Lancaster University Management School Working Paper 2000/005

A New Look at Gender Effects in Participation and Occupation Choice

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VERY PRELIMINARY DRAFT – PLEASE DO NOT QUOTE

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ABSTRACT

The growth in female labour particpation and occupational attainment represents the most dramatic feature of labour markets in the second half of the twentieth century. This has been due in part to developments in social attitudes and the consequent changes in the prices attached to womens' characteristics, and in part to changes in those characteristics themselves. This paper analyses these issues by constructing models of participation and occupational choice for the years 1970 and 1990, and then by evaluating which participation and occupation regimes would have been selected by respondents with the characteristics of women observed in 1970 had they faced the coefficients which obtained in 1990. It is established that changing prices accounts for a substantial part of the improvement in womens' fortunes in the labour market. To provide a basis of comparison, the model is also estimated for men. Choices concerning occupational and labour market participation are modelled using both the standard multinomial logit and the nested logit techniques. The latter, which has not previously been employed in the present context, alleviates problems due to the strong assumption in simpler models of the independence of irrelevant alternatives, and provides much additional useful information.

JEL Classification: J16, J62, J7
Keywords: Participation, Occupation, Occupational Segregation, Nested Logit

Acknowledgements: Without implication, the authors thank Steve Bradley, Jim Taylor and David Sapsford for useful discussions.

1. Introduction

A quarter of a century after the introduction of extensive legislation for gender equality, there remains considerable concern that women lag significantly behind men in the labour market. In the UK this is evidenced by the work of Blackaby *et al*. (1997), who show that, as a proportion of male earnings, female earnings rose from about 55 percent to 72 per cent between the early 1970s and mid-1990s. In the United States, meanwhile, papers by, *inter alia*, Blau and Khan (1994) have shown that female earnings rose sharply in the late 1970s from around 60 per cent of male earnings to about 70 per cent in the early 1990s. But wages are not the only dimension along which discrimination might take place.

The labour market for females differs from that for males most evidently in the participation dimension. Although female labour force participation has risen very dramatically during the last century (Mincer, 1962) its extent remains well below the male participation rate. Moreover, a relatively high proportion of women are employed part-time. An interesting research issue, which has been pursued with some vigour, has therefore been to ascertain the extent to which the labour market participation of women is determined by their personal characteristics vis-à-vis the rewards offered by the labour market to those same characteristics – what we might call the 'prices' attached to the variables in the participation equation. Key papers in this area have been authored by Blank (1989, 1990), who argues that the participation status of women is determined largely by household compositoin, education, ethnicity and age.

A second dimension in which male and female experience of the labour market is distinct concerns the selection of occupation. It has long been contended that a considerable portion of the male:female earnings differential is due to occupational segregation (Brown *et al*., 1980; Dolton and Kidd, 1994), and there exists also a substantial literature on the 'glass ceiling' which might hinder women from climbing up the job ladder (Gregg and Machin, 1994).

In light of the above discussion, the aim of this paper is to examine the inter-related choices of participation and occupation which are made by individuals in an appropriate empirical framework where limited dependent variable models are estimated with correction for sample selection effects. In so doing, we aim to throw light on the question of how much of the progress achieved by women in recent decades can be attributed to changes in characteristics, and how much to changes in prices. The latter, of course, may reflect profound attitudinal changes in society.

To set the scene, we first construct a simple theoretical model which motivates the empirical work which follows. Consider the participation and occupation choices made by a single individual, i. This individual's utility maximisation problem may be represented by

$$U_i = \max\{U_{im}(c_m(x_i,h_i,y_m,z), h_i), U_{in}(c_n(x_i,h_i,y_n,z),h_i)\}$$

where c denotes consumption, x is a vector of characteristics, y_m and y_n are occupation-specific shift effects which affect remuneration, z denotes macroeconomic environmental conditions, h is the hours of labour supplied, and m and n denote the two alternative occupations which the individual may select. The maximisation of utility is of course subject to non-negativity constraints on consumption and hours, and also to a time constraint which imposes the maximum number of hours available for either work or leisure. Consumption is supposed to be determined positively by personal characteristics which influence the wage, and also by the number of hours worked and a variety of environmental conditions which may or may not be occupation-specific. In addition to raising earnings, hours may also have a negative impact on utility, since ceteris paribus more leisure is preferred to less. The individual must therefore choose the number of hours and the occupation which maximises her utility, given the values of the exogenous variables in the above equation. Hence the solution implies

$$h_i = h_i(x_i,y_m,z)$$

and occupation m will be chosen if $U_{im}>U_{in}$. Otherwise the worker will choose occupation n.

A number of previous studies have attempted to operationalise this model empirically. Two approaches have been standard in the literature. The first is to estimate a multinomial logit model in which participation choices and occupation choices are made simultaneously. This is the method favoured by, *inter alia*, Makepeace (1996) and Johnes (1999). It has the advantage that the number of occupation and participation regimes which may be considered is not limited by the choice of methodology. To be sure, statistical considerations may lead one to prefer a relatively parsimonious specification of the multinomial logit, but this would result from the properties of the data rather than from the modelling procedure itself. The main disadvantage of the multinomial logit approach is that it supposes that participation and occupation decisions are arrived at simultaneously.

The latter observation has led many researchers to prefer a bivariate probit approach. In this modelling procedure, the particpation decision is made in the first stage of the model, and occupational choices are made in a second stage. Papers which have adopted this method include Dolton and Makepeace (1993) and Johnes (2000). An appealling characteristic of these papers is that they allow for sample selection biases which arise from the manner in which the participation decision interacts with occupational choice. Sample selection issues have received considerable attention in the microeconometrics literature since the seminal contributions of Heckman (1979) and Lee (1983). In the present context, the problem is that we observe occupational choices only for those who have decided to participate in the labour market. Without correction, the equation which explains occupation would be based upon a non-random sample of individuals. The bivariate probit approach corrects for such biases. However, the approach does suffer a major weakness in the present context. It allows consideration of only two participation states and two occupations. It is natural, however, to consider a greater variety of participation modes – for example, full-time, part-time and non-participation. And the collapse of occupations into just two broad categories would appear to be an excessive over-simplification.

In view of the fact that neither the above methods is without its weaknesses, a third tool of analysis is applied in the present paper – namely nested logit. Nested logit models were developed in the early 1980s by McFadden (1981), but it is only recently that they have come to be used regularly in empirical analyses. Indeed, as far as we are aware, the present paper represents the first application of this method in the field of labour economics. In other areas, interesting applications are to be found in the work of Ferguson (1993), Guadagni and Little (1998) and Chattopadhyay (2000).

