WORLD EMPLOYMENT PROGRAMME RESEARCH

Working Papers

International Labour Office, Geneva

WEP 2-21/WP.96

WORLD EMPLOYMENT PROGRAMME RESEARCH

Working Paper

POPULATION AND LABOUR POLICIES PROGRAMME
Working Paper No. 96

FEMALE LABOUR FORCE PARTICIPATION IN PERU: AN ANALYSIS USING THE WORLD FERTILITY SURVEY

by

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September 1980

ISBN 92-2-102542-X

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Preface

This paper is one contribution to a cross-cultural analysis of female labour force participation using the World Fertility Survey. Several country analyses are being undertaken - one, on Sri Lanka, is already available in preliminary form[1], and another on Jordan is being drafted.[2] In addition, cross-country comparisons for some 15 countries are presently under way. It is hoped that these analyses will together help to understand international variations in female activity patterns, and thereby contribute to an understanding of the factors determining the economic roles of women. Comments on this paper by Cynthia Lloyd, René Wéry and Guy Standing are gratefully acknowledged.

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[1] See G. Standing: "Analysing women's labour force activity with the WFS: Insights from Sri Lanka", Population and Labour Policies Programme Working Paper No. 85 (Geneva, ILO, March 1980).

[2] See R. Wéry: "Female employment in Jordan" (Geneva, ILO, forthcoming).

1. Introduction: Peru and the World Fertility Survey

The World Fertility Survey is not primarily aimed at measuring labour force participation, but collects some information on labour supply, mainly of ever-married women and their husbands, because of the correlation between these variables and fertility. The basic ("core") questionnaire of the WFS asks each woman for current, post-marriage, and pre-marriage work status, occupation, and whether the work is undertaken at home. For the husband, current or most recent occupation and work status (excluding retirement and unemployment) are asked. This is a rather restricted data set for analysing labour supply. Nevertheless it is sufficient for many relationships to be discerned, and the restrictions on data from individual countries are largely compensated, from an analytical perspective, by the possibilities for inter-country comparison.

In Peru, the WFS used a cluster sample of 8290 dwellings which gave a data set for analysis of 5640 ever-married women aged 15-49, stratified by region.[1] Around two-thirds of the women were in current legal union, around a quarter in consensual union, and the remaining tenth widowed, divorced or separated. Sixty-four per cent of the women were urban (24 per cent Lima) and 36 per cent rural. The survey included not only the core WFS questionnaire and two demographic modules, but also economic and community level questionnaires. However for purposes of the current paper, only data from the core have been used. There are two reasons for this. First, at the time of writing only the data from the core questionnaire were available to the ILO. Second, and more substantively, data from the core questionnaire have been organised in standard form for all participating countries by WFS staff in London, and this is the only part of the survey which is common to all countries. For international comparative analysis, therefore, it is desirable to work at the level of the standardised core data. At the same time, the availability of broader types of socio-economic data provides a potential for checking and extending the analysis carried out with the standardised data set. At a later stage it is hoped to be able to take advantage of this potential.

2. Patterns of Labour Force Participation

The main labour force categories available for Peru in the standard data set, and the distributions of various populations according to these categories, are reproduced in Tables 1 and 2. It should be noted at the outset that several important aspects of labour supply are not available in the data file used. These include any measure of unemployment or of potential labour supply; secondary activities; seasonal or other variability; domestic work; and supply of labour of household members other than husband and wife.[2] The

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[1] See Republica Peruana, Instituto Nacional de Planificación, Oficina Nacional de Estadistica: Encuestra Nacional de Fecundidad de Peru, 1977-78, Informe General (Lima, 1979).

[2] Note that in the absence of information on domestic work, the term "work" is henceforth used in the conventional economic activity sense.

chronology is incomplete - e.g., economic activity within birth intervals is missing and for husbands it is not possible to identify those who are currently not working. Moreover, there are no wage or income data. Despite these lacunae, considerable possibilities for analysis exist with the variables available in Tables 1 and 2.

Table 1 gives the work status breakdown for women prior to marriage, and the most recent work status of women (after marriage) and their husbands; that is, for those who are currently inactive, retired or unemployed the last work status is taken. It is also possible to separate out current activity in the data set (this is done in Tables 3 to 5 below). Table 2 gives the corresponding occupation data. The only other employment information worthy of note in the standard data file is the place of work.[1]

The various categories of work status and occupation have quite different meanings and quite different determinants, and their distribution across the different regions of Peru indicates a corresponding variation in the mode of production. The ease of entry to different occupations and different work statuses varies, and so the incidence and availability of differing work patterns will alone generate variations in observed labour supply. In Table 1, the proportion of women working after marriage is highest in rural areas, where the incidence of unpaid family work is also highest. Wage work, on the other hand, is the main occupational category in Lima, especially for women prior to marriage - it also dominates for men in urban areas as a whole. The nature of the decision to work, the nature of the job search, the implications for income and the interactions with other aspects of individual and household behaviour all differ substantially between urban and rural areas. Differential patterns can also be seen in the occupational distribution in Table 2, where in Lima, women concentrate in sales, and, especially before marriage, in domestic service to a much greater degree than men. In rural areas, however, there is much less variation by sex and marital status (though the occupational pattern is of course very different from that in urban areas).

In order to analyse labour supply relationships, a multivariate model is required. However, an overview of some of the more obvious bivariate relationships is useful. We therefore consider here the relationships between female labour force participation and family size, labour force participation and education, and labour force participation and husband's work status. The underlying theory is considered in the next section.

Table 3 gives the distribution of work status by number of living children, by type of location. The need to separate the pattern by location is evident from Tables 1 and 2, and different patterns between locations show up in Table 3 as well. There is a general tendency for the incidence of self-employment to be associated with large family size in urban areas, but not in rural where

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[1] Some additional data were collected but not included in the standardised file. These included years of work prior to and after marriage, work in the interval between marriage and first birth, as well as distinctions between part-time, full-time and seasonal work.

Table 1: Work status (% distribution)

	Women, post-marriage			Husbands			Women, pre-marriage		
	L	U	R	L	U	R	L	U	R
Family worker: Unpaid/kind	0.9	10.8	44.8	0.1	0.4	3.2	4.4	16.0	47.0
: Cash	1.7	0.9	0.1	1.4	1.7	1.1	2.3	2.3	1.3
Non-family wage worker: Unpaid/kind	0.5	0.9	2.8	0.1	0.5	1.5	1.0	2.2	2.6
Cash	28.4	19.8	5.6	72.1	57.4	23.5	59.5	37.9	15.3
Independent alone				19.2	29.0	61.1			
1-4 employees	26.1	29.2	13.2	6.1	8.4	7.7	5.3	7.4	6.0
5+ employees				1.1	1.7	1.7			
No work	42.4	38.5	33.4	0.0	0.9	0.3	27.6	34.3	27.8
Total	100	100	100	100	100	100	100	100	100

L = Lima; U = other urban; R = rural.

Figures in this and subsequent tables are obtained from weighted data.

Table 2: Occupational distribution of those in economic activity (%)

	Women, post-marriage			Husbands			Women pre-marriage		
	L	U	R	L	U	R	L	U	R
Professional	9.6	10.4	0.8	17.1	10.9	2.0	7.1	9.2	1.0
Clerical	13.1	5.2	0.4	12.3	9.2	1.1	20.0	8.9	0.4
Sales	32.8	33.3	5.5	14.4	12.0	4.0	12.0	15.5	3.9
Farmers*	0.5	15.1	66.3	1.3	15.8	63.4	0.1	0.6	0.9
Agricultural Lab.*	1.3	4.7	8.3	2.2	8.9	17.3	4.7	21.7	67.3
Household services	10.7	7.2	1.3	0.0	0.1	0.0	32.9	27.4	13.1
Other services	10.8	9.3	2.1	8.9	6.7	1.1	4.1	3.7	1.4
Skilled production	18.5	12.7	13.4	33.8	22.4	6.9	14.6	10.0	9.9
Unskilled production	2.6	2.1	2.0	9.9	13.9	4.2	4.5	2.8	2.1
Total**	100	100	100	100	100	100	100	100	100

* Note that prior to marriage, unpaid family farm workers were generally classified as agricultural labourers, while after marriage they were mostly classified as farmers.

