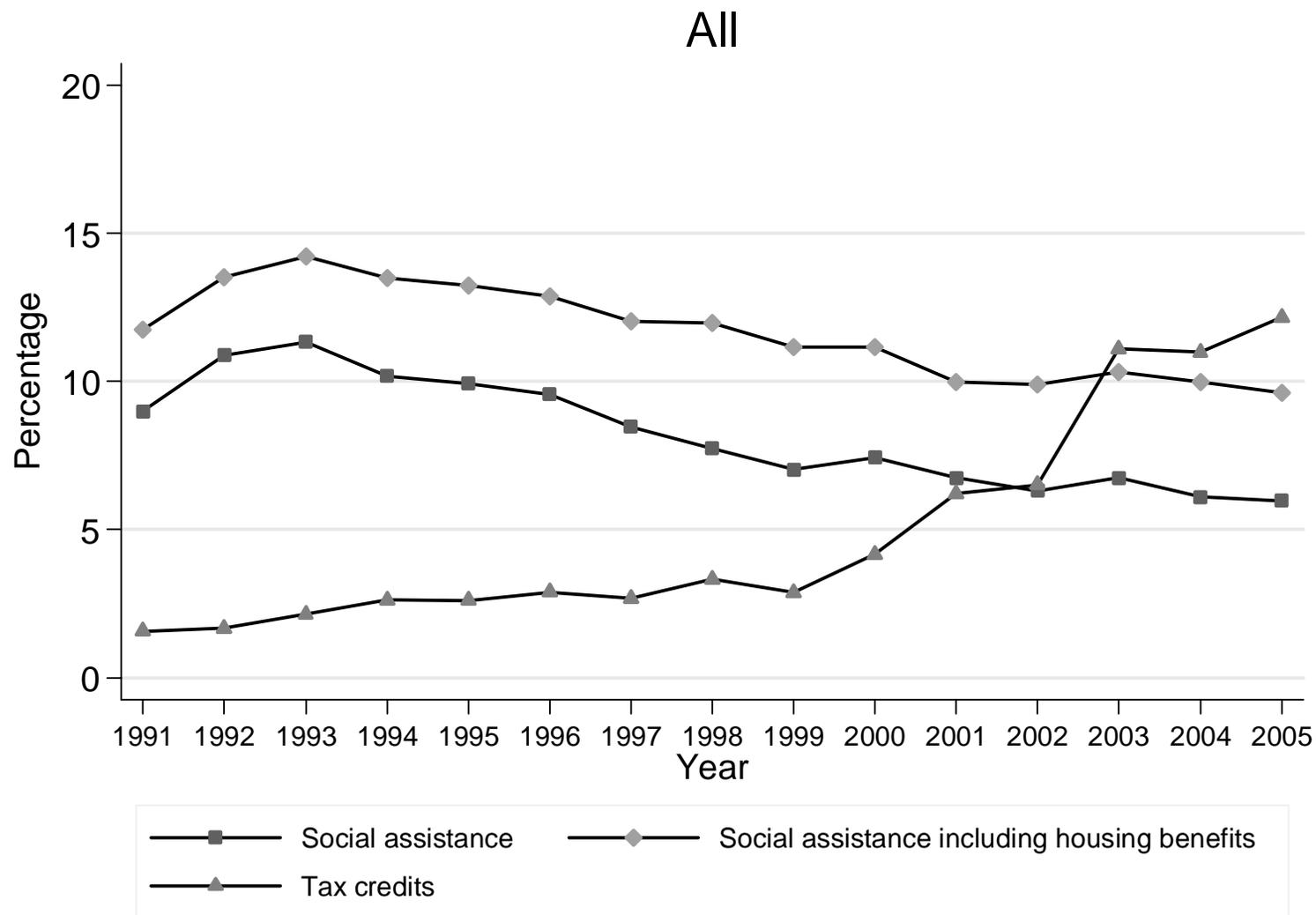
All

Legend:
- Social assistance
- Social assistance including housing benefits
- Tax credits

