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Sara Connolly and Mary Gregory

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Manor Road Building, Oxford OX1 3UQ

Part-time Work – A Trap for Women's Careers?

An Analysis of the Roles of Heterogeneity and State Dependence

Sara Connolly
School of Economics and Social Studies
University of East Anglia
Norwich NR4 7TJ
UK
Email: sara.connolly@uea.ac.uk

Mary Gregory
Department of Economics
University of Oxford
Oxford OX1 3UQ
UK
Email: mary.gregory@economics.oxford.ac.uk

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Abstract

Part-time work has been a major area of employment growth for women in the UK over recent decades. Almost half the women in employment now work part-time and two-thirds have worked part-time for some part of their working lives. Part-time employment is welcomed by many women as a means of maintaining labour market participation particularly during the childcare years. However many part-time jobs are low paid and offer little opportunity for career advancement. This leads to conflicting views of the role of part-time work: allowing a full-time career to be maintained or as a dead-end trap for women's careers.

This paper examines this issue using cohort data which follows women's labour market involvement up to age 42. The pathways followed through full-time employment, part-time employment and non-employment are found to be complex and highly varied. Using several estimation methods (pooled multinomial logits, dynamic random effects binary choice logits and selection-corrected random effects probits) on a 20-year panel we examine the relative roles of heterogeneity in characteristics and state dependence in explaining the choice of labour market state. Our major finding is that a woman's labour market history reveals itself as the major determinant of subsequent labour market state, dominating the role of characteristics. Part-time work serves two different functions. Women whose past history involves full-time work even in conjunction with spells of part-time work or non-employment, revert to full-time work. Women whose labour market history combines spells in part-time work with non-employment are unlikely subsequently to take up full-time work.

The growing participation of women in employment has been one of the leading labour market developments of recent decades on both sides of the Atlantic. In spite of the progress which women have made in many of the EU economies, their lower participation rate remains one of the major sources of the employment gap between the US and the EU.[1] This is reflected in the Council of Europe's Lisbon goals for the transformation of the European economy, which include the target of over 60 percent employment participation of women by 2010 - still a modest target relative to the rate of over 74 percent currently prevailing in the US. With an employment rate for women of 73 percent already achieved the UK is one of the EU's acknowledged areas of success in this.

A very significant contribution to employment and employment growth for women in the UK comes through part-time work. In the mid-1970s 9.8 million women were in work, around 32 percent working part-time. By the early 2000s the total number of women in work had risen to 13.7 million; part-time work grew particularly rapidly, increasing its share to around 48 percent. On a life-cycle perspective the role of part-time work is even greater than these cross-section figures suggest. Among women aged 22-59 who were in work for at least five years between 1975 and 2001 34 percent only ever worked full-time, 13 percent only ever worked part-time while 53 percent recorded spells in both states.[2] Combining these last two groups shows that two-thirds of women work part-time at some stage of their adult careers. Part-time employment plays a particularly important role in the labour market involvement of women of child-bearing age. Over the period 1981-2000 women from the 1958 birth cohort, then between the ages of 23 and 42, spent just under ten years on average in full-time employment, a little over five years in part-time employment and just over four years in family/home care. The role which part-time work plays within the life-cycle, and the implications of a spell in part-time work for a woman's future economic status, are therefore issues of major importance.

In many respects the growth of part-time employment is to be welcomed as a route by which women can choose to combine continuing labour market involvement with domestic responsibilities, particularly during the childcare years. In research on actual and preferred employment patterns for the OECD Jaumotte (2003) shows that among couple families with a child under the age of six the combination of a full-time job for the male partner with a part-time

job for the mother is often preferred to full-time work for both. In the UK 42 percent are reported as favouring the full/part-time combination against 32 percent preferring both working full-time.[3] The Kok Report to the EU on progress towards achieving the Lisbon goals urges member countries to 'remove obstacles to, and raise the attractiveness of, part-time work for employers and workers' as 'both an issue of gender equality and a matter of economic effectiveness' (Kok, 2003). However, the status of part-time work is controversial, in the UK and elsewhere. It is widely documented that many part-time jobs are 'bad' jobs in low-wage occupations with little career progression.[4] As a striking specific instance women in part-time work have been the largest group whose pay was up-rated with the introduction of the National Minimum Wage (NMW) in the UK in 1999. The Low Pay Commission estimates that around 70 percent of the beneficiaries from the NMW are women, and two-thirds of the jobs affected are part-time (LPC, 2001). This leads to the perspective of part-time work as a dead-end or trap to women's careers, often part of an 'exclusionary' cycle, where low-wage, insecure part-time jobs alternate with spells of non-employment (Blossfeld and Hakim, 1997).

These conflicting views point to possible diverse roles for part-time work. That it can be the preferred choice emphasises the relevance of individual heterogeneity in preferences and opportunities. That it can be seen as a trap in a segmented labour market points to a potentially important role for state-dependence in the duration or incidence of part-time work. This is the theme which is explored in this paper. Since few women work part-time on a permanent basis our primary focus of interest is the choices between full-time work, part-time work and non-employment, and the transitions between these states over the life-cycle.

The transition patterns between these labour market states are complex and varied. A natural and attractive view of part-time work is as a stepping stone to full-time work for women who have been out of the labour force, probably for family reasons, or in the reverse direction for older workers winding down to retirement. However, only a small proportion of transition paths conform to this pattern. For the UK the National Child Development Survey (NCDS) following a 1958 birth cohort shows that of the women who were at home for childcare at age 23 only 18 percent moved into part-time employment at age 33 and then to full-time employment at age 42. O'Reilly and Bothfeld (2002) using the British Household Panel Survey (BHPS) for women of

all ages find that over the years 1990-5 'only a tiny number' of women were able to use part-time work as a bridge back into a full-time job after a spell of non-employment.

Taking as their focus part-time work as a transitional labour market states O'Reilly and Bothfeld compare the relative importance of part-time work in a 'maintenance' role, enabling employment continuity to be maintained, and in an 'exclusionary' pattern where it is interspersed with spells of non-employment. They find the 'exclusionary' pattern to be much the more prevalent. In 26 percent of all spell sequences women transiting through part-time work from non-employment exit back to non-employment. A further 23 percent of transitions involve movement out of non-employment to part-time employment as a continuing state. Successful 'maintenance' transitions, where a part-time spell is a temporary alternative to full-time work, constitute under 8 percent of spell sequences. Although O'Reilly and Bothfeld cover transitions for women of all ages their relatively short data period, 1990-5, can give only a snapshot view within the life-cycle. For the US, where part-time work among prime-age women is much less common, Blank (1998) identifies two dominant patterns in transitions through part-time work. For the majority of those who engage in a spell in part-time work this serves as an alternative to full-time work, to which they then return. The primary role for part-time work is thus the 'maintenance' one, supporting continued labour market participation within a basically full-time career. The other major group identified enters part-time work from non-employment and then leaves the labour market again. For these women part-time work is part of an 'exclusionary' cycle of weak labour market attachment. Like O'Reilly and Bothfeld, Blank gives the 'stepping stone' view no support, concluding that, while part-time work serves an important function in bringing women from outside the labour market into paid employment, it does little to then move them into full-time work.

Our purpose in this paper is to present an analysis of the role of part-time work in the life-cycle of women in Britain. We use the National Childhood Development Survey (NCDS) to follow members of a 1958 birth cohort up to 2000 when they were aged 42. The time-span available covers half of their labour market life-cycle, almost the entirety of their child-bearing years and a major portion of the period when childcare responsibilities are greatest. The survey has its main sweeps for the cohort in its adult years at ages 23, 33 and, most recently, 42. At these dates

extensive information is collected on a wide range of personal and household characteristics, and on labour market status. The surveys also contain direct reporting of intra-household roles, including how childcare responsibilities are shared. Attitudes to the mother's labour market involvement are elicited through questions such as whether family life is perceived as suffering if she works full-time. Retrospective information is collected on the principal personal and labour market events occurring in the years between the main sweeps. On the basis of these we allocate each year to one of three labour market states: full-time employment, part-time employment or non-employment (out of the labour market).[5] This derived time-profile of labour market status can be matched to time-varying personal characteristics, such as the number and ages of children and characteristics of any spouse.