While much of the novelty of the present paper lies in the choice of estimation methodology, the main focus of interest remains on the gender issues which are uncovered by the statistical estimation. We are especially interested in the information which our analysis provides about the changing fortunes of women over time. In particular, we address the question of whether or not women are now finding it easier to enter certain occupations than they did in the past. To this end, we shall investigate how, in comparison to the 1970 outturn, our sample of women in 1970 would have fared had they faced the same participation and occupation model as women faced in 1990. That is, how do 1970 women fare when they are 'pushed through' the model with 1990 parameters? As we shall see, the evidence suggests that prices moved in favour of women over this 20 year period.

The remainder of the paper is organised as follows. The next section discusses the data set used in our analyses. Following that, the methods of estimation are discussed and the results are presented. These include an analyses based upon the nested logit specification, but for purposes of comparison we conduct and report also on the results of a more conventional multinomial logit analysis of participation and occupation choice. The paper ends with a conclusion.

2. Data Sources

The main source of data are the uniform October files of the US Current Population Surveys (CPS), from 1970 though 1990.[1] The CPS is a monthly survey of around 60000 households in the United States. In each month a common core of questions is asked, augmented by questions which are specific to each month. The October series are particularly useful for research on educational issues, and have been assembled into a set of uniform files by Hauser *et al.* (1993). These have the advantage of being particularly convenient for analysis – a common coding scheme is used across years for each variable – but do suffer some disadvantages. Since only variables about which information was solicited in each year appear in the files, data are only available for a relatively limited group of variables. We do not,

[1] These data were kindly made available to us by the ICPSR through the Data Archive.

for example, have information about remuneration, though we do have data on variables which are commonly held to be key determinants of earnings, such as schooling and age.

Variables included in the CPS data which are of interest in the context of the present study include information about individuals' age, marital status, family composition (including numbers of children in various age groups), ethnicity, gender, education (by highest grade completed), area of residence (urban or otherwise), employment status, weekly number of hours worked, industry and occupation.

The CPS also provides information about individuals' state of residence. It is instructive to use this in order to graft onto the data set some further data concerning the state of the 'local' labour market. State unemployment rates are available from the US Statistical Yearbook, and are used in the sequel in order to ascertain the impact of the local labour market buoyancy on participation.

The structure of the uniform files is somewhat unusual in that it focuses on young people aged under 35 years. The files were compiled in this way in order to focus on education issues. Data on older workers are available in the files, but only where such people are living in households where the reference person within the household is in the focus age group. The sample of older workers is not therefore random, and for this reason we exclude them from our analysis altogether, though we do intend to study them at a later date by using the full CPS files. While the number of people sampled in the CPS is large, therefore – and while we have total numbers of observations of some 78590 and 72611 respectively in 1970 and 1990 – the number of useable observations of those aged between 16 and 34 years is considerably smaller. In 1970 we have 24225 observations, while in 1990 we have 29788. The data set remains fairly large, therefore, but a caveat must be attached to the results which follow inasmuch as the behaviour of the young age group may not be representative of that of those in a wider group of people of working age.

3. Methodology and Results

3.1 Multinomial Logit

Two methods are used to analyse the data in this section. The first is the familiar multinomial logit technique. This originated in the work of Nerlove and Press (1973) and applications in the area of occupational choice date from the contribution of Schmidt and Strauss (1975). The model is given by the equation

$$P(j) = \exp(\boldsymbol{\beta}'\mathbf{x}_j) / \Sigma_n \exp(\boldsymbol{\beta}'\mathbf{x}_n)$$

As noted earlier, we do not have data on remuneration. We would, however, expect pay to be an important determinant of both occupational choice and the participation decision.[2] Variables such as schooling and age, which are expected to be important determinants of the wage, are therefore included are explanatory variables in the model. The equations which we have estimated might therefore most usefully be regarded as reduced forms.

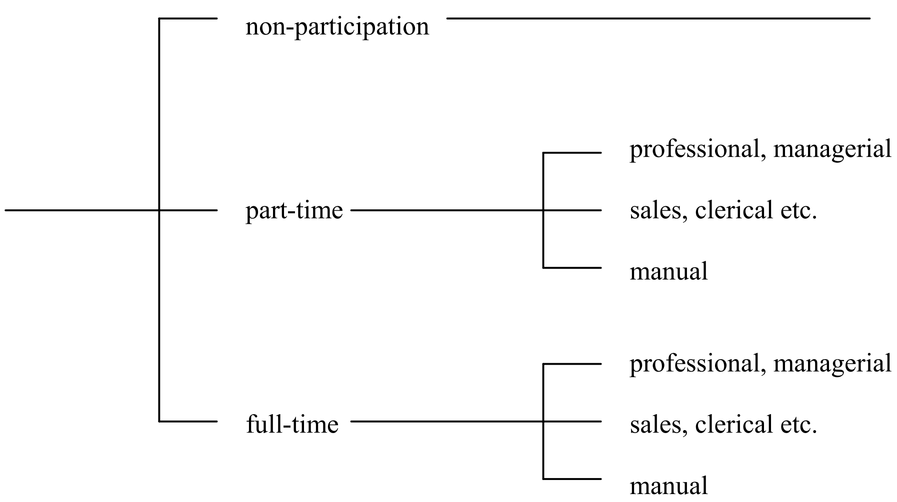
It is necessary to determine at the outset the level of disaggregation which is to be applied to the occupation data. We have chosen to define three occupations: professional and managerial; sales, clerical and other non-manual; and manual occupations. This choice is not arbitrary. Starting from a specification in which occupations were disaggregated as much as possible, a Cramer and Ridder (1988) test was used to determine the extent to which occupations should be pooled.

There are three categories of participation: full-time (40 hours and above); part-time; and non-participation. Our results are not sensitive to alternative definitions of the cut-off between full- and part-time work. Forth hours has been chosen as the cut-off for the results which are reported here because we observe in our data a concentration of workers who actually work 40 hours per week.

[2] The verb 'participate' and its associated noun are used here to describe a respondent who is in work.

3.2 Nested Logit

Since the nested logit model is not commonly used in labour economics, we shall discuss the method in some detail. Nested logit is essentially a generalisation of the multinomial logit, developed to mitigate problems which might arise from a violation of the assumption, common to simple logit analyses, of the independence of irrelevant alternatives. In this model, decision-making follows a heirarchical structure as illustrated below.



This decision tree comprises two levels which we may conveniently refer to as 'branch' and 'twig'. The branch level refers to the participation decision between non-participation, part-time and full-time. We suppose that this decision precedes any decision made by the respondent concerning occupation. If the respondent chooses not to participate, then that is the end of the decision-making process. Otherwise, the respondent moves on to the twig level, at which she makes the choice of occupation.

