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

An Analysis of the Roles of Heterogeneity and Persistence

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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 persistence in explaining the choice of labour market state. Our major finding is that a woman's labour market history becomes the major determinant of subsequent labour market state, dominating the role of characteristics. Part-time work serves two different functions. Those whose past history involves full-time work even in conjunction with spells of part-time work or non-employment, revert to full-time work. Those whose labour market history combines spells in part-time work with non-employment are unlikely 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. Combining these last two groups shows that a substantial majority 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 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.[2] The Kok Report to the EU on progress towards achieving the Lisbon goals (Kok, 2003) 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'. 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.[3] 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 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. 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 is of part-time work 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 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 a temporary state between 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 their sample 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, emerge as few in number, less than 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 the 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 main survey dates for the cohort in its adult years at ages 23, 33 and, most recently, 42. At these main

survey 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 and which member provides care when a child is sick. Attitudes to mothers' labour market involvement are elicited through questions such as whether family life is perceived as suffering if the mother works full-time. Retrospective information is collected on the principal personal and labour market events occurring in the years between the main surveys. On the basis of the detailed calendar provided for jobs held 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) on the basis of the activity characterizing the largest proportion of time within the year. 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.

Our central focus is the choice of labour market state over this segment of the life-cycle and the roles of individual heterogeneity and persistence in this. We find a remarkable range of different pathways in the sequence of labour market states engaged in by this cohort. Apart from continuous full-time employment we identify seven major patterns. These include the 'maintenance' pattern identified by Blank but in a much less prominent role, and also the 'stepping-stone' pattern. The 'exclusionary' pattern noted both by Blank and by O'Reilly and Bothfeld is rare. This greater variety relative to Blank's findings 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. In line with previous work we confirm the role of individual heterogeneity in choices of labour market state, notably employment against non-employment and full-time against part-time work. The set of attitudinal measures for the survey years, offering direct measurement of attributes central to heterogeneity, appear effective 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. Our major new finding is clear evidence of persistence in labour market status. While heterogeneity in personal characteristics and attitudes is a major influence on early choices of labour market state, in later

phases a woman's past labour market history is sufficient to explain her further choices between employment and non-employment and between full- and part-time work.

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 approach. 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 provide detailed information on personal, household and labour market status at ages 23, 33 and 42. In addition interim surveys and retrospective questions make it is possible to construct a complete annual history for the key variables of interest covering the years 1981-2000. In terms of labour market states, full- and part-time employment are self-classified. Within non-employment caring at home is specifically identified, along with education, training, sickness, unemployment and 'other' states. The potential sample comprises 8,960 women; we restrict our attention to those women who were present in sweeps 4, 5 and 6 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, 67 percent are in employment while 23 percent are out of the labour market, engaged in family/home care. Full-time work is by far the most frequent employment status, with part-time employment scarcely featuring (Table 1). By 1991, when the women are aged 33, the proportion in employment has risen slightly, to 70 percent. Its composition, however, has changed radically, with the numbers in full-time work falling steeply, and the numbers in part-time work rising almost equally steeply. Full-time work is now only marginally more common than part-time work. One woman in four is engaged exclusively in family/home care, a small increase over the proportion at age 23. By 2000, when the cohort are aged 42, the proportion in employment has risen substantially, to 81 percent, while only 12 percent are engaged in full-time family/home care. The rise in labour market participation

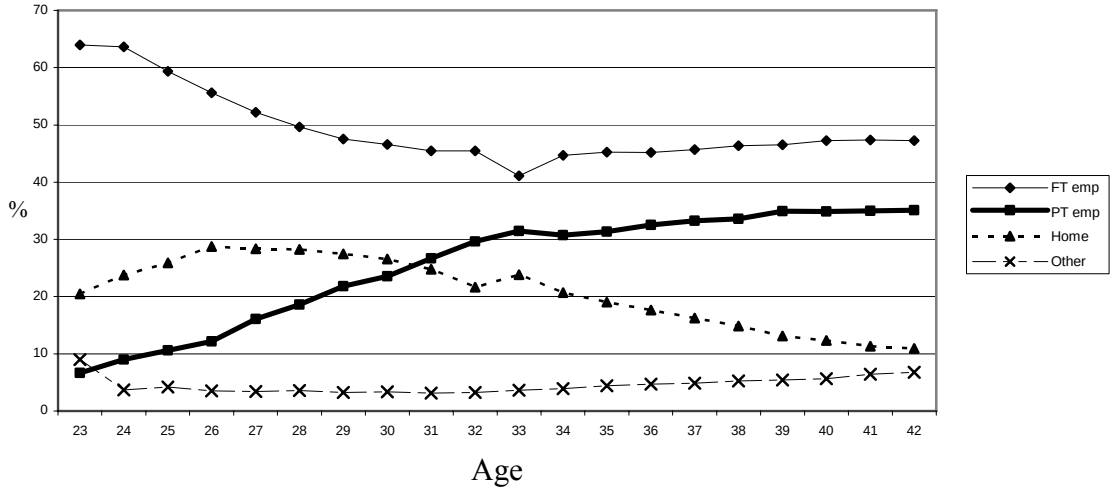
between the ages of 33 and 42 mainly involves a shift back into full-time employment, although the proportion working part-time also rises. At each of the three survey dates much the largest group not in employment are those caring at home.