We find the pathways followed through full-time employment, part-time employment and non-employment to be complex and highly varied. This greater variety relative to Blank's study may reflect the much larger role for part-time work in the life-cycle of British women, while the time-span covered is much greater than was available to O'Reilly and Bothfeld. Our central focus is the roles of individual heterogeneity and state dependence in the choice of labour market state. In line with previous work we confirm the role of observable characteristics (education, family structure) in the choice of both employment against non-employment and full-time against part-time work. The set of attitudinal measures reported for the survey years are effective, relative to econometric methods, in controlling for otherwise unobservable heterogeneity. The length of the panel available and the extended segment of the life-cycle which it spans allow us to model in considerable detail the individual's labour market history and its impact on subsequent choices. We find clear evidence of persistence in labour market status. A woman's labour market history reveals itself as the major determinant of subsequent labour market state, dominating the role of characteristics. While heterogeneity in personal characteristics and attitudes is a major influence on early choices of labour market state, in later phases a woman's labour market history is sufficient to explain her further choices between employment and non-employment and between full- and part-time work. A further major finding is that part-time work serves two different functions. Women whose past history predominantly involves full-time work possibly in conjunction with spells of part-time work or non-employment, revert to full-time work. Women whose labour market history combines spells in part-time work with non-employment are

unlikely subsequently to take up full-time work. Part-time work is both a support and a trap for women's future careers, but these alternative roles apply to different groups.

The paper is structured as follows. Section 1 profiles the employment states and transition patterns up to age 42 for the women in our sample. Section 2 reviews the econometric approaches which we adopt. Section 3 reports the empirical estimates. Section 4 draws some implications.

1. Employment states and transitions, ages 23-42

The National Child Development Survey (NCDS) follows the birth cohort of 8-15 March 1958. Sweeps 4, 5 and 6, for 1981, 1991 and 2000 provide detailed information on personal and household characteristics and labour market status of cohort members at ages 23, 33 and 42. In addition retrospective questions make it possible to construct a complete annual history for the key variables of interest covering the years 1981-2000. In particular work history diaries dating job changes by month allowing economic activity in each year to be classified (subject to recall bias). The labour market states identified are full- and part-time employment and non-employment; within non-employment caring at home is specifically identified, along with education, training, sickness, unemployment and 'other' states[6]. The NCDS samples of women were 6270 in sweep 4 in 1981, 5799 in sweep 5 in 1991 and 5789 in sweep 6 in 2000; we restrict our attention to those women who were present in all three sweeps (4495) and for whom we have a full employment history between 1981 and 2000. The sample available for the analysis comprises 3459 women.

Looking first only at the direct survey years, the life-cycle dimension to labour market status is striking. In 1981, when the cohort is aged 23, 70.6 percent are in employment while 20.5 percent are out of the labour market, engaged in family/home care (Table 1). Full-time work is by far the most frequent employment status, with part-time employment scarcely featuring By 1991, when the women are aged 33, the proportion in employment has risen slightly, to 74 percent. Its composition, however, has changed radically, with the numbers in full-time work falling steeply, and the numbers in part-time work rising even more steeply. One woman in five is engaged

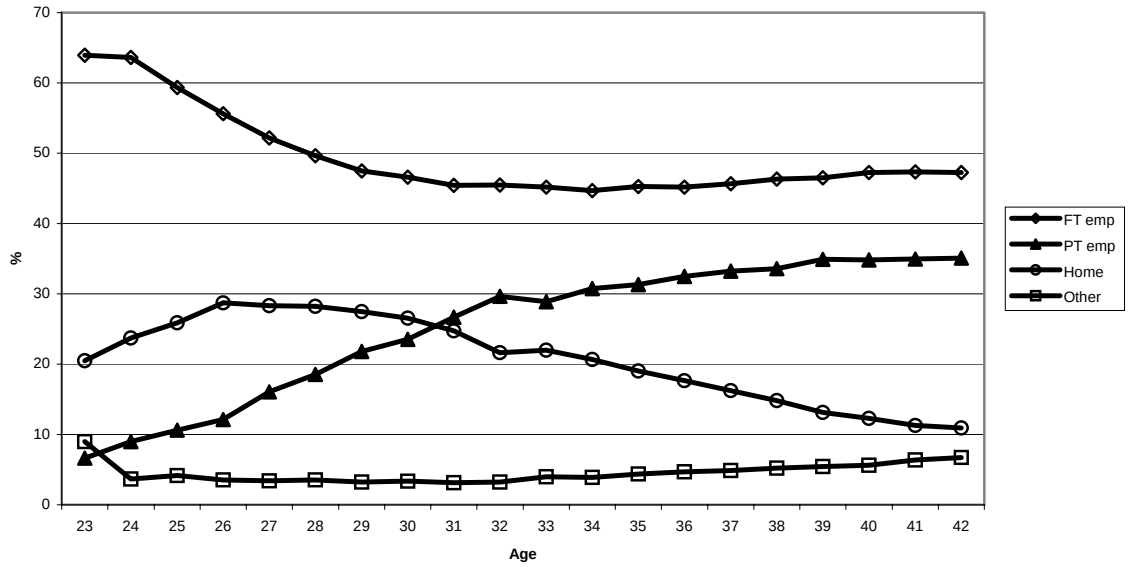
exclusively in family/home care, a marginal increase over the proportion at age 23. By 2000, when the cohort is aged 42, the proportion in employment has risen substantially, to 82.3 percent, with the numbers engaged in full-time family/home care declining to 10.9 percent. The rise in labour market participation between the ages of 33 and 42 principally involves a shift into part-time employment, continuing the earlier pattern although at a reduced rate. At each of the three survey dates caring at home is much the most common reason for non-employment.

Table 1 *Employment Status of Women at Ages 23, 33 and 42 (%)*

	Age 23	Age 33	Age 42
Employment	70.6	74.0	82.3
Full-time	63.9	45.1	47.3
Part-time	6.6	28.9	35.1
Home	20.5	22.0	10.9
Other	9.0	4.0	6.8
Unemployed	5.7	0.9	1.3
Education	1.8	1.0	0.6
Sick	0.2	1.0	3.7
Other	1.3	1.1	1.2
Total sample	3459	3459	3459

Between these benchmark dates labour market status changes in a smooth profile, as shown in Chart 1. As the women move through their twenties the shift out of full-time and into part-time work is strong and sustained; the proportion at home rises but then falls towards to its original level. As they move through their thirties the most striking change is the steep fall in the numbers at home. The proportion in full-time employment starts to rise again from age 33, climbing slowly but steadily. The strongest growth continues to be in part-time employment, but at a slower rate than when the women were in their twenties.

Chart 1 ***Economic Activity of Women Aged 23 to 42 (%)***



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The average employment experience of this cohort of women over the 20 years between age 23 and age 42 is summarised in Table 2. Ten years are spent in full-time work, five in part-time work and four in home care. But as the median and modal statistics show, patterns are heavily skewed, particularly in terms of the role of full-time employment.

Table 2 *Years in Each Employment State, Ages 23-42*

	Full-time employment	**Part-time employment**	**Home**	**Other**
Mean	9.9	5.1	4.2	0.9
Median	9	4	2	0
Mode	20	0	0	0
Standard deviation	7.0	5.2	4.9	2.2

Although the patterns in the aggregate are smooth, at the individual level labour market histories are very diverse. Figure 1 shows the employment pathways at ages 33 and 42 for women who at age 23 were in the two major states – full-time employment and at home for family care. Even restricting the pathways to three states and three years gives 18 possible routes. All are

populated, but at widely differing frequencies. Among those who were in full-time employment at age 23 (64% of the sample) five major routes emerge:

(i)	full-time → full-time → full-time	32%
(ii)	full-time → part-time → part-time	15%
(iii)	full-time → at home → part-time	13%
(iv)	full-time → part-time → full-time	10%
(v)	full-time → full-time → part-time	9%

Together these pathways account for 79% of women who were working full-time, although clearly each individually is a minority route. Part-time employment plays widely differing roles. On routes (ii), (iv) and (v) the move to part-time work involves a step downwards in labour market involvement, while on route (iii) it represents an increase. On route (ii) part-time status, with its partial attachment to the labour market, is persistent. Route (iv), the 'maintenance' pattern, where part-time employment is a temporary state within a full-time trajectory, involves only 10 percent of cases.

Among the small group who were at home at age 23 (21% of the sample) all the categories are relatively small, with three, highly varied, pathways almost equally favoured:

(vi)	at home → part-time → full-time	18%
(vii)	at home → full-time → full-time	17%
(viii)	at home → part-time → part-time	16%

The first of these is the stepping-stone pattern. The exclusionary pattern, home to part-time to home again, characterises only 3 percent of cases, a much smaller proportion than those at home throughout.

When labour market status in each of the intervening years is also taken into account women's career patterns inevitably emerge as much more complex even than this. We combine the minor reasons for non-employment with 'caring at home' into the category 'out of the labour market'

or non-participation. Even with just three possible labour market states in any one year over the 20-year span 3.5 billion patterns of labour market involvement are possible. The variety of actual career patterns followed is summarised in Table 3.