To estimate the nested logit model, we first estimate a series of distinct multinomial logits across all occupational choices within each branch. Hence the conditional probability of selecting the kth twig of the jth branch is

$$P(k \mid j) = \exp(\boldsymbol{\beta}'\mathbf{x}_{k|j}) / \Sigma_{n|j} \exp(\boldsymbol{\beta}'\mathbf{x}_{n|j}) = \exp(\boldsymbol{\beta}'\mathbf{x}_{k|j}) / \exp(J_j)$$

say, where J_j is known as the inclusive value. At the next level up, the probability of selecting the jth branch is given by

$$P(j) = \exp(\boldsymbol{\alpha}'\mathbf{y}_j + \tau_j J_j) / \Sigma_m \exp(\boldsymbol{\alpha}'\mathbf{y}_m + \tau_m J_m)$$

As in the standard multinomial logit, it is necessary to restrict some parameters to unity in order to achieve identification. Where all of the deep parameters of the model, that is the τ_m, equal unity, the model collapses to a standard multinomial logit. The multiple logit model estimated in section 3.1 is therefore simply a special case of the nested logit in which the deep parameters all equal one. This observation will be useful at a later stage in the paper when we come to test the models against one another.

The above model is estimated using full information maximum likelihood, so that the parameters associated with the two levels of the model are estimated simultaneously. This is achieved using the *nlogit* plug-in to *Limdep*.

The nested logit is appealling in the present context for at least two reasons. First, it allows us to relax the assumption that participation and occupation are simultaneously determined, in favour what might be a more realistic scenario in which participation decisions are made before occupational decisions.

Secondly, it is conceivable that, in the simple multinomial logit specification of our model, the error terms associated with a given occupational choice in the full-time regime might be correlated with those attached to the same occupation in the part-time regime. If this is so, then the independence of irrelevant alternatives assumption is violated, and the multinomial logit model may give spurious results. By moving to a heirarchical modelling approach, this problem is removed.

3.3 Comparison of the two methods

The nested logit and multinomial logit results reported above concur in considerable measure. This is reassuring inasmuch as it implies that the sequential versus simultaneous decision-making issue is a matter of little import. It would nonetheless be instructive to conduct a test which allows us to establish whether or not one of the models dominates the other.

Since the multinomial logit is a special case of the nested logit, such a test is easily constructed. Let LR_n denote the log likelihood associated with the preferred nested logit model, and let LR_m be the corresponding statistic associated with the nested logit model where all deep parameters are constrained to equal unity. Then the test statistic

$$-2(LR_m - LR_n)$$

is distributed as a χ-square, the degrees of freedom being determined by the number of restrictions which are imposed in order to reduce the nested logit to a simple multinomial logit.

3.4 Empirical results

Results obtained from the multinomial logit estimation are presented in Tables 1-4. Since the multinomial logit is a special case of the nested logit where the deep parameters (the coefficients on the inclusive values) are restricted to equal unity, these are presented in the form of a nested logit. This aids comparison with the unrestricted nested logit equations which we shall present later. These report the models estimated, separately for men and women, for the years 1970 and 1990.

Tables 5-8 report the corresponding marginal effects. In many respects, the results are unsurprising. Schooling is associated with greater labour market participation and attainment. Age, which proxies experience, enters as a quadratic. Ethnicity generally has the expected effect on both participation and occupation, though there have been some interesting changes over time. For women, being white reduced the likelihood of labour market participation in 1970, but increased it in 1990. Results for the intervening years, not reported here, suggest that this change was gradual. We speculate that it reflects the changing social attitudes towards women and work. Residence in a metropolitan area typically reduces the likelihood of participation, both for women and men; this is likely due to unemployment in the city, and recalls the findings of Harris and Todaro (1970). Finally, as in other studies, we find that marital status and family composition variables have distinct effects for women and men. In the case of women, both marriage and childrearing raise the probability of non-participation and render full-time participation less likely. Being married typically increases the likelihood with which men enter full-time employment. It is conceivable that childrearing, and possibly marriage, should be treated as endogenous, but we do not investigate this. Finally, a high rate of local unemployment reduces the probability with which a respondent is working.

Some of the changes in marginal effects over time are revealing. For instance, it is clear that, amongst women, the adverse impact of marriage on participation has weakened over time. Results which we have obtained for the intervening years (not reported here) suggest that this change has been gradual over the 20 year period. Another socially important change concerns ethnicity; while white women were (in comparison with other women) relatively unlikely to participate in 1970, they were more likely to do so by 1990.

The count R^2 obtained from the multinomial logit model for women is 0.55 in 1970 and 0.43 in 1990. These figures disguise, however, a weakness of the model in discriminating between non-participation and limited participation. In both years, the model underpredicts the incidence of part-time and manual full-time work, and overpredicts nonparticipation. In future work, we intend to use data across the full age range derived from the 1990 CPS; the availability of a wider menu of variables for use in the analysis may then enable us to model the part-time work decision more satisfactorily.

The unrestricted nested logit equations are reported in Tables 9-12. After extensive experimentation, we favour a specification in which family composition variables operate at branch level as determinants of participation, while the remaining variables in the model influence occupational choice at the twig level.

It is easily seen that the inclusive value parameters are significantly greater than zero and significantly less than one. Application of the likelihood ratio test described in section 3.3 yields, for women, a chi-square statistic of 208.00, and for men a corresponding statistic of 54.64. Both these indicate, with a high level of significance, that the unrestricted nested logit model is preferred to the standard multinomial logit. The higher value of the test statistic for women is unsurprising, since this group characteristically face a more complex participation decision than men.

3.4 Prices and Characteristics

It is instructive to examine to what extent the changing pattern of female participation and the pattern of females' distribution across occupations is due to changes in the market-relevant characteristics, and to what extent it is due to a change in the 'prices' attached to those characteristics. This may be achieved by following the procedure adopted by Dolton *et al.* (1989). To preserve conciseness, the results obtained using only the unrestricted nested logit estimation procedure are reported here.[3]

Row 1 of Table 13 shows the distribution of female respondents to the 1970 survey across the 7 regimes. The table also shows, in row 2, the corresponding distribution as predicted by our nested logit model. That is, the vector of characteristics of the female respondents in 1970 is multiplied by the vector of nested logit coefficients; each woman is then predicted to enter the regime to which is attached the highest estimated probability. As noted earlier, the model does not discrminate terribly well between non-participation and part-time work or full-time manual work, and this explains the differences observed between the first two rows of the table.

The third row of the table shows the distribution across regimes which we would predict for female respondents to the 1970 survey if they faced the same vector of nested logit coefficients as did their male counterparts in 1970. It is easily observed that, for given characteristics, men at this time were much more likely to participate in the labour market than women – and to do so predominantly in full-time jobs. Moreover, men were much more likely than women to be selected into manual work.

The final row of Table 13 is obtained in similar fashion to the third row. This time, however, we examine what would have been the likely destination of our 1970 group of women had they confronted the 'price' vector faced by women in 1990. Given characteristics, women in 1990 were much more likely to work than their counterparts in 1970. This is true of both part-time and full-time regimes. We conclude that 'prices' moved in a direction which was favourable to female employment over this 20 year period.