** excludes small numbers "not specified".

Table 3: Work status of ever married women (%) by number of children and location

	Lima					Other urban					Rural				
Number of children:	0	1-2	3-4	5-7	8+	0	1-2	3-4	5-7	8+	0	1-2	3-4	5-7	8+
Self-employed	10.3	13.3	23.7	24.6	34.3	16.2	18.1	26.1	31.0	32.5	10.3	11.9	13.0	11.7	9.7
Wage employed*	25.0	19.6	12.0	9.0	10.5	25.0	16.2	15.5	9.0	5.9	7.9	7.6	5.3	6.4	3.6
Family worker**	2.9	3.2	1.8	0.4	0.0	8.4	7.9	9.7	13.3	13.1	39.1	39.4	41.2	45.9	39.1
Worked after marriage but not now	11.8	19.0	22.7	24.6	17.9	6.0	12.4	12.0	15.2	15.0	3.5	6.1	7.6	5.9	8.8
Worked before marriage only	30.9	31.7	27.3	22.8	23.9	24.8	21.8	18.1	16.8	17.7	19.8	16.5	15.0	13.7	14.0
Never worked	19.1	13.3	12.3	18.7	13.4	19.7	23.6	18.6	14.7	15.9	19.3	18.5	17.8	16.3	24.8
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Observations	76	553	470	299	75	120	717	599	552	171	127	521	575	618	167

* Includes unpaid and kind-paid employees.

** Includes paid and unpaid and workers on family farm.

the pattern appears to be non-linear. In all regions the incidence of wage work is lower with larger family sizes, while unpaid family work has a mixed pattern. Among those not working at present the percentage never having worked is unrelated with family size. Larger families are associated with greater cessation of work after marriage to some extent in all locations, but with less cessation of work at or prior to marriage.

The interpretation of these bivariate results is of course risky. A relative compatibility between large family size and urban self-employment can be inferred, and a relative incompatibility between large family size and wage employment. Cessation of work after marriage also appears to be linked to large family size, though no inference about the direction of causation can be made. The tendency for those who worked only before marriage to have fewer children could merely result from a relationship of both these variables to duration of marriage. More generally, the work status of women is likely to be affected by their access to labour markets. One variable likely to strongly influence this access is the nature of the husband's work, and Table 4 gives the distribution of the work status of married women by the work status of their husbands.

The dominant pattern of Table 4 is fairly straightforward. A self-employed husband without employees is associated with a self-employed wife (Lima, other urban) or with a wife working unpaid in the family enterprise (other urban, rural). Where the husband is an employer the pattern is somewhat similar, though less strong. Non-working wives are more frequent where their husbands are wage workers. This is pretty consistent; the wife obviously has much readier access to economic activity when the husband has a business in which she can work, or through which contacts can be made for suitable job opportunities, than when the husband is in wage work. Work of the woman is also likely to have similar - but perhaps weaker - effects on her husband's work status.

Another determinant of labour market access is education level. Table 5 gives the distribution of work status by education. Several clear patterns emerge. Firstly, with some exceptions, those with higher education levels engage less in self-employment and family work, and more in wage employment. The exceptions concern the no education and primary education groups, which are not significantly different from each other (suggesting non-linearity in the impact of education) and the family worker group in Lima, for which the sample is small. In rural areas the size of the secondary and more education sub-groups is also too small for reliable estimates. In urban areas, those with the highest educational levels are least likely to be inactive; for those who have never worked or only worked before marriage, there is a non-linear pattern; women with intermediate education levels have the highest probability to belong to these groups. On the other hand, the cessation of work after marriage appears more common among those with no education. In rural areas the pattern is less clear, and is in any case difficult to compare because of the concentration of women in the lowest two education levels.

Table 4: Work status of ever married women (%) by work status of current or last husband and location*

Husband / Woman	Lima					Other urban					Rural				
	Self	Em-ployer	Wage	Family work	Total	Self	Em-ployer	Wage	Family work	Total	Self	Em-ployer	Wage	Family work	Total
Self-employed	30.8	28.4	16.1	20.0	19.8	31.2	33.4	20.3	15.5	24.7	11.4	16.1	11.1	12.8	11.8
Wage employed**	8.3	21.1	16.0	10.0	14.9	8.3	11.9	17.1	12.4	13.9	3.9	3.4	13.1	8.1	6.3
Family worker**	3.6	5.3	1.4	0	2.1	21.2	13.6	3.9	17.4	10.3	51.8	35.5	20.6	40.7	42.0
Worked after marriage but not now	20.9	14.7	21.9	0	20.9	9.9	12.6	14.3	10.6	12.8	6.4	5.7	7.7	3.8	6.6
Worked before marriage only	26.5	18.9	28.9	50.0	28.0	15.1	18.7	21.8	16.2	19.4	12.1	16.8	23.5	9.3	15.3
Never worked	9.9	11.6	15.7	20.0	14.4	14.3	9.8	22.6	27.9	19.0	14.5	22.5	24.0	25.6	18.1
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Observations	282	106	1062	22	1472	627	217	1251	45	2139	1227	189	501	87	2003

* Excludes a small number of women whose husbands have never worked.

** See footnotes to Table 3.

Table 5: Work status of ever married women (%) by education and location

	Lima				Other urban				Rural			
	None	Primary	Sec-ondary	More	None	Primary	Sec-ondary	More	None	Primary	Sec-ondary	More
Self-employed	28.4	24.6	13.9	10.4	25.4	29.8	17.8	5.8	12.7	11.1	11.2	0
Wage employed*	11.0	9.3	16.1	47.9	9.8	7.8	15.2	64.5	6.6	5.0	13.9	84.0
Family worker*	0	1.8	2.4	4.2	19.6	10.8	4.1	0	46.2	38.7	22.3	0
Worked after marriage but not now	30.3	22.5	17.7	16.7	15.3	12.3	13.1	10.4	5.7	7.2	13.4	0
Worked before marriage only	20.2	30.2	29.8	13.5	17.4	20.4	22.0	8.2	12.6	17.6	24.0	0
Never worked	10.1	11.6	20.1	7.3	12.4	19.0	27.8	11.1	16.3	20.4	15.1	16.0
	100	100	100	100	100	100	100	100	100	100	100	100
Observations	121	683	560	107	397	1141	468	153	994	958	50	7

* See footnotes to Table 3.

Some of these results - notably increasing wage employment with education - can be readily explained in terms of the increased access to jobs which higher levels of education provide. Others appear to result from interactions with other variables. For instance, the cessation of work after marriage was seen, in Table 3, to be linked positively to numbers of children. At the same time, education levels are linked negatively to fertility[1], so that these tabulations are insufficient to indicate whether the relationship is with fertility or education. Moreover, the number of children ever born is a rising function of age, while education, for various reasons, is a declining function of age. Thus yet another variable should be controlled for. In order to deal with this problem, two multivariate techniques are used in this paper - discriminant analysis, and the estimation of linear and non-linear models.

3. Determinants of Labour Supply

There exists a considerable literature on the determinants of labour supply, and there is little point in attempting here to present the theory *in extenso*.[2] Broadly, one can identify a set of micro-economic determinants which influence the costs of and benefits from different types of labour force participation, and a set of macro-structural determinants which influence the attitudes of individuals toward labour market activity, and constrain their abilities to choose between different types of behaviour. This is true whether or not an underlying model of individuals or households as rational, optimising entities is used to generate theoretical predictions - in practice, the resulting empirical analysis tends to be remarkably similar whether one takes a restricted neo-classical model of household behaviour or a broad, behavioural approach.