Table 3 *Patterns of Annual Labour Market State, Women aged 23-42; percentages*

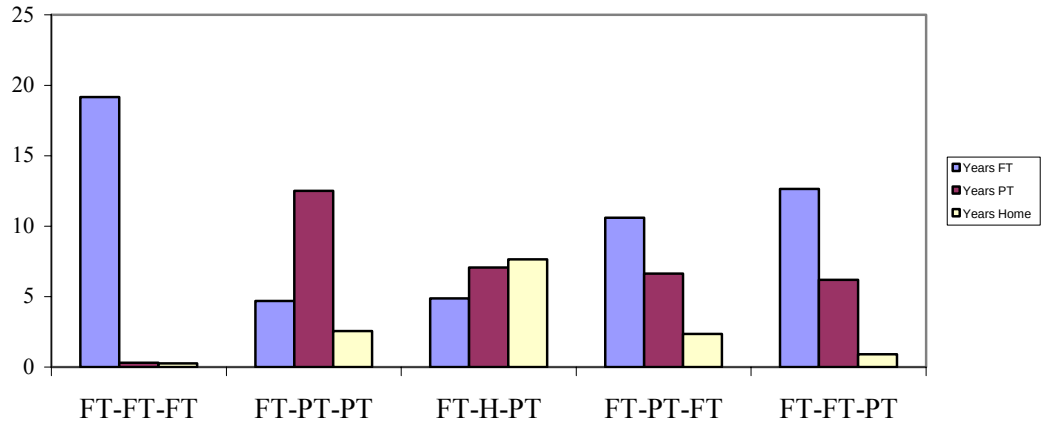
	Ages 23-42	Ages 23-33	Ages 33-42
Full-time employment only	15.4	23.9	25.1
Part-time employment only	0.4	0.8	11.5
Out of labour market only	1.9	5.1	6.0
Combinations of FT employment and OLM	15.4	21.9	10.1
Combinations of PT employment and OLM	8.6	12.8	18.6
Combinations of FT and PT employment	11.7	10.5	17.7
All three states	46.7	25.1	10.9
Total	100	100	100

Source: Authors' calculations using NCDS.

By far the most striking feature is that across the period as a whole much the most common pattern involves time spent in all three states; close to half of the sample (46.7%) combine both full- and part-time employment with spells out of the labour market. Clearly this combination of states covers many different sequences, as highlighted by the much smaller proportions of women who combine all three states in the two sub-periods, particularly after age 33. As was suggested in Table 1 and Chart 1 above, between ages 23 and 33 the other most frequent patterns are continuous full-time employment, and full-time employment combined with years out of the labour market. Part-time work, either alone or in combination with either of the other states, is of limited importance, although increasing as the women move into their thirties. At ages 33-42 the incidence of continuous full-time employment scarcely changes but it becomes the most common pattern. In this decade part-time employment also comes to the fore, in combination with non-participation (18.6%) and with full-time employment (17.7%). For this sub-period, therefore, the two patterns for part-time work identified by Blank (1998) for the US emerge clearly in our data also.[7]

To further summarise the different patterns over the entire 20 years we revert to the five major pathways identified above on the main survey dates, starting from full-time employment at age 23. For these five pathways Chart 2 shows the average number of years spent within each state between the ages of 23 and 42. This confirms that the identification of the pathways from the main survey years alone gives a reasonably accurate representation of the distribution of time within the various states, although it is notable that when the full annual profile is included the 'maintenance' pattern FT-PT-FT includes a non-trivial amount of time spent out of the labour market, as does the FT-PT-PT sequence.

Chart 2 *Average Number of Years in Each State, by Pathway*



An alternative perspective on time spent in the various states is through the year-to-year transitions between them shown in Table 4. This highlights the high level of year-to-year persistence in type of economic activity found in other contexts. In total 88 percent of women are in the same labour market state in any year as in the previous year. In a similar analysis for the US over 14 years for women of all ages Blank (1998) reports 79 percent remaining in the same state. Full-time employment is the most persistent state. Between the ages of 23 and 42 45.5 percent of women are in full-time employment in any year and remain so in the following year. Only 1.3 percent move from full-time work to part-time work while only 2.6 percent leave the labour market. Persistence also strongly characterises both part-time employment and non-participation. The contrast between the two sub-periods noted above re-emerges. Between the ages of 23 and 33 non-participation was more important and more persistent than part-time work,

but this was reversed with the rise of, and persistence in, part-time work between the ages of 33 and 42. However in both cases the level was much lower than for full-time work.

Table 4 *Average Year-to-Year Transitions across Labour Market States, Women aged 23 to 42* *percentages*

Year *t+1*	Full-time employment	Part-time employment	Out of labour market
Year *t*			
Ages 23-42			
Full-time	45.5	1.3	2.6
Part-time	1.5	21.7	1.6
Out of labour market	1.5	3.3	20.9
Ages 23-33			
Full-time	47.7	1.4	3.8
Part-time	1.0	14.6	1.8
Out of labour market	1.9	3.9	23.8
Ages 33-42			
Full-time	43.1	1.1	1.2
Part-time	2.0	29.6	1.4
Out of labour market	1.1	2.7	17.7

Source: Authors' calculations using NCDS.

Overall, these patterns confirm that women in this cohort are strongly attached to the labour market. 89 percent were in full-time employment at some point between the ages of 23 and 42. Part-time employment is playing an increasingly important role, with 49 percent working part-time at some stage between the ages of 23 and 33, rising to 59 percent between the ages of 33 and 42. But women have been combining work and family in a wide range of ways, and the diversity of these is the most striking feature.

We turn now to econometric analysis of the two dimensions of interest: the choice of labour market state (full-time employment, part-time employment, out of the labour market) and persistence within that state. There are two alternative explanations for persistence. The first is that differences in characteristics, observable and unobservable, across individuals lead them to make different choices. If, as is likely, these characteristics are persistent over time, then the

occurrence of a particular state makes the same state more likely in the future; however this correlation arises because past history is essentially a proxy for the individual heterogeneity. The second source is that experience of a particular state itself changes future behaviour. A number of reasons can be identified in the present context. One of the most important involves human capital. Choice among the alternative labour market states is based on relative utility, reflecting in part the relative returns to time in the market and time at home. The potential market wage reflects work experience to date. The lower rate of human capital formation with part-time employment or time out of the labour market reduces the potential market wage, an effect which may be reinforced by actual or perceived depreciation of skills with lower participation. In addition, changing state will be inhibited by the fixed costs incurred. These are greatest in the case of moves in or out of employment but even a move between full- and part-time work is likely to require establishing new arrangements for childcare, and may involve a job change. To further complicate matters, persistence may be reinforced by the endogenous evolution of preferences (Hyslop, 1999). Part-time or non-employment may be accompanied by engagement in non-market activities which comes to be increasingly valued and decreasingly compatible with full-time work. Or the social engagement of work may be increasingly hard to forgo. To establish how far genuine state dependence exists and to identify this requires control for individual heterogeneity.

Our focus of interest is therefore to identify the factors influencing choices among the alternative states and to identify how far past choices, expressed in the woman's labour market history, affect subsequent outcomes; in particular, how far does part-time work support a full-time career, and how far, or in what circumstances, does it become a trap?

2. The econometric models

To address these issues appropriately requires an econometric model within a panel data framework, including choice across multiple discrete states, observed and unobserved individual heterogeneity, and previous status. In principle this may be formulated, following Heckman (1981) as:

$$y_{it}^{*} = \beta' X_{it} + \gamma y_{it-1} + u_{it} \qquad (1)$$

where y_{it}* is the propensity for individual i to be in a given labour market state, y_{it-1} is the previous actual state, and X_{it} is a vector of observable explanatory variables with coefficients β. The error term u_{it} comprises two components:

$$u_{it} = \phi_i + \varepsilon_{it} \qquad (2)$$

where ϕ_i is an unobservable person-specific time invariant element and ε_{it} is a random component with mean zero, variance σ^2_{ε}, serially uncorrelated and uncorrelated with the person-specific element ϕ_i .

Within this framework various econometric problems have to be addressed:

(i) The error term u_{it} will be correlated with the included explanatory variables: u_{it} includes the person-specific effect, such as motivations and attitudes to labour market work which, in this context, must be expected to be correlated with the included explanatory variables.

(ii) The error term u_{it} will be serially correlated, due to the presence of the unobserved individual-specific effect.

(iii) The presence of the lagged dependent variable y_{it-1} gives rise to further serial correlation in the error term.

(iv) The problem of initial conditions: since the observation of labour market activity at t=1 does not necessarily coincide with the point of entry into the labour market the first observed labour market state may be affected by pre-sample labour market history.