4. Conclusion

Whether participation and occupation are simultaneous or sequential decisions is a matter of contention. It is likely that different people make these decisions in different ways, and so neither modelling strategy will properly capture the means by which choices are made by all. Nevertheless, the congruence which we observe in the results obtained by the two methods used here is encouraging. Inasmuch as the data suggest that we should prefer one method to the other, the nested logit wins. This suggests that the independence of irrelevant alternatives which is implicitly assumed by the simple multinomial logit procedure does not hold.

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[3] We have calculated the corresponding results using instead the multinomial logit model, and they are close to those reported here.

Consideration of the nested logit has offered some further advantages, moreover. In particular, it has allowed us to disentangle direct and indirect effects of explanatory variables on the participation decision. It also clarifies the distinction between variables which affect participation and those which influence occupation. So we believe that the nested logit approach – used here in labour economics for the first time as far as we are aware – promises much as a tool of analysis.

The most pronounced change in the labour market during the last century has been the increase in female participation. Our analysis has shown that this extended through the last quarter of the century. While womens' characteristics have certainly changed in a direction which improves their prospects in the labour market, the prices attached to those characteristics have improved too. These price changes likely reflect a mix of attitudinal change and market imperatives. The latter include the increase in demand for women resulting from hikes in youth pay in the 1970s (Hamermesh, 1993), while the former include the cultural impacts of the womens' movemenr of the 1960s and 1970s (Shu and Marini, 1998).

A number of issues remain. As ever, the question of endogeneity is a worry. We have assumed family structure and urban residence to be exogenous. Schooling has also been assumed exogenous, though some recent studies suggest that we should instrument for it (see, for example, Harmon and Walker, 1995). It is not clear that any variables for which we currently have data would serve as suitable instruments in these cases. Neither is it clear that the substantial differences between men and women which we have observed, or the changes in the prices attached to womens' characteristics, would be wiped away by a more satisfactory treatment of this issue. A second concern is the possible existence of unobserved heterogeneity. This is mitigated to some extent by the use of the nested logit approach. Here, at branch level, participation is determined so that, at twig level, occupational choice may be modelled in a manner which accounts for workers' selection into participation regimes. But a more effective means of tackling the problem of latent differences across respondents must await the development of large panel datasets with sufficient numbers of respondents changing participation and occupational regimes. The final worry concerns the limited age range of the sample. Extending this to cover the full working age range is our first priority for the future.

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Table 1: Multinomial logit results, women 1970

Twig level equations						
	Prof/man/tech FT	Sal/cle/ser FT	Manual FT	Prof/man/tech PT	Sal/cle/ser FT	Manual PT
Constant	-21.116	-4.818	-2.847	-19.542	-4.507	-2.183
	(-12.39)	(-5.94)	(-2.37)	(-9.46)	(-5.32)	(-1.46)
Schooling	0.757	0.144	-0.088	0.753	0.129	-0.164
	(32.61)	(10.21)	(-4.88)	(28.08)	(8.82)	(-8.08)
Age	0.943	0.387	0.278	0.712	0.265	0.238
	(7.12)	(5.97)	(2.92)	(4.50)	(3.93)	(2.02)
Age squared	-0.017	-0.008	-0.005	-0.013	-0.006	-0.004
	(-6.89)	(-6.34)	(-2.88)	(-4.33)	(-4.28)	(-1.94)
Race n.e.s.	-0.283	0.090	-0.036	-0.781	-0.229	0.070
	(-0.75)	(0.389)	(-0.09)	(-1.65)	(-0.868)	(0.16)
Race black	0.319	0.499	0.958	-0.484	0.263	0.497
	(1.94)	(5.93)	(8.68)	(-1.97)	(2.885)	(3.291)
Urban		0.310	-0.058		-0.082	-0.902
		(3.19)	(-0.45)		(-0.73)	(-5.43)
Unemployment	-0.196	-0.068	-0.045	-0.136	0.056	-0.089
	(-3.38)	(-1.93)	(-0.80)	(-2.04)	(1.57)	(-1.25)
Married		-0.056	0.201		0.201	0.382
		(-0.57)	(1.62)		(1.59)	(2.32)
Kids 0-5		0.562	0.755		0.064	0.162
		(6.94)	(8.32)		(0.87)	(1.79)
Kids 6-13		0.035	0.177		0.083	0.096
		(0.58)	(2.68)		(1.27)	(1.28)
Branch level equations						
	Full-time			Part-time		
Urban	-0.534			0.860×10^{-3}		
	(-5.58)			(0.01)		
Married	-1.365			-1.236		
	(-13.45)			(-9.92)		
Kids 0-5	-1.542			-0.774		
	(-19.85)			(-11.16)		
Kids 6-13	-0.244			-0.087		
	(-4.20)			(-1.37)		
Deep parameters						
Full-time	1.00	part-time	1.00	Non-participation	1.00	
	(restricted)		(restricted)		(restricted)	
Log-likelihood			-17315.89			
Log-likelihood (constants only)			-20465.15			

Table 2: Multinomial logit results, men 1970

	Prof/man/tech FT	Sal/cle/ser FT	Manual FT	Prof/man/tech PT	Sal/cle/ser FT	Manual PT
Twig level equations						
Constant	-21.648	-11.637	-6.418	-20.598	-7.782	-4.103
	(-11.23)	(-6.71)	(-4.13)	(-7.15)	(-3.29)	(-2.46)
Schooling	0.738	0.355	0.067	0.762	0.286	-0.005
	(25.36)	(12.57)	(2.68)	(20.93)	(7.01)	(-0.20)
Age	1.097	0.761	0.705	0.830	0.429	0.465
	(7.04)	(5.30)	(5.39)	(3.70)	(2.20)	(3.33)
Age squared	-0.018	(-0.013)	-0.012	-0.013	-0.008	-0.008
	(-5.80)	(-4.36)	(-4.56)	(-3.04)	(-2.05)	(-2.83)
Race n.e.s.	0.008	0.398	0.164	0.420	0.850	-0.317
	(0.01)	(0.686)	(0.30)	(0.62)	(1.22)	(-0.50)
Race black	-1.569	-0.861	-0.910	-1.475	-0.572	-0.639
	(-8.22)	(-5.30)	(-6.27)	(-4.55)	(-2.57)	(-4.08)
Urban		0.195	-0.262		0.266	-0.811
		(2.61)	(-3.83)		(1.58)	(-6.04)
Unemployment	-0.542	-0.487	-0.447	-0.461	-0.413	-0.281
	(-6.37)	(-5.82)	(-5.68)	(-4.36)	(-3.70)	(-3.33)
Married		-0.490	-0.206		-0.498	-0.692
		(-5.17)	(-2.38)		(-2.34)	(-4.12)
Kids 0-5		-0.016	0.041		-0.025	0.211
		(-0.37)	(1.09)		(-0.219)	(2.63)
Kids 6-13		-0.119	0.006		0.275	0.346
		(-2.88)	(0.17)		(2.51)	(3.86)
Branch level equations						
Urban	0.120			0.626		
	(0.876)			(3.72)		
Married	2.182			2.133		
	(11.41)			(9.28)		
Kids 0-5	0.024			-0.086		
	(0.27)			(-0.79)		
Kids 6-13	0.028			-0.310		
	(0.45)			(-3.10)		
Deep parameters						
Full-time	1.00	part-time	1.00	Non-participation	1.00	
	(restricted)		(restricted)		(restricted)	
Log-likelihood			-14042.17			
Log-likelihood (constants only)			-16561.27			