The costs and benefits of labour supply depend on many factors. Among the most important are certainly wage and income levels. Unfortunately, the WFS core questionnaire contains no data of this type. Other important variables directly affecting the costs and benefits which are absent from the WFS include working hours, conditions and other characteristics of employment; activities and income of household members other than the respondent and her husband; employment and unemployment levels, and job accessibility in the labour markets to which labour might be supplied. Thus, the specification of a labour supply model is bound to be incomplete, though variables can be found which proxy to some extent for those which are absent from the data.

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[1] At the risk of complicating the presentation further, it could be noted that in addition to behavioural factors, age has an impact on both fertility and labour supply.

[2] See G. Standing: *Labour Force Participation and Development* (Geneva, ILO, 1978), and Standing and Sheehan: *Labour Force Participation in Low-Income Countries* (Geneva, ILO, 1978) for elaboration of the issues concerned.

A. Measures of labour supply

The diverse patterns of labour supply by work status, occupation and region noted in the last section suggest a need to disaggregate labour supply by these variables prior to analysis. The broad regional groupings - Lima, other urban, rural - although evidently imperfect, go some way towards allowing for regional differentiation. For labour market patterns the problem is less easily resolved. The occupational breakdown is of evident importance but in part overlaps with the work status classification, in many ways represents less fundamental alternatives than those associated with different work status choices and can be adequately taken into account in the selection of independent variables. Different types of work status are therefore on theoretical grounds the most appropriate basis for disaggregation.

Classificatory techniques of analysis can use all available work status disaggregations which appear to be theoretically distinct, and this is the approach adopted for the discriminant analysis below. The specification of labour supply models calls for some aggregation, however, since the most convenient technique involves estimation of the probability that individuals will fall in particular labour supply categories, taken one at a time, and it is desirable both to retain a sufficient number of observations for each case and to limit the proliferation of functions which are unlikely to be statistically distinct.

The following appeared to be important as basic categories for current activity.

1. no work
2. family work (including both paid and unpaid work, and work on family farm)[1]
3. self-employment
4. wage work (including unpaid and kind-paid work for non-family employers)[1]

The four categories above are mapped onto four dummy variables, defined as follows.

	No work	Family work	Self	Wage
LFA	0	1	1	1
LFNF	0	0	1	1
LFW	0	0	0	1
LFS	0	0	1	0

[1] The incidence of cash payment in family work, and of unpaid or kind paid work for non-family members is small and not normally worth separate analysis. Were these categories larger, they would have to be examined in more detail. The nature of paid family work might for instance be such as to include elements of wage employment, whereas unpaid "wage" work might be akin to family work if it merely reflects reciprocal social obligations. On this see footnote 1 page 23 which comments on one result from the discriminant analysis below.

A second aspect of labour supply that can be taken into account is the time dimension. The WFS data permit us to separate out those who worked after marriage but have since ceased:

CMLFNF, worked after marriage outside family but not now.

The cessation of work after marriage was seen, in Table 3, to be associated with family size. It is therefore interesting to look at this as a separate aspect of behaviour, measuring change rather than the current outcome.

Another variable worth consideration, although not without ambiguities, is labour force experience prior to marriage. This is not ideal as a dependent variable, because it is chronologically prior to most of the variables available in the WFS to explain labour supply. Nor is it entirely satisfactory as an independent variable explaining current labour supply. Clearly, a positive correlation can be expected between past labour force experience and current labour force participation, if only because a degree of labour force commitment and an increased ability to obtain jobs are likely to arise out of successful prior labour supply. But the factors which lead to previous labour supply are not necessarily distinct from those leading to current labour supply. Thus the residuals of past labour supply will be correlated with the residuals of current labour supply, biasing the results if both variables are included in a model, and in any case making the separation of these two variables difficult. Despite these problems, it was considered worthwhile to introduce, experimentally, a variable measuring labour force participation before marriage:

YLFNF : dummy variable taking the value 1 if the woman worked outside the family before marriage.

In addition to including the time dimension in separate variables as above, it is possible to build it into categorical variables. The dependent variable of the discriminant analysis, PES, thus includes the following categories:

- currently self-employed
- currently cash wage worker
- currently kind or unpaid employee
- currently paid family worker
- currently unpaid family worker or family farm worker
- currently inactive or unemployed but worked at some time since marriage
- no work since marriage but worked before
- never worked

B. Demographic variables

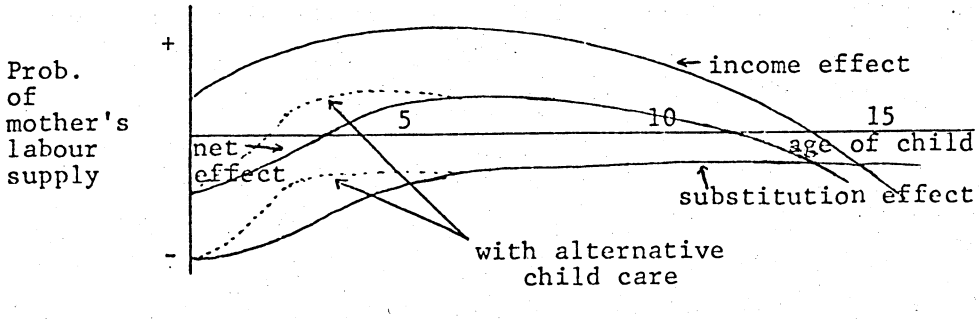
(i) Family structure

The presence of children can be regarded as affecting the labour supply of their mothers (and potentially also their fathers, but here we are concerned only with women) through conventional income and substitution effects (in addition to psychological and other effects which we cannot measure). The substitution effects arise from a shift in the relative costs of labour force activity or inactivity imposed by the presence of children. The opportunity cost of labour supply is clearly likely to be higher the younger the children; also certain types of work - particularly much urban wage work - are incompatible with child care, while other types of work can be combined with looking after children at the cost of some loss of productivity. The substitution effects are also likely to be modified by the presence of older children, or other family members, who can look after younger children.

The income effects, on the other hand, have a different pattern. The tendency for substitution effects to cause women to leave the labour force where children are present is partly offset because doing so would decrease income. There is also an income effect due to the direct costs of child-rearing, in terms of the child's own consumption, which is small for very young children but rises steadily with age. Under the usual assumptions of labour supply responses to wages and incomes the income effect of the presence of a young child will generate higher labour supply. As the child gets older, however, he or she is likely to undertake income-earning activities which may partly or wholly offset the income effect on the mother's labour force participation. These sets of hypotheses are reflected in Figure 1. The net effect is likely to be negative for young children, but at higher ages it may be positive or negative depending on the balance of income and substitution effects. In any case it is likely to be higher (more positive or less negative) at intermediate ages than for either younger or older children, and in general this latter effect will be greater the more the compatibility between child care and the particular type of work involved.

Figure 1

Effects of presence of children of different ages on mother's labour supply



Variables used to measure these various phenomena are:

C0002 : number of living children aged 0 to 2
C0204 : number of living children aged 2 to 4
C0409 : number of living children aged 4 to 9
C0914 : number of living children aged 9 to 14
C04F14 :) dummy variable taking the value 1 if
C04M14 :) there are living children aged 0 to 4 and girls (F) or boys (M) aged 4-14; this is used as a proxy for childcare.[1]

An additional related variable measures current pregnancy:

VPREG : 6 months or more pregnant (dummy).

(ii) Marital status

The following variables were used:

V109 : age at marriage
WIDOW : dummy, 1 if current marital status widow
DIVSEP : dummy, 1 if current marital status divorced or separated
UNION : dummy, 1 if in consensual union

The age at marriage can affect current labour force participation indirectly in so far as it is associated with labour force experience prior to marriage. The other three marital status variables have rather obvious effects. Where the husband is dead or absent, the women will in general have a greater need for labour force activity; women in consensual unions may also have a greater need for financial independence, although this is less certain.

(iii) Age

The independent effect of age can reflect various life cycle factors not captured in other variables, the accumulation of certain types of labour force experience, and normative patterns of age-related behaviour. An age variable therefore needs to be included:

V010 age of women (years)
WQUAGE age squared

The squared term allows for non-linearity.