No satisfactory estimation method exists for dynamic multiple choice models, such as a dynamic multinomial logit or probit, particularly in the presence of unobserved individual-specific effects (Arellano and Honore, 2001). Our estimation strategy is therefore to present a series of estimates, each addressing a sub-set of the estimation issues identified above, in order to build up a weight of evidence on the economic questions. The following estimators are used:

(1) ***Pooled multinomial logit estimation*** - this retains as the priority issue the simultaneous multi-way choice among the three alternative labour market states. Since a formal dynamic structure cannot be estimated within this approach we include a detailed set of variables characterising the individual's employment history. In this pooled cross-section framework the treatment of individual heterogeneity has to be restricted to observables.

(2) ***Binary choice random effects logits*** - in the case of two-way discrete choices dynamic panel methods can be applied. We therefore formulate the choice of labour market state as a two-step sequence of binary choices. The first-stage decision may be between employment and non-employment, and the second stage between full- and part-time work, given the choice of employment. Or the first-stage decision may be for or against full-time work, and the second stage part-time work or non-employment, given the rejection of full-time employment. Unobserved individual heterogeneity can be addressed within this dynamic framework through the random effects model, under the assumption that the individual-specific heterogeneity ϕ_i takes the appropriate distributional form, in this case logistic. The random effects approach imposes the assumption of orthogonality between the unobserved ϕ_i and ε_{it}.

A further way of addressing unobserved heterogeneity is to follow Chamberlain (1984) and Wooldridge (1995) by making the unobservable person-specific effect a linear function of the time-means of the included *X*'s:

$$\phi_i = \alpha_0 + \alpha_i + \delta \bar{X}_i \qquad (3)$$

where α_0 is a common intercept, $\bar{X}_i$ is the vector of means of the time-varying covariates with coefficients δ, and α_i is the pure individual effect, assumed to be logistically distributed with mean zero and variance σ^2_{α}. Inserting this in (1) gives

$$y_{it}^{*} = \beta' X_{it} + \gamma y_{it-1} + \delta \bar{X}_i + \alpha_i + \varepsilon_{it} \qquad (4)$$

This model is equivalent to estimation using random effects and including the means of the time dependent variables as additional regressors. This specification implies that the correlation between successive error terms for a given individual is constant and given by

$$r = corr(u_{it}, u_{it-1}) = \frac{\sigma^2_{\alpha}}{\sigma^2_{\alpha} + \sigma^2_{\varepsilon}} \qquad (5)$$

We estimate the random effects logit model both as a dynamic panel and with the dynamic structure replaced by the set of variables representing the individual's work history. This allows assessment of the effectiveness of the employment history representation for estimates, including the pooled multinomial logit, where dynamic estimates are not available.

The random effects dynamic panel approach does not allow for formal conditioning of the second-stage decision on the outcome of the first stage.

3. ***Random effects bivariate probit model with sample selection*** – this approach again applies to the two-step bivariate decision but estimates the full/part-time decision y_{iA} jointly with the selection equation on employment/non-employment y_{iB} :

$$\begin{aligned} y_{iA}^{*} &= \beta_A' X_{iA} + \varepsilon_{iA} \\ y_{iB}^{*} &= \beta_B' X_{iB} + \varepsilon_{iB} \end{aligned} \qquad (6)$$

where y^* denotes the latent variable, $y_{iA} = 1$ if $y_{iA}^* > 0$, $y_{iB} = 1$ if $y_{iB}^* > 0$ and y_{iA} is observed only if $y_{iB} = 1$. Random effects, as implemented previously, are again applied. A dynamic formulation is not available so detailed work histories are used.

Our estimation strategy can be summarized. The pooled multinomial approach (1) addresses the three-way decision directly. The dynamic structure is captured through the detailed histories of employment states, and individual heterogeneity through the rich set of observables, including responses to attitudinal questions. The random effects logits (2) allow dynamic panel estimation

with unobserved heterogeneity for a two-step sequence of binary choices, but the second step is not formally conditioned on the first-stage decision. Since the dynamic version is available this offers the opportunity for formal comparison with the specification based on work histories. The selection-corrected random effects bivariate probit (3) incorporates conditioning on the first-stage outcome along with the detailed employment histories and the set of observables, including attitudinal variables. Again the dynamic formulation is not available and work histories replace this. Although our observation period starts early in the women's labour market experience nonetheless in each panel model we control for the potential correlation between the initial state y_{i1} and included characteristics by using the earlier employment history available in our data.

3. Estimates of choice of employment state

We estimate employment status equations for women aged 23 to 42. The analysis starts at age 23 since at that point the vast majority of the sample have completed full-time education and face the choice set of the three states: full-time employment, part-time employment and non-employment. Information from employment history diaries for the years before age 23 allow us to control for any initial conditions at the starting state y_{i1}. Since age 23 coincides with one of the main survey sweeps a range of further information is available characterizing the women at that stage, notably on their attitudes to work and family life. Similarly, additional attitudinal and other information is available for age 33. The survey does not yet continue beyond age 42. Summary statistics on the variables used are given in the Appendix.

(1) *Pooled multinomial logit (with employment histories)*

Model (1) estimates a multinomial logit model on the pooled observations over the 20-year period, with the dynamic structure represented by a set of detailed measures of previous employment states. The model is specified as follows:

$$E_{it} = f(B_{it}, H_{it}, Exp_i, M_{it}, Q_{i23}, H_{i23}, F_{i23}, P_i, t)$$

where E_{it} is an indicator of employment state in year t, with '0' representing non-employment (OLM), '1' part-time employment (PT) and '2' full-time employment (FT). B_{it} are the set of variables for the key child-bearing and child-care influences: whether the woman gave birth to a baby in the current year t, whether the household contained a child aged under five, and the number of children that she has. H_{it} are the set of detailed employment history measures, summarising patterns of full- and part-time employment and non-employment over the previous five years. Exp_i measures the years of prior employment experience since age 23 (linear and quadratic). M_{it} are a set of dummies reflecting marital status and partner's employment status. The set of variables subscripted 23 indicate status at age 23. Q_{i23} are a set of measures of the highest level of qualification attained, H_{i23} the pre-sample employment history, F_{i23} family size at age 23. P_i is a set of variables recording attitudes towards combining work and motherhood, and family formation plans, as reported at age 23 and again at age 33. A time trend is also included to capture both any changes in macroeconomic conditions or the effects of the cohort ageing, where these cannot be distinguished within the single cohort.

Table 5 gives the estimation results for the pooled MNL model. The effects of personal, family and household characteristics, already well established in the literature, are replicated. Much the strongest influence supporting non-employment and part-time work rather than full-time employment is current child-bearing, and the presence of a pre-school child is also a major influence. The number of children present in the household influences non-employment but not part-time work. Being married promotes non-employment and part-time work, and an employed partner supports an orientation to part-time rather than full-time work. Divorce is associated with non-employment – the lone mother problem. Higher educational attainment influences against both non-employment and part-time employment. Among the attitudinal variables views on the importance of work for women and care for sick children are reflected particularly in the choice of non-employment.

[Table 5 about here]

The influence of work history on choice of employment state is striking, with strongly determined effects and clear sign-reversals for the different labour market states. Persistence in

employment status is very marked. Women who have been continuously in full-time work over the previous five years are unlikely to proceed to either non-employment or part-time work. Likewise, continuous part-time or non-employment repeats itself in future choices. The most striking result is that a history of full-time employment combined with part-time work makes subsequent non-employment or part-time employment less likely, even where much of the time has been spent in part-time work. This gives support to the concept of the maintenance role of part-time work, serving as an interlude in a career basically oriented towards full-time work. Conversely, career histories comprising spells in part-time work with non-employment are strongly associated with further non-employment and part-time work. This supports the concept of part-time work as part of a profile of persistently weak labour market attachment.

(2) ***Binary choice random effects logits***

The dynamic logit approach applies to binary decisions; we approach this through a two-stage decision structure. The choice at the first stage is between employment and non-employment, and at the second stage between full-time and part-time work. The alternative formulation, with the first-stage decision for or against full-time employment, and the second-stage between part-time work and non-employment, has also been examined.

For the first-stage choice the models is specified as:

$$E_{it} = f(B_{it}, E_{i\,t-1}, Exp_i, M_{it}, Q_{i23}, H_{i23}, F_{i23}, P_i, t)$$

where E_{it} is a binary indicator of employment/non-employment in year t, and E_{it-1} its lagged value. B_{it} indicates whether the woman had a baby in year t, and the other personal, household and attitudinal characteristics are as above.