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

	Age 23	Age 33	Age 42
Employment	70.6	72.6	82.3
Full-time	63.9	41.1	47.3
Part-time	6.6	31.5	35.1
Home	20.5	23.8	10.9
Other	9.0	3.6	6.8
Unemployed	5.7	1.6	1.3
Education	1.8	0.8	0.6
Sick	0.2	0.6	3.7
Other	1.3	0.6	1.2
Total sample	3459	3459	3459

Retrospective responses provided in sweeps 5 and 6 allow the construction of employment histories over the intervening years. From a combination of diary record and retrospective life histories obtained in the survey years, it is possible to date job changes by month, allowing the predominant economic activity of each year to be identified (subject to recall bias). As shown in Chart 1, the changes in women's labour market status between the benchmark dates given in Table 1 evolve smoothly. As the women move through their twenties the shift from full-time to part-time work is strong and sustained, while the proportion at home remains relatively constant. 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 and climbs steadily. Part-time employment also continues to rise but at a slower rate than when the women were in their 20s.

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



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 were spent in full-time work, five in part-time work and four years at home. 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 (60% 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 those who were at home at age 23 (23% 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%
	at home → full-time → full-time	17%
	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*

	1981 to 2000		1981 to 1991		1991 to 2000	
	Number	%	Number	%	Number	%
Full-time employment only	531	15.4	826	23.9	869	25.1
Part-time employment only	13	0.4	29	0.8	397	11.5
Out of labour market only	64	1.9	175	5.1	209	6.0
Combinations of FT employment and OLM	533	15.4	756	21.9	350	10.1
Combinations of PT employment and OLM	299	8.6	442	12.8	645	18.6
Combinations of FT and PT employment	404	11.7	362	10.5	612	17.7
All three states	1615	46.7	869	25.1	377	10.9
Total	3459	100	3459	100	3459	100

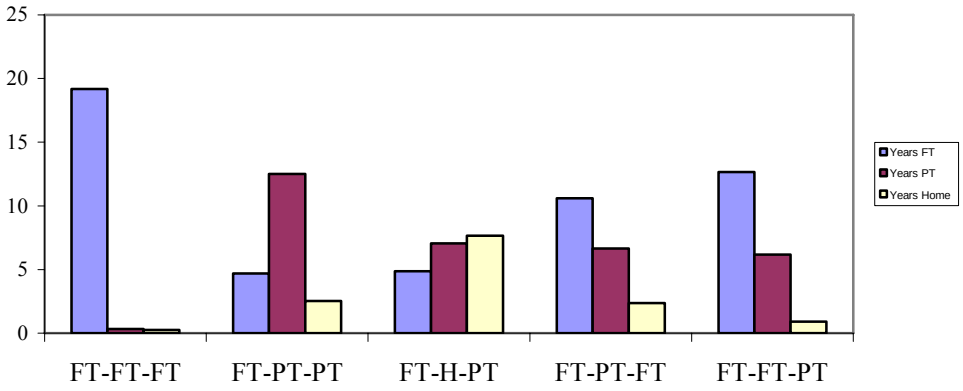
Source: Authors' calculations using NCDS.

