Fertility Expectations and Residential Mobility in Britain

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Extended Abstract

It is plausible that people take into account anticipated changes in family size in choosing where to live. The objective of the paper is to estimate how expected future fertility affects residential movement in Great Britain using a mature 18-wave panel survey, the British Household Panel Study. Many previous studies of residential movement claim that the numbers of children at different ages affect returns to or costs of movement. For example, the presence of school-age children may reduce mobility by raising the cost of moving. But the impact of existing children on mobility might operate through their impact on expected future childbearing (e.g. the more children a woman has the less likely she expects more). We find evidence of a substantial positive effect of expecting to have more children on residential mobility, even after allowing for existing children and endogeneity of fertility expectations.

Estimation of the impact of anticipated events on current transitions in an event history framework is challenging. The basic model of anticipation effects takes the form: $y_{ti} = \lambda_0 d_{ti} + \sum_{j=1}^{\infty} \lambda_j \mathbf{E}_t[d_{t+j,i}] + e_{ti}$, where y_{ti} is some continuous outcome variable (possibly a latent one) for person i; d_{ti} is the 'treatment' at time t; $\{d_{t+j,i}\}$ are a sequence of future treatments; $\mathbf{E}_t$ indicates expectations based on information at time t, and e_{ti} are other influences on the outcome. This relatively generic formulation of anticipation effects is from Malani and Reif (2012).

The main problems with estimating this equation are that there are potentially an infinite number of anticipation terms and expectations about them are unobserved. The usual way to circumvent these issues is to make the 'rational expectations assumption'—that people hold objectively correct expectations given the information available—but it is not appealing. It is preferable to measure expectations directly, and there is considerable research in this area (e.g. see the survey in Manski 2004). In the paper we use measures of fertility expectations in the British Household Panel Study (BHPS).

We have a direct, albeit imperfect measure of $\sum_{j=1}^{\infty} \lambda_j \mathbf{E}_t[d_{t+j,i}]$, denoted as $E_t(d_f)_i$, which is derived from a survey question about expected future treatments: whether a couple expects to have another child or the number of children the couple expects to have at some time in the future. The main equation of interest is:

$$y_{ti}^{*} = \alpha_i + \delta E_t\left(d_f\right)_i + \pi X_{ti} + u_{ti} \qquad [1]$$

y_{ti}^{*} is a latent mobility propensity, where movement takes place when y_{ti}^{*} >0. There is also an equation for expectations:

$$E_t\left(d_f\right)_i = \mu_i + \beta Z_{ti} + \lambda d_{ti} + \epsilon_{ti} \qquad [2]$$

where $E[\alpha_i \mu_i] \neq 0$ or (and possibly also) $E[u_{ti}\varepsilon_{ti}] \neq 0$. The variables of X_{ti} may be a subset of those in Z_{ti}, but it is not necessary for identification of δ in some circumstances.

Nature of the data

The BHPS contains a variable called wLCHMOR, which records the response to the question *'Do you think you will have any (more) children?'* It is available in waves 2, 8, 12, 13 and 17. (In the same waves, there is another variable, wLCHMORN (wLCHNMOR in wave 8), which records the response to the question *'How many (more) children do you think you will have?'*). We take wLCHMOR as $E_t(d_f)_i$. It is not an ideal expectations variable as it does not specify when the children are expected to arrive, nor does it allow for uncertainty of responses, say by indicating the chances of having another child. Some key features of the data follow:

1. In these waves, there are 569 women (aged under 45) who were observed both with at least one year in which they moved and one year in which they did not. Among this group, there were 460 who moved once, 101 who moved twice and 8 who moved three times. These women contribute 2017 person-year observations in total. They constitute the sample for fixed effect estimation in the next section.
2. Overall, there are 748 moves, 608 moving once, 121 twice and 19 three times, among 2700 women contributing 6493 observations. They constitute the sample for random effect estimation in the next section.
3. As to the main explanatory variable, there are 585 women who are observed expecting additional children in at least one year and not expecting more children in at least one year. Among this group 410 expected a child once, 120 twice, 44 three times and 11 four times. .

Preliminary empirical analysis

Assume initially that $E_t\left(d_f\right)_i$ is not correlated with u_{it}, but may be correlated with α_i. We estimate the parameters in equation [1] using 'conditional logit'. More efficient random effect (RE) estimates are possible if we can accept the hypothesis that α_i is not correlated with explanatory variables in equation (1), and we test that hypothesis using a Hausman test. In addition to the fertility expectations variable, we include variables for presence of a partner, whether a homeowner or not, residential tenure (all measured in the previous year) and age. The RE estimates also include a series of dummy variables for educational level.

The fixed and random effect estimates (s.e.) of δ are 0.259 (0.169) and 0.263 (0.101), respectively. The random effect estimate of var(α_i) is virtually zero, and this continues to be the case when we confine the sample to the FE sample. The difference between the FE and RE estimate of δ is small, suggesting small correlation between $E_t(d_f)_i$ and α_i; thus, a local Hausman test for our main parameter of interest accepts the RE estimates (although the test is biased if $E_t(d_f)_i$ is correlated with u_{it}). There are large differences between the FE and RE estimates of the parameters associated with being a homeowner and residential tenure. The direction of the differences suggest the following correlations with α_i: women with a higher mobility propensity have shorter tenures and are more likely to be homeowners. The former association implies that unobserved heterogeneity is being captured in the coefficient of residential tenure in the RE estimates.

Can we relax the assumption that that $E_t(d_f)_i$ is not correlated with u_{it}? For exploratory purposes, assume $E(\alpha_i X_{ti}) = 0$. Given the results above, this assumption may still produce estimates of δ of the correct magnitude, although the other parameter estimates may be badly biased. It is more convenient to work with normality assumptions. Under the assumption that $E_t(d_f)_i$ is not correlated with u_{it}, estimates (s.e.) of δ (probit coefficients) are, for comparison purposes:

- 0.144 (0.056), random effect probit; estimate of var(α_i) is virtually zero.
- 0.144 (0.056), ordinary probit, robust s.e. (the same, as we would expect).

Allowing $E_t(d_f)_i$ to be correlated with u_{it}, using past fertility variables as excluded instruments with IV probit, treating $E_t(d_f)_i$ as a continuous variable:

- Estimate of δ= 0.428 (0.262), robust s.e.
- Wald test of exogeneity: chi-square(1)=1.55, p-value = 0.213.
- Negative correlation of error terms in (1) and (2): -0.109 (0.087)
- Regression of generalised residual from probit equation on all exogenous variables suggests instruments are valid.

Allowing $E_t(d_f)_i$ to be correlated with u_{it}, using bivariate probit, treating $E_t(d_f)_i$ as a dichotomous variable, using child variables as excluded instruments:

- Estimate of δ= 0.512 (0.184), robust s.e.

- Estimate of correlation between error terms in (1) and (2): -0.274 (0.113).
- Wald test of exogeneity: chi-square(1)=5.33, p-value = 0.021.
- Regression of generalised residual from equation on all exogenous variables suggests instruments are valid in joint test of child variables, but number of children aged 3-4 is significantly related to residual (t-value=2.01).

Tentative conclusions

Irrespective of the assumptions about the error components of the model, we find evidence for a substantial impact of fertility expectations on residential mobility. Preliminary estimates indicate that expecting another child raises the probability of moving by 0.03 or more compared to an overall mobility rate of 0.14 per annum. Assuming the exogeneity of fertility expectations when this is incorrect appears to lead to an understatement of the stimulating effect of expecting another child on mobility.