The second-stage choice between full- and part-time employment is specified as

$$FT_{it} = f(K_{it}, K5_{it}, FT_{i\,t-1}, PT_{i\,t-1}, Exp_i, M_{it}, Q_{i23}, H_{i23}, F_{i23}, P_i, t)$$

where FT_{it} is a binary variable indexing at 1 for current full-time employment and zero for part-time; FT_{it-1} and PT_{it-1} denote full- and part-time employment at $t-1$. K_{it} the number of children the women has in year t, $K5_{it}$ is a dummy variable indicating the presence of a pre-school child (aged under five) in the household, and Exp_i, M_{it}, Q_{i23}, H_{i23}, F_{i23}, P_i and t are again as above.

Many of the same variables measuring characteristics and attitudes are relevant and included in both equations. This raises an identification issue. We postulate that the birth of a child in the current year is more relevant to the employment/non-employment choice, while the presence of a pre-school age child and the number of children impact more on the full/part-time decision. These relative weightings are supported by the estimates in Table 5 above. We therefore achieve identification by adopting these as exclusion restrictions.

Since dynamic estimation is possible within the random effects logit approach but not within either the pooled multinomial logit (1) above or the selection-corrected probit (3) below we repeat the specification of the dynamic random effects logit model but with the lagged dependent variable replaced by the set of variables representing the detailed structure of the individual's employment history.

The results for the choice of employment against non-employment are presented in Table 6 and for full- against part-time employment in Table 7. In both Tables the first set of columns give the dynamic panel estimates without and then with the means of the time-varying co-variates. In the second set of columns the dynamic specification is replaced by the representation of past employment history. For the labour market participation decision in Table 6 this involves alternative combinations of employment/non-employment status over the preceding five years. For the choice of full- against part-time employment in Table 7 combinations involving full-, part-time and non-employment over the preceding five years are used.

Looking first at labour market participation (Table 6) two influences clearly dominate in the decision. A woman who has a baby in year t is much less likely to work in that year than a woman who does not. This effect is very strongly determined and confirms our identification strategy. It is also unaffected by the form in which past history is represented. The other

dominant influence on the employment/non-employment choice in both variants is employment history. In the dynamic specification the lagged dependent variable is highly significant. When the detailed employment histories are used current labour market participation is strongly predicted by the woman's employment patterns of the preceding five years. The larger the number of years from the preceding five that she has been in employment the more likely she is to be currently working. This effect rises monotonically. Among other potential influences, women who are married or divorced are rather less likely to be employed than women who are single, after controlling for the birth of a child, and those with larger families are less likely to be in employment. Women who are better qualified are more likely to be employed, although this effect is not linear; those with teaching or nursing qualifications are more attached to employment. Attitudes towards market work and childcare affect behaviour; women who disagree that work is less important for women than for men, or who disagree that the mother should take responsibility for looking after children when they are ill are more likely to be employed.

The similarity of the overall results between the dynamic and the work history specifications suggests that the detailed employment histories are a good representation of the dynamic structure. The inclusion of the means of the time-varying variables does not affect the impact of employment history but reduces the influence of education and the attitudinal variables. This suggests that the random effects assumption of orthogonality between the unobservable individual effect and the included observables is over-strong.

[Table 6]

The estimates of the second-stage decision between full- and part-time work are presented in Table 7. First checking the identifying variables, amongst those women in employment at *t*, those with pre-school age children or larger families are less likely to be working full-time. The presence of a pre-school child is strongly determined in both specifications, but the number of children in the dynamic specification only. Table 7 also reveals clear persistence in employment status; women who worked full-time in *t-1* are much more likely to be in full-time work in *t* while those who worked part-time are less likely to be in full-time work. Taking the more

detailed work histories, a record of full-time work, including in combination with spells of part-time work or non-employment, is strongly conducive to current full-time work. A previous history of part-time work and non-employment, alone or in any combination, is a strong pointer against full-time employment currently. This further confirms the differing tracks which women follow in regard to the role of part-time work.

Women who are married, divorced or have an employed partner are rather less likely to be in full-time employment than single women. Educational attainment, noted above as clearly conducive to a preference for employment over non-employment, tends to be associated with a preference for full-time over part-time employment but the effect is not strongly determined. Attitudes to work and family have little impact on the full/part-time choice. While the means of the time-varying variables are often significant their inclusion has little impact on the other estimated coefficients, suggesting that for the full/part-time decision unobserved heterogeneity is uncorrelated with the observed covariates.

[Table 7]

In Tables 6 and 7 the binary choice is posed as firstly to work, then secondly to choose between full- and part-time status. A plausible alternative formulation, given that almost all the women in our sample are in full-time work at an early stage in their careers, is to formulate the choice as firstly whether to work full-time, and then, if that is rejected, to choose between part-time work and non-employment. Repeating the estimation on this basis (results available but not quoted) shows little difference. In particular, the dominance of past employment history as the leading determinant of current status is repeated.

(3) ***Random effects bivariate probit model with sample selection***

The results in Tables 6 and 7, while conditional on employment, do not formally incorporate the conditioning. Table 8 reports the estimates from a random effects bivariate probit with the correction for selection into employment. Only the work history formulation is available. In the equation for selection into employment this is represented by combinations of employment/non-employment over the preceding five years. The choice of full-time over part-time status is related

to the 15 combinations of full/part-time and non-employment over the preceding five years. The model is specified as:

$$FT_{it} = f(K_{it}, K5_{it}, H_{it}, Exp_i, M_{it}, Q_{i23}, H_{i23}, F_{i23}, P_i, t)$$
$$E_{it} = f(B_{it}, H_{it}, Exp_i, M_{it}, Q_{i23}, H_{i23}, F_{i23}, P_i, t)$$

where FT_{it} is only observed if $E_{it}=1$. All other variables are as previously defined.

The results in Table 8 are very much in line with those derived above. The identifying restrictions, number of children and the presence of a child under five, are strongly significant influences against employment. Selection into employment strongly reflects previous employment history, and again is monotonic in the proportion of the previous five years spent in work. On the choice of full-time against part-time employment the impact of the detailed work histories is highly significant and in line with the findings in the uncorrected specification above. Previous full-time employment, on its own or in conjunction with spells of part-time work or non-employment, is a clear pointer to current full-time employment. Continuous part-time work or spells in part-time work in conjunction with spells of non-employment are clear pointers against the choice of full-time work.

The most striking difference to emerge from the selection-corrected estimates is the increased strength of the attitudinal variables for both the choice of employment and the choice of full- against part-time work. This indicates that, in least in this context, well-aligned qualitative or attitudinal information can be a useful measure of otherwise unobservable individual heterogeneity.

[Table 8]

4. Conclusions

Our main purpose has been to investigate the role of part-time work in a woman's life-cycle. Our descriptive analysis of the data showed many and varied pathways, difficult to summarise in any comprehensive way. Our econometric analysis, however, gives clear evidence of systematic

orientations underlying these diverse patterns. Along with individual characteristics persistence in employment status is a major characteristic. Women with a history of employment or of choice of a particular employment state are more likely to be in the same state subsequently than women without that experience. These results are robust to the approach to employment history and the estimation process applied.

More strikingly, an employment history that combines full-time work with part-time employment or non-employment points to subsequent full-time employment. An employment history comprising part-time employment and spells out of the labour market becomes self-repeating. So to the question whether part-time work is a help or a hindrance to women's careers we give a two-part answer. Part-time work serves different functions for different groups of women. The choice of employment rather than non-employment and between full-time and part-time work can be explained by a range of personal and household characteristics. But more importantly the outcomes are persistent; a major part of the explanation of current employment status arises from past actual patterns of labour market involvement. For those committed to a mainly full-time career, as shown in their past labour market history, it provides a temporary means of continued employment participation. For others whose labour market attachment has been weaker, involving combinations of spells in part-time work with non-employment, it continues this pattern. Part-time work may therefore be either a temporary support, maintaining commitment to a full-time career during the childcare years, or a dead-end, where women are trapped in a limited job/no-job cycle.

