

NON-TECHNICAL SUMMARY

Virtually all British women nowadays participate in the labour market at some point of their adult lives, but few do so continuously. This paper seeks to identify characteristics which distinguish those who were participating from those who were not at one given moment in 1980, the time of the Women and Employment Survey, and also to quantify the effects of such variables on labour supply to the cash economy. This is of interest for the specific purpose of forecasting the female labour force as well as throwing light on more general questions about the role of employment in women's lives and of women in the economy.

When a number of possible explanatory factors are considered jointly, in a multiple regression, those most important in reducing the chances of current labour force participation are the presence of young children, low earning power and high levels of alternative income. Other factors which significantly reduce participation of women who are neither students nor permanently disabled themselves are: belonging to the older generation; being married to a non-working husband and being responsible for an adult dependant. Other factors which were found to have little or no independent effect on participation in paid work were marital status, earlier family history, education, and fertility intentions. Although women living with husbands were not less likely to be members of the labour force than non-married women with similar responsibilities for children, they were less likely to be in full-time work or to describe themselves as unemployed.

These findings reinforce other economic research on the determinants of female labour supply and establish that models often estimated only for married women are relevant to the non-married. What is also new about this study is the method used to impute women's earning potential. It takes advantage of the work history information collected in the survey to construct an index of each woman's earning potential from her best paid occupation and her cumulated years of work experience in the past. The relative pay of different occupational categories was estimated

from the hourly pay of women currently in work. This also showed how pay rises with the length of previous work experience, and confirms other research that the low pay of many working women is partly attributable to the interruptions in their work history. Another source of low pay appears to be downward occupational mobility when women who still have domestic commitments return to work part-time.

Interruptions to women's work histories are predominantly associated with children, but these interruptions are not the only consequences of childbearing for women's working lives, for the nature of the employment to which many mothers return is different from what it would have been had they had uninterrupted careers. At least while the children remain dependent, the working mother is likely to work part-time and her hourly pay is also likely to be less than it would have been, as she has missed some of the increments a continuous worker might have expected and she may also have her skills temporarily or permanently downgraded. Hence the lifetime earnings foregone as a result of childbearing are likely to be proportionately greater than the loss of contact with the labour force.

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**PARTICIPATION IN PAID WORK: MULTIPLE
REGRESSION ANALYSIS OF THE WOMEN AND
EMPLOYMENT SURVEY**

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ABSTRACT

Models to explain the chances of economic activity, employment and full-time work in a national cross-section of British women in 1980 in terms of a number of demographic and economic variables are estimated by OLS. Marital status differentials are minor once the presence of dependent children and the level of alternative income are controlled. Earning power is also an important factor; it is imputed on the basis of work history information at the level of pay associated with the best paying occupation, not necessarily that current or most recent, on the grounds that mature women workers are often over-qualified for the jobs with which they combine domestic responsibilities. Regional variations, remote childbearing and marital history, and fertility intentions have little or no explanatory power. Participation rates among women who are neither students nor permanently sick are also reduced by responsibility for adult dependants, being married to a non-earning husband and living in an area of high unemployment. Through the last two factors adverse demand conditions reduce both the chances of women having jobs, and to a smaller extent, of married women describing themselves as economically active.

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INTRODUCTION

This paper summarizes the results of a study of one section of the data collected in a nationwide sample survey of over 5000 women in Great Britain in 1980 - the Women and Employment Survey. The study was originally commissioned to increase understanding of factors influencing female labour supply, for use in official labour force projections, by identifying and quantifying such effects in a multivariate framework. The main report of the Survey (Martin and Roberts 1984a) describes its main findings, largely by crosstabulation of the wide range of information collected - subjective, objective and retrospective, and the Technical Report (Martin and Roberts 1984b) describes and evaluates the actual conduct of the survey. The Research Paper (Joshi 1984), which was presented at the Manchester Conference provides much greater detail about the subset of variables which were made available for the regression exercise: mainly "objective" descriptions of current circumstances with some summaries of employment history, whose collection was the Survey's special feature. The regression analyses presented in this paper simplify the results reported in the Research Paper. This is a happy outcome of re-estimation that was unavoidable after the discovery of an error in the computation of the wage imputation formula after the Conference and after the Research Paper went to press. Despite the correction, the results in this paper bear a very strong resemblance to those discussed at greater length in the Research Paper.

The application of multiple regression to the analysis of any one variable rests on an assumption about the direction of causality, namely that the "dependent" variable to be analysed is explained, or influenced by a set of other independent variables. We treat a woman's labour force participation as the variable to be explained in a model where the influences on her behaviour might include such considerations as: her need for money; the rate of pay she could command; the availability of jobs; her domestic responsibilities; her health; her own preferences for paid work, unpaid work and leisure; the attitudes of people around to her economic role.

Although these factors may themselves have been influenced by her own economic activity (or lack of it) in the past, they are treated here as potential determinants of current labour market participation, in so far as the survey provides any evidence for them, in single equation multiple regression.

Formally we estimate a set of parameters in the following model:

For each woman:

$$P = b_0 + \sum X_j b_j + u$$

where

P is the probability of participation,

X is a vector of explanatory variables,

u is the unexplained residual.

There are three definitions of participation,

$P_1 = 1$ if Economically active, otherwise zero,

$P_2 = 1$ if Working, otherwise zero,

$P_3 = 1$ if Working fulltime, otherwise zero.

The j subscript denotes any one of a list of explanatory variables defined in Appendix A. If b_{1j} , b_{2j} and b_{3j} are the regression parameters expressing the effects of a unit change in variable j on the activity, work and full-time work rates respectively, the effects on the chances of a woman reporting unemployment are given by $b_1 - b_2$, and of her working part-time by $b_2 - b_3$.

THE DEPENDENT VARIABLES

The notion of labour supply is difficult to measure operationally in interview surveys (see Joshi and Owen, 1984, Martin and Roberts 1984a, Chs. 2 and 7). It is often assumed that variations in the work rate reflect variations in labour supply, and this is the most common source of evidence used in the literature. However although women with a high propensity to supply labour to the paid economy are more likely to be observed at a survey in employment than those with a low propensity to perform paid work there are various reasons why this is not a perfect indicator. On the one hand, the binary variable, whether or not a woman is working does not tell us about the quantity or quality of work that is being performed by the workers, and on the other, it is only under exceptional circumstances that all non-workers can reasonably be regarded as withholding labour from the cash economy. In this paper, three indicators of labour supply are analysed side by side, the proportion working fulltime, the proportion working at all and the proportion of women who are "economically active" on the conventional definition of either being engaged in paid employment or seeking it. Although the distinction between full-time and part-time work is only a small step towards differentiating between workers it does embody some information about quality as well as quantity of labour that is being performed since so much part-time employment is confined to a few low status (if not low skill) occupations, whereas fulltime employment is more heterogeneous. The inclusion amongst the economically active of non-workers who reported seeking employment as their main reason for not working does not provide the most extensive estimate of women available for paid work since it excludes cases who gave other reasons for not being employed - chiefly domestic responsibilities - but who, on further questioning admitted that they were seeking work, or might soon be available for employment. There is also the theoretical possibility that some of the women who do appear as unemployed might be regarded as withholding

rather than unsuccessfully supplying their labour if they were holding out for better job offers than those they faced. This hypothesis could be the subject of further investigation. However the analysis of Chapter 10 of the Main Report reveals that it is seldom necessary to leave a job to find a better one. Furthermore, the analysis of the border-line cases in Chapter 7 of the Main Report reveals that the job-seekers included in our definition of the economically active were on the whole looking for full-time rather than part-time jobs, which strengthens the case for including them in the labour force taken as a measure of potential labour supply.