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Receipt rates (%): families with children

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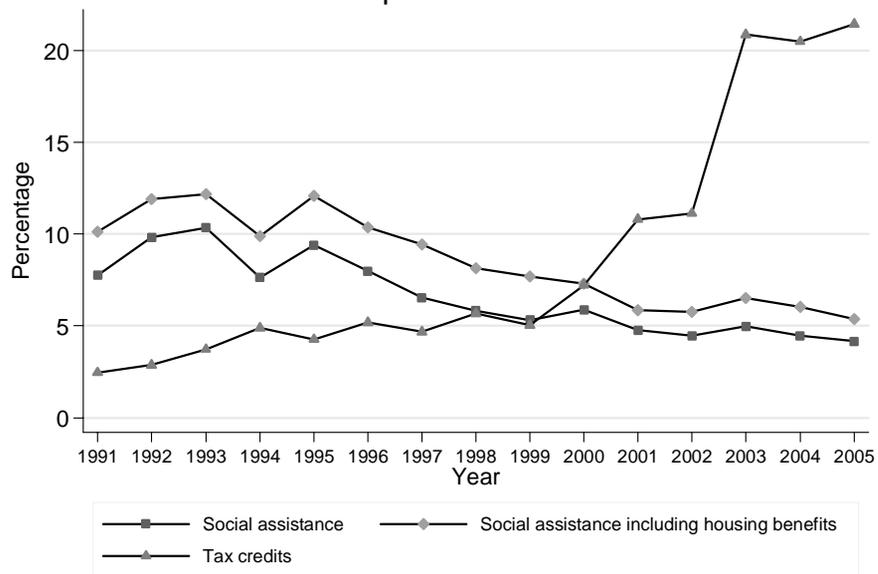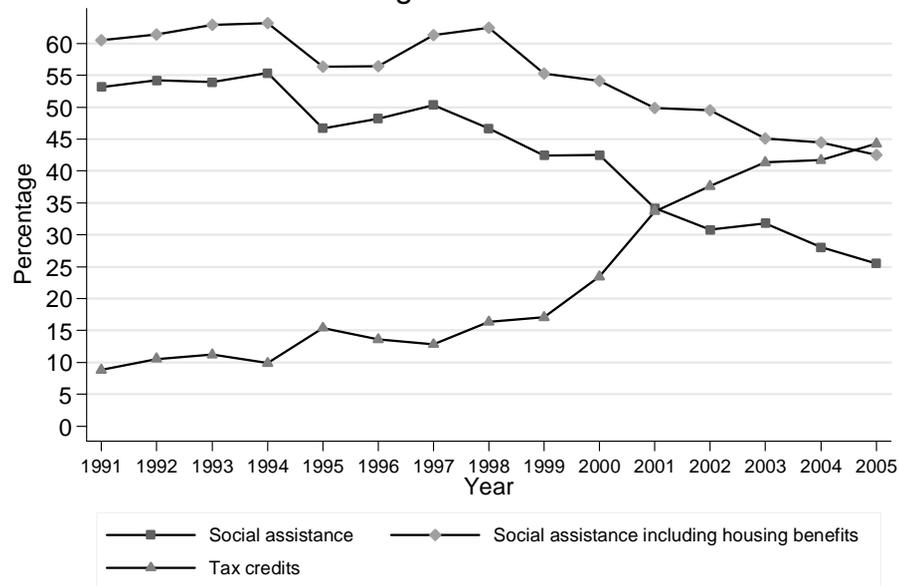
Receipt rates (%): families without children