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Table 5 Pooled Multinomial Logit Estimates of Choice of Full/ Part-time/ Non-Employment (ages 23 to 42)

0 – OLM in year t **1 – part-time in year t** **2 - full-time in year t**	Non-employment (OLM)		Part-time employment	
Explanatory variables	Coefficient	z-statistic	Coefficient	z-statistic
Employment history				
Employed FT in all of the five previous years t-1, …, t-5	-2.2825	-39.23	-3.4922	-56.25
Employed PT in all of the five previous years t-1, …, t-5	-0.1166	-1.56	1.9482	33.98
OLM in all of the five previous years t-1, …, t-5	2.8971	42.45	0.2367	3.26
Employed FT in four and PT in one of the five previous years	-1.9597	-19.26	-0.9786	-14.08
Employed FT in three and PT in two of the five previous years	-1.7575	-16.28	-0.7493	-10.33
Employed FT in two and PT in three of the five previous years	-1.8969	-16.55	-0.6922	-9.47
Employed FT in one and PT in four of the five previous years	-1.8669	-15.89	-0.3325	-4.70
Employed FT in four and OLM in one of the five previous years	0.1817	2.88	-1.6988	-20.96
Employed FT in three and OLM in two of the five previous years	0.4629	6.84	-1.7736	-18.65
Employed FT in two and OLM in three of the five previous years	0.7389	10.40	-1.5546	-15.83
Employed FT in one and OLM in four of the five previous years	0.7801	10.64	-1.5106	-14.95
Employed PT in four and OLM in one of the five previous years	1.4551	15.07	2.1061	23.96
Employed PT in three and OLM in two of the five previous years	1.8190	17.80	2.0463	21.29
Employed PT in two and OLM in three of the five previous years	2.1224	20.09	1.9903	19.55
Employed PT in one and OLM in four of the five previous years	2.3828	22.00	1.9166	18.06
Employed in all three states in the five previous years	-	-	-	-
Demographics				
Number of children in year t	0.1652	9.32	0.0237	1.31
Had a baby in year t	2.8991	55.16	1.6328	25.97
Has child aged five or under	1.2811	37.33	1.5582	43.50
Single	-	-	-	-
Married	0.4205	7.66	0.2104	3.62
Divorced	0.3900	6.55	0.0093	0.14
Widowed	-0.1279	-0.51	-0.3369	-1.21
Partner is employed	-0.0648	-1.33	0.2721	5.31
Plans to have (have more) children	-0.0293	-0.94	0.0262	0.85
Highest qualification at age 23				
None	-	-	-	-
Sub O-level	-0.3667	-5.14	-0.2116	-2.90
O-level or equivalent	-0.3581	-9.98	-0.1104	-2.97
A-level or equivalent	-0.4811	-9.80	-0.2930	-5.73
Nursing	-0.9232	-12.37	0.0575	0.88
HND or equivalent	-0.4431	-5.48	-0.1090	-1.35
Teaching	-1.0565	-7.19	-0.3154	-2.35
Degree or higher	-0.6173	-11.58	-0.2558	-4.70
Attitudes towards family and employment				
Agrees that work is less important for women	0.1523	3.01	0.1317	2.50
Neither agrees nor disagrees	-	-	-	-
Disagrees that work is less important for women	-0.1482	-3.35	0.0191	0.42
Agrees that wives who do not have to work should not work	0.0283	0.53	-0.0169	-0.30
Neither agrees nor disagrees	-	-	-	-
Disagrees that wives who do not have to work should not work	-0.0816	-1.85	-0.0388	-0.85
Agrees that women should look after children if they are ill	-0.0495	-1.07	-0.1581	-3.43

Neither agrees nor disagrees	-	-	-	-
Disagrees that women should look after children if they are ill	-0.1938	-4.33	-0.0388	-0.85
Time trend	-0.0383	-7.15	0.0965	17.75
Constant	0.1034		0.62	
Number of observations	69180		Pseudo Rsq=0.4686	
LR chi(86)	67724.04			
Log likelihood	-11356.503			

All specifications also include controls for prior employment experience and plans at age 16 for family formation.

Table 6 Random Effects Logit Estimates of Employment/Non-employment: Dynamic Specification and with Detailed Employment Histories (ages 23 to 42)

0 – Not employed in year t **1 – Employed in year t**	Random Effects no means		Random Effects with means		Random Effects no means		Random Effects with means	
Explanatory variables	Coefficient	z-statistic	Coefficient	z-statistic	Coefficient	z-statistic	Coefficient	z-statistic
Employment history								
Employed in t-1	3.7406	108.13	3.9796	110.41	-	-	-	-
Employed in all of the five previous years t-1, …, t-5	-	-	-	-	4.1760	76.32	3.7648	72.90
Employed in four of the five previous years	-	-	-	-	2.0353	37.78	1.6405	31.42
Employed in three of the five previous years	-	-	-	-	1.8086	34.24	1.5037	29.23
Employed in two of the five previous years	-	-	-	-	1.6828	32.47	1.4910	29.35
Employed in one of the five previous years	-	-	-	-	1.5084	29.11	1.4471	28.30
Employed in none of the five previous years	-	-	-	-	-	-	-	-
Demographics								
Had a baby in year t	-2.6821	-56.42	-2.6403	-51.83	-2.7458	-55.89	-2.7521	-54.26
Single	-	-	-	-	-	-	-	-
Married	-0.6060	-8.39	-0.6833	-7.44	-0.4734	-6.29	-0.0953	-1.16
Divorced	-0.6074	-7.44	-0.7509	-6.94	-0.5358	-6.20	-0.2482	-2.58
Widowed	-0.4055	-1.28	-0.5335	-1.36	-0.2119	-0.66	0.0191	0.06
Partner employed	0.0394	0.63	-0.1788	-2.31	0.0192	0.30	-0.1063	-1.55
Plans to have (more) children	-0.0250	-0.64	0.1199	2.53	-0.1166	-2.89	-0.0094	-0.22
Starting state								
First state post FT education, FT employment	-	-	-	-	-	-	-	-
First state post FT education, PT employment	0.2226	0.97	0.1536	0.96	0.4025	1.12	0.1627	0.85
First state post FT education, OLM	-0.1119	-2.21	-0.0451	-1.30	-0.0187	-0.27	-0.0029	-0.07
Number of children at age 23	-0.1262	-3.43	0.0361	1.39	-0.2301	-4.48	0.2518	7.50
Plans to return to work if OLM at age 23	-0.4349	-5.94	-0.0659	-1.34	-0.6365	-6.20	0.1548	2.66
Highest qualification at age 23								
None	-	-	-	-	-	-	-	-
Sub O-level	0.3315	2.88	0.0425	0.55	0.4099	2.56	0.0977	1.03
O-level or equivalent	0.3250	5.55	0.1033	2.61	0.3380	4.27	0.1435	3.00
A-level or equivalent	0.3599	4.33	0.0621	1.10	0.4518	3.92	0.1327	1.95
Nursing	1.0693	8.92	0.3199	3.73	1.1928	7.56	0.5072	5.04
HND or equivalent	0.5311	4.05	0.1521	1.68	0.8083	4.91	0.3060	2.83
Teaching	1.0240	4.46	0.3703	2.26	1.5586	5.67	0.7204	3.81

Degree or higher	0.4938	5.33	0.0586	0.92	1.1757	9.83	0.5131	6.70
Attitudes towards family and employment								
Agrees that work is less important for women	-0.0874	-1.09	-0.0085	-0.16	-0.1253	-1.15	0.0358	0.55
Neither agrees nor disagrees	-		-	-	-	-	-	-
Disagrees that work is less important for women	0.2532	3.57	0.0007	0.02	0.4175	4.36	0.0848	1.47
Agrees that wives who do not have to work should not work	-0.1099	-1.30	0.0041	0.07	-0.1943	-1.67	-0.0336	-0.48
Neither agrees nor disagrees	-	-	-	-	-	-	-	-
Disagrees that wives who do not have to work should not work	0.0564	0.81	0.0409	0.87	0.0370	0.39	0.0686	1.20
Agrees that women should look after children if they are ill	0.0961	1.31	0.0852	1.73	0.0587	0.59	0.0899	1.51
Neither agrees nor disagrees	-	-	-	-	-	-	-	-
Disagrees that women should look after children if they are ill	0.1797	2.51	0.0679	1.41	0.2432	2.50	0.0943	1.62
Means								
Had a baby in year	-	-	1.8684	5.78	-	-	-1.3955	-2.64
Employment experience	-	-	0.7703	62.87	-	-	1.2119	56.46
Married	-	-	0.8453	6.65	-	-	0.1207	0.93
Divorced	-	-	0.8350	5.91	-	-	0.2194	1.50
Widowed	-	-	0.3902	0.69	-	-	0.0448	0.07
Partner employed	-	-	0.3064	2.75	-	-	0.3886	3.35
Plan more children	-	-	-0.1095	-1.57	-	-	-0.0223	-0.30
Constant	-2.3371	-11.60	-13.0709	-53.68	-6.2266	-28.25	-13.2243	-56.24
Time trend	0.0465	6.81	0.2795	43.67	0.2053	35.47	0.3069	53.16
Number of observations	68161		68161		69180		69180	
Number of groups	3459		3459		3459		3459	
Log likelihood	-18644.861		-16124.884		-22003.082		-19947.822	

All specifications also include controls for prior employment experience and plans at age 16 for family formation.

