Evolving interrelations in demographic processes and the Great Recession: continuous evolution or seismic shift?

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The Great Recession has had a dramatic effects on many transitions in the United Kingdom, primarily a depression in employment and delays in leaving full time education as young people extend educational enrolment in the face of labour market uncertainty. Demographic responses have also been observed, through depressed fertility behaviour at an aggregate level via depressed partnership formation and elevated union dissolution. That said, it is unclear whether the recession had no only affected the rate of transition, but also the association between them. This paper therefore models the evolving interrelationship between five major transitions- leaving full-time education, employment, independent housing, forming coresidential relationships and having a child. Data are from the UK-HLS, a nationally representative sample survey, to make cross cohort and pre-post-recession comparisons. Preliminary results indicate an increasing dichotomisation of career paths particularly in the post recession era: transitions reflect either an employment focussed or family focussed path.

Motivation

The interrelationship between demographic processes in the United Kingdom has undergone considerable evolution in recent decades. There has been a clear disassociation between marriage and fertility, with and increasing proportion of birth to non-married parents, and a greater incidence of unions (both marital and non-marital) which do not result in a child. These changes have also been reflected in other life course transitions. Increasingly there is a strong association between housing transitions and fertility behaviour, either as a marker of security in the instance of joint housing purchases (Holland 2012) or simply to find suitably spacious housing or suitable environs for child rearing (Kulu 2007). Education is a key influence on many demographic transitions, with general postponement of both marriage and fertility transitions due to increasing educational enrolment, particularly among women (Ni Bhrolchain and Beajouan 2012).

The Great Recession marked a sharp change in many of these patterns of behaviour. As well as the obvious effects of lowered employment and housing purchases, there were associated slowdowns in demographic transitions. In the UK, while aggregate fertility rates slowed only slightly in their upward trajectory, there was a decline in the overall rate of first birth among the young (Lyons-Amos and Schoon 2014)- and in particular disadvantaged groups- with fertility increases driven largely by recuperation effects at older ages. While the direct effects of the recession on these process are increasingly well understood, in the nature of the interaction or association between these processes post recession is poorly explored.

This paper will therefore explicitly focus on the effect of the recession not only on the intensity of five major transitions (having first birth, forming a coresidential union, leaving full time education, obtaining a first job and living independently) but on the correlation in the timing of these processes. In particular, we examine trends which have emerged across cohorts and represent the evolution of new processes of the transition to adulthood among younger compared to older birth cohorts, and those which have emerged after the 2008 credit crunch, and potentially represent either temporary or permanent alterations to the interrelationship of demographic processes. This allows us to address the research question: is the recession is responsible for changing the nature of the interrelation between demographic processes? Or has merely influenced the rate of a series of interrelated events, the fundamental structure of which remains unaltered?

Data and Method

Data are drawn from the combined British Household Panel Survey (BHPS) and Understanding Society longitudinal data series. The BHPS is a nationally representative household based survey which captured information from 10300 individuals in 1991, who have been followed in yearly waves since, with boost samples from Wales and Scotland, and Northern Ireland added in 1999 and 2001 respectively. In 2009, the BHPS was replaced by Understanding Society, an expanded survey of 40000 households. BHPS members were invited to join Understanding Society, and entered the survey in Understanding Society Wave 2 (2010/2011). Thus, the combination of the surveys gives a large nationally representative longitudinal series of 20 years, with interval censoring occurring during 2009.

Interrelations between processes are modelled via correlated survival models. For each process (leaving full time education, obtaining employment, moving to independent housing, forming coresidential relationships and having a child) we fit a survival model as defined in equation 1. In this equation $\pi^s(t)$ represents the probability of experiencing the relevant event, *s*, at age *t*. This is

dependent on a baseline profile captured by a quadratic function, relevant controls and a dummy variable coded 0 for pre-recession intervals and 1 for post-recession.

$$probit\left(\pi^{s}(t)\right) = x(t)'\beta^{s} + \boldsymbol{\Omega}$$

Equation 1

The parameter $\boldsymbol{\Omega}$ represents the error term in the survival model, which takes a multivariate normal distribution as defined in equation 2. In this equation, the diagonal terms σ^{s} is the error term for process *s,* while the off-diagonal terms are the covariances between processes. Covariance terms are the key source of interpretation for this analysis: positive covariances are taken to indicate that transitions are likely to occur at a roughly similar age, while negative covariances unlikely to occur at a similar stage in the lifecourse.

$$\boldsymbol{\Omega} = \begin{pmatrix} \sigma^{1} & & & & \\ \sigma^{12} & \sigma^{2} & & & \\ \sigma^{13} & \sigma^{23} & \sigma^{3} & & \\ \sigma^{14} & \sigma^{24} & \sigma^{34} & \sigma^{4} & \\ \sigma^{15} & \sigma^{25} & \sigma^{35} & \sigma^{45} & \sigma^{5} \end{pmatrix}$$