Couples without children
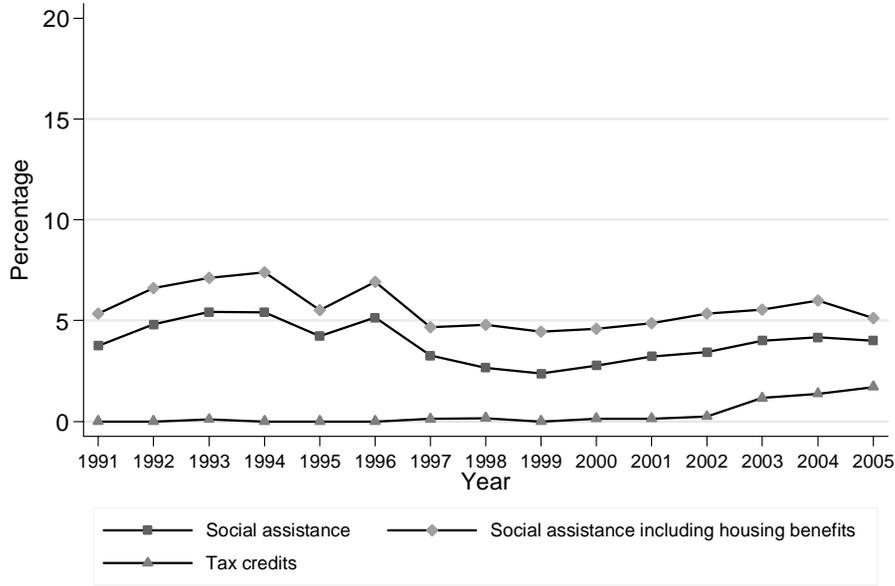
Single
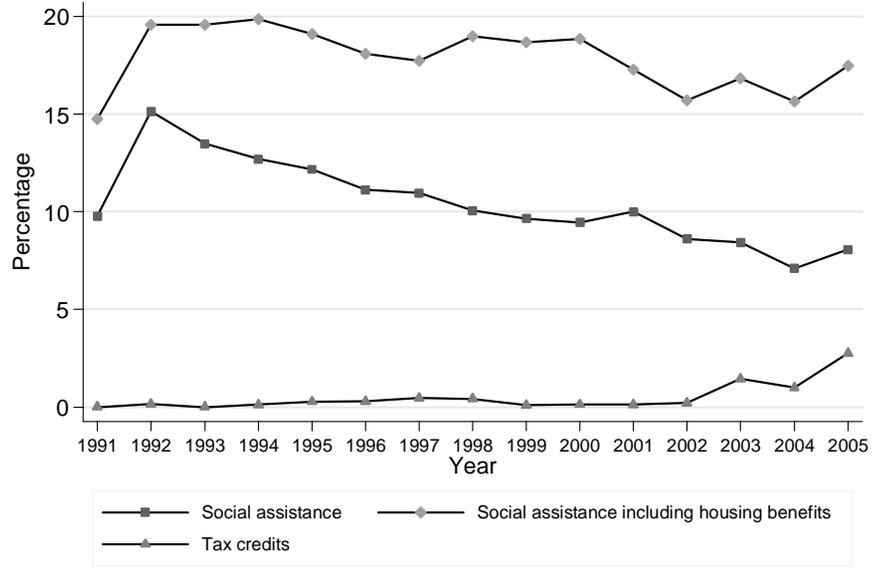
Annual SA entry and exit rates (%), all adults
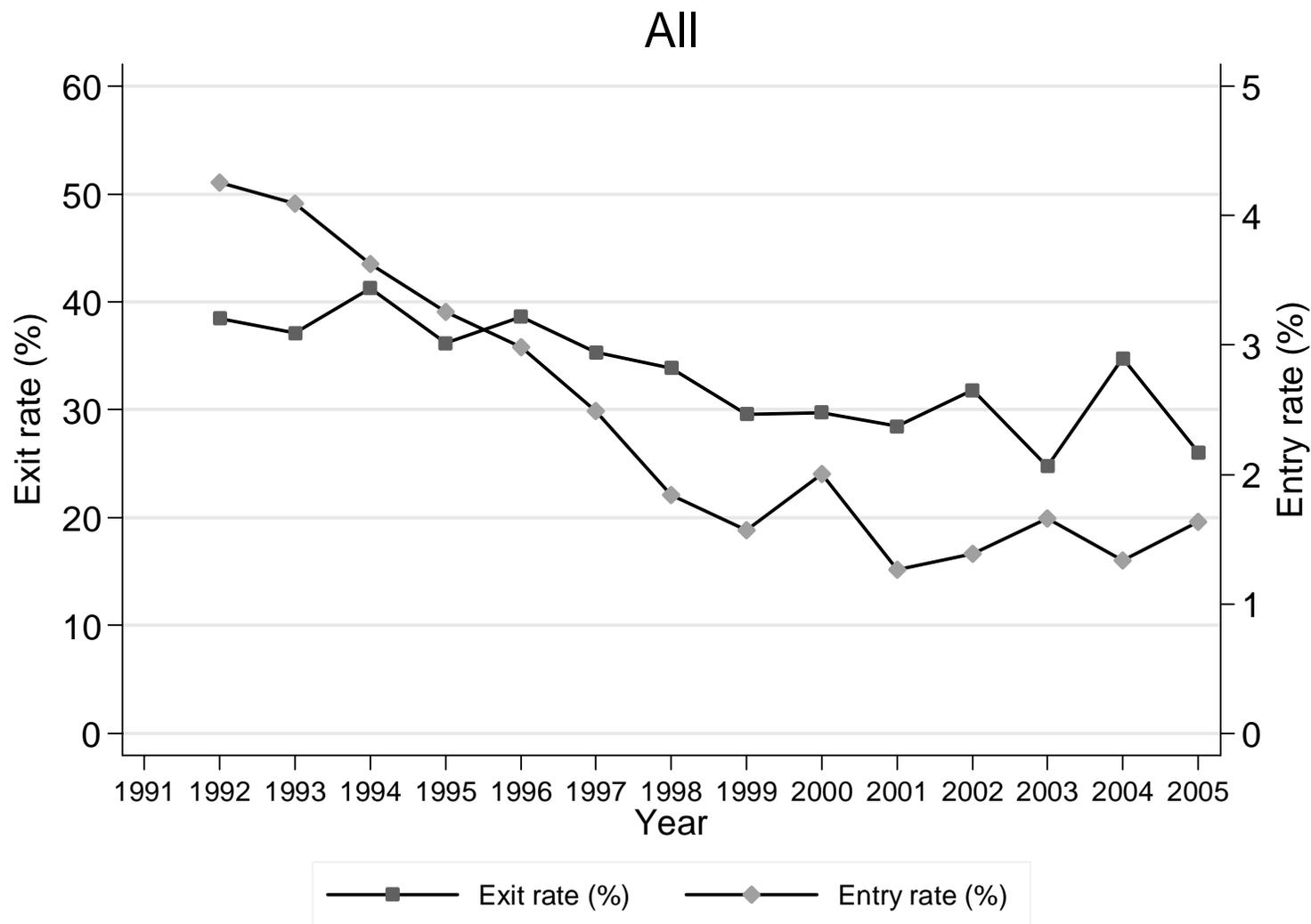