No one indicator is perfect, and neither is the method of analysis which is applied to them, namely Ordinary Least Squares regression of the bounded binary variables; however the method does have the advantages of permitting a large number of independent variables to be considered within the computing resources available to this exercise and of automatically providing models for the two implicit components of the labour force, part-time employment and self-reported unemployment by subtraction. This provides some insights for the choice of dependent variables in other work and some indication of what may be missing in the analyses of other data sets if only one dependent variable is analysed, albeit with non-linear estimation methods.

THE SAMPLE ANALYSED

The sample analysed in Table 1 consists of 4348 women aged 16-59 out of the 5588 who were interviewed in the Women and Employment Survey in April-May 1980. 293 full-time students were excluded from the sample as were 122 women who gave permanent sickness as the reason for not having paid work. In these cases no further explanation is needed for economic inactivity. A

further 825 cases have been dropped because information was missing on at least one included explanatory variable - mostly because women were unable to estimate their household's net weekly income. This listwise deletion of missing data contrasts with the pairwise convention adopted in the Research Paper but permits formal hypothesis testing, and would be necessary in any future work with non-linear estimation methods. The means and standard deviations of this sample are presented in Appendix A, along with a marital status breakdown of a longer list of variables analysed in Appendix B for a slightly reduced sample after deletion of a further 33 cases with missing data on the extra variables. Further descriptive statistics including correlation matrices are available in the Annex B of the Research Paper.

THE RESULTS

Table 1 shows the preferred models to explain the variations in the chances of women participating in paid work on three different measures of participation. These models have been derived after investigating several more complex models, starting with those reported in Appendix B. A number of potential explanatory variables have been dropped as adding little to the explanatory power of those remaining in Table 1. Much of the information which is unique to this Survey from the life-histories - work participation of the respondent's own mother, remote fertility history, future fertility intentions - as well as education, proved redundant given the allowances that are made for the quality and quantity of her employment history in the imputed earnings potential term. It also proved possible to simplify the effects of region, housing tenure and age, but the big economy has been achieved by finding that marital status differences assumed when we estimate the model separately for the two sub-samples are not significant for most of the independent variables. Allowing for marital status differences only in the effect of age and income, F statistics of 1.73, 1.87 and 1.67 on the the restrictions necessary to pool the models for the activity rate, the work

rate and the full-time work rate respectively, indicate accepting the pooled model at the .01 level, although the first two tests are on the border line at the .05 level. With less parsimonious age effects the test was also more decisively in favour of pooling the work models.

At most stages of experimentation the model for the activity rate seemed to require more complexity, as was also discovered when Jean Martin attempted to subject it to the sort of log-linear modelling reported for the work rate in Chapter 6 of Martin and Roberts (1984b). Given the indeterminacy of the measure of unemployment, it was decided to ignore these indications, and impose most of the simplifications acceptable for the work rate model, rather than retain a specification which was unnecessarily cumbersome for the more clear-cut variable. Non-working women with domestic responsibilities are less likely to get themselves classified as 'active', even if they are seeking or available for employment, than those free of such commitments, so the sensitivity of the activity rate model to marital status is to some extent spurious. The simplification has also sacrificed a little information, significant in Appendix B, that age at entry into motherhood makes some difference to whether a mother works full-time or part time, but not whether or not she works at all.

The model for the work rate explains nearly one third of the variation in the sample, which is fairly respectable for a cross-section. The models for the activity rate and the full-time rate fit even better (despite their over-simplification noted above), with adjusted R Square statistics of .36 and .42 respectively. The variables which are mainly responsible for the explanation offered are the presence of pre-school children, non-labour income and the imputed potential rate of pay. These all have t statistics over 12. As expected, the first two factors reduce participation and above average earning power raises the chances of a woman engaging in paid work. The specification and estimated effects of each group of independent variables are discussed below.

THE PRESENCE OF DEPENDENT CHILDREN

There is no doubt that the presence of children in the home has a considerable impact on how parents spend their time, particularly mothers, which is reflected in their current participation in the labour market. Even if reproductive decisions are influenced by economic considerations, the presence and age of children once they have been born is irreversible. The information is treated as pre-determined and these factors are therefore brought into consideration as determinants of current participation. In his contribution to the volume on Female Labour Supply edited by Smith (1980), Schultz (1980) argued for the exclusion of terms about children in the estimation of female labour supply on the grounds of the endogeneity of fertility, but these considerations are weakened if decision-making about fertility is sequential (see De Cooman, Ermisch and Joshi, 1984, and references therein). In any case, it is important from the point of view of developing any economic theory of fertility to know precisely how the constraint on economic activity from children presents itself. A special effort has therefore been put into exploring the way in which it is most appropriate to describe the presence of children in estimating the determinants of labour supply.

Until recently many estimates of female labour supply allowed for children by including the numbers in each of several age groups. Although this captures, to some extent at least, the feature that the younger a child is the more demands are made on the mother's time, the trouble is that the effects of one child in an age group appears half that of two, one third that of three and so on. If there are any scale economies in the time cost of children the model should not be linear in the number of children. Indeed once an allowance has been made for the presence and age of the youngest child little difference is made by any number of extra children. This was established in various

experiments with 1974 General Household Survey data reported in papers by Joshi and Owen in 1981 and 1983, using logit estimates in the first case and O.L.S. on a more general model in the second. It has also now been formally demonstrated with the present data set that the restrictions necessary to express a more general model in terms of the numbers of dependent children in the age groups 0-4, 5-10 and 11-15 lose considerably more explanatory power than those imposed in Table 1.

Table 1 suggests that mothers of babies under one year of age are 64 percentage points less likely to have a paid job than otherwise similar women with no dependent children. As the age of their youngest child rises mothers become more likely than the mother with an infant to have a job; mothers of children aged 6-10 are only 13 percentage points less likely to have employment than "childfree" women and those whose only dependent child is of secondary school age (11-15) are as likely as women with no dependent children to have a job. Additional children under 5 intensify the inhibiting effect of one, but not proportionately; older children in the primary school age range (5-10) have no effect one way or the other on the probability of working, whereas teenagers other than the youngest increase the chances of their mothers having jobs. It is tempting to interpret this last effect as reflecting the need for extra income that this age group engenders, but experiments with deflating income terms by equivalence scales in a sample from the GHS (Joshi and Owen, 1983) suggest that this is not the whole story. Perhaps some older children are net contributors of time to the household if, for example, they can see their younger siblings home from school.