Table 3: Multinomial logit results, women 1990

Twig level equations						
	Prof/man/tech FT	Sal/cle/ser FT	Manual FT	Prof/man/tech PT	Sal/cle/ser FT	Manual PT
Constant	-17.616	-7.614	-6.013	-14.474	-1.659	-7.496
	(-13.59)	(-8.97)	(-4.45)	(-8.18)	(-1.97)	(-4.25)
Schooling	0.602	0.188	-0.008	0.670	0.141	-0.041
	(38.49)	(15.78)	(-0.48)	(32.73)	(11.56)	(-2.11)
Age	0.757	0.522	0.447	0.331	0.084	0.454
	(8.13)	(8.41)	(4.57)	(2.61)	(1.36)	(3.55)
Age squared	-0.013	-0.010	-0.008	-0.005	-0.002	-0.008
	(-7.52)	(-8.21)	(-4.09)	(-2.29)	(-1.37)	(-3.30)
Race n.e.s.	-0.797	-0.401	-0.280	-0.618	-0.716	0.091
	(-5.00)	(3.40)	(-1.47)	(-3.20)	(-5.33)	(0.44)
Race black	-0.650	-0.339	0.062	-0.607	-0.394	-0.361
	(-6.24)	(-4.68)	(0.59)	(-4.22)	(-5.12)	(-2.29)
Urban		0.111	-0.315		-0.193	-0.702
		(1.58)	(-2.82)		(-2.06)	(-4.40)
Unemployment	-0.151	-0.150	-0.188	-0.113	-0.185	0.031
	(-2.25)	(-2.81)	(-2.22)	(-1.31)	(-3.40)	(0.29)
Married		-0.119	-0.247		-0.248	-0.505
		(-1.82)	(-2.57)		(-2.61)	(-3.72)
Kids 0-5		0.172	0.380		0.069	0.056
		(3.42)	(5.65)		(1.25)	(0.70)
Kids 6-13		0.193	0.296		0.071	0.087
		(3.83)	(4.87)		(1.20)	(1.11)
Branch level equations						
	Full-time			Part-time		
Urban	-0.245			-0.006		
	(-3.39)			(-0.07)		
Married	-0.265			0.214		
	(3.87)			(2.29)		
Kids 0-5	-1.162			-0.650		
	(24.66)			(12.39)		
Kids 6-13	-0.433			-0.150		
	(9.08)			(2.62)		
Deep parameters						
Full-time	1.00	part-time	1.00	Non-participation	1.00	
	(restricted)		(restricted)		(restricted)	
Log-likelihood			-23371.98			
Log-likelihood (constants only)			-26453.66			

Table 4: Multinomial logit results, men 1990

Twig level equations						
	Prof/man/tech FT	Sal/cle/ser FT	Manual FT	Prof/man/tech PT	Sal/cle/ser FT	Manual PT
Constant	-20.513	-10.319	-6.738	-23.557	-2.734	-6.24
	(-14.21)	(-8.86)	(-7.05)	(-8.43)	(-1.86)	(-5.139)
Schooling	0.682	0.333	0.079	0.769	0.206	-0.005
	(40.49)	(20.58)	(6.43)	(27.91)	(9.07)	(-0.37)
Age	0.901	0.597	0.637	0.882	0.0776	0.492
	(8.69)	(6.90)	(9.06)	(4.45)	(0.708)	(5.52)
Age squared	-0.015	-0.011	-0.012	-0.015	-0.002	-0.009
	(-8.00)	(-6.72)	(-8.67)	(-4.27)	(-0.94)	(-5.39)
Race n.e.s.	-1.132	-0.721	-1.071	-1.217	-0.475	-0.445
	(-6.84)	(-4.81)	(-8.16)	(-4.19)	(-2.32)	(-2.81)
Race black	-1.428	-0.709	-1.094	-0.909	-0.459	-0.868
	(-11.71)	(-7.32)	(-12.88)	(4.54)	(-3.53)	(-7.56)
Urban		0.249	-0.211		0.048	-0.388
		(3.57)	(-3.20)		(0.333)	(-2.90)
Unemployment	-0.161	-0.253	-0.271	-0.086	-0.207	-0.034
	(-2.01)	(-3.26)	(-4.01)	(-0.67)	(-1.96)	(-0.40)
Married		-0.441	-0.121		-0.687	-0.477
		(-5.98)	(-1.85)		(-4.23)	(-3.36)
Kids 0-5		0.023	0.127		-0.016	0.139
		(0.49)	(3.21)		(-0.15)	(1.59)
Kids 6-13		0.008	0.113		-0.024	0.129
		(0.16)	(2.63)		(-0.207)	(1.28)
Branch level equations						
	Full-time			Part-time		
Urban	-0.111			0.050		
	(-1.33)			(0.39)		
Married	1.344			1.114		
	(14.19)			(7.76)		
Kids 0-5	-0.185			-0.1501		
	(-3.35)			(-1.71)		
Kids 6-13	-0.095			-0.083		
	(-1.702)			(-0.083)		
Deep parameters						
Full-time	1.00	part-time	1.00	Non-participation	1.00	
	(restricted)		(restricted)		(restricted)	
Log-likelihood			-21250.46			
Log-likelihood (constants only)			-24207.40			