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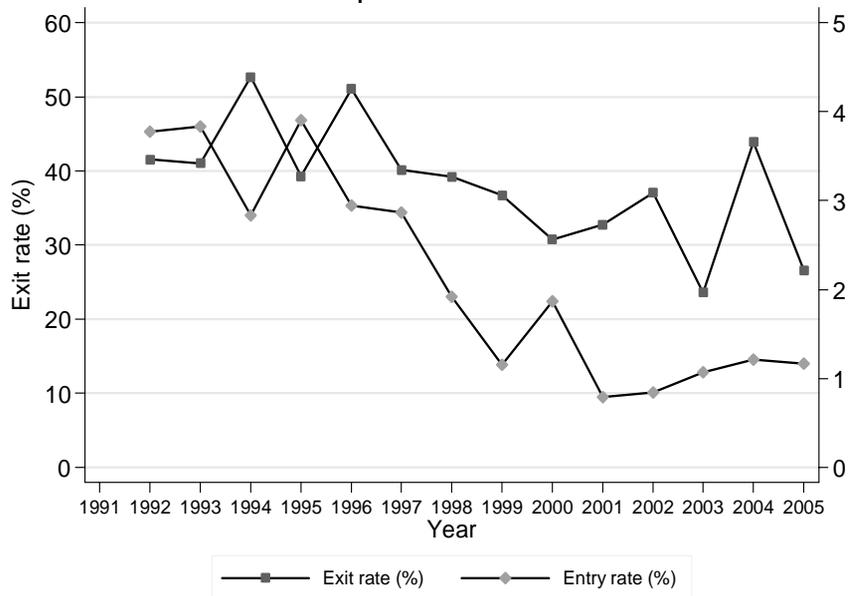
SA exit and entry rates (%): families with children
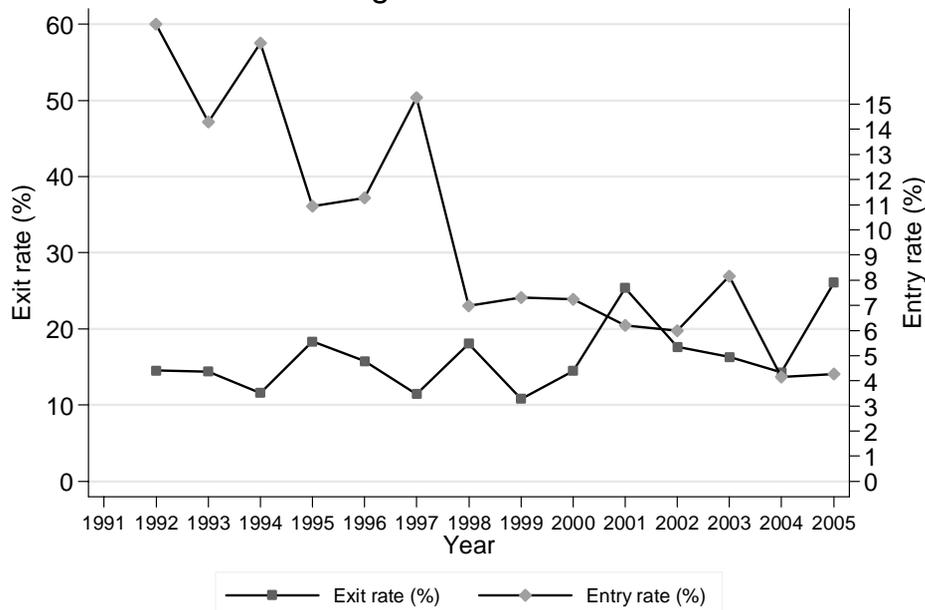