It is of course possible that different age groups of the population have quite different labour supply behaviour. This is tested in Section 5 below by disaggregating the population into two groups by age.

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[1] Data on adults who could take over childcare were not available; nor were data on the actual activities of the children concerned.

(iv) Migration

Migration can be closely related to labour supply for many reasons. The decision to migrate may at the same time be a decision to supply labour to a different market. Migration may increase labour supply if it releases the pressure of normative behaviour in a traditional environment, if it is associated with increased income needs, if it constitutes a conscious response to differential economic opportunities. Alternatively, migration may be associated with lower labour supply if there is less access to the new labour market, or if migrants are discriminated against in terms of wages. And there will frequently be a change in the nature of work with migration - e.g., from self-employment to wage labour.

Unfortunately, in the WFS only data on lifetime migration between major types of location - rural, town, city - were collected. This is insufficient to capture many of the particular relationships referred to above. The variables available, and used, were:

WMIGRU : dummy variable, = 1 if the woman migrated from a rural to an urban area since the time she was growing up

WMIGUR : ditto, urban-rural

WMIGUU : ditto, from town to city or city to town

(v) Education

Education changes the benefits of labour force participation, by changing potential job opportunities and raising the expected wage; but schooling also changes labour force behaviour by reducing teenage labour force experience and by changing tastes and objectives. There are also many indirect effects through the impact of education on other aspects of behaviour.

Table 5 suggested that the relationship of education to labour supply was irregular and non-linear. Education level has therefore been introduced as a series of dummy variables.

EDW0 : no education

EDW1 : primary education (complete or incomplete)

EDW2 : secondary education (complete or incomplete)

EDW3 : post-secondary education (complete or incomplete)

EDW4 : university education (complete or incomplete)

EDW34 : EDW3 + EDW4 (where number of observations is small)

C. Husband's characteristics

The characteristics of the husband enter into the analysis in several ways. First, the earning capacity of the husband, if present, will have an income effect on labour supply of the wife. Second, the nature of the husband's occupation will affect the possibilities for labour market entry by the wife. Third, the type of family structure and the nature of the husband-wife

relationship will influence the wife's independent activities. There is not much information, in the WFS, on family structure. The absence of the husband is reflected in the marital status variables, above. No data are available on the insertion of the husband-wife relationship in a large kin and community network.

(i) Husband's demographic/educational characteristics

V802 : years of schooling of husband
S002 : age of husband

The education of the husband, besides having various unpredictable effects in terms of taste and status changes, may be regarded as a proxy for income (in the absence of the latter variable). The expected partial effect of husband's education on wife's labour force participation is therefore negative. The age of the husband may also proxy for income to some extent, but also reflects various life cycle and normative factors in much the same way as the age of the wife.

(ii) Husband's economic characteristics

HS1 : dummy, 1 if husband is/was self-employed without employees
HS2 : dummy, 1 if husband employer
HRAG : dummy, 1 if husband working in agriculture
HSKL : dummy, 1 if husband a skilled production worker
HUNSKL : = 1 if husband unskilled production worker
HHHS : = 1 if husband service worker
HPRC : = 1 if husband professional/clerical worker
HSALES : = 1 if husband sales worker
HN : = 1 if husband has never worked

Variables HS1 and HS2 can be expected to be associated with higher rates of self-employment and unpaid family work of wives, and lower rates of wage employment and inactivity. The excluded class for these variables consists essentially of wage workers, together with small numbers of non-workers and family workers. The variables refer to the last occupation of the last husband - thus current information on, say, unemployment or retirement is not available, although these are also likely to have significant impacts on female labour supply.

Variables HRAG through HN are indicators of husband's occupation. Access to agricultural employment is in general easier than access to other types of work, so that a general positive effect of HRAG can be expected. A similar comment could be made for HSALES, at least as far as self-employment is concerned. No obvious predictions can be made for the other variables, which combine income, substitution, job access and status effects.

D. Macro-variables

The structure of behaviour and of economic activity in a given region affects individual labour supply in many ways, most of them not amenable to analysis with the WFS data set. However, it is possible to construct variables which reflect to some extent these macro-structural patterns. Labour supply will, for instance, depend on labour market structure, and this can be partly measured by the distribution, across different occupations, of the women in the sample or their husbands.[1]

A number of different aspects of behaviour can be aggregated in this way for different sub-regions, thus giving an estimate of the average pattern of behaviour, or the population distribution of various socio-economic variables in each sub-region. It is then assumed that the individual's behaviour is affected by the patterns she observes in her sub-region of residence, and the data in the survey are used to provide an estimate, for each sub-region, of the patterns concerned. In order not to bias the results, macro-variables for each individual are computed excluding the value for that individual of the variable concerned - i.e., for variable V, in sub-region i, and observation k, the corresponding macro-variable MV is computed as

$$MV_j = \sum_{\substack{j \in i \\ j \neq k}} V_j/(N_i - 1)$$

where N_i is the number of observations in sub-region i.[2] If this procedure were not adopted there would be an in-built correlation between MV and V which would have to be allowed for in interpreting coefficient estimates. The sub-regions taken for purposes of these variables were the primary sampling units, of which there are 124.[3] One of these consists of metropolitan Lima, which was not broken down into sub-regions. Thus macro-variables were not defined for the Lima sub-sample analysed below.

The following macro-variables have been used in the analysis below:

TWN : % of women currently not working
TWF : % of women currently active in family work
TWW : % of women currently active in wage work
TWS : % of women currently self-employed
THX : % of husbands currently active in wage work
CWRAG : % of working women occupied in agriculture
CWPRW : % of working women occupied as manufacturing production workers

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[1] Data on adults who could take over childcare were not available; nor were data on the actual activities of the children concerned.

[2] V may be a continuous or a dummy variable, but not a categorical variable.

[3] See Appendix C for a discussion of the choice of regional level for defining macro-variables.

Variables TWN through TWS give the average work status of women, and thus reflect both the type of employment opportunities and normative behaviour. THX, measuring the incidence of wage employment among husbands, is intended to give additional information on the mode of production, while CWRAG and CWPRW measure the availability of particular important types of occupations. Preliminary analysis indicated that a more detailed breakdown of husband's work status or of women's occupations would not improve the explanatory power of the model tested below.[1]

It is also possible to develop other macro variables which would measure regional norms with respect to education and fertility. There is some reason to hypothesise that labour supply behaviour would respond not to the absolute levels of education and fertility, but to deviations from the local mean. However, such patterns did not show up in the data and the hypotheses remain unverified.

It might finally be commented that independently measured macro variables from community data sources, censuses, and so on would be desirable to improve this component of the analysis.

4. A Discriminant Analysis of Labour Force Participation

A convenient technique for analysing the distribution of a population across several categories is discriminant analysis, the main features of which are summarised in Appendix E. The dependent variable used was PES, which identifies eight activity categories presented in Section 3.A. However, of these categories, several occur rather rarely. For instance, the "family paid" group has only 19 observations in Lima, 13 in other urban and one in rural. In order to avoid cluttering the analysis with relatively uninteresting data about these rather infrequent categories, groups with less than 20 observations have been excluded, leaving the pattern in Table 6 to be explained by the discriminant analysis.

The majority of the variables discussed in Section 3 were entered into the analysis. Among the variables measuring head's occupation, HRAG, HSKL, HUNSKL and HPRC were all retained leaving HHHS, HSALES, and the small number of non-working heads (HN) as the omitted class. The measure of work before marriage, YLFNF, was omitted because its definition overlapped with that of the dependent variable. All the macro variables defined in Section 3 were retained except TWN, which is almost entirely determined by TWF, TWW, and TWS.