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 full-time employment only and full-time employment combined with years out of the labour market are the other most frequent patterns. Part-time work is of limited importance, either alone or in combination with either of the other states. In the following decade, by ages 33-42, the incidence of continuous full-time employment has scarcely changed but it has become the most common pattern. The other major feature of this decade is the emergence of part-time employment as a leading category, 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 are to the fore in our data also.[4]

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 on a full yearly profile 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. These are shown in Table 4. This highlights the high level of year-to-year persistence in type of economic activity found in other contexts. Full-time employment is much the most persistent state. Between the ages of 23 and 42 on average 45.5 percent of women were in full-time employment in any year and remained in full-time employment in the following year. Only 1.3 percent moved to part-time employment while 2.6 percent left the labour market from full-time work. Persistence also strongly characterises both part-time employment and non-participation. In total 88 percent of women were 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. 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; 1958 Birth Cohort, Women aged 23 to 42 (%)*

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 there may be differences in characteristics, observable and unobservable, across individuals, leading them to make different choices. If, as is likely, these characteristics are correlated over time, then it would appear that the experience of a particular state makes the same state more likely in the future, but this correlation arises because past experience is essentially a proxy for the individual heterogeneity. The second argument is that the experience of a particular state itself changes 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 will reflect work experience to date. The lower rate of human capital formation with part-time employment or time out of the labour market will reduce the potential market wage, an effect which may be reinforced by any 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 voluntary 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 Model

To address these issues appropriately within a panel data framework requires an econometric model 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_t 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_t .

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, possibly including motivations and attitudes to labour market work which, in this context, must be correlated with both the included *X*'s.

(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} also gives rise to serial correlation in the error term.

(iv) The problem of initial conditions - the initial observation of labour market activity at t=1 does not necessarily coincide with the point of entry into the labour market. There may therefore be a pre-sample labour market history that is relevant to subsequent experience. For example, a woman whose prior career was characterised by absence from the labour market may find it more difficult to enter employment at a later stage.

No satisfactory estimation method exists for dynamic multiple choice models, such as a dynamic multinomial logit or probit (Arellano and Honore, 2001). Our estimation strategy is therefore to present a series of estimates, each addressing a sub-set of the estimation issues to build up a weight of evidence on the economic questions.

(1) ***Pooled multinomial logit estimation*** - this retains as the priority issue the simultaneous multi-way choice among the three alternative labour market states. The treatment of individual

heterogeneity has to be restricted to observables. Since a formal dynamic structure cannot be estimated we include a detailed set of variables characterising the individual's employment history.

(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: for example, the first-stage decision may be to work or not to work, and the second stage between full- and part-time work, conditional on the choice of 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. In addition 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) 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 the 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 second-stage decision jointly with the selection equation of the first stage outcome. Random effects, as implemented previously, are again applied. A dynamic formulation is not available so detailed work histories are used.

$$\begin{aligned} z_{i1} &= \beta_1^{'} x_{i1} + \varepsilon_{i1} \\ z_{i2} &= \beta_2^{'} x_{i2} + \varepsilon_{i2} \end{aligned} \qquad (6)$$

Where $y_{i1}=1$ if $z_{i1}>0$, $y_{i2}=1$ if $z_{i2}>0$ and y_{i1} is only observed if $y_{i2}=1$.

We now summarise our estimation strategy. 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 without conditioning 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. In general initial conditions do not pose a problem. We are dealing with the period from age 23 when a large proportion of the sample were in full-time employment. In addition we are able to

extract from our data any earlier employment history, allowing control for the potential correlation between the initial state y_{i1} and included characteristics.

3. Estimates of choice of employment state

We estimate employment status equations for women aged 23 to 42. Age 23 is taken as the starting point because by this age the vast majority of the sample have completed full-time education and are facing the choice set of the three states: full-time employment, part-time employment and non-employment. Age 23 is also one of the main survey dates, giving a number of special questions, notably on attitudes to work and family life. We use information from employment history diaries for the years before age 23 to control for initial conditions at the starting state y_{i1}. 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:

$$E_{it} = f(B_{it}, H_{it}, Exp_{i\,t-6}, M_{it}, Q_{i23}, H_{i23}, F_{i23}, P_i, t)$$

where E_{it} is an indicator of employment state in year t, with '0' representing non-employment, '1' part-time employment and '2' full-time employment. 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 present. 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. $Exp_{i,t-6}$ measures the number of years of employment experience (linear and quadratic) prior to the five-year period of the detailed employment histories. 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 a single cohort.