SA exit and entry rates (%): families without children
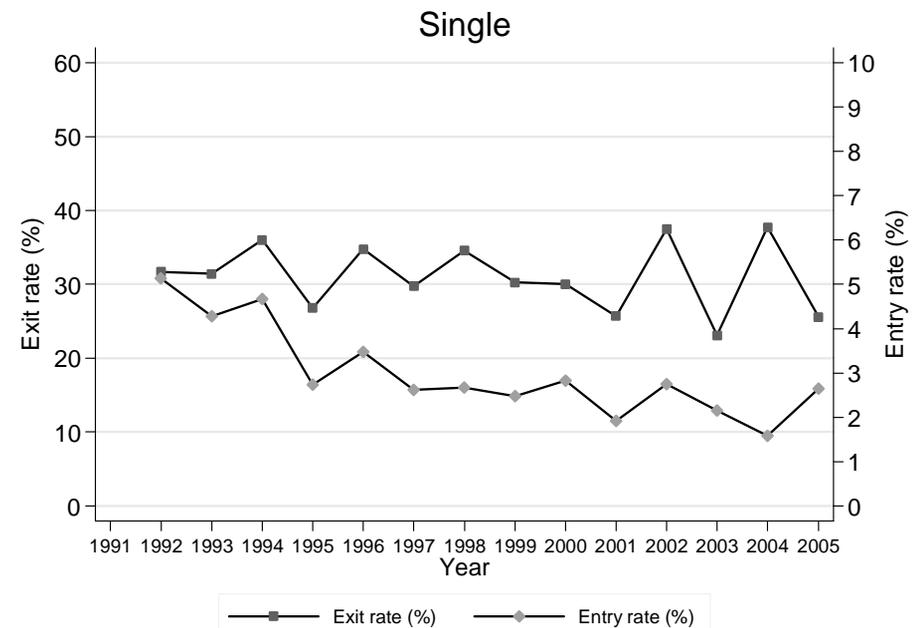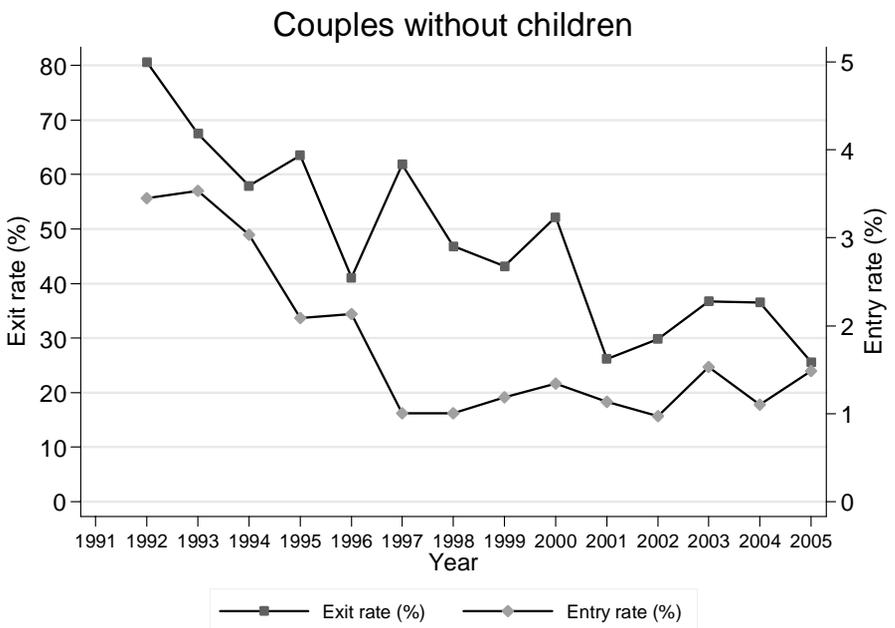
Summary: overall SA entry and exit rates