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[1] The use of variables TWN through TWS in functions where the equivalent micro-level labour supply measure is the dependent variable raises estimation problems, since the disturbance terms are not independent; in fact, in a linear model, for each observation the disturbance term becomes a linear combination of all disturbance terms, making OLS estimates inconsistent. Although appropriate maximum likelihood estimation techniques exist which avoid this problem (see L. Erbring and A.A. Young: "Individuals and social structure: contextual effects as endogenous feedback", Sociological Methods and Research, Vol. 7, No.4, May 1979) we did not have the corresponding computer programme available and therefore neglect this problem in the model estimation below.

Table 6
Distribution of observations by work status and region

	Number of cases		
	Lima	Other urban	Rural
Self-employed	253	550	259
Wage employed	185	294	78
Working for someone else - kind/unpaid	-	-	46
Unpaid family work/ family farm	-	226	870
Worked after marriage but not now	267	295	128
Worked only before marriage	362	444	290
Never worked	189	432	347
Total	1256	2241	2018

(a) Lima

Results for Lima are given in Table 7. If we use the group centroids to interpret the functions, it is fairly clear that function 1 separates wage employment from the rest, while function 2 distinguishes between self-employment (negative) and the two categories of no work since marriage (positive). Function 3 discriminates between "never worked" (negative) and "worked before marriage only" (positive), with the other categories grouped centrally. Function 4 separates out those who have ceased work since marriage.

Clear patterns can also be identified in the coefficients of the standardised discriminant functions. In function 1, the family structure fertility variables - C0002 to C04F14 and pregnancy, VPREG - all contribute positively to the discriminant function, and are therefore associated negatively with wage employment and positively with the absence of work since marriage. Although the coefficients are individually not large, the sum across these variables is .58. The marital status variables (WIDOW, DIVSEP, UNION), all have negative signs - all deviations from legal marriage are thus associated with higher wage employment. Higher levels of education (EDW3, EDW4 especially) are also associated with more wage employment. The remaining variables, mainly measuring husband's occupational characteristics, have weak effects, erratic in sign.

Function 2 gives age (V010), marital status (WIDOW, DIVSEP), a number of husband's characteristics and migration from another urban area (WMIGUU) as the most important variables. The family structure-fertility variables have little net effect, but age is strongly associated with self-employment, and

Table 7

Discriminant analysis results: Lima standardised discriminant function coefficients and group centroids

	Function 1**	Function 2**	Function 3**	Function 4*
% of variance	47.6	29.7	14.6	8.1
C0002	.19	.10	.17	-.05
C0204	.08	.05	-.13	.06
C0409	.05	-.13	.09	.22
C0914	.09	-.06	.03	-.11
C04F14	.01	-.06	-.03	-.13
VPREG	.16	.04	.04	.01
V010	-.09	-.54	-.12	-.64
V109	-.21	.20	.87	.21
WIDOW	-.07	-.25	-.07	.42
DIVSEP	-.50	-.34	-.02	.03
UNION	-.27	-.07	-.04	-.43
EDWO	-.08	-.05	-.00	-.29
EDW2	-.19	.12	-.51	.11
EDW3	-.65	.04	-.10	.08
EDW4	-.43	-.16	-.21	.03
V802	-.00	.15	-.10	-.08
S002	.14	.28	.01	.57
HS1	.10	-.31	.13	.16
HS2	-.07	-.23	-.01	.28
HRAG	-.09	.27	-.16	.02
HSKL	-.01	.22	-.03	-.30
HUNSKL	.02	.20	-.17	.34
HPRC	-.06	.23	-.20	-.27
WMIGRU	-.04	-.09	.03	-.22
WMIGUU	.06	-.40	-.25	-.17
Group centroids				
Self-employed	0.18	-0.62	0.01	0.16
Wage employed	-1.07	0.07	-0.01	0.06
Worked after marriage but not now	0.05	-0.12	0.00	-0.35
Worked before marriage only	0.24	0.33	0.27	0.08
Never worked	0.27	0.31	-0.52	0.07

Significance level: ** better than .1%
* better than 1%

with a larger number of women who have worked since marriage. The coefficient of age at marriage (V109) is positive. The latter two results can be explained by the observation that the cumulative likelihood of working since marriage is positively related to the duration of marriage. The widowed, divorced and separated seem more likely to be in self-employment. In function 1 these groups were also found more likely to be in wage employment, indicating that probability of inactivity among them is particularly low. Education appears relatively unimportant, but husband's characteristics have a considerable impact: husband's age (S002), and to a lesser extent education (V802) are both negatively associated with self-employment, and positively with non-work, and the same is true of the occupational indicators, while the reverse is true of husband's self-employment (HS1, HS2). These results suggest that access to self-employment through the husband's work pattern is important, and also suggest that there are income effects (husband's income presumably being positively associated with his age and education). An interesting additional relationship is that between migration from another urban area and self-employment. There is a tendency for migrants to move into - presumably marginal - self-employment in trade. Eighteen per cent of migrants fall in this category, as compared with nine per cent of natives.

Function 3 has few variables with large coefficients. The largest corresponds to V109, the age at marriage, which is associated with more women working before marriage - again this is fairly obvious, and associated with the duration of the relevant period. Intermediate levels of education (EDW2), and to a lesser extent higher education, are positively associated with the never worked category. Thus education appears to be associated with a dichotomisation of the population into the wage labour-never worker categories. Other variables have smaller and more erratic coefficients, though one might note that the incidence of husband's occupation (HRAG through HPRC), and also migration from urban areas (WMIGUU), appear to have an impact.

Finally, function 4, which broadly identifies those who have ceased work after marriage, has several variables with large coefficients, but the over-all significance of the function is fairly low. The largest impact comes from age - either own age (V01C) or husband's age (S002). Own age is positively associated with drop-out from the labour force, but the partial effect of husband's age is the reverse. Widowhood is associated with less drop-out, consensual union with more. In view of the low over-all significance it would seem risky to attempt to interpret this function further.

(b) Urban other than Lima

Five functions can be distinguished in urban areas (Table 8). The first clearly separates the wage employed (positive) and unpaid family workers (negative) from other groups, with an intermediate distinction between the self-employed and non-workers. Function 2 separates the wage employed and family workers on the one hand from the non-workers, especially the never-workers, on the other. Function 3 discriminates between the self-employed and those who have ceased work since marriage on the one hand, and unpaid family workers and

never-workers on the other, a distinction which appears analytically rather dubious. Function 4 seems to distinguish between those who ceased work after marriage and those who stopped at marriage, while function 5 separates those who worked only before marriage from those who never worked. The interpretation of functions 3 to 5 appears rather difficult. No function clearly separates out the self-employed.

In function 1, the demographic variables, including marital status, play a rather limited role. Intermediate and higher education levels (EDW2,3,4), however, are associated strongly with more wage employment and less unpaid family work. Self-employment of the husband (HS1,HS2) is associated with more unpaid family labour and less wage work, but the other husband-related variables have little effect. Among the macro-variables, the coefficient of the variables measuring the regional incidence of family labour (TWF) is large but coefficients of the other variables (including TWW, which measures the incidence of wage labour) are small.

Function 2 is somewhat more responsive to demographic variables. The presence of young children (C0002) is associated with non-work, while higher age (V010), higher age at marriage (V109), and absence of husband (WIDOW, DIVSEP) are all associated with more wage employment and family work. As before, however, the largest impact comes from education, with higher education levels strongly associated with work. Husband's self-employment has a weak positive effect as well, but again most of the husband's occupational variables have little effect. Among the macro variables, the incidence of agricultural work is positively associated with wage and family employment, and there is also an effect of the three macro variables measuring work status, TWF, TWW and TWS - all three are positive in the discriminant function.

Function 3 has generally positive, though rather weak, family structure effects - i.e., more children are associated with more self-employment, or the cessation of work after marriage, and less in the categories of family work and never worked. The effect of age is strong and positive, and that of the head being in agriculture strong and negative, and the macro work status variables also have fairly large coefficients. Function 4 gives a large weight, in the cessation of work after marriage, to the presence of young children, and also to age. In function 5, which separates those who never worked and the self-employed from those who worked at some time but not now, several variables have quite large coefficients. These include the presence of young children (negative), age at marriage (negative), education (positive with increasing education), and the work status macro variables (positive for self-employment, negative for the others).