Equation 2

In order to establish changes in the relationship between processes, we estimate survival models stratifying the model by covariates of interest. Specifically, we estimate separate models for three birth cohorts (1980-84, 1985-89 and 1990 or more recent) to assess cross cohort changes in demographic interrelationships, and pre-/post-recession models to assess the changing relationship due to the recent economic slump where models are stratified by the covariate of interest. Models are estimated using MLwiN 2.21 for Windows via the runmlwin .ado for Stata 13 (Leckie and Charlton 2013).

Preliminary findings

This section presents preliminary findings following the modelling procedure described in the method section. At present, the analysis includes only four transitions (independent living is omitted), and stratifies only by birth cohort and the pre-/post-recession dummy variable. Future analysis will include all major transitions, as well as expanding the analysis to other variables of interests, such as sex.

Aggregate relationships

Table 1 presents the estimated covariance matrix for a model including only a baseline specification of age and age^2 and a dummy variable for recession. 95% confidence intervals are included as a test of significance. We note a number of strong and plausible associations: leaving full time education and obtaining a first job are strongly positively associated, as are forming a coresidential partnership and first birth. We also note a number of labour market and demographic correlations: finding a first job and forming a coresidential union are positively correlated indicating similar timings in labour market and partnership stability.

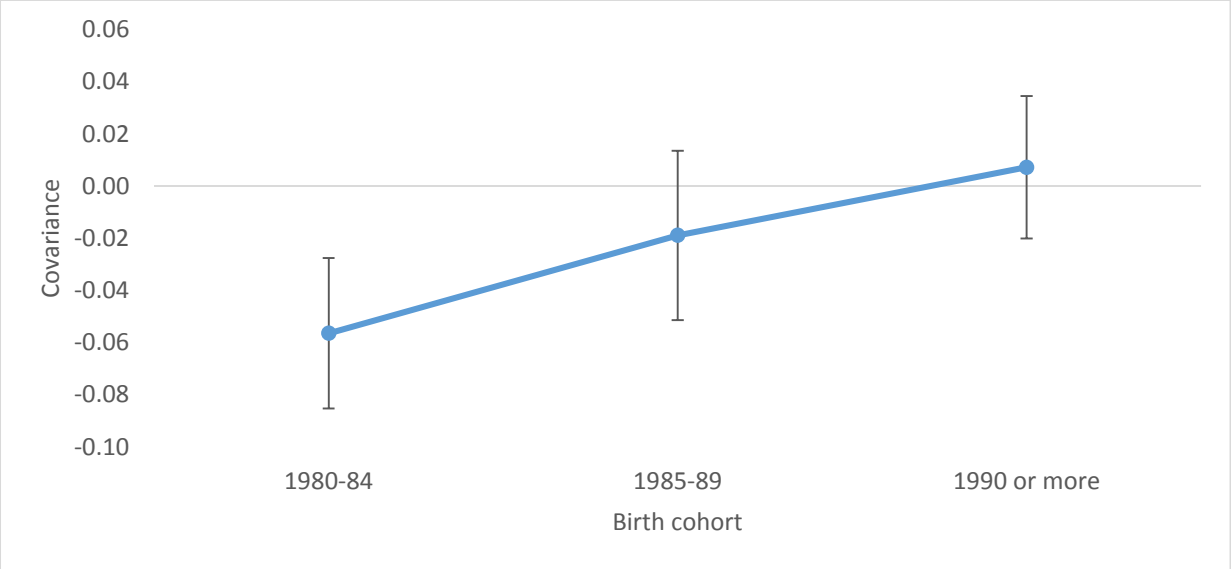
Table 1: Overall association between transition processes

	First birth (95% confidence interval)			First job (95% confidence interval)			Leaving FT education (95% confidence interval)		
First job	-0.03	(-0.05,	-0.01)						
Leaving FT education	-0.02	(-0.04,	0.00)	0.39	(0.38,	0.41)			
First coresidential union	0.24	(0.22,	0.25)	0.15	(0.13,	0.17)	-0.03	(-0.05,	-0.01)

Stratified results by cohort

Figure 2 presents the evolution of the covariance between leaving education and forming a coresidential union across three birth cohorts. The figure is presented with confidence intervals adjusted to allow pairwise comparison (non-overlap of the confidence interval indicates a significant difference). Broadly speaking, we see a collapse in the negative covariance between leaving full time education and a movement into a slight positive relationship. We conjecture that this perhaps represents an increasing specialisation in educational and demographic behaviour: the increasing rates of educational uptake in the early 20s- and particularly that which precludes union formation such as higher education- are associated with a compression of behaviour such as leaving full time education and forming first union (e.g. Ni Bhrolchain and Beaujean 2013).