Table 5 gives the estimation results for the pooled MNL model. The effects of the 'family' and 'household' variables, already well established in the literature, are replicated. Child-bearing and the presence of a pre-school child are both strongly conducive to non-employment and part-time employment rather than full-time employment, although the number of children influences non-employment but not part-time work. Being married also promotes non-employment and part-time work; being divorced is associated with non-employment and having an employed partner supports an orientation to part-time rather than full-time work. Higher educational attainment influences against both non-employment and part-time employment. The attitudinal variables perform rather weakly.

[Table 5 about here]

Our main interest is in the influence of work history on choice of employment state. Here the results are striking, with strongly determined effects and clear sign-reversals for the different labour market states. A history of continuous full-time employment makes both non-employment and part-time employment an unlikely choice. Continuous part-time employment makes that state a highly likely further choice, while sustained non-employment similarly supports its own continuation. A history of full-time employment combined with part-time work makes both non-employment and part-time employment less likely. This gives support to the concept of part-time work serving as an interlude in a basically full-time career. When labour market history combines spells of full-time work with non-employment further non-employment becomes more likely and part-time work unlikely. Career histories comprising part-time work and non-employment are strongly associated with further non-employment and part-time work. This again 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 for binary decisions requires a two-stage decision structure here. We model this as the choice at the first stage 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.

The models are specified as follows:

$$E_{it} = f(B_{it}, E_{i\,t-1}, Exp_{i\,t-2}, D_{it}, Q_{i23}, H_{i23}, F_{i23}, P_i, t)$$

where E_{it} is a binary indicator of employment/non-employment in year t, B_{it} indicates whether the woman had a baby in year t, $Exp_{i\,t-2}$ is a measure of employment experience, D_{it} are a set of dummies reflecting marital status, household employment, family formation plans, Q_{i23} are a set of dummies indicating highest level of qualification at age 23, H_{i23} are a set of variables that reflect the pre-sample employment history, F_{i23} is family size at age 23, P_i is a set of dummies reflecting attitudes towards combining work and motherhood; we include a time trend to capture both any changes in macroeconomic conditions or the effects of the cohort ageing, where these cannot be distinguished within a single cohort.

The second-stage equation for employment state is specified as

$$FT_{it} = f(K_{it}, K5_{it}, FT_{i\,t-1}, PT_{i\,t-1}, Exp_{i\,t-2}, D_{it}, Q_{i23}, H_{i23}, F_{i23}, P_i, t)$$

where FT_{it} is a binary variable indicating full-time relative to part-time employment in year t, K_{it} indicates the number of children which 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 $Exp_{i\,t-2}$, D_{it}, Q_{i23}, H_{i23}, F_{i23}, P_i and t are as above.

Many of the same variables measuring personal attributes and attitudes are relevant and included in both equations. The birth of a child in the current year is regarded as more relevant to the

employment/non-employment choice, while the presence of a pre-school age child and the number of children in the household impact more on the full/part-time decision. Identification is achieved 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 or the selection-corrected probit we repeat the specification of the dynamic random effects logit replacing the lagged dependent variable by a set of variables representing the detailed structure of the individual's employment history. The results for the choice of employment as against non-employment are presented in Table 6 and for the choice of full- against part-time employment in Table 7. In both Tables the first set of columns give the dynamic panel estimates without and 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 is employment history. This again applies to both specifications. In the dynamic specification a woman who was employed in *t-1* is much more likely to work in *t* than a woman who was not. With detailed employment histories the choice of labour market participation is very strongly predicted by employment patterns of the preceding five years. The strength of the effect increases monotonically with the proportion of the five years which has been spent in employment. 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. 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. Attitudes towards market work and childcare can be significant;

those women who disagree that work is less important for women than for men, and those women who disagree that the mother should take responsibility for looking after children when they are ill are more likely to be employed. The roles of the remaining variables are closely similar between the two specifications, suggesting that the detailed employment histories are a good representation of the dynamic structure. The influence of education and the attitudinal variables is reduced by the inclusion of the means of the time-varying 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 random effects logits on the second-stage decision between full- and part-time work are presented in Table 7. Among the identifying variables, amongst those women in employment at *t*, those with pre-school age children or larger families are less likely to be in full-time employment. The presence of a pre-school child is strongly determined in both specifications, but the number of children in the household 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 employment in *t* and those who worked in part-time employment in *t-1* are less likely to be in full-time employment in *t*. The role of past employment status as a predictor of the choice of full-time against part-time employment is equally clearcut. A history of full-time work, including in combination with spells in part-time work or non-employment, is 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.