(c) Rural

Seven categories of work can be identified in rural areas with a sufficient number of observations for analysis, but only four (out of a possible six) discriminant functions are significant. These are presented in Table 9. Function 1 basically separates out unpaid family work from all other categories, with never work, non-work since marriage and wage employment together at the

Table 8

Discriminant analysis results: Urban other than Lima
Standardised discriminant function coefficients
and group centroids

	Function 1**	Function 2**	Function 3**	Function 4**	Function 5*
% of variance	48.4	34.7	10.5	3.4	3.0
C0002	-.07	-.20	.04	.52	-.31
C0204	-.08	-.03	.18	.07	-.01
C0409	.03	.04	.19	-.05	-.15
C0914	-.07	-.00	.05	.21	.08
C04F14	.08	.09	-.12	-.21	.23
VPREG	-.11	-.03	.11	-.19	-.11
V010	-.05	.25	.52	.67	.02
V109	.09	.21	.04	-.52	-.55
WIDOW	.01	.12	.11	.11	-.03
DIVSEP	.19	.35	.23	.22	.14
UNION	.17	.10	.21	.38	-.12
EDW0	-.01	.08	-.13	.27	-.30
EDW2	.26	.01	-.18	.19	.14
EDW3	.66	.53	-.16	.07	.21
EDW4	.41	.28	-.05	.27	.16
V802	-.04	-.13	-.25	.32	-.04
S002	-.12	-.11	-.02	-.06	.06
HS1	-.32	.20	-.02	-.10	.24
HS2	-.21	.11	.23	-.14	-.01
HRAG	-.08	.12	-.61	-.03	-.11
HSKL	.05	-.12	-.09	-.22	-.13
HUNSKL	.03	-.05	.02	.06	-.37
HPRC	.04	-.00	-.08	-.18	-.12
WMIGRU	.01	-.01	.01	-.10	-.00
WMIGUU	.04	.01	.15	-.11	-.01
CWRAG	.08	.24	.13	-.22	.08
CWPRW	.07	-.09	-.07	.09	.09
THX	-.13	.12	-.22	.19	.05
TWF	-.50	.44	-.28	.26	-.28
TWW	.11	.20	.26	-.04	-.40
TWS	-.12	.23	.34	-.19	.25
Group centroids					
Self-employed	-0.35	0.06	0.38	-0.09	0.14
Wage employed	1.26	0.84	-0.07	-0.03	0.02
Family unpaid	-1.26	0.94	-0.43	0.06	-0.04
Worked after marriage but not now	0.09	-0.21	0.23	0.39	-0.11
Worked before marriage only	0.00	-0.32	-0.00	-0.17	-0.26
Never worked	0.15	-0.66	-0.38	0.01	0.16

opposite extreme. Function 2 clearly identifies wage labour, and function 3 self-employment, while function 4 separates out the unpaid or kind-paid category of non-family work. Thus the four functions clearly separate out the different categories of work. They are less good at discriminating between the different categories of non-work, although the never worked category is at the extreme of functions 1 and 2.[1]

Function 1 is rather simple. The factor which dominates participation in unpaid family work is the regional incidence of this type of work (TWF) - i.e., structural economic and social factors dominate the work status pattern. There is also some effect in the same direction of regional non-family labour force participation (TWW and TWS), no doubt associated with the relatively high positive scores for non-work on this function. The only other variables with sizeable discriminant function coefficients are HS1 and HRAG, indicating self-employment and agricultural work of the household head associated with unpaid family work.

Function 2 incorporates a broader range of factors associated with wage employment. Negative effects on wage employment are associated with the presence of young children, with an older husband, and with husband's self-employment. Positive effects on wage employment are associated with own age, education, and among macro-variables, the extent of agriculture, wage, and - somewhat surprisingly - self-employment.

Function 3 indicates that self-employment is associated with industry (CWPRW) more than with agriculture (CWRAG), and also with the regional incidence of wage and self-employment. Other variables are weaker. There is some relationship with age, and with separation from husband, and also with husband's occuption.

Finally, function 4 indicates that unpaid or kind-paid non-family work is associated positively with the incidence of agriculture, with the age of the women and of the head, and with the age at marriage, and negatively with recent migration, head's self-employment, and head's education. Family structure variables have mixed effects which are difficult to interpret, but which are perhaps associated with the relatively large negative value for the centroid of the group which ceased work after marriage.

Several patterns emerge clearly from the discriminant analysis. Firstly, different types of work evidently have quite different types of determinants, and the aggregation of all economic activities into a single category is likely to hide more than it reveals. Secondly, the pattern across regions differs considerably, both in terms of the pattern of group centroids, and in terms of the balance of discriminating variables. The largest component of the variance

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[1] With reference to the discussion, in Section 3, about appropriate breakdowns of the work status variable, the results here are of interest. Unpaid or kind-paid non-family work is seen to be distinct from both other types of non-family work, and from unpaid family work - falling closer to the former in function 1, to the latter in function 2, and being quite distinct in function 4.

Table 9

Discriminant analysis results: Rural standardised discriminant function coefficients and group centroids

	Function 1**	Function 2**	Function 3**	Function 4*
% of variance	56.1	22.0	11.4	6.7
C0002	-.03	-.17	.04	-.17
C0204	.01	.05	.00	.02
C0409	-.05	-.02	.05	.26
C0914	.04	.05	-.12	-.05
C04F14	.04	.08	-.12	-.29
VPREG	-.00	-.01	-.13	-.06
V010	-.13	.34	.26	.43
V109	.04	-.01	-.15	.31
WIDOW	-.00	.03	.09	.21
DIVSEP	-.08	.13	.25	.09
UNION	-.05	.14	-.09	-.21
EDW0	-.04	.03	.14	.04
EDW2	.02	.12	.02	.06
EDW3	.01	.63	-.10	.13
EDW4	.08	.17	-.07	.12
V802	-.04	-.09	.03	-.42
S002	-.03	-.42	-.05	.35
HS1	-.31	-.25	.08	-.36
HS2	-.17	-.21	.05	-.11
HRAG	-.31	.03	-.26	.10
HSKL	-.13	.05	.21	-.08
HUNSKL	-.08	.04	-.04	-.07
HPRC	-.11	.06	-.17	-.10
WMIGUR	.11	.07	.06	-.38
CWRAG	.10	.37	.16	.76
CWPRW	.11	-.05	.43	-.00
THX	-.12	.05	-.25	-.03
TWF	-1.08	.06	.07	-.53
TWW	-.21	.57	.22	-.12
TWS	-.23	.33	.54	.15
Group centroids				
Self-employed	0.23	-0.01	0.80	-0.01
Wage employed	0.56	2.07	-0.18	0.11
Non-family work unpaid or kind	0.20	0.03	0.02	1.04
Unpaid family work	-0.76	-0.04	-0.08	0.01
Worked after marriage but not now	0.17	0.18	0.10	-0.42
Worked before marriage only	0.65	-0.13	-0.22	-0.25
Never worked	0.84	-0.29	-0.15	0.17

involves the separation of wage employment in Lima, the distinction between wage employment and unpaid family work in other urban areas, and the separation of unpaid family labour in rural areas. However, in all regions a clear separation of wage labour is achieved in the first two functions. Self-employment seems more difficult to separate out. Discrimination between the different categories of non-work - never, before marriage only, and stopped after marriage - is less good than between the categories of work, though patterns, which vary from one region to another, can be identified. Third, the family size and structure variables are rather weak. The presence of very young children tends to have a larger coefficient than the other variables, usually associated with lower labour supply, but there is no other evidence of incompatibility between family size and any type of labour force participation. Fourth, the age, age at marriage and marital status variables have quite large effects. Widowhood, divorce, separation and (less uniformly) consensual union all appear to be positively associated with economic activities of all types. Fifth, the education variables also have a quite considerable impact, especially in Lima and other urban areas. Higher education is widely associated with wage labour, and may also be associated with non-work under some circumstances. Sixth, husband's characteristics have a wide impact, especially husband's self-employment. Seventh, migration has a mixed impact which appears to depend on the specifics of the migration process. Eighth, the macro variables have an impact which is often large, and sometimes dominant, with individual behaviour tending to align itself with the regional norm.