Table 7 Random Effects Logit Estimates of Choice of Full/Part-time Employment Status: Dynamic Specification and with Detailed Employment Histories (ages 23 to 42)

0 – Part-time in year t **1 – Full-time in year t**	Random Effects no means		Random Effects with means		Random Effects no means		Random Effects with means	
Explanatory variables	Coefficient	z-statistic	Coefficient	z-statistic	Coefficient	z-statistic	Coefficient	z-statistic
Employment history								
Employed FT in t-1	3.7869	53.36	3.8896	58.66	-	-	-	-
Employed PT in t-1	-1.2271	-19.65	-1.0812	-18.00	-	-	-	-
OLM in t-1	-	-	-	-	-	-	-	-
Employed FT in all of the five previous years t-1, …, t-5	-	-	-	-	3.8003	48.57	3.8188	48.23
Employed PT in all of the five previous years t-1, …, t-5	-	-	-	-	-2.2986	-25.04	-2.2894	-24.67
OLM in all of the five previous years t-1, …, t-5	-	-	-	-	-1.0406	-10.27	-1.0488	-10.02
Employed FT in four and PT in one of the five previous years	-	-	-	-	0.8884	9.65	0.8978	9.67
Employed FT in three and PT in two of the five previous years	-	-	-	-	0.5677	5.71	0.5702	5.70
Employed FT in two and PT in three of the five previous years	-	-	-	-	0.6210	6.18	0.6257	6.19
Employed FT in one and PT in four of the five previous years	-	-	-	-	0.5844	5.69	0.5861	5.67
Employed FT in four and OLM in one of the five previous years	-	-	-	-	1.9139	19.94	1.9337	20.11
Employed FT in three and OLM in two of the five previous years	-	-	-	-	1.6838	15.54	1.6905	15.60
Employed FT in two and OLM in three of the five previous years	-	-	-	-	1.9855	13.40	1.9857	13.39
Employed FT in one and OLM in four of the five previous years	-	-	-	-	0.9033	7.61	0.9038	7.54
Employed PT in four and OLM in one of the five previous years	-	-	-	-	-2.4235	-18.83	-2.3976	-18.58
Employed PT in three and OLM in two of the five previous years	-	-	-	-	-2.5955	-19.15	-2.5775	-18.99
Employed PT in two and OLM in three of the five previous years	-	-	-	-	-2.5525	-18.94	-2.5453	-18.85
Employed PT in one and OLM in four of the five previous years	-	-	-	-	-2.3690	-18.07	-2.3621	-17.89
Employed in all three states in the five previous years	-	-	-	-	-	-	-	-
Demographics								
Number of children in year t	-0.4746	-12.83	-0.5740	-10.60	-0.0666	-1.69	-0.1142	-2.18
Has child aged five or under	-1.0584	-18.89	-1.0415	-17.78	-1.8647	-34.27	-1.7972	-31.82
Single	-	-	-	-	-	-	-	-
Married	-0.3256	-3.14	-0.2545	-1.90	-0.1440	-1.38	-0.1058	-0.84
Divorced	-0.1702	-1.47	-0.5638	-3.66	-0.1854	-1.59	-0.4425	-3.10
Widowed	0.2722	0.57	0.0525	-0.09	0.3417	0.69	-0.1066	-0.19
Partner employed	-0.4175	-4.53	-0.6599	-5.75	-0.5822	-6.31	-0.7667	-7.14
Plans to have (more) children	-0.1066	-1.98	-0.0839	-1.29	-0.1605	-2.98	-0.0838	-1.36
Starting state								
First state post FT education, FT employment	-	-	-		-	-	-	-

First state post FT education, PT employment	-0.1774	-0.61	-0.1917	-0.65	0.0789	0.24	0.0926	0.26
First state post FT education, OLM	0.0144	0.21	0.0145	0.21	-0.0085	-0.11	0.0090	0.12
Number of children at age 23	0.2847	3.14	0.1791	1.83	0.5627	5.38	0.4150	3.79
Highest qualification at age 23								
None	-	-	-	-	-	-	-	-
Sub O-level	0.2299	1.45	0.2036	1.27	0.1422	0.80	0.1333	0.75
O-level or equivalent	0.1831	2.26	0.1972	2.38	0.0627	0.68	0.0884	0.95
A-level or equivalent	0.2791	2.46	0.3367	2.89	0.2153	1.67	0.2968	2.26
Nursing	-0.0693	-0.48	0.0098	0.07	-0.3831	-2.31	-0.2559	-1.55
HND or equivalent	-0.0074	-0.04	0.0623	0.36	0.0287	0.15	0.1328	0.68
Teaching	0.3675	1.29	0.4838	1.67	0.4528	1.45	0.6429	2.12
Degree or higher	0.1553	1.27	0.2784	2.22	0.4669	3.30	0.6078	4.32
Attitudes towards family and employment								
Agrees that work is less important for women	-0.2026	-1.78	-0.2071	-1.79	-0.1853	-1.42	-0.1899	-1.46
Neither agrees nor disagrees	-	-	-	-	-	-	-	-
Disagrees that work is less important for women	-0.0439	-0.45	-0.0257	-0.26	0.0281	0.25	0.0207	0.18
Agrees that wives who do not have to work should not work	0.0493	0.41	0.0332	0.27	0.0631	0.47	0.0856	0.63
Neither agrees nor disagrees	-	-	-		-	-	-	-
Disagrees that wives who do not have to work should not work	0.0728	0.75	0.0583	0.59	0.1500	1.36	0.1534	1.40
Agrees that women should look after children if they are ill	-0.1078	-1.06	-0.0777	-0.75	-0.0631	0.47	-0.1364	-1.17
Neither agrees nor disagrees	-	-	-	-	-	-	-	-
Disagrees that women should look after children if they are ill	0.2264	2.30	0.2390	2.40	0.1916	1.73	0.2074	1.85
Means								
Number of children	-	-	0.2102	2.81	-	-	0.4318	3.73
Number of children under age 5	-	-	-0.5184	-2.29	-	-	-1.9830	-4.55
Employment experience	-	-	-0.1824	-5.59	-	-	-0.0229	-0.60
Married	-	-	-0.3915	-1.79	-	-	-0.3390	-1.42
Divorced	-	-	0.5965	2.59	-	-	0.7167	2.87
Widowed	-	-	0.7363	0.72	-	-	1.5302	1.36
Partner employed	-	-	0.5399	2.76	-	-	0.6547	3.01
Plan more children	-	-	-0.0284	-0.24	-	-	-0.2540	-1.99
Constant	4.4115	14.06	7.0779	14.07	2.7485	8.32	2.8048	5.46
Time trend	-0.1222	-10.49	-0.1982	-14.35	-0.0618	-5.87	-0.0609	-4.67
Number of observations	51322		51650		51650		51650	
Number of groups	3392		3395		3395		3395	
Log likelihood	-10279.042		-10426.292		-11356.503		-12047.831	

All specifications also include controls for prior employment experience and plans at age 16 for family formation.

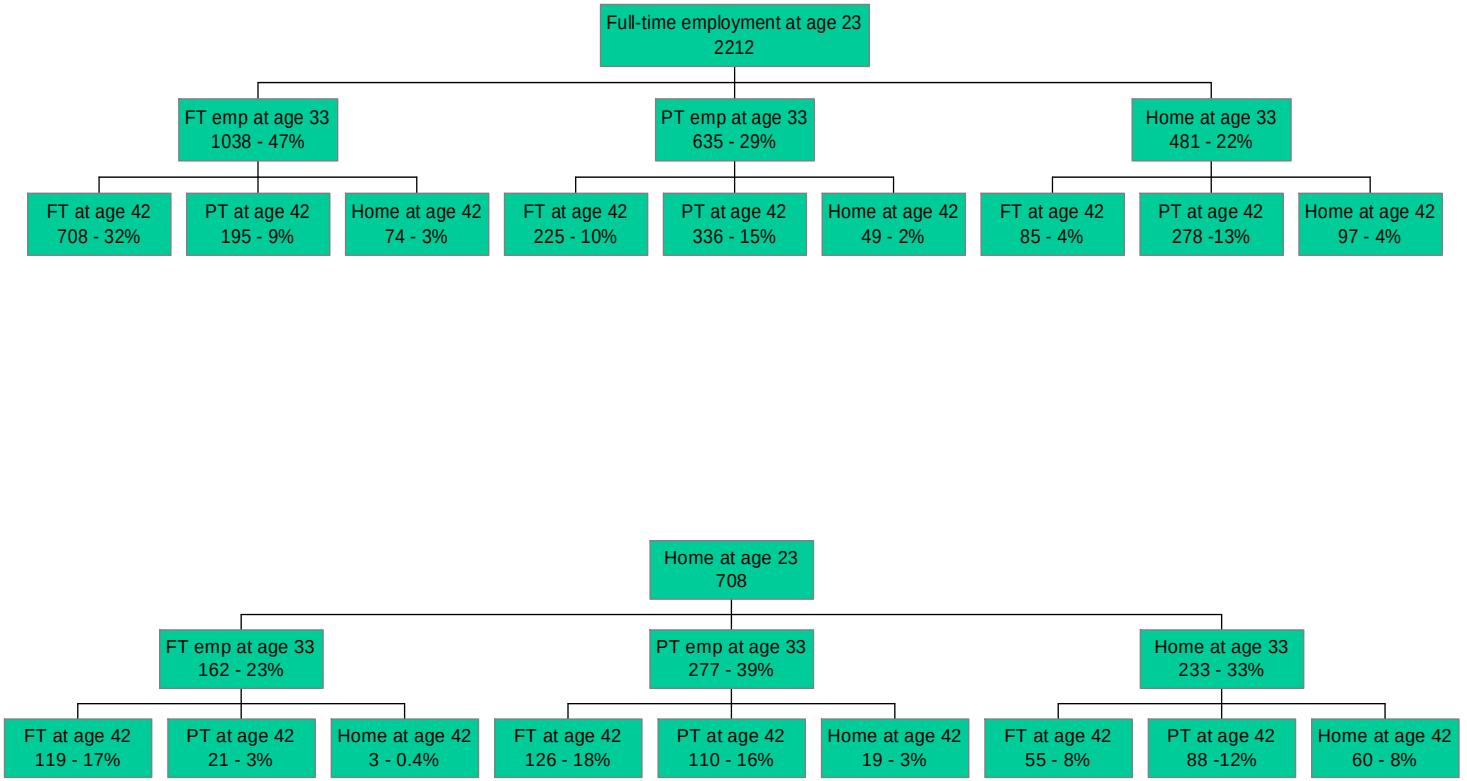
Table 8 Random Effects Bivariate Probit with Correction for Sample Selection (ages 23 to 42)