- Decline over the whole period 1991–2005 in entry rates and in exit rates (except for lone parents)
  - decline in cross-sectional SA receipt rate driven by entry rate decline
- Decline in entry rates levelled off at end of 1990s
  - does this reflect policy changes such as WFTC introduction?

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Statistical models for SA receipt

See paper for comparison of three model types:

1. 'basic' transition model
   – Pr(transition) = f(covariates)

2. endogenous switching probit regression models
   – Effects of covariates on Pr(receipt at t) depend on whether received SA at t–1
   – cf. Cappellari & Jenkins (*JAE* 2004; *JRSSC* 2008)

3. dynamic random effects probit regression models
   – Pr(receipt at t) depends on whether received SA at t–1, and other covariates
   – cf. Andrén (2007), Hansen & Lofstrom (2006), and Hansen, Lofstrom & Zhang (2006) in applications to SA dynamics, and many others to the dynamics of (un)employment

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Dynamic random effects probit regression model

$$p*_{it} = \lambda y_{it-1} + \gamma' Z_{it} + \xi' \overline{Z}_i + u_i + \zeta_{it}$$

The underlying chances of individual i at time t receiving SA ($p*_{it}$) depend on

- whether receiving last period ($y_{t-1} = 1$ if receipt; 0 if not)

- a set of explanatory variables (Z_{it})

- a set of time-averaged explanatory variables to capture persistent 'fixed' individual factors ($\overline{Z}_i$)

- an unobserved fixed individual factor (u_i)

- idiosyncratic random chance (ζ_{it})