5. Estimating Labour Force Participation Models

Building on the broad indications available from the discriminant analysis, we can investigate the relationships in more detail by estimating labour force participation models. The discriminant analysis has indicated that there is a need to disaggregate economic activity. For purposes of this section, therefore, we analyse the following dependent variables:

LFA : dummy variable, 1 for any labour force activity, 0 otherwise
LFW : 1 for any wage labour activity, 0 otherwise
LFS : 1 for self-employment, 0 otherwise
CMLFNF : 1 if the woman ceased non-family work after marriage, 0 if the woman is still undertaking non-family work with the remaining cases (no work, worked before marriage only, family work only) excluded from the analysis of this variable.

The independent variables are similar to those of the discriminant analysis, except that (a) a non-linear term in age is introduced; (b) the age at marriage is dropped, since it was collinear with and probably proxying for pre-marital labour force experience and/or schooling. A variable more specifically measuring work experience was introduced instead (YLFNF); (c) only two indicators of husband's occupation were used, HRAG and HSALES.

The full results for LFA, LFW and LFS are given in Table 10. We shall discuss the results variable by variable.

(i) VPREG. Current pregnancy (six months or more) tends to have the expected negative effect on wage employment (significant in urban areas), but the effects on self-employment are mixed and less significant, leading to an insignificant relationship with LFA.

(ii) Age (V010, WQUAGE). The partial relationship of labour force participation of all types with age is generally significant and non-linear in urban areas, but weak in rural areas. Where significant, the maximum of the age function tends to fall in the age range 35-40.

(iii) Marital status (WIDOW, DIVSEP, UNION). In general, departures from current legal marriage are associated with higher work rates, and the effects are quite sizeable - widowhood, divorce or separation are associated with a rise in the over-all labour force participation rate of over 35 percentage points in Lima, 15 to 20 in other urban areas, and 10 to 15 in rural areas. In Lima the larger effect on wage employment comes from DIVSEP, the larger effect on self-employment from WIDOW. In other urban and rural areas, DIVSEP appears to have a larger impact than WIDOW (though the difference between the coefficients of DIVSEP and WIDOW is not significantly different from zero), concentrated on wage employment in urban and on self-employment in rural.

The over-all impact on LFA is significant in all regions for both DIVSEP and WIDOW. Consensual union has a strong positive impact only on urban wage employment - other coefficients are not significantly different from zero.

(iv) Migration. Since the definition of the migration variables is rather unsatisfactory, it is perhaps not surprising that their performance is poor. In addition, there is a good deal of collinearity with education and family size, and, in the rural case, with husband's occupation and the macro variables as well. In any case, migration from rural to urban areas is not significantly associated with any difference in labour supply pattern. In rural areas, migration from urban areas is associated with lower labour force activity over-all. The fact that this lower activity rate does not show up in wage or self-employment suggests that it is concentrated on unpaid family workers. Migration from other urban areas into Lima is significantly associated with higher self-employment. As noted in Section 4, this essentially reflects self-employment in retail trade, apparently a favoured sector for in-migrants.

(v) Family size and structure. On the whole, the pattern of coefficients of variables measuring the number of children does not encourage strong conclusions. The presence of children up to two years old has a consistent negative effect on the different types of labour supply, though significance is acceptable in all regions only for wage labour supply. Since the sums of the coefficients of LFW and LFS are close to the coefficients of LFA, it can be inferred that the effect of children aged two or less on unpaid family labour is negligible. Referring back to the model proposed in Section 3, we would expect the coefficient of C0002 to be negative, that of C0204 to be less so,

Table 10

OLS estimates of labour force participation functions
(standard errors in brackets)

Region	Lima			Other urban			Rural		
Dependent	LFA	LFW	LFS	LFA	LFW	LFS	LFA	LFW	LFS
VPREG	-.058	-.077^{+}	.013	.015	-.061*	.071^{+}	-.026	-.0005	-.036
	(.058)	(.041)	(.048)	(.042)	(.027)	(.038)	(.037)	(.015)	(.026)
V010	.049**	.032**	.020^{+}	.045**	.0070	.034**	.013	.0045	.012^{+}
	(.015)	(.010)	(.012)	(.010)	(.0066)	(.009)	(.010)	(.0041)	(.007)
WQUAGE[1]	-.066**	-.043**	-.024	-.056**	-.0067	-.046**	-.014	-.0039	-.016
	(.021)	(.015)	(.018)	(.015)	(.0100)	(.014)	(.015)	(.006)	(.011)
WIDOW	.376**	.055	.293**	.141*	.049	.038	.105^{+}	.026	.062
	(.095)	(.067)	(.079)	(.062)	(.040)	(.056)	(.059)	(.024)	(.042)
DIVSEP	.356**	.223**	.092*	.219**	.161**	.032	.155**	.015	.075^{*+}
	(.050)	(.036)	(.042)	(.034)	(.022)	(.031)	(.045)	(.018)	(.032)
UNION	.046	.085**	-.031	.020	.052**	-.0088	.020	.012	-.022
	(.037)	(.026)	(.031)	(.026)	(.016)	(.023)	(.023)	(.009)	(.017)
WMIGUR	-	-	-	-	-	-	-.056*	.0044	.013
							(.026)	(.010)	(.018)
WMIGRU	.0083	.0023	.0061	-.0040	.0037	.0005	-	-	-
	(.037)	(.026)	(.031)	(.024)	(.016)	(.022)			
WMIGUU	.060^{+}	-.022	.094**	.015	.011	.029	-	-	-
	(.031)	(.022)	(.026)	(.025)	(.016)	(.023)			
C04F14	-.0025	-.013	.006	.030	.042*	-.013	-.048^{+}	.013	-.025
	(.038)	(.027)	(.032)	(.029)	(.019)	(.026)	(.027)	(.011)	(.020)
C0002	-.044	-.039^{+}	-.006	-.084**	-.044**	-.027	-.021	-.024**	-.0022
	(.028)	(.020)	(.024)	(.020)	(.013)	(.018)	(.020)	(.008)	(.014)
C0204	-.033	-.020	-.006	-.002	-.028*	.027	-.0004	.0015	-.0063
	(.027)	(.019)	(.022)	(.020)	(.013)	(.018)	(.020)	(.008)	(.014)
C0409	.0026	-.016	.015	-.005	.0027	.0002	.018	-.0023	.0009
	(.016)	(.011)	(.014)	(.012)	(.008)	(.011)	(.012)	(.005)	(.009)
C0914	-.024	-.026^{*+}	.008	-.010	-.015^{+}	.0030	-.011	.0041	-.0093
	(.016)	(.011)	(.013)	(.012)	(.008)	(.011)	(.013)	(.005)	(.0094)
EDWO	.0007	.026	-.017	-.020	.012	-.066^{*+}	.035	.0031	.027^{+}
	(.051)	(.036)	(.043)	(.029)	(.018)	(.026)	(.022)	(.009)	(.016)
EDW2	.025	.063**	-.042	-.024	.090**	-.080**	.022	.042	-.030
	(.034)	(.024)	(.029)	(.029)	(.019)	(.027)	(.068)	(.027)	(.048)
EDW3	.430**	.573**	-.165*	.406**	.776**	-.294**	-	-	-
	(.090)	(.064)	(.075)	(.061)	(.039)	(.055)			
EDW4	.286**	.246**	-.0004	.165**	.410**	-.162**	-	-	-
	(.069)	(.049)	(.057)	(.059)	(.038)	(.053)			
EDW34	-	-	-	-	-	-	.353*	.751**	-.192
							(.169)	(.068)	(.121)

/continued...