Table 5: Marginal effects obtained from multinomial logit model for women, 1970

	Non participation	Prof/man/tech FT	Sal/cle/ser FT	Manual FT	Prof/man/tech PT	Sal/cle/ser FT	Manual PT
Constant	1.373	-0.364	-0.407	-0.009	-0.291	-0.317	0.016
	(8.73)	(-9.82)	(-3.58)	(-0.15)	(-8.05)	(-2.83)	(0.35)
Schooling	-0.0346	0.014	0.014	-0.008	0.012	0.106	-0.007
	(-13.41)	(16.40)	(7.10)	(-9.86)	(16.39)	(5.39)	(-12.53)
Age	-0.089	0.015	0.041	0.006	0.009	0.016	0.002
	(-7.15)	(5.81)	(4.46)	(1.21)	(3.51)	(1.77)	(0.58)
Age squared	0.002	-0.273 x10^{-3}	-0.863 x10^{-3}	-0.100x10^{-3}	-0.162x10^{-3}	-0.363x10^{-3}	-0.290x10^{-4}
	(7.46)	(-5.52)	(-4.82)	(-1.08)	(-3.26)	(-2.09)	(-0.43)
Race n.e.s.	0.021	-0.005	0.025	0.273x10^{-3}	-0.013	-0.032	0.003
	(0.46)	(-0.69)	(0.765)	(0.014)	(-1.64)	(-0.92)	(0.266)
Race black	-0.106	0.002	0.056	0.042	-0.012	0.010	0.009
	(-6.35)	(0.726)	(4.79)	(7.74)	(-2.95)	(0.80)	(2.04)
Urban	0.066	-0.008	-0.018	-0.026	0.002	0.008	-0.024
	(5.95)	(4.45)	(-2.29)	(-5.38)	(1.27)	(1.06)	(-6.34)
Unemployment	0.008	-0.004	-0.010	-0.002	-0.002	0.012	-0.002
	(1.12)	(-3.31)	(-2.05)	(-0.59)	(-1.90)	(2.59)	(-1.09)
Married	0.302	-0.015	-0.158	-0.032	-0.011	-0.077	-0.008
	(23.31)	(-7.3)	(-18.57)	(-6.83)	(-5.19)	(-8.96)	(-2.29)
Kids 0-5	0.213	-0.022	-0.107	-0.021	-0.006	-0.051	-0.006
	(34.85)	(-15.10)	(-21.94)	(-8.072)	(-5.36)	(-11.11)	(-3.41)
Kids 6-13	0.026	-0.004	-0.030	-0.940x10-3	-0.631x10^{-3}	0.008	0.002
	(5.11)	(-3.45)	(-7.42)	(-0.501)	(-0.60)	(2.26)	(1.45)

Table 6: Marginal effects obtained from multinomial logit model for men 1970

	Non participation	Prof/man/tech FT	Sal/cle/ser FT	Manual FT	Prof/man/tech PT	Sal/cle/ser FT	Manual PT
constant	0.141	-1.750	-0.388	1.562	-0.225	0.048	0.612
	(5.36)	(-12.20)	(-2.65)	(8.50)	(-4.69)	(0.972)	(6.39)
schooling	-0.003	0.073	0.023	-0.080	0.011	0.001	-0.003
	(-8.09)	(36.00)	(10.73)	(-28.88)	(14.17)	(1.72)	(20.52)
Age	-0.011	0.053	0.006	-0.013	0.002	-0.008	-0.030
	(-4.94)	(4.78)	(0.504)	(-0.887)	(0.55)	(-1.99)	(-3.91)
Age squared	$0.180 x 10^{-3}$	$-0.802 x 10^{-3}$	$-0.523 x 10^{-4}$	$0.954 x 10^{-4}$	$-0.130 x 10^{-4}$	$0.114 x 10^{-3}$	$0.478 x 10^{-3}$
	(4.23)	(-3.90)	(-0.242)	(0.352)	(-0.193)	(1.46)	(3.26)
Race n.e.s.	-0.002	-0.021	0.046	0.005	0.005	0.018	-0.052
	(-0.29)	(-0.60)	(1.18)	(0.01)	(0.664)	(1.51)	(-1.39)
Race black	0.014	-0.089	0.018	0.022	-0.011	0.010	0.035
	(6.07)	(-5.47)	(1.24)	(1.20)	(-1.83)	(2.16)	(3.76)
Urban	$-0.340 x 10^{-3}$	0.014	0.055	-0.081	0.012	0.023	-0.023
	(-0.19)	(1.82)	(6.11)	(-6.74)	(5.22)	(7.26)	(-3.18)
Unemployment	0.007	-0.014	-0.008	-0.002	$-0.362 x 10^{-3}$	$0.781 x 10^{-3}$	0.018
	(5.46)	(-2.99)	(-1.43)	(-0.290)	(-0.25)	(0.358)	(4.10)
Married	-0.027	0.047	-0.031	0.058	0.06	-0.006	-0.046
	(-10.15)	(4.77)	(-2.83)	(4.02)	(1.90)	(-1.45)	(-5.69)
Kids 0-5	$-0.677 x 10^{-3}$	-0.003	-0.007	0.009	-0.003	-0.004	0.009
	(-0.57)	(-0.745)	(-1.35)	(1.41)	(-1.89)	(-1.804)	(2.39)
Kids 6-13	$0.785 x 10^{-6}$	0.004	-0.017	0.017	-0.006	$-0.926 x 10^{-3}$	0.004
	(0.00)	(0.99)	(-3.52)	(2.89)	(-3.79)	(-0.509)	(1.32)

Table 7: Marginal effects obtained from multinomial logit model for women 1990

	Non participation	Prof/man/tech FT	Sal/cle/ser FT	Manual FT	Prof/man/tech PT	Sal/cle/ser FT	Manual PT
constant	1.581	-1.134	-0.652	-0.058	-0.381	0.720	-0.077
	(10.92)	(-11.82)	(-4.74)	(-0.823)	(-5.94)	(5.76)	(-1.49)
schooling	-0.049	0.040	0.008	-0.010	0.021	-0.003	-0.006
	(-25.43)	(32.78)	(4.11)	(-11.93)	(25.10)	(-1.93)	(-11.27)
Age	-0.085	0.044	0.063	0.010	0.002	-0.040	0.006
	(-8.09)	(6.30)	(6.26)	(2.02)	(0.52)	(-4.38)	(1.53)
Age squared	0.002	$-0.722x10^{-3}$	-0.001	$-0.159x10^{-3}$	$-0.172x10^{-4}$	$0.688x10^{-3}$	$-0.977x10^{-4}$
	(7.618)	(-5.69)	(-6.36)	(-1.66)	(-0.21)	(3.99)	(-1.39)
Race n.e.s.	0.115	-0.039	-0.009	0.005	-0.010	-0.075	0.014
	(5.74)	(-3.29)	(-0.47)	(0.49)	(-1.46)	(-3.62)	(2.31)
Race black	0.082	-0.035	-0.020	0.019	-0.014	-0.029	-0.003
	(6.61)	(-4.50)	(-1.67)	(3.48)	(-2.63)	(-2.47)	(-0.68)
Urban	0.048	-0.008	0.005	-0.024	0.006	-0.010	-0.017
	(4.78)	(-1.61)	(0.53)	(-4.54)	(1.84)	(-1.10)	(-4.27)
Unemployment	0.033	-0.004	-0.011	-0.005	$-0.308x10^{-3}$	-0.017	0.004
	(3.62)	(-0.85)	(-1.32)	(-1.10)	(-0.10)	(-2.15)	(1.33)
Married	0.050	-0.010	-0.057	-0.021	0.015	0.026	-0.004
	(5.19)	(-1.99)	(-6.69)	(-4.69)	(4.54)	(3.22)	(-1.28)
Kids 0-5	0.179	-0.053	-0.106	-0.012	-0.003	-0.003	$-0.794\ x10^{-3}$
	(33.56)	(-15.74)	(-18.48)	(-4.35)	(-1.73)	(-0.57)	(-0.40)
Kids 6-13	0.042	-0.027	-0.027	$-0.325x10^{-3}$	$-0.714x10^{-3}$	0.011	-0.002
	(8.02)	(-7.49)	(-5.07)	(-0.14)	(-0.34)	(2.42)	(1.26)