The pattern of child effects found for the work rate is repeated, to a slightly greater degree, on the activity rate. Unemployment is inhibited by the same factors as employment, rather more than in proportion to the overall margin of unemployment over employment in the sample (9%). However the

pattern of child effects on the chances of full-time employment is different, and helps explain how the high incidence of paid work by mothers of dependent children is actually sustained. At virtually all ages children lower the full-time work rate more than they lower the work rate. In other words, they restrict their mothers' participation, not totally, but to part-time employment which is consistent with their maternal responsibilities. This is particularly so once children reach school age. Mothers of a youngest child aged 6-10 are 37 percentage points less likely than otherwise similar child-free women to have full-time jobs and 24 percentage points more likely to have part-time jobs. If they have more than one child in this age band their chances of working full-time go down by another 5 points which are added to their chances of part-time employment. Mothers of a single teenager have their full-time work rate reduced by 17 percentage points and their chances of part-time employment correspondingly increased.

These coefficients can be summarised in terms of the "lifetime direct effects" of having various different numbers of children, whose derivation is explained in Chapter 5 of the Research Paper.

Family size (any birth interval exactly 3 years)	Reduction attributable to Children in years of:		
	Economic Activity	Paid Work	Full-time Work
One child	3.7	3.2	5.7
Two children	5.5	4.9	7.5
Three children	7.4	6.6	9.2
Four children	9.3	8.5	10.9

This brings out clearly the non-linear nature of child effects. The totals for larger families diminish with smaller birth intervals. Further work is in progress on the indirect effects and whether these estimates themselves might be altered by non-linear estimation of the participation model.

FINANCIAL STICKS AND CARROTS

Economic theory and the empirical literature suggest that both the high rates of pay and low levels of alternative income would encourage women to participate in paid work (see Hornstein et al 1981). It is, however, doubtful whether the Survey's summary information about the household's financial circumstances would ever permit the sort of approach to estimating these economic effects presented by Blundell et al in this volume or Zabalza (1983) via a reconstruction of a non-linear budget constraint and the inference of the parameters of a utility function. The Women and Employment Survey is strong in information about previous employment and this is what has been used to impute a gross rate of potential pay to all women in the sample.

Pay

Table 2 shows a selection of analyses of the hourly pay of those working women for whom it was defined. The first equation, a model which explains 42% of the variance in terms of work experience and current occupation, forms the basis of the formula used to impute a gross rate of pay to every woman in the participation analysis. It can be compared with the model for equation 2 (estimated subsequently on a slightly revised data set) which included significant information about education and no information about current occupation (except that implicit in the variable for whether or not a job is part time), and explains 36% of the variance. Occupation is clearly a better indicator of pay differentials than education. The last two equations in Table 3 shows the sample split into the better-paying non-manual jobs (equation 4) and in equation (3) manual and sales occupations, a number of other regressions having established that women's sales occupations are certainly no better paid than the unskilled reference category. This exercise also reveals that occupation augments the explanatory power of education and work experience and suggests that their effects are stronger and better determined, statistically, within the better-paying part of the labour market. None of these estimates makes any allowance for biases that may be introduced by selectivity or

endogeneity (see Killingworth 1983).

Occupation is not favoured for inclusion in earnings functions designed to estimate the returns to human capital formation, because high occupational levels may be the outcome of effort to achieve advancement - or as this Survey clearly shows - low status occupations for women are often consequent upon spells out of the labour force and current domestic constraints. Nevertheless, the function of the earnings analysis needed here is to impute an offered wage to non-participants for whom no actual wage is observed. Occupation seemed a particularly promising indicator given that virtually all women in the Survey had reported at least one spell of paid work in their work history.

Each job was coded into a thirteen-fold classification, whose first eleven terms appear in the lefthand side of Table 2. The other categories are "unskilled" and "unclassifiable". In the summaries of the work histories available for this regression exercise there was information about the most recent occupation for non-workers, the current occupation of workers and for everyone who had ever had an occupation, the "top occupation", the occupation coming highest "up" the ladder imposed by the coding scheme. The pay regressions established that this scheme more or less reproduced the relative pay ladder, once some categories were bracketed together and sales and child-care relegated to the lowest rungs.

On a criterion whose limitations are discussed in Annex A of the Research Paper, its Table A2 shows that 28% of the sample had experienced occupational downgrading. As the analysis of the main report (Martin and Roberts, 1984, Chapter 10) and of Dex, 1984b reveal in greater detail, much, though not all, of this occupational downgrading is associated with mothers returning to the labour market after childbearing to part-time jobs for which they are over-qualified.

If occupation is to be used to impute earning power for the analysis of labour supply, the question arises as to which occupation to take. There are some circumstances in which the most recent occupation of non-workers

would not be comparable with the current occupation (or actual pay) of those currently working. A woman facing one of the severest domestic constraints, namely a non-worker with young children, would tend to be attributed the sort of pay she would have had before child-bearing, while an equivalent woman who had just rejoined the labour force could be characterized by substantially lower pay if she had taken a job which was consistent with her domestic responsibilities but not her previous achievements and qualifications. Furthermore, as argued at greater length in the Research Paper, one is making allowance for current domestic circumstances in other terms in the participation functions, and one wants an index of gross earning power, not domestically constrained earning power, in the imputed wage term. It was therefore decided to impute the "potential pay" of both workers and non-workers on the basis of their "top" occupations, not the current or most recent where these differed. This is tantamount to making an assumption that any divergence of most recent from "top" occupation was due to transitory factors. Another interpretation of this procedure was offered in the discussion at Manchester - namely that the pay foregone by women working in something beneath their "top" occupation represented a differential that they were willing to sacrifice for the "compensating" attributes of the job which made it compatible with their domestic responsibilities. This however begs the question about whether such sacrifices would be necessary if employer practices sensitive to the needs of working parents were more widely spread in the labour market.

The formula used to impute potential pay in the regression reported here incorporates corrections noted in the Research paper and its erratum slip, but does not incorporate any further experiments, for which there is obviously still a lot of scope. Equation 1 in Table 2 yields the following expression for imputation:

Natural logarithm of potential earnings = .088
+ 0.035 x full-time work experience measured in years
+ 0.029 x part-time work experience measured in years
- 0.021 x years of work experience, squared ÷ 100
- 0.037 x age (years) x work experience ÷ 100
+ 0.005 x Years in current job (if currently working)
+1.035 If "top" occupation professional (i.e. R.G. Social Class 1)
+ .903 If " " teacher
+ .375 If " " nursing or other intermediate non-manual
+ .264 If " " clerical
+ .110 If " " skilled manual or semi-skilled factory (or
most recent occupation in this category and
"top" occupation sales or childcare)
+ .087 If top occupation semi-skilled non-factory, non-domestic (or
if most recent job is in this category and
"top" occupation sales or childcare)
- .154 If top and most recent occupation childcare

Women whose top occupations are unskilled, semi-skilled, domestic or in sales have earnings imputed on the basis of age and work experience alone, and those few who had never worked would have an imputed wage based only on the constant term equivalent to £1.09 per hour. As work experience builds up from zero, imputed earning power builds up by about 2% per year of work experience at the outset, around 1% at the mean, but as age increases and work experience mounts up, the return to experience gradually weakens, diminishing to zero somewhere between ages 50 and 60 for representative histories. This does not take into account the more recently computed evidence in columns 3 and 4 of Table 2 that the strength of work experience effects on pay varies with occupation. Women currently working are imputed a benefit from seniority in their present jobs to the tune of about 0.5% per year of service. Non-

workers have wages imputed at a "starting salary" level for their "best" occupation on record.