Expressions for the SA exit rate (or persistence rate = one minus exit rate) and the SA entry rate are implied by the model

 – A positive coefficient (γ_k) on an observed variable (Z_{itk}) is associated with an increase in both the exit rate and entry rate

 – The more positive that λ is, the lower is the exit rate, i.e. the higher the persistence rate (but the entry rate does not depend on λ)

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Explanatory variables

- Individual-level (respondent and spouse, if present)
  - Age, sex, educational qualifications, whether has health problems
- BU level
  - \# kids, and whether age of youngest kid < 5
  - BU type (couple, single adult, lone parent)
  - whether lives in London
  - housing tenure (if lived in owned accommodation rather than rented)
  - unemployment rate in the adult's travel-to-work area at the time of the interview
- Time-averaged versions of the above
- Calendar time
  - survey year dummies allowing Pr(receipt), and transition rates, to vary over time, and also allowing the effect associated with past receipt (λ) to vary with time
- Some interaction effects, particularly with lone parent status

Explaining the trends in aggregate SA exit and entry rates

- Changes in the 'processes' over time
  - characterised by changes in model *parameters* with calendar time
  - examined via model parameter estimates
- Changes over time in the nature of the populations 'at risk' of exit and entry
  - characterised via changes in the distributions of the explanatory variables
  - examined via descriptive statistics …

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Trends in explanatory variables, 1991–2005

Among non-recipients (at risk of entry to SA)

- fall in % with no/low educational qualifications
- fall in local area unemployment rates
  - both trends would contribute to lowering the entry rate (as observed)

Among recipients (at risk of exit from SA)

- fall in % with no/low educational qualifications
- fall in local area unemployment rates
  - these trends would contribute to raising the exit rate
- small rise in average age
- rise in % with health problems
- decline in % living in owner-occupied housing (more renters)
  - the latter trend in particular would contribute to lowering the exit rate (as observed)

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A sample of estimates
(Model 4, Table 7)

Pr(receives SA at t)	Est. Coeff.	
Received SA at $t-1$	0.9922 ***	λ
Received SA at $t-1$ and survey year is 1998–2005	0.4789 ***	
Received SA at $t-1$ and BU is lone parent at t	0.4827 ***	
Received SA at $t-1$, BU is lone parent at t, and survey year is 1998–2005	–0.3717 ***	
Age (years)	–0.0025	
Female	–0.0963 ***	
Has health problem(s)	0.0592	
Educational qualifications		z_{it}
O-level(s), CSE, etc.	–0.2966 ***	
A-level(s) or higher	–0.5081 ***	
Missing	–1.1902 ***	
Spouse's age (years)	0.0023	
Spouse: no educational qualifications	0.6495 ***	
Spouse has O-level(s), CSE, etc.	0.6245 ***	
Spouse has A-level(s) or higher	0.4511 ***	
Spouse's missing educational qualifications	0.0328	
Number of children in BU = 1	0.0079	
Number of children in BU = 2	0.0286	
Number of children in BU = 3 or more	0.1072	
Age of youngest child < 5	0.2962 ***	
BU type: lone parent	0.6006 ***	
BU type: couple	–0.7251 ***	
House tenure: owned	–0.1972 ***	
Lives in London (inner or outer)	0.3173 **	
Unemployment rate in TTWA (%)	0.0353 ***	
Time-averaged characteristics		
Has health problem(s)	0.3062 ***	$\bar{z}_i$
Spouse: no educational qualifications	–0.1510	
Spouse has O-level(s), CSE, etc	–0.3996 **	
Spouse has A-level(s) or higher	–0.3228 *	
Spouse's missing educational qualifications	–0.3167	
BU type: couple	0.0955	
BU type: lone parent	0.3360 **	
Number of children in BU = 1	–0.0080	
Number of children in BU = 2	–0.0340	
Number of children in BU = 3 or more	0.3560 ***	
Age of youngest child < 5	–0.0898	
House tenure: owned	–0.8072 ***	
Lives in London (inner or outer)	–0.3314 **	
Unemployment rate in TTWA (%)	0.0225 **	
Constant	–1.3882 ***	