Table 8: Marginal effects obtained from multinomial logit model for men 1990

	Non participation	Prof/man/tech FT	Sal/cle/ser FT	Manual FT	Prof/man/tech PT	Sal/cle/ser FT	Manual PT
Constant	0.814	-1.616	-0.294	0.844	-0.276	0.297	0.232
	(10.56)	(-11.97)	(-2.17)	(5.03)	(-5.60)	(4.81)	(2.71)
Schooling	-0.020	0.064	0.022	-0.057	0.010	-0.318x10-3	-0.020
	(-20.41)	(40.86)	(12.14)	(-26.38)	(16.95)	(-0.33)	(-20.76)
Age	-0.053	0.045	0.005	0.028	0.006	-0.024	-0.007
	(-9.41)	(4.59)	(0.50)	(2.38)	(1.73)	(-5.27)	(-1.15)
Age squared	0.961×10^{-3}	-0.684×10^{-3}	-0.108×10^{-3}	-0.590×10^{-3}	-0.916×10^{-4}	0.412×10^{-3}	0.100×10^{-3}
	(8.88)	(-3.82)	(-0.58)	(-2.59)	(-1.52)	(4.63)	(0.841)
Race n.e.s.	0.077	-0.041	0.020	-0.102	-0.007	0.018	0.036
	(7.87)	(-2.66)	(1.14)	(-4.19)	(-1.46)	(2.02)	(3.14)
Race black	0.085	-0.071	0.037	-0.078	0.256×10^{-4}	0.022	0.004
	(13.27)	(-5.77)	(3.16)	(-4.72)	(0.01)	(4.02)	(0.46)
Urban	0.014	0.006	0.054	-0.072	0.004	0.012	-0.017
	(2.56)	(0.79)	(6.52)	(-6.41)	(1.82)	(2.83)	(-2.73)
Unemployment	0.019	0.005	-0.010	-0.031	0.002	-0.419×10^{-3}	0.015
	(3.44)	(0.80)	(-1.26)	(-3.09)	(1.01)	(-0.01)	(2.74)
Married	-0.090	0.051	-0.012	0.107	0.003	-0.027	-0.031
	(-14.27)	(7.29)	(-1.41)	(9.62)	(1.20)	(-5.28)	(-4.89)
Kids 0-5	0.009	-0.013	-0.013	0.014	-0.001	-0.004	0.008
	(2.31)	(-2.93)	(-2.30)	(2.19)	(-0.77)	(-1.09)	(2.05)
Kids 6-13	0.002	-0.010	-0.012	0.018	-0.001	-0.004	0.007
	(0.64)	(-2.02)	(-1.99)	(2.68)	(-0.65)	(-1.27)	(1.82)

Table 9: Nested logit results, women 1970

Twig level equations						
	Prof/man/tech FT	Sal/cle/ser FT	Manual FT	Prof/man/tech PT	Sal/cle/ser FT	Manual PT
Constant	-66.880	-48.922	-46.806	-100.644	-84.176	-81.235
	(-6.23)	(-4.62)	(-4.40)	(-4.21)	(-3.54)	(-3.41)
Schooling	2.483	1.730	1.413	4.131	3.357	2.939
	(7.86)	(5.53)	(4.52)	(4.43)	(3.61)	(3.16)
Age	4.458	3.907	3.869	5.332	4.960	5.013
	(5.30)	(4.70)	(4.63)	(3.32)	(3.11)	(3.13)
Age squared	-0.088	-0.079	-0.078	-0.107	-0.102	-0.102
	(-5.26)	(-4.78)	(-4.68)	(-3.33)	(-3.17)	(-3.18)
Race n.e.s.	0.524	1.134	0.864	-3.833	-3.524	-3.543
	(0.25)	(0.55)	(0.41)	(-0.75)	(-0.69)	(-0.69)
Race black	5.727	6.221	6.764	4.678	5.485	5.446
	(4.61)	(5.02)	(5.44)	(2.06)	(2.43)	(2.41)
Urban		0.164	-0.236		0.034	-0.761
		(1.46)	(-1.64)		(0.25)	(-3.96)
Unemployment	-1.073	-0.858	-0.805	-0.213	-0.042	-0.198
	(-3.11)	(-2.52)	(-2.34)	(-0.30)	(-0.59)	(-0.28)
Married		-0.142	0.027		-0.071	0.016
		(-1.33)	(0.20)		(-0.47)	(0.08)
Kids 0-5		0.257	0.362		-0.114	-0.066
		(2.87)	(3.58)		(-1.39)	(-0.66)
Kids 6-13		0.006	0.159		0.100	0.111
		(0.10)	(2.23)		(1.37)	(1.31)
Branch level equations						
	Full-time			Part-time		
Urban	-0.338			-0.141		
	(-6.54)			(-2.69)		
Married	-1.339			-1.026		
	(-23.02)			(-16.35)		
Kids 0-5	-1.007			-0.660		
	(-31.52)			(-22.30)		
Kids 6-13	-0.170			-0.019		
	(-6.79)			(-0.79)		
Deep parameters						
Full-time	0.0995	part-time	0.0448	Non-participation	1.00	
	(6.44)		(3.91)		(restricted)	
log-likelihood			-17190.08			
log-likelihood (constants only)			-20465.15			