Figure 2: Cross cohort evolution of association between leaving full time education and forming coresidential union for 3 birth cohorts

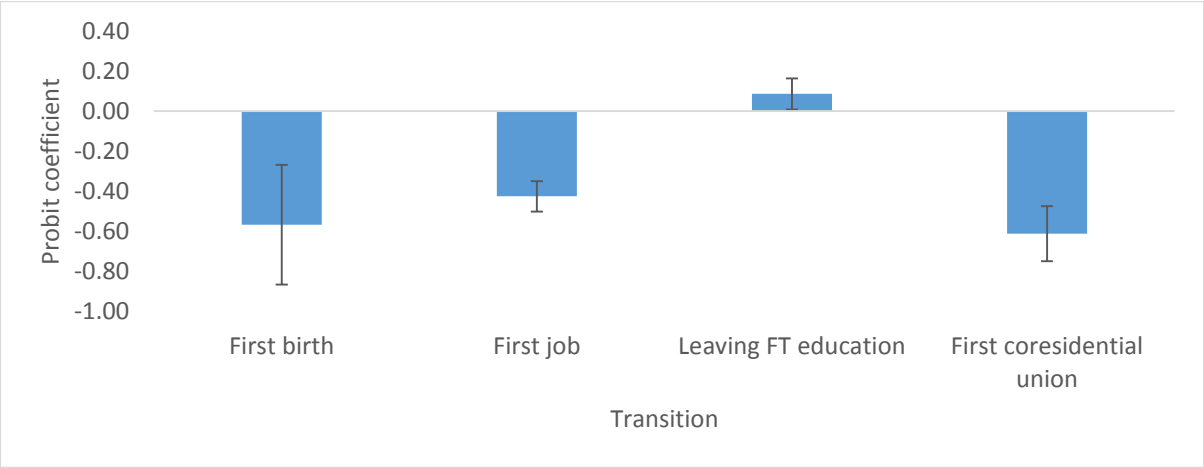


Effect of recession

The effect of the recession is captured in terms of both a direct effect (probit coefficient on the overall probability of transition) and a comparison in the estimated covariance matrices for pre- and post- recession. Figure 2 presents estimated probit coefficients, where negative values indicate a slower rate of transition in the post recession era. Of the four transitions modelled, having a first

birth, getting a first job and forming a coresidential union all have significantly negative coefficients, indicating slower transitions after the recession. Only leaving full time education has a positive coefficient, indicating that the rate of leaving full time education is more rapid post recession.

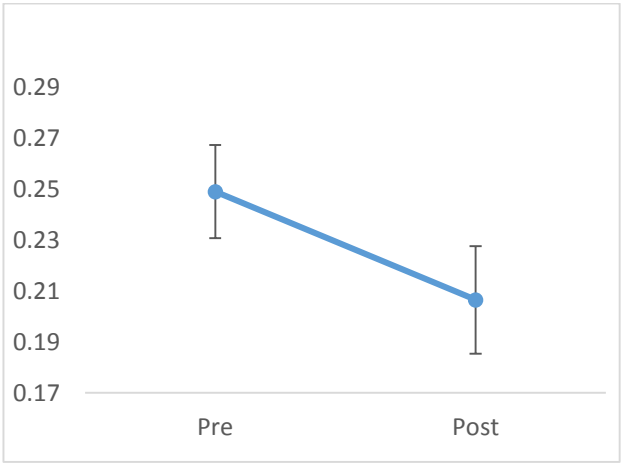
Figure 3: Estimated probit coefficients for pre-/-post recession indicator



We also not a number of changing interrelationships between demographic processes in the post recession period. Two selected relationships are presented in Figure 4. Figure 4a presents the change in the interrelationship between first birth and forming a coresidential union. In the post-recession era, we not a considerable decrease in the positive covariance between first birth and union formation. Since fertility rates fell even net of the effect of union status (Lyons-Amos and Schoon, 2014) this is likely a change in the relationship between union formation and fertility behaviour, characterised by a postponement of planned births. Moreover, we noted little change in the relationship in this association across cohorts, suggesting that this trend is driven primarily by the recession. In contrast, we note a trend in the association between leaving full time education and forming a coresidential union which mirrors that across cohorts (see figure 2). In this case we conclude that the recession did not prompt a change in the relationship between demographic processes, but rather an acceleration in an already evolving relationship.

Figure 4: Change in the covariance between pre- and post- recession period

a) First birth and forming coresidential union



b) Leaving full time education and forming coresidential union