Other influences on the full/part-time choice are much as expected. Women who are married or divorced are rather less likely than single women to be in full-time, rather than part-time employment. Having an employed partner (which has no impact on the employment/non-employment decision above) supports part-time rather than full-time work. Plans in relation to family completion and a return to work support the choice of full-time status. A finding less easily anticipated relates to the role of education. Educational attainment was noted above as

clearly conducive to a preference for employment over non-employment. However except for women qualified to degree level education is not associated with a preference for full-time over part-time employment. In the cases of those with nursing qualifications the choice of part-time work is more common, presumably reflecting the availability of flexible and diverse opportunities in part-time work. Overall, while the means of the time-varying variables are often significant their inclusion has little impact on the estimated coefficients, suggesting that for the full/part-time decision unobserved heterogeneity is uncorrelated with the observed co-variates.

[Table 7]

In Tables 6 and 7 the binary choice has been 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, now with the correction for selection into employment. Since the selection equation is into employment, this includes the employment/non-employment history over five years as above. 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, again as above. The model is specified as follows:

$$FT_{it} = f(K_{it}, K5_{it}, H_{it}, Exp_{i\,t-6}, D_{it}, Q_{i23}, H_{i23}, F_{i23}, P_i, t)$$

$$E_{it} = f(B_{it}, H_{it}, Exp_{i\,t-6}, D_{it}, Q_{i23}, H_{i23}, F_{i23}, P_i, t)$$

Where FT_{it} is only observed if $E_{it}=1$.

The results in Table 8 strongly confirm those derived above. Selection into employment strongly reflects previous employment history, again monotonic in the proportion of the previous five years spent in full-time work. The identifying restrictions, on number of children in the household and the presence of a child under five, are strongly significant influences against employment. 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 uncorrected findings 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 part-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. These attitudes influence the decision conditional on whether to be active in the labour market, and, given a positive outcome to that, also on the choice of full- against part-time work.

[Table 8]

4. Conclusions

The results from each of the estimations presented in Tables 5-8 provide strong evidence of state dependence in both employment and employment status. 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; the impact of previous state on current state remains strongly positive regardless of how we measure employment history and of the estimation process applied.

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 that part-time employment might be used either as part of a maintenance career path which would be reflected in an employment history that combines

limited part-time employment with substantial periods of full-time work, or as an exclusionary career path where the employment history would combine part-time employment with spells out of the labour market. We find clear evidence in support of the differing roles for part-time work: the maintenance paths where transitions back into full-time employment from part-time work or non-employment, and exclusionary paths involving part-time work and non-employment with full-time work an unlikely occurrence. 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 participation has been more patchy, involving combinations of spells in part-time work with non-employment, it continues this pattern. It may therefore be either a temporary support or a dead-end.

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

0 – OLM in year t 1 – Part-time in year t 2 - Full-time in year t	OLM		PT employment	
Explanatory variables	Coefficient	z-statistic	Coefficient	z-statistic
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
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	-	-	-	-
Years of experience (%) age 23 to t-6	0.0057	2.76	0.0027	1.30
Square of yrs of exp (%)	0.00002	0.95	-0.00007	-3.79
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
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	-3.8398	-2.47
Number of observations	69180		Pseudo Rsq=0.4686	
LR chi(86)	67724.04			
Log likelihood	-11356.503			

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
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
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
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 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
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
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
Plans to return to work if OLM at age 23								
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
Number of observations	51322		51650		51650		51650	
Number of groups	3392		3395		3395		3395	
Log likelihood	-10279.042		-10426.292		-11356.503		-12047.831	