In the sample of workers with hourly pay defined (1984 version) mean log pay was .51 (i.e. £1.67 per hour). For these cases mean imputed potential pay was .56, implying a differential attributable to occupational downgrading (averaged over the whole workforce) of .05 or 5 per cent rather than the figure of 32 per cent erroneously offered on page 21 of the Research Paper. Despite this variable's powerful effect at explaining variations in participation the imputed pay of non-workers is not on average far below that of those currently working, at .49 it is only just below the actual pay of those currently working, a differential roughly accounted for by the duration of the current job. In terms of the summary of past work experience and occupation represented by the rest of the expression women currently not working are not mostly so dissimilar from women currently working.

The estimated wage effects in Appendix B are similar for each subsample and resemble those reported in Table 1. On all three dependent variables the coefficient is well determined and strongly positive. Note however that the smallest dependent variable, the full-time work rate attracts the largest coefficient, and the activity rate the smallest. This suggests that though all three explicit components of labour supply are positively encouraged by high wages that there is a negative association of both part-time work and unemployment with high earning power. Women with high earning power are not only more likely than not to be in the labour force, but among those in the labour force, high wage women are likely to work full-time. The negative association of imputed wages and unemployment is open to the interpretation that employers find the least skilled and least experienced relatively unattractive in a regime where there is job rationing. In this case, inferences about supply elasticity would be exaggerated if based on the work rate rather than the activity rate (or better still an activity rate adjusted to include all those

seeking work). The negative association of part-time employment with high earning potential may reflect hours of work being more sensitive to substitution effects than the crude participation indicator, but it may also reflect institutional constraints if high skilled women who would ideally like to work part-time are forced by the lack of such opportunities at appropriate levels to work full-time or not at all. If these cross-sectional coefficients can be applied to the aggregates, they suggest that a rise in women's wages, other things being equal, would not only bring extra women into the work force but cause an absolutely greater shift in the numbers in full-time work with a net drop in the numbers working part-time.

The net pay coefficients are considered in terms of elasticities in Table 3 alongside the estimated income effects and analogous estimates for other surveys. All the studies of micro data quoted in Table 3 yield estimates of a wage elasticity for married women's activity rates in the range 0.2 to 0.5. Our estimates of 0.45 (Table 1) and 0.53 (Appendix B) straddle the estimate by Layard et al (1980) from 1974 General Household Survey data of 0.49. In other words, both studies suggest that a one percentage point increase in wage rates, would, all else equal, induce about half a percent increase in the activity rate of married women. The estimates suggest that there would be proportionately slightly more increase in the work rate of married women and a nearly doubling of their chances of working full-time, but this may not be all entirely a supply response.

Given the experimental nature of the wage term used here, the crude technique of estimation, and the indeterminacy of the measurement of the dependent variable, these estimates are not offered as the last word on what parameters should be used in forecasting policy simulation, but merely as confirmation that the search for better estimates is worthwhile.

Income

The data used to concoct net income of households other than the woman's net earnings was not ideal, as will be clear from the details set out in the Research Paper, but in its crude form the variable is also a very powerful predictor of participation. High income has the expected negative effect on the need to participate, part-time or full-time as a member of the labour force. Its positive correlation with potential earnings, .26 in the married sample (.11 in the non-married) mean that in practice income and wage effects tend to cancel each other out, neither one influence being apparent at the bivariate level until the other is also allowed for.

The level of alternative income is much higher among the married sample (£90.73 per week on average) than amongst the non-married (£16.55). This largely reflects the fact that husbands' earnings are the main source of other income. The fact that the number of other people with whom the income has to be shared differs from case to case is crudely allowed for by entering a separate income term for each sub-sample in the regression. We do not know how many people the other income has to be shared with nor what the correct equivalence scale is (social security legislation implies that a couple needs 1.6 as much income as a single person). On any reckoning, at the mean, the married women are better off than the non-married and this alone could account for any tendency of child-free wives to participate less in paid work than women without husbands, as discussed below. Whether the responses to income changes by non-married women are, in absolute terms, greater (as the crude coefficients imply) than those of married women, depends on what the appropriate equivalence scale is. The elasticity reported in Table 3 suggest that in proportional terms, the married women are somewhat more responsive to changes to income, and would be even if these elasticities were evaluated at the

higher average levels of participation of the non-married. These elasticities suggest that for married women a given percentage increase in household net income would reduce work and activity rates by about one third as much, and full-time participation by about one half. Among the non-married activity would fall by one tenth of a proportional increase in income, the full-time rate by one fifth and the work rate by 17%. The apparent positive association of unemployment with net income is the spurious result of unemployment benefits being included in the global estimate of household net income. The income due to owner-occupied housing is not imputed but a crude allowance was attempted by including dummy variables for women who lived in owner-occupied housing, distinguishing those whose homes were being bought on mortgage from those which were owned outright. In Appendix B the latter term had the negative sign which would be compatible with an interpretation as an income effect, but only the term indicating mortgage commitments survived the simplifications imposed in Table 1 where it reveals that women with mortgages are, other things being equal, about 5 percentage points more likely to be in employment than women in other tenures.

With the usual caveats about the robustness of the estimates, and caution about inferences from cross section to time series, the combination of wage and income elasticities can be used to simulate the likely response of female labour supply to simultaneous increases in both male and female wages. The weighted average of the wage elasticity for the married and non-married sample would be offset by the value of the income elasticity (weighted by the proportion married) on the assumption that the non-labour income of the non-married would not be affected. On this basis the coefficients of Table 1 could be construed to imply that a one per cent global rise in wages would increase the female activity rate by 0.19 per cent the work rate by 0.32 per cent and the full-time work rate by 1.00 per cent. This result for the

work rate happens to be quite close to the estimate based on the time series of female employment rates (0.30) quoted in Table 3, and so reinforces the suggestion that growth of real wages had a part to play in explaining the secular increase in women's work participation.

OTHER PEOPLE IN THE HOUSEHOLD

The potential effects of non-earners other than children on household income increasing the need for cash and thereby encouraging women's participation is as far as we can tell, outweighed by their needs for unpaid service. The 14% of the sample who were taking extra responsibility for the care of dependants - mostly elderly and mostly not actually co-resident (see p.25 of the Research Paper) were 10 percentage points less likely than similar women to be in paid work - about half the effect of the average dependant child. On the whole women under 60 combine responsibilities for adult dependants with labour force participation even more frequently than responsibility for children. It is likely that women over 60 also share responsibilities for the very elderly with the age group on which this Survey provides the evidence.

Husband not working

There is a variety of reasons why the husband's work status may affect a wife's earning behaviour. We have already allowed for the income effect of a husband not earning - sometimes known as the "additional worker effect" - increasing wife's participation through financial necessity, and of the reverse physical dependence effect of a sick or disabled husband who requires looking after at home. Wives under 60 tend to cease work when their husbands retire either because the couple wish to share leisure activities, or because the husband expects more domestic attention, and does not wish his wife to usurp the role of the breadwinner. This sort of argument is also among the many offered to account for the characteristically low economic activity

rates among wives of unemployed men, discussed by McKee and Bell (1984) and first noted by Smee & Stern (1978). Among the explanations they advanced for this phenomenon is the disincentive to earning by wives created by the rules of the benefit system, particularly Supplementary Benefit, where a wife's earnings serve merely to reduce a husband's benefit entitlement.