Table 10: Nested logit results, men 1970

Twig level equations						
	Prof/man/tech FT	Sal/cle/ser FT	Manual FT	Prof/man/tech PT	Sal/cle/ser FT	Manual PT
constant	-31.952	-22.005	-16.433	-20.081	-8.025	-4.671
	(-3.81)	(-2.61)	(-1.98)	(-5.81)	(-2.91)	(-2.09)
schooling	0.984	0.595	0.291	0.658	0.248	-0.002
	(5.53)	(3.34)	(1.65)	(12.00)	(5.39)	(-0.05)
age	2.052	1.727	1.659	0.917	0.506	0.529
	(2.63)	(2.21)	(2.14)	(3.30)	(2.12)	(2.63)
age squared	-0.034	-0.029	-0.028	-0.015	-0.009	-0.009
	(-2.50)	(-2.12)	(-2.09)	(-2.83)	(-2.04)	(-2.37)
race n.e.s.	0.285	0.650	0.409	0.469	0.859	-0.324
	(0.22)	(0.51)	(0.33)	(0.63)	(1.12)	(-0.46)
race black	-2.823	-2.113	-2.151	-1.519	-0.645	-0.734
	(-2.83)	(-2.12)	(-2.17)	(-3.95)	(-2.28)	(-2.83)
urban		0.180	-0.293		0.287	-0.770
		(2.37)	(-4.15)		(1.69)	(-5.56)
unemployment	-1.134	-1.084	-1.042	-0.488	-0.447	-0.323
	(-2.37)	(-2.26)	(-2.17)	(-3.29)	(-3.04)	(-2.54)
married		-0.488	-0.212		-0.466	-0.646
		(-5.09)	(-2.37)		(2.17)	(-3.74)
kids 0-5		-0.010	0.055		-0.024	0.208
		(-0.22)	(1.42)		(-0.21)	(2.52)
kids 6-13		-0.116	0.012		0.278	0.345
		(-2.77)	(0.35)		(2.50)	(3.75)
Branch level equations						
	Full-time			Part-time		
urban	0.055			0.531		
	(0.42)			(2.77)		
married	2.027			2.018		
	(10.77)			(8.04)		
kids 0-5	0.045			-0.061		
	(0.53)			(-0.55)		
kids 6-13	0.017			-0.270		
	(0.30)			(-2.38)		
Deep parameters						
full-time	0.4382	part-time	0.8804	Non-participation	1.00	
	(2.37)		(4.27)		(restricted)	
log-likelihood			-14032.64			
log-likelihood (constants only)			-16561.27			

Table 11: Nested logit results, women 1990

Twig level equations						
	Prof/man/tech FT	Sal/cle/ser FT	Manual FT	Prof/man/tech PT	Sal/cle/ser FT	Manual PT
constant	-64.375	-54.343	-52.543	-68.582	-55.933	-61.637
	(-5.72)	(-4.85)	(-4.67)	(-3.04)	(-2.49)	(-2.73)
schooling	1.828	1.376	1.135	3.540	2.917	2.692
	(6.94)	(5.26)	(4.35)	(4.11)	(3.39)	(3.13)
age	3.846	3.648	3.597	2.831	2.713	3.130
	(5.08)	(4.83)	(4.73)	(2.15)	(2.07)	(2.38)
age squared	-0.068	-0.065	-0.064	-0.048	-0.047	-0.054
	(-4.95)	(-4.78)	(-4.63)	(-2.02)	(-1.98)	(-2.27)
race n.e.s.	-2.815	-2.591	-2.579	-7.906	-7.917	-7.091
	(-3.58)	(-3.31)	(-3.22)	(-2.81)	(-2.82)	(-2.53)
race black	-2.593	-2.158	-1.715	-7.297	-7.027	-6.948
	(-4.66)	(-3.94)	(-3.11)	(-3.11)	(-3.00)	(-2.97)
urban		0.094	-0.357		-0.205	-0.728
		(1.25)	(-3.00)		(-1.92)	(-4.21)
unemployment	-0.832	-0.813	-0.830	-1.862	-1.969	-1.796
	(-2.58)	(-2.54)	(-2.54)	(-2.00)	(-2.12)	(-1.92)
married		-0.178	-0.358		-0.384	-0.664
		(-2.62)	(-3.60)		(-3.53)	(-4.40)
kids 0-5		0.071	0.221		0.071	0.063
		(1.35)	(3.12)		(1.15)	(0.71)
kids 6-13		0.190	0.268		0.044	0.074
		(3.71)	(4.2)		(0.68)	(0.88)
Branch level equations						
	Full-time			Part-time		
urban	-0.197			-0.142		
	(-3.77)			(-2.92)		
married	-0.374			-0.013		
	(-7.57)			(-0.24)		
kids 0-5	-1.004			-0.580		
	(-33.478)			(-20.43)		
kids 6-13	-0.303			-0.106		
	(-10.47)			(-3.77)		
Deep parameters						
full-time	0.1609	part-time	0.0629	non-participation	1.00	
	(5.69)		(3.49)		(restricted)	
log-likelihood			-23267.98			
log-likelihood (constants only)			-26453.66			

Table 12: Nested logit results, men 1990

Twig level equations						
	Prof/man/tech FT	Sal/cle/ser FT	Manual FT	Prof/man/tech PT	Sal/cle/ser FT	Manual PT
constant	-79.408	-69.114	-65.297	-28.720	-8.171	-11.577
	(-2.89)	(-2.51)	(-2.37)	(-7.05)	(-2.64)	(-3.93)
schooling	2.169	1.813	1.536	0.848	0.294	0.098
	(3.24)	(2.71)	(2.29)	(12.61)	(5.49)	(2.04)
age	5.592	5.284	5.326	1.298	0.510	0.894
	(2.55)	(2.41)	(2.43)	(4.55)	(2.56)	(4.14)
age squared	-0.010	-0.095	-0.096	-0.023	-0.010	-0.017
	(-2.52)	(-2.41)	(-2.43)	(-4.04)	(-2.35)	(-4.08)
race n.e.s.	-8.001	-7.646	-7.985	-1.856	-1.030	-1.019
	(-2.45)	(-2.34)	(-2.44)	(-4.04)	(-2.71)	(-2.82)
race black	-9.226	-8.471	-8.825	-1.649	-1.286	-1.701
	(-2.59)	(-2.38)	(-2.48)	(-4.17)	(-3.57)	(-4.77)
urban		0.230	-0.286		0.051	-0.348
		(3.24)	(-4.15)		(0.33)	(-2.26)
unemployment	-1.952	-2.034	-2.049	-0.194	-0.330	-0.137
	(-2.00)	(-2.09)	(-2.10)	(-0.96)	(-1.84)	(-0.82)
married		-0.458	-0.144		-0.627	-0.417
		(-6.12)	(-2.13)		(-3.54)	(-2.55)
kids 0-5		0.047	0.149		-0.071	0.087
		(0.98)	(3.61)		(-0.62)	(0.86)
kids 6-13		0.025	0.124		-0.083	0.063
		(0.48)	(2.76)		(-0.69)	(0.57)
Branch level equations						
	Full-time			Part-time		
urban	-0.111			-0.037		
	(-1.67)			(-0.39)		
married	1.184			0.851		
	(14.72)			(7.34)		
kids 0-5	-0.103			-0.078		
	(-2.28)			(-1.21)		
kids 6-13	-0.040			-0.021		
	(-0.93)			(-0.31)		
Deep parameters						
full-time	0.1211	part-time	0.4789	non-participation	1.00	
	(2.52)		(5.56)		(restricted)	
log-likelihood			-21233.14			
log-likelihood (constants only)			-24207.40			

Table 13 Actual and predicted outcomes under various conditions

	non-participation	Prof./Man FT	Serv. FT	Manual FT	Prof./Man PT	Serv. PT	Manual PT
women 1970: outturn	6475	839	2566	734	496	1978	442
women 1970: prediction	10085	908	2479	30	0	28	0
women 1970 characterisitcs: men 1970 prices	44	2019	68	11368	0	0	31
women 1970 characteristics: women 1990 prices	8659	1113	3270	0	23	465	0