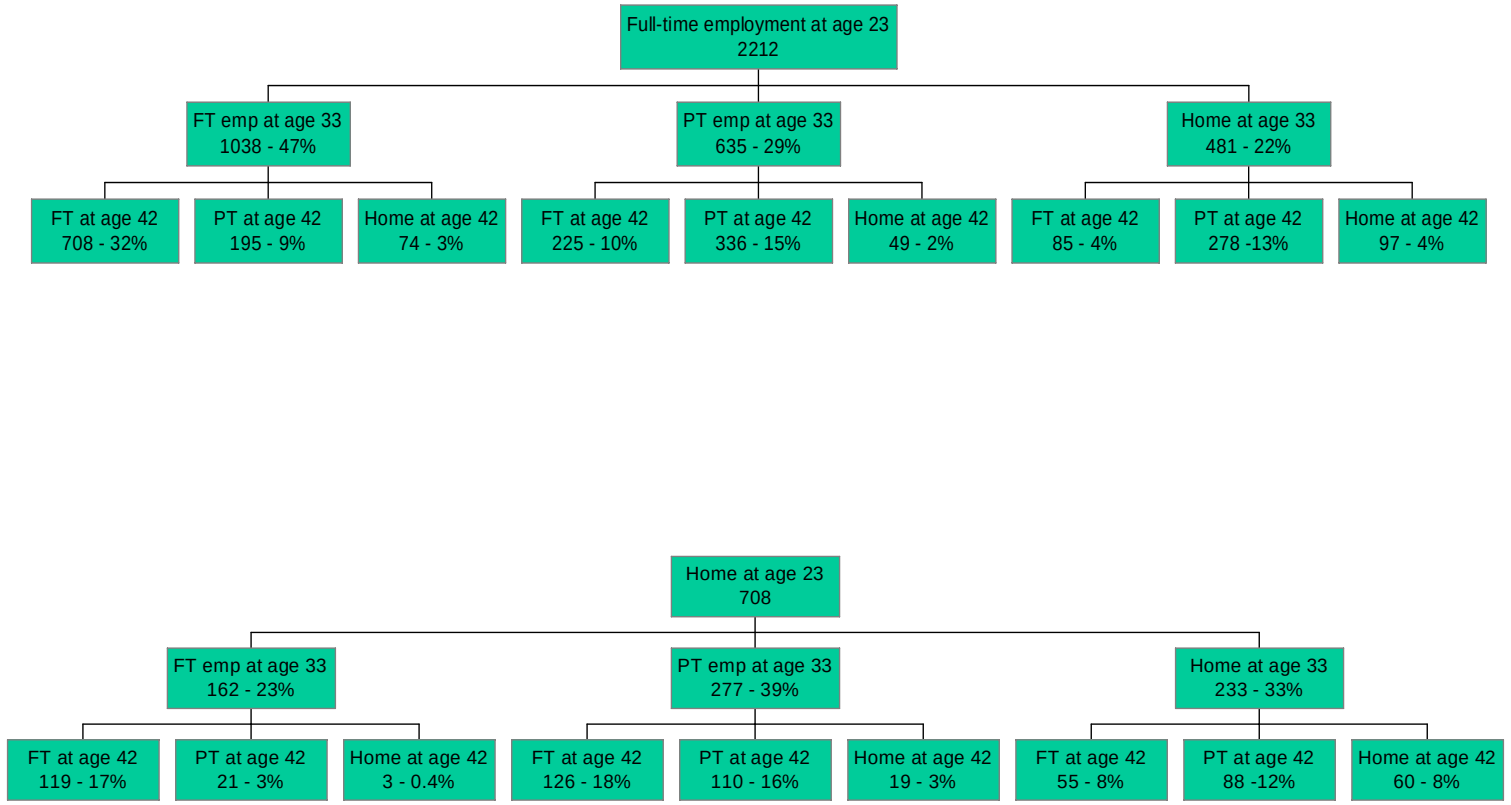
All specifications also include controls for employment experience and plans at age 16 for family formation.