A minority among the non-earning husbands in the regression sample could be distinguished as known recipients of unemployment benefits, either National Insurance or Supplementary benefit. A test of the benefit effect on wives' labour supply would be to see whether the economic activity rate of this group was particularly depressed. There is some confirmation for such an effect to the extent that these wives were 11 percentage points less likely to describe themselves as economically active than even the wives of other non-working husbands (some of whom were probably also unemployed). This larger (and older) group of non-working husbands were associated with a 24 percentage point reduction, ceteris paribus, in their wives' work and activity rate. The huge effect of "unemployed" husbands on their wives' work rate, -0.47, reflects a high rate of unemployment among these wives themselves. The incidence of unemployment is not random among young couples, and this suggests that there are demand factors contributing to the low incidence of earning wives among unemployed men as well as supply factors. It remains to be investigated whether the low rates of economic activity among wives of non-earning husbands persist if the economic activity rate is redefined to include all non-working women who appeared on further questions to be available for paid work. It is possible that the apparent "supply" effects of -.35 and -.24 are exaggerated if the husband's presence in the home reduced the chances of job-seeking wives reporting job search as the main reason for not working. Any extrapolation of the effects of rising male unemployment on female activity rates should take into account that these coefficients would

be partially offset by rises in wives' participation induced through the income term. An extra 100 married men becoming unemployment beneficiaries would be associated with 35 fewer wives in the labour force only if their family income were unaffected. If net family income also dropped by, say £50 per week, the net fall in the number of "active" wives would be 23. Such a change would also tend to be associated with an increase, of 12, in the number of wives who were themselves unemployed, as there would be a net change, of 35, in the number with jobs.

JOB AVAILABILITY

Theoretically, in a "perfect market" there should be no need for any index of the demand for labour, beyond the wage rate, to explain participation, for market forces would set the wage at the level which cleared the market. However, in a situation where labour supply and demand diverge, factors which influence the demand for labour will influence the numbers observed actually working. Furthermore, the "discouraged worker" hypothesis also maintains that job availability will affect the numbers of non-workers who declare themselves to be economically active (i.e. unemployed), so we look for direct demand effects on both worker rates and economic activity rates. Respondents' perceptions of job availability and their own availability for work have been discussed at greater length in the Martin and Roberts (1984a).

The indicator of local job availability which was taken was the rate of registered unemployment as a percentage of total employment in the local area. This was constructed - with some difficulty - by Department of Employment statisticians matching the local authority of the interview with their Department's travel-to-work areas. This is not the only or the ideal index of local variations in availability of jobs for women, though it ought to be fairly suitable for our reference case, the woman who is not constrained by family responsibilities to a very small "walk-to-work" area.

The significance of the coefficients on this term have improved with the pooling of the married and non-married sample, and the simplification of the regional terms. Table 1 reports that a one percentage point increase in the local unemployment rate - other things, including the number of jobless husbands, being equal - is associated with 0.8 percentage points less on the female activity rate - mild confirmation of a "discouraged worker effect" when labour supply is measured in this way. The larger coefficient on the work rate cannot be viewed as a supply effect, it is just describing the unsurprising fact that in places where the local unemployment rate is high there is also unusually high unemployment among women. For every 1 percentage point increase in the local unemployment rate there is 0.5 point increase on the percentage of all women who are unemployed, (or about $\frac{3}{4}$ of a point in the percentage of unemployed among the labour force). The full-time work rate varies little area to area when all the other factors are controlled.

REGION

It proved possible to simplify the rather minor regional effects across the 12 standard regions reported in Appendix B into a dichotomy which contrasts Scotland, 'North' and North-West-England with the rest. Since this puts Yorkshire and Humberside in the "South", our northern region is one lying to the North of a diagonal line running roughly between the estuaries of the Mersey and the Tees. Residence in Northern Britain appears to add about 7 percentage points to the chances of a woman having a paid job. This is picking up the vestiges of regional patterns which were once very much more marked, and which Stern (1981) has shown to have eroded during the 1970's.

AGE and MARITAL STATUS

The two variables by which labour force participation rates tend to be classified on standard tabulations reflect factors which vary with life-cycle and cohort, many of which have been explicitly allowed for in this model: the presence of dependent children, physical disability of self or spouse, income and earning power. It was nevertheless instructive to see how much these variables could add in themselves to the explanation of participation rates after allowance has been made for these specific effects.

Age

It appeared in the Research Paper that age-cum-cohort effects varied between the married and non-married sample, and it was suggested that the differences between cohorts were not so much differences between generations of women as between vintages of marriage. The explorations leading up to Table 1 confirm that the effects of the age term differed between the subsamples, and that the significant difference was between women currently living with and without husbands, rather than an alternative division between those who had ever and never been married. These results differ from those reported in the Research Paper in that, after correcting an age-related component of the imputed wage term, the estimated effects of age in the participation functions are reduced.

Indeed where the dependent variable is the work rate, the only significant age effect is for married women over 40, for whom an advancing age reduces participation by the square of the number of years that have elapsed multiplied by .00063, so that, for example, a 57 year old married woman is 18 percentage points less likely than one of 40 to be working. This specification ("ageing begins at 40") was also found to fit aggregate data where it was possible to control separately for cohort (Joshi and Overton, 1984) but the magnitude of the coefficient is over twice the size in this micro data, where it presumably captures cohort as well as ageing effects.

Note, however that these differences, or lack thereof, are evaluated by comparing hypothetical women with very different levels of alternative income. Net household income other than own earnings is £90.73 per week for the woman with a husband and £16.93 for the woman living alone. If the lone woman needs more income to have comparable purchasing power to that at the disposal of the married woman, the estimated income parameters imply that her participation rates would be reduced, and those of the married woman would be raised if her income were to be adjusted downwards to a level comparable with the average lone woman. It is not known exactly how the income variable should be adjusted to represent an equivalent level of resources other than earnings, but let us assume, for the sake of argument, that £2 of other net income for the married is equivalent to £1 for the non-married. In this case global net equivalent income becomes £37.52 (ie $.753 \times £90.73 \times .5 + .244 \times £16.93$). The standard married woman would take a drop of £15.69 (of £7.845 in equivalent terms) to reach such a level of income which would raise her work and activity rates by about 4 percentage points and her chances of full-time work by 2.5 points. The standard non-married woman would have to have an increase in non-labour income of £20.59 per week to reach this hypothetical comparable level which, according to the parameters estimated would reduce her activity rate by 10 percentage points and her work and full time rates by 16 percentage points. These adjustments predict higher work and activity rates for childless women who are married than those not living with a partner, and also higher full-time work rates for married women under 40. However the excess unemployment rate of the non-married survives most reasonable attempts to adjust for income differences as does the greater tendency of married women to work part-time.

Thus it would seem that most of the observed excess in the actual participation rates of non-married women over wives is attributable to the presence of children and the availability of higher alternative sources of income, but the very presence of a husband, after allowing for these factors affects the way women divide their time between paid and unpaid work.

Wives' greater tendency to be part-time members of the paid workforce than women without partners presumably reflects the extra domestic work required to look after the average husband.