	FT Employment		Selection Equation - Employment	
Explanatory variables	Coefficient	z-statistic	Coefficient	z-statistic
Employment history years t-5 to t-1				
Employed in all of the five previous years t-1, …, t-5	-	-	1.9630	112.27
Employed in four of the five previous years	-	-	1.0863	53.59
Employed in three of the five previous years	-	-	0.7854	37.44
Employed in two of the five previous years	-	-	0.6228	28.40
Employed in one of the five previous years	-	-	-	-
Employed in none of the five previous years	-	-	-	-
Employed FT in all of the five previous years t-1, …, t-5	1.9522	58.56	-	-
Employed PT in all of the five previous years t-1, …, t-5	-0.9930	-29.94	-	-
OLM in all of the five previous years t-1, …, t-5	0.0253	0.48	-	-
Employed FT in four and PT in one of the five previous years	0.6991	16.83	-	-
Employed FT in three and PT in two of the five previous years	0.5829	13.15	-	-
Employed FT in two and PT in three of the five previous years	0.5547	12.34	-	-
Employed FT in one and PT in four of the five previous years	0.3619	8.39	-	-
Employed FT in four and OLM in one of the five previous years	1.0712	23.07	-	-
Employed FT in three and OLM in two of the five previous years	1.1306	20.86	-	-
Employed FT in two and OLM in three of the five previous years	1.0109	17.18	-	-
Employed FT in one and OLM in four of the five previous years	1.0862	17.08	-	-
Employed PT in four and OLM in one of the five previous years	-1.0235	-21.78	-	-
Employed PT in three and OLM in two of the five previous years	-0.9931	-19.11	-	-
Employed PT in two and OLM in three of the five previous years	-0.9711	-17.15	-	-
Employed PT in one and OLM in four of the five previous years	-0.7953	-11.98	-	-
Employed in all three states in the five previous years	-	-	-	-
Demographics				
Had a baby in year t	-	-	-1.3498	-64.92
Number of children in year t	-0.1402	-14.11	-	-
Has child aged five or under	-0.6480	-32.60	-	-
Single	-	-	-	-
Married	-0.0217	-0.66	-0.2420	-9.51
Divorced	0.0344	0.94	-0.2375	-8.22
Widowed	0.0861	0.46	-0.0207	-0.19
Partner is employed	-0.1682	-5.64	0.0738	3.30
Plans to have (have more) children	0.0774	4.25	-0.0914	-6.37
Starting state				
First state post FT education, FT employment	-	-	-	-
First state post FT education, PT employment	0.0195	0.27	0.0527	0.78
First state post FT education, OLM	0.0313	1.67	-0.0587	-3.92
Number of children at age 23	-	-	-0.0457	-4.31
Plans to return to work if OLM at age 23	0.1717	6.68	-0.0845	-4.31
Highest qualification at age 23				
None	-	-	-	-
Sub O-level	0.1352	3.21	0.0907	2.78
O-level or equivalent	0.1173	5.27	0.1089	6.61
A-level or equivalent	0.1684	5.27	0.1213	5.01
Nursing	0.0213	0.57	0.3976	11.48
HND or equivalent	0.0479	1.09	0.1236	3.01

Teaching	0.2077	2.46	0.3873	5.46
Degree or higher	0.1537	4.73	0.1667	6.21
Attitudes				
Agrees that work is less important for women	0.0537	1.73	-0.0657	-2.84
Neither agrees nor disagrees	-	-	-	-
Disagrees that work is less important for women	0.1088	4.16	0.0410	2.01
Agrees that wives who do not have to work should not work	0.1272	3.96	-0.0789	-3.22
Neither agrees nor disagrees	-	-	-	-
Disagrees that wives who do not have to work should not work	0.1270	4.79	-0.0290	-0.14
Agrees that women should look after children if they are ill	0.0863	3.16	-0.0269	-1.29
Neither agrees nor disagrees	-	-	-	-
Disagrees that women should look after children if they are ill	0.1950	7.39	0.0017	0.08
Time	0.0040	2.56	-0.0068	-6.67
	N=69180	Log-likelihood=-40431.35		

All specifications also include controls for prior employment experience and plans at age 16 for family formation.

Figure 1 *Employment States at Ages 33 and 42: Women in Full-time Work or At Home at Age 23*



Note: numbers do not add to totals for the earlier age due to the omission of 'other' employment states, including education, unemployment and sickness.

Appendix – means and standard deviations of variables

Variable	Mean	Standard deviation
Employed in year t	0.747	0.435
Employed full-time in year t	0.660	0.474
Had a baby in year t	0.073	0.259
Number of children in year t	1.330	1.199
Has pre-school age child in year t	0.292	0.455
Years of employment experience	4.249	4.404
Married	0.667	0.471
Divorced	0.074	0.261
Widowed	0.003	0.054
Partner employed	0.664	0.472
Plans to have (more) children	0.698	0.459
First state post full-time education, FT employment	0.602	0.489
First state post full-time education, PT employment	0.010	0.097
First state post full-time education, non-employment	0.365	0.481
Number of children at age 23	0.445	0.779
Plans to return to work if non-employed at age 23	0.149	0.356
Highest qualifications at age 23 - Sub O-level	0.041	0.198
Highest qualifications at age 23 - O-level or equivalent	0.388	0.487
Highest qualifications at age 23 – A-level or equivalent	0.128	0.334
Highest qualifications at age 23 - Nursing	0.051	0.219
Highest qualifications at age 23 – HND or equivalent	0.039	0.193
Highest qualifications at age 23 - Teaching	0.012	0.110
Highest qualifications at age 23 – Degree or higher	0.115	0.319
Agrees that work is less important for women	0.187	0.390
Disagrees that work is less important for women	0.692	0.462
Agrees that wives who do not have to work should not work	0.148	0.355
Disagrees that wives who do not have to work should not work	0.725	0.447
Agrees that women should look after children if they are ill	0.373	0.484
Disagrees that women should look after children if they are ill	0.507	0.500

[1] For a detailed analysis and discussion see European Commission (2004, chap. 3).

[2] Figures based on administrative data from the New Earnings Survey Panel Dataset 2001.

[3] The preferred patterns are remarkably diverse. The strongest support for part-time work is in the Netherlands where 70% prefer the full/part-time combination against only 6% preferring both to work full-time. In Sweden, by contrast, only 22% favour the full/part-time combination while 67% prefer full-time work by both partners.

[4] OECD (1999, 2002) detail international experience; on the UK see Hakim (1998) and Grimshaw and Rubery (2001).

[5] The monthly work histories are discussed by Narendranathan and Elias (1993).

[6] The employment history data does not allow us to identify spells of maternity leave. It is possible that some women on maternity leave described these periods as spells of employment and that others described them as spells of family or home care.

[7] Since we have only a single cohort it is not possible to identify whether the increasing role of part-time work is an age effect, the consequence of the cohort becoming older, or a time effect, brought about by general economic or societal changes.