Positive coefficient: covariate associated with higher probability of receipt

Negative coefficient: covariate associated with lower probability of receipt

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Model implications for differences in SA receipt patterns and dynamics

Predicted 'steady-state' SA transition probabilities and related statistics for different types of person

Person type	Pr(persistence) s_i	Pr(entry) e_i	Median receipt (years)	Median non-receipt (years)	Pr(receipt)
1 Base	0.65	0.34	1.60	1.66	0.49
As Base, except:					
2 Man	0.68	0.37	1.77	1.50	0.53
3 Has health problems	0.75	0.45	2.40	1.15	0.64
4 Respondent has A-level(s) or higher	0.49	0.21	0.97	2.98	0.29
5 Respondent and spouse have A-level(s) or higher	0.26	0.08	0.52	8.69	0.09
6 Youngest child < 5	0.59	0.28	1.29	2.09	0.41
7 Has 3+ children	0.72	0.42	2.11	1.28	0.60
8 Non-owner	0.88	0.65	5.47	0.66	0.85
9 Lives in London	0.64	0.34	1.57	1.69	0.49
10 Local unemployment rate = 3%	0.54	0.25	1.13	2.45	0.35
11 Survey year after 1998	0.73	0.29	2.24	2.00	0.52
12 Survey year after 1998, local unemployment rate = 3%	0.64	0.21	1.53	3.01	0.36
13 Lone mother	0.94	0.64	10.85	0.67	0.91
14 Lone mother and non-owner	0.99	0.88	71.29	0.33	0.99
15 Lone mother and survey year is post-1998	0.93	0.59	9.80	0.77	0.90
16 Lone mother, survey year is post-1998, local unemployment rate = 3%	0.89	0.48	5.80	1.05	0.81
17 Favourable characteristics	0.22	0.06	0.46	11.09	0.07

Predictions derived from model (4) estimates shown in Table 7. For the formulae used to generate the predictions, see main text. Base case refers to a 40 year old woman, living outside London in an area with unemployment rate of 9%, with one child aged under 5 years, married (spouse aged 40), no health problems, no educational qualifications (self and spouse), owner-occupier, survey year is before 1998. 'Favourable characteristics' case is as Base Case, except high educational qualifications for respondent and spouse, local unemployment rate is 3%, and age of youngest child is over 5 years.

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Conclusions: substantive findings for GB

- Decline over the last 15 years in the SA annual entry rate (from above 4% to below 2%), combined with rise in the average SA annual persistence rate from around 60% to nearly 75% (= decline in the annual exit rate from around 40% to nearly 25%)

- Decline in entry rate driving the fall in point-in-time receipt rate since the early 1990s (from over 10% to nearly 5%)

- Trends partly driven by changes in the nature of the populations 'at risk', e.g.
  - Factors such as secular rise in educational qualifications, and the decline in unemployment rates, associated with lower entry rate
  - Growing concentration of individuals living in social housing among SA recipients associated with declining SA exit rates

- Some pure calendar time effects (pre-1998 vs. 1998 on)
  - distinct trend for lone parents (lower Pr(receipt) from 1998)
  - but results overall leave a puzzle since main policy change (WFTC) was introduced Oct 1999

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Conclusions: some lessons for studies elsewhere

- The definition of social assistance benefit receipt is not straightforward, with the choice depending on
  - country-specific factors – the structure of the social security benefit system and how it has changed over time
  - data sources available (what is possible with household panel surveys differs from what is possible with data sets built from benefit administration records)
- The issues of most interest and/or feasible to study are country- and data-specific
  - cf. focus on time trends here, but not differences between e.g. immigrants and non-immigrants, or by ethnic group
- Evaluations of specific policies require different type of study
- Caution urged regarding causal interpretation of associations found
  - NB potential feedback effects: not only may a number of demographic and other characteristics such as housing tenure determine outcomes such as SA receipt, but past receipt may also contribute to the determination of those characteristics

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