CONCLUSIONS

Three binary indicators of labour force attachment - the activity rate, the work rate and the full-time work rate - appeared to be strongly reduced by the presence of dependent children, by high levels of alternative income and by low earning capacity. This was imputed on the basis of the woman's occupational and employment history, using parameters estimated in an analysis of the hourly pay of women employed in 1980.

The constraint on labour force participation associated with children is expressed in terms of the age of the youngest child present. It is not linear in the numbers of children. Indeed the marginal effect of older children may be slightly positive.

No one of the three dependent variables used here is a perfect indicator of labor supply. Studies which concentrate on the work rate alone would miss the strong inhibiting effect of school age children on full-time participation, and could also ignore the potential labour supply of the unemployed. Estimates of wage and income elasticities from the work rate may confound supply parameters with effects on the chances of members of the labour force being out of a job, however the ambiguities of the definition of the activity rate make this variable difficult to interpret. Potential labor supply from women with domestic responsibilities is difficult to establish with standard survey data.

Adverse demand conditions, reflected in the local unemployment rate and arguably, the fact that a woman's husband has no job, reduce the chances of women as well as men being employed. The corresponding increases in self-reported unemployment do not account for all the shortfall of women's jobs, so there is some evidence for "discouraged worker effects" on the measured activity rate.

The method of analysis applied has been relatively unsophisticated and there is clearly scope to test the robustness of the results with non-linear estimation techniques, alternative definitions of the dependent variable, refinement of the imputed wage and making better use of the survey's retrospective material to investigate models of joint strategies for labour supply and childbearing. The full data set has now been deposited in the ESRC Data Archive, and it is hoped that this predominantly descriptive exercise may form a signpost and a challenge to more sophisticated examinations, and provide some guidance for the specification of models to be fitted to other data.

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For further references, readers are referred to Joshi (1984) and review articles in Hornstein et al (1981)

Table 1

Linear Regression Analyses of Three Measures of
Women's Work Participation: Great Britain 1980

Dependent variable	Regression coefficients			t statistics		
	Active	Working	Full-time	Active	Working	Full-time
Mean	0.719	0.659	0.383			
Independent variables:						
Youngest child						
aged						
0	-0.697	-0.635	-0.570	24.2	20.9	18.6
1- 2	-0.587	-0.534	-0.546	26.1	22.8	22.2
3- 4	-0.380	-0.326	-0.467	16.3	13.3	17.0
5	-0.249	-0.228	-0.438	7.8	6.6	12.3
6-10	-0.165	-0.129	-0.365	8.8	6.5	16.7
11-15			-0.173			8.5
Number of other children U - 4	-0.092	-0.075	-0.054	3.6	2.8	2.1
Presence of other children:						
5-10	-	-	-0.051	-	-	2.6
11-15	0.052	0.044	0.064	2.9	2.3	3.3
*Log Earnings Potential	0.302	0.368	0.534	12.5	14.6	21.5
If Married:						
* Other income **	-0.233	-0.247	-0.157	13.4	13.1	8.8
Husband 'unemployed'	-0.347	-0.473	-0.231	6.0	7.6	3.9
Husband other non-work	-0.236	-0.243	-0.093	9.0	8.6	3.5
Age **	-0.383	-	-1.315	5.4	-	17.3
Square of excess of age over 40**	-0.035	-0.063	-0.011	3.2	7.9	1.0
If Not Married						
* Other income **	-0.491	-0.767	-0.778	8.6	13.2	13.1
Age **	-0.315	-	-0.830	4.2	-	10.8
Mortgage Dependant	0.043	0.052	0.025	3.5	4.0	1.9
Dependant	-0.105	-0.096	-0.061	6.4	5.4	3.6
*Local unemployment rate	-0.008	-0.013	-0.004	3.2	4.8	1.5
North of Mersey-Tees	0.067	0.070	0.043	4.4	4.2	2.8
Constant	1.002	0.796	1.007	36.0	47.3	34.3
Adjusted R Square	0.357	0.322	0.421	degrees of freedom		
Residual Sum of Squares	563.0	659.9	592.4	19	17	21

Sample n = 4348 Women aged 16-59, neither students nor permanently sick,
no missing data on any of the included variables

*measured as difference from sample (or sub-sample) mean

** coefficient multiplied up by 100. Decimal point must be moved 2 places to the left before evaluating effects.

Definitions, means and standard deviations of the variables are given in Appendix A.

Table 2

Regression Analysis of the Pay received by Women employed in 1980:

Models with work experience and (1) occupation, (2) education

(3 & 4) education separately for 2 occupational groups.

dependent variable Log hourly pay	(1)		(2)		Manual + Sales Occupations		Other Non Manual	
	b	t	b	t	b	t	b	t
Current occupation:								
Professional	1.035	15.4	-	-	-	-	-	-
Teaching	0.903	34.7	-	-	-	-	-	-
Nursing, medical, social	0.368	15.3	-	-	-	-	-	-
Other intermediate non- manual	0.386	13.3	-	-	-	-	-	-
Clerical	0.264	17.6	-	-	-	-	-	-
Sales	-	-	-	-	-	-	-	-
Skilled manual	0.105	4.0	-	-	-	-	-	-
Child care	-0.154	3.7	-	-	-	-	-	-
Semi-skilled: factory	0.117	5.9	-	-	-	-	-	-
domestic and service	-	-	-	-	-	-	-	-
other	0.087	2.7	-	-	-	-	-	-
Years of post-compulsory education	-	-	0.074	17.4	0.018	2.1	0.069	14.2
Highest qualification A level or above	-	-	0.146	6.9	0.003	0.1	0.144	5.9
Current job part-time	-	-	-0.091	6.3	-0.076	4.2	-0.019	2.3
Years in current job	.005	3.3	0.005	3.5	0.003	1.5	0.069	14.2
Years of work experience full-time	.035	12.8	0.034	16.7	0.019	7.2	0.040	14.0
part-time	.029	9.9	0.028	12.7	0.016	5.7	0.034	10.2
Years of work squared + 100	-.021	3.3	-0.068	13.3	-0.037	5.6	0.078	10.6
Years of work x age + 100	-.037	6.2	-	-	-	-	0.011	7.2
Years since education not employed	-	-	-0.007	7.5	-0.002	1.7	0.011	7.2
Constant	0.088	n.a.	0.171	10.0	0.221	9.6	0.187	7.9
Adjusted R Square	0.421		0.363		0.062		0.411	
Residual Sum of Squares		259.5		279.3		118.3		133.4
degrees of freedom	2888	14	2896	8	1476	8	1411	8
n	2903		2905		1485		1420	
date of estimate	1982		1984		1984		1984	

F test for restrictions needed to pool (3) and (4) = 35.2
Pooling rejected.