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
Time	0.004	2.563	-0.0068	-6.670
Employment history years t-5 to t-1				
Employed in all of the five previous years t-1, …, t-5	-	-	1.9630	112.274
Employed in four of the five previous years	-	-	1.0863	53.594
Employed in three of the five previous years	-	-	0.7854	37.436
Employed in two of the five previous years	-	-	0.6228	28.399
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	58.559	-	-
Employed PT in all of the five previous years t-1, …, t-5	-0.9930	-29.943	-	-
OLM in all of the five previous years t-1, …, t-5	0.0253	0.477	-	-
Employed FT in four and PT in one of the five previous years	0.6991	16.834	-	-
Employed FT in three and PT in two of the five previous years	0.5829	13.148	-	-
Employed FT in two and PT in three of the five previous years	0.5547	12.343	-	-
Employed FT in one and PT in four of the five previous years	0.3619	8.385	-	-
Employed FT in four and OLM in one of the five previous years	1.0712	23.068	-	-
Employed FT in three and OLM in two of the five previous years	1.1306	20.857	-	-
Employed FT in two and OLM in three of the five previous years	1.0109	17.177	-	-
Employed FT in one and OLM in four of the five previous years	1.0862	17.058	-	-
Employed PT in four and OLM in one of the five previous years	-1.0235	-21.782	-	-
Employed PT in three and OLM in two of the five previous years	-0.9931	-19.113	-	-
Employed PT in two and OLM in three of the five previous years	-0.9711	-17.153	-	-
Employed PT in one and OLM in four of the five previous years	-0.7953	-11.984	-	-
Employed in all three states in the five previous years	-	-	-	-
Demographics				
Had a baby in year t	-	-	-1.3498	-64.921
Number of children in year t	-0.1402	-14.105	-	-
Has child aged five or under	-0.6480	-32.690	-	-
Single	-	-	-	-
Married	-0.0217	-0.664	-0.2420	-9.509
Divorced	0.0344	0.940	-0.2375	-8.219
Widowed	0.0861	0.463	-0.0207	-0.194
Partner is employed	-0.1682	-5.637	0.0738	3.297
Plans to have (have more) children	0.0774	4.249	-0.0914	-6.373
Starting state				
First state post FT education, FT employment	-	-	-	-
First state post FT education, PT employment	0.0195	0.271	0.0527	0.784
First state post FT education, OLM	0.0313	1.670	-0.0587	-3.923
Number of children at age 23	-	-	-0.0457	-4.310
Plans to return to work if OLM at age 23	0.1717	6.677	-0.0845	-4.310
Highest qualification at age 23				
None	-	-	-	-
Sub O-level	0.1352	3.213	0.0907	2.781
O-level or equivalent	0.1173	5.268	0.1089	6.613
A-level or equivalent	0.1684	5.267	0.1213	5.006
Nursing	0.0213	0.572	0.3976	11.476
HND or equivalent	0.04794	1.091	0.1236	3.008
Teaching	0.2077	2.464	0.3873	5.463

Degree or higher	0.1537	4.733	0.1667	6.211
Attitudes				
Agrees that work is less important for women	0.0537	1.726	-0.0657	-2.843
Neither agrees nor disagrees	-	-	-	-
Disagrees that work is less important for women	0.1088	4.157	0.0410	2.011
Agrees that wives who do not have to work should not work	0.1272	3.960	-0.0789	-3.221
Neither agrees nor disagrees	-	-	-	-
Disagrees that wives who do not have to work should not work	0.1270	4.791	-0.0290	-0.143
Agrees that women should look after children if they are ill	0.0863	3.158	-0.0269	-1.294
Neither agrees nor disagrees	-	-	-	-
Disagrees that women should look after children if they are ill	0.1950	7.388	0.0017	0.084
	N=69180	Log-likelihood=-40431.35		

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

Variables	Mean	Standard deviation
Employed in year t	.7466031	.4349594
Employed Full-time in year t	.6602904	.4736152
Had a baby in year t	.0725643	.2594219
Number of children in year t	1.330225	1.199104
Has pre-school age child in year t	.2918907	.4546356
Years of employment experience	4.249292	4.403608
Married	.6671003	.4712544
Divorced	.0737207	.2613178
Widowed	.002891	.0536907
Partner employed	.6639202	.47237
Plans to have (have more) children	.6978896	.4591762
First state post FT education, FT employment	.6024863	.4893874
First state post FT education, PT employment	.0095403	.0972083
First state post FT education, OLM	.3651344	.4814713
Number of children at age 23	.4449263	.7788563
Plans to return to work if OLM at age 23	.148887	.3559796
Highest qualifications at age 23 - Sub O-level	.0407632	.1977426
Highest qualifications at age 23 - O-level or equivalent	.3876843	.4872254
Highest qualifications at age 23 – A-level or equivalent	.1280717	.334172
Highest qualifications at age 23 - Nursing	.0505927	.219166
Highest qualifications at age 23 – HND or equivalent	.0387395	.1929749
Highest qualifications at age 23 - Teaching	.0121422	.1095216
Highest qualifications at age 23 – Degree or higher	.1150622	.3190992
Agrees that work is less important for women	.1873374	.3901849
Disagrees that work is less important for women	.6918184	.4617453
Agrees that wives who do not have to work should not work	.1480197	.355122
Disagrees that wives who do not have to work should not work	.7247759	.4466303
Agrees that women should look after children if they are ill	.3729402	.4835899
Disagrees that women should look after children if they are ill	.5073721	.4999493

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

[2] 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.

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

[4] 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.