Table J Estimated elasticities of women's participation with respect to wages and income

Source	Sample	Dependent variable	Estimated elasticities			Notes
			Own wage	Husband's wage	Non-labour income	
Micro-studies						
HES						
1980						
Table 1	Married	Active Working Full-time	0.45 0.59 1.08	-0.32 -0.36 -0.50		a,d a,d a,d
	Non-married	Active Working Full-time	0.35 0.48 0.81	-0.10 -0.17 -0.20		a,d a,d a,d
Appendix B	Married	Active Working Full-time	0.53 0.60 1.76	-0.31 -0.36 -0.45		a,d a,d a,d
	Non-married	Active Working Full-time	0.26 0.50 0.77	-0.09 -0.18 -0.21		a,d a,d a,d
GHS 1974						
Joshi (1984)	Married	Active	0.22	-0.08	-0.03	a,e
Layard et al (1980)	Married	Active	0.49	-0.28	-0.04	b,f
Zabaiza (1983)	Married	Active	0.41	-0.09	0	c,g
GHS 1971						
Greenhalgh (1980)	Married	Active	0.36		-0.35(gross) -0.45(net)	a,f

FES* 1970-77								
Stern (1981)	Married	Working	--	-0.29	-0.07	b		
Aggregate data								
Census 1971								
'Towns'								
Greenhalgh (1977)	Married	Active	1.35	-0.88	-0.23	a,h		
Time series	All females							
Joshi et al (1985)	GB 1950-74	Employees		0.30		a,h		

Notes to Table 3:

Form of estimation:

- (a) linear probability model
- (b) logit transformation
- (c) inferred from a constant elasticity of substitution (CES) utility function

Specification of wage term:

- (d) imputed on basis of experience and top occupation, logarithm
- (e) imputed on basis of education, age and social class background
- (f) logarithm of (e)
- (g) as (f) but estimated with correction for selectivity bias
- (h) actual wage rates (in logs)

Note on income elasticities:

The elasticities estimated from this data set are the proportional changes in participation with respect to a rough estimate of net income. From the other data sources the elasticities are with respect to gross, that is pre-tax, income. Because marginal tax rates exceed average rates the elasticity with respect to net income is absolutely larger than that with respect to gross income. Both estimates are quoted from Greenhalgh's analysis of the 1971 GHS.

* Family Expenditure Survey

APPENDIX A PART (1)

Definitions, Means and Standard Deviation of Variables in Regression Samples: Women aged 16-59, Great Britain, 1980

	Table 1		Appendix B		Hot married	S. D.
	Short List	Full List	Married	Hot married		
Sample numbers analyzed	4348	3176	805	1139	53	
excluded:						
missing data	825		79		43	
permanently sick	122		19		274	
students	293					
	Mean	S. D.	Mean	S. D.	Mean	S. D.
Working in paid job last week	.559	.474	.618	.486	.770	.421
Active: working/seeking work (main reason no work)	.719	.460	.665	.472	.866	.341
Full-time: working full-time (self definition)	.383	.488	.284	.451	.661	.474
Married: living with legal or de facto spouse	.736	.441	1.000	.000	.000	.000
Own children present:						
youngest aged 0	.053	.224	.068	.251	.012	.110
1-2	.089	.285	.111	.314	.030	.170
3-4	.067	.251	.082	.274	.029	.168
5	.032	.176	.038	.191	.016	.125
6-10	.136	.343	.162	.368	.066	.248
11-15	.129	.335	.153	.360	.060	.237
Number of other children under 5	.062	.235	.026	.160	.007	.084
Presence of older children aged 0-2	.021	.144	.021	.144	.006	.078
3-4	.044	.205	.057	.232	.006	.078
5-10	.143	.360	.181	.385	.040	.197
11-15	.137	.344	.168	.374	.051	.220
Potential hourly earnings: log £	.533	.248	.547	.237	.496	.273
Household's net income other than own pay: £p.w.	66.795	34.622	90.879	40.335	16.995	20.205
Other income (£ per week) if married, otherwise 0	4.466	10.356	.013	.113		
Other income (£ per week) if not married, otherwise 0	.009	.097	.074	.262		
Husband unemployed (benefit reported)	.055	.227				
Husband not working, other						
Age (years) if married, otherwise 0	36.316	12.036	37.962	10.918	31.647	13.825
Age (years) if not married, otherwise 0	27.977	19.999				
Age (years) if not married, otherwise 0	8.340	15.636				
(Age - 40) squared			123.317	115.627	260.729	180.133
(Age - 40) squared if over 40 and married, otherwise 0	35.855	82.722				

APPENDIX B PART (iv)

Earnings potential in £ph	8.9	9.1	13.2	4.8	6.4	8.4
Other income $\frac{1}{100}$	11.9	11.7	7.6	9.5	12.6	12.9
Owner occupier: outright mortgage	2.0	0.5	1.9	0.4	0.8	0.7
	2.5	3.0	1.1	0.7	0.9	1.7
Dependant Husband: unemployment benefit other non-work	5.1	4.1	3.1	3.6	2.1	1.3
	5.3	7.1	4.1	-	-	-
	8.1	8.2	3.9	-	-	-
Local unemployment per cent	2.9	3.7	1.4	0.6	0.3	0.3
Region: North	1.9	2.5	1.7	0.6	0.4	0.5
York and Humberside	1.8	1.8	0.3	0.2	0.5	1.3
North-West	2.9	3.1	2.8	0.5	0.5	0.7
W Midlands	1.8	1.1	2.4	0.1	1.5	1.7
E Midlands	1.0	0.7	1.3	2.5	0.4	0.4
E Anglia	2.0	1.6	0.7	1.8	1.6	1.2
GLC	0.8	0.7	2.1	0.8	0.2	0.5
South West	0.4	0.2	0.8	1.5	0.4	1.8
Wales	0.8	0.0	1.5	1.5	1.5	1.2
Scotland	3.0	2.7	3.4	0.8	1.0	1.1
Qualified: A level+	0.2	0.9	0.9	1.2	2.1	1.9
O level	0.2	0.2	2.2	1.3	3.1	3.1
CSE etc	0.3	1.0	1.2	1.6	3.6	4.5
Remarried	0.3	0.1	4.5	-	-	-
Never married	-	-	-	1.3	0.5	0.5
Widowed	-	-	-	1.1	0.7	2.6
Own mother worked	0.9	0.8	1.7	1.6	1.4	2.3
Constant	18.2	16.5	13.2	13.9	8.5	6.9
F ratio	34.6	31.3	32.7	15.4	13.0	23.9
Sum of squares: regression	241.9	239.9	212.8	51.4	70.5	126.4
residual	465.7	509.6	432.6	81.1	131.3	128.7

APPENDIX B PART (ii)

Earnings potential in £ per hour	0.352	0.373	0.500	0.228	0.387	0.508
Other income $\$pw \times 100$	-0.232	-0.239	-0.143	-0.479	-0.811	-0.825
Owner occupier: outright mortgage	-0.048	-0.013	-0.044	-0.010	0.023	0.020
	0.045	0.054	0.019	0.016	0.024	0.046
Dependant	-0.100	-0.095	-0.058	-0.103	-0.079	-0.049
Husband: unemployment benefit	-0.329	-0.466	-0.251	-	-	-
Other non-work	-0.231	-0.245	-0.107	-	-	-
Local unemployment per cent	-0.011	-0.015	-0.005	-0.002	-0.002	0.002
Region: North	0.074	0.101	0.063	0.026	0.023	-0.031
York and Humberside	0.051	0.054	0.007	-0.066	-0.023	-0.059
North-West	0.085	0.095	0.081	-0.019	-0.024	-0.033
W Midlands	0.050	0.032	0.066	-0.003	0.067	-0.072
E Midlands	-0.032	-0.023	0.037	-0.093	-0.022	-0.019
E Anglia	-0.079	-0.066	-0.027	-0.112	-0.122	-0.095
GLC	0.021	0.020	0.053	-0.025	-0.006	-0.021
South West	-0.011	0.008	0.024	-0.059	-0.020	-0.087
Wales	0.029	-0.000	0.055	-0.069	-0.089	-0.074
Scotland	0.103	0.096	0.112	-0.032	-0.050	-0.053
Qualified: A level+	0.005	0.023	0.021	0.036	0.078	0.070
O level	0.005	0.004	0.044	0.031	0.094	0.094
CSE etc	0.005	0.021	0.024	0.040	0.120	0.147
Remarried	0.008	0.002	0.110	-	-	-
Never married	-	-	-	-0.043	-0.022	-0.027
Widowed	-	-	-	-0.038	-0.031	-0.113
Own mother worked	0.013	0.012	-0.024	0.029	0.032	0.052
Constant	1.155	1.098	0.803	0.998	0.773	0.624
R ²	0.342	0.320	0.330	0.309	0.349	0.495
Degrees of freedom: regression	47	47	47	45	45	45
residual	3128	3128	3128	1093	1093	1093

APPENDIX B PART (iii)

t statistics

Independent variable	Married			Non-married		
	Active	Working	Full-time	Active	Working	Full-time
Youngest child: age						
0	14.8	13.6	10.0	4.5	2.8	2.9
1-2	13.5	12.6	10.2	5.8	4.0	4.2
3-4	8.5	7.8	9.0	5.5	2.6	3.0
5	-5.1	5.1	7.5	4.0	2.2	3.6
6-10	6.2	5.0	9.4	2.2	1.0	3.9
11-15	0.9	0.7	4.4	1.5	0.9	1.8
Other children: age						
0-2	2.2	1.7	1.6	2.2	1.0	0.2
3-4	2.8	2.4	1.6	2.1	0.6	0.6
5-10	1.8	1.1	2.9	0.1	0.5	0.8
11-15	1.9	1.3	2.5	1.0	1.9	1.1
Family incomplete: youngest age						
0-2	1.6	1.4	1.3	0.9	1.1	0.1
3-4	1.8	1.8	0.7	0.4	0.5	0.9
5-10	1.0	0.7	0.9	1.5	1.1	1.4
11-15	1.6	1.1	0.0	-	-	-
No. of children 16+	0.6	0.5	2.0	0.6	0.0	0.9
Age at first birth:						
15-19	2.3	2.2	3.5	1.3	0.8	0.6
20-22	1.9	1.7	4.9	1.1	0.2	1.7
23-24	0.2	0.6	5.4	1.4	0.7	1.7
25-29	0.5	0.5	6.3	0.4	0.8	0.3
30-34	0.4	0.9	4.6	0.2	1.2	0.1
35-39	1.3	1.0	2.2	0.6	0.9	0.1
40+	0.7	0.9	1.0	0.0	0.2	2.7
Age (years) + 100 (Age-40) + 100	4.5	4.2	7.5	2.1	1.0	1.3
	2.8	3.1	0.6	0.4	0.5	1.2

APPENDIX A PART (ii)

Household owns accommodation outright	.128	.334	.185	.389
Household buying home on mortgage	.500	.500	.238	.426
Taking care of a dependant	.152	.359	.093	.291
Unemployment rate for local area: %	6.546	2.754	6.589	2.882
Region of residence:				
North	.073	.261	.075	.263
Yorkshire & Humberside	.095	.294	.083	.275
North-West	.112	.316	.127	.333
West Midlands	.093	.290	.096	.294
East Midlands	.070	.254	.069	.254
East Anglia	.037	.188	.021	.144
Greater London	.099	.299	.143	.350
South-West	.077	.267	.070	.256
Wales	.059	.235	.051	.220
Scotland	.084	.278	.111	.314
North of Mersey-Tees: North, N.-West and Scotland	.280	.449		
Qualifications: A level or above	.169	.375	.187	.390
O level	.179	.383	.255	.436
CSE etc.	.152	.359	.159	.366
Remarried	.086	.281	.631	.483
Never-married			.125	.330
Widowed			.572	.495
Mother employed in own childhood	.484	.500		
Expects further births: youngest now				
0-2	.073	.261	.013	.114
3-4	.016	.124	.005	.072
5-10	.009	.093	.005	.072
11-15	.001	.025	.000	.000
Number of children over age 16	.901	1.377	.572	1.273
Age at first birth, if any:				
15-19	.136	.343	.085	.279
20-22	.235	.424	.130	.336
23-24	.172	.377	.054	.225
25-29	.227	.419	.081	.273
30-34	.060	.237	.038	.131
35-39	.010	.101	.006	.078
40+	.001	.031	.001	.030

Unless otherwise indicated, all variables take the value 1 when the description applies and 0 when it does not.

Source: CPS analysis of Women and Employment Survey, 1984

APPENDIX B PART (i)

Regression analysis of three indicators of participation: full list of explanatory variables estimated separately for samples with and without husband present

Independent variable	Regression coefficients					
	Married			Non-married		
	Active	Working	Full-time	Active	Working	Full-time
Youngest child: age						
0	-0.694	-0.668	-0.451	-0.430	-0.341	-0.347
1-2	-0.570	-0.555	-0.413	-0.449	-0.397	-0.413
3-4	-0.352	-0.336	-0.356	-0.381	-0.225	-0.254
5	-0.236	-0.247	-0.333	-0.311	-0.221	-0.349
6-10	-0.193	-0.163	-0.283	-0.109	-0.064	-0.247
11-15	-0.025	-0.018	-0.113	-0.089	-0.053	-0.106
Other children: age						
0-2	-0.105	-0.087	-0.075	-0.245	-0.136	-0.021
3-4	-0.102	-0.092	-0.054	-0.237	-0.093	-0.084
5-10	-0.042	-0.028	-0.066	0.004	0.030	0.050
11-15	0.043	0.030	0.055	0.048	0.113	0.063
Family incomplete: youngest age						
0-2	-0.059	-0.054	-0.047	0.087	0.135	0.088
3-4	-0.113	-0.115	-0.040	0.052	-0.088	-0.149
5-10	0.073	-0.052	-0.064	0.184	0.164	0.209
11-15	-0.430	-0.326	0.005
No. of children 16+	0.005	0.004	0.015	0.005	0.001	-0.012
Age at first birth:						
15-19	0.081	0.091	-0.116	-0.070	-0.056	-0.051
20-22	0.062	0.057	-0.150	-0.055	0.011	-0.103
23-24	0.007	0.019	-0.171	-0.080	-0.048	-0.118
25-29	0.015	0.019	-0.198	-0.019	0.049	-0.022
30-34	-0.018	-0.041	-0.187	-0.013	0.109	-0.012
35-39	0.096	0.078	-0.156	0.072	0.129	-0.010
40+	0.170	0.210	-0.230	-0.000	0.075	-0.937
Age (years) + 100 (Age-40) ² + 100	-0.599	-0.575	-0.933	-0.261	-0.162	-0.213
	-0.023	-0.027	0.005	-0.003	-0.005	0.012