[1] Coefficients and standard errors multiplied by 100.

** 1% 2-tail
*+ 1% 1-tail
* 5% 2-tail
+ 5% 1-tail or 10% 2-tail

Table 10 (continued)

Region	Lima			Other urban			Rural		
Dependent	LFA	LFW	LFS	LFA	LFW	LFS	LFA	LFW	LFS
V802	-.0076^{+} (.0045)	.0020 (.0032)	-.0068^{+} (.0038)	-.0071* (.0035)	-.0021 (.0022)	-.0071* (.0031)	-.0041 (.0047)	-.0035^{+} (.0019)	-.0015 (.0034)
S002	-.0021 (.0022)	-.0015 (.0015)	-.0005 (.0018)	-.0012 (.0016)	-.0025*$^{+}$ (.0010)	.0012 (.0015)	-.0011 (.0015)	-.0026** (.0006)	-.0006 (.0011)
HS1	.064^{+} (.035)	-.042^{+} (.025)	.091** (.030)	.093** (.026)	-.055** (.017)	.064** (.023)	.085** (.026)	-.039** (.011)	.015 (.019)
HS2	.177** (.050)	.024 (.036)	.107*$^{+}$ (.042)	.104** (.035)	-.061** (.022)	.121** (.031)	.086* (.039)	-.044** (.016)	.033 (.028)
HRAG	-.024 (.072)	.072 (.051)	-.127* (.060)	.062* (.027)	.030^{+} (.017)	-.075** (.024)	.017 (.031)	-.019 (.012)	-.083** (.022)
HSALES	.099*$^{+}$ (.039)	-.005 (.028)	.102** (.033)	.104** (.034)	.030 (.021)	.053^{+} (.030)	-.134*$^{+}$ (.056)	-.049* (.022)	.019 (.040)
TWN	-	-	-	-.483** (.079)	.058 (.045)	-.041 (.085)	-.886** (.096)	.019 (.025)	.050 (.054)
TWF	-	-	-	-.080 (.129)	-	-	.074 (.106)	-	-
TWS	-	-	-	-	-	.399** (.131)	-	-	.465** (.124)
TWW	-	-	-	-	.340** (.088)	-	-	.529** (.070)	-
CWRAG	-	-	-	.172*$^{+}$ (.071)	.073* (.033)	.032 (.060)	.0068 (.075)	.051^{+} (.027)	.058 (.063)
CWPRW	-	-	-	-.057 (.065)	.034 (.043)	-.051 (.064)	-.0019 (.077)	.011 (.032)	.236** (.058)
THX	-	-	-	.035 (.060)	-.015 (.039)	-.047 (.053)	.069 (.062)	-.016 (.026)	-.105*$^{+}$ (.045)
YLFNF	.043^{+} (.027)	.062** (.019)	-.005 (.023)	.083** (.020)	.083** (.013)	.037* (.018)	.020 (.024)	.060** (.010)	.083** (.017)
Constant	-.453	-.410	-.168	-.144	-.089	-.386	.605	.0027	-.159
N	1289	1289	1289	2268	2268	2268	2019	2019	2019
R^2	.123	.167	.098	.176	.270	.089	.226	.159	.090
$\bar{Y}$	0.365	0.144	0.196	0.487	0.133	0.247	0.599	0.037	0.119
Maximum of age function	37.1**	36.6**	41.6	39.8**	52.6	37.5**	47.9	58.0*	37.1
Joint F for education dummies	10.45**	25.95**	1.80	14.08**	107.2**	9.45**	2.25	40.6**	1.88
Joint F for husband's activities	7.61**	1.78	11.20**	11.51**	3.55**	8.60**	5.15**	6.79**	5.04**

that of C0409 to be less negative or positive, and that of C0914 to be less positive or more negative than that of C0409. The interaction term C04F14 would be expected to have a positive sign. However, only one function conforms significantly to this pattern, that for wage labour in urban areas other than Lima. In general the interaction term is variable in sign and insignificant. There is a slight tendency for the distribution of coefficients across C0002 to C0914 to follow the non-linear pattern expected - the coefficient of C0409 is more positive or less negative than those of C0204 and C0914 in 6 and 7 cases out of 9 respectively, and in Lima the expected pattern is observed for all the labour supply categories. However, with the exception of urban wage labour, differences between coefficients are uniformly insignificant. In so far as there is a pattern, it could be suggested that the presence of young children somewhat reduces wage labour supply; that there is a slight tendency for the presence of children of all ages (perhaps excepting age group 4 to 9) to be associated with lower wage labour supply in Lima and other urban areas; and that the presence of children has little effect on self-employment, and little effect in rural areas in general. These results all conform to a greater or lesser extent to expectations, but their weakness should be emphasised: family size is at most only a secondary determinant of female labour force activity, and for many types of labour force activity it is not a determinant at all. The contrast between these results and the bivariate pattern identified in Table 3 underlines the risks of attempting to interpret two- or three-way tabulations without controlling for the variety of other factors involved.

(vi) Education. The dummy variables measuring education are widely significant. The excluded class is EDW1, those having some primary education. On the whole, education levels higher than this are associated with higher over-all levels of economic activity, more wage employment, and less self-employment; those without schooling, however, have activity patterns which are generally not much different from those with primary schooling. In fact, in all cases except rural self-employment, the coefficients of EDW0 lie between those of EDW2 and zero (or exceed those of EDW2), suggesting a slight non-linearity. The highest coefficients are all associated with post-secondary schooling - there is a drop for the university level, EDW4. However there are not enough observations in the latter category for this result to be reliable.

(vii) Husband's age and education. Expectations for these variables, discussed in Section 3, were that their partial effects would be negative, since both are regarded as proxies for income. These expectations are confirmed: in both cases eight out of nine coefficients are negative, significant at five per cent or better in five cases for V802 (education) and in two cases for S002 (age). There are no statistically supported differences between the different regions and labour force categories.

(viii) Husband's work status and occupation. The four variables included in the model have a number of significant effects. Self-employment of the husband is positively associated with self-employment of the wife, especially where the husband has employees (HS2), and also with higher labour force activity over-all. There is a negative effect on wage labour supply in rural

areas and in urban areas other than Lima, comparable in magnitude to the positive effect on self-employment, but there is also a strong positive association with labour supply to unpaid family work, as can be inferred by the difference between the coefficients of LFA, LFW and LFS.

The occupational variables HRAG and HSALES are more ambiguous. Where the husband is in agriculture, the wife is less likely to be self-employed, whereas the opposite is true where the husband works in trade, in urban areas at least. A large positive effect of HRAG on unpaid family work in rural and urban (non-Lima) areas can also be inferred. Where the head is in trade, the wife's over-all labour force participation is significantly higher in urban areas, but significantly lower in rural areas.

It should be noted that HS1, HS2, HRAG and HSALES are interdependent. Thus where the head is self-employed in agriculture, the net effect is HS1 + HRAG, and the significance of the four variables should be assessed jointly (a joint F test is given at the bottom of the table, where it can be seen that significance levels are mostly high). Taking the joint effects into account, it can be seen that the effects of husband's occupation and work status can be large - for instance, where the head is self-employed in sales (HS1 + HSALES), over-all female activity rates are roughly 20 percentage points higher than in the excluded class in urban areas.

(ix) Macro variables. The structural factors embodied in the macro variables are strongly related to female labour supply. The average work status variables, TWN through TWW, all have the expected effects. TWN, the non-work rate, is negatively related to over-all labour force activity. Indeed, in rural areas the coefficient is not significantly different from unity, which would imply individual behaviour varying in direct relation to average behaviour. For wage and self-employment, the corresponding macro variables (average wage and self-employment rates) are significant and TWN is not. Labour supply responses are estimated to be of the order of one third (urban) to one half (rural) of the change in the macro variable. These results may be interpreted in two completely different ways: either they reflect a tendency for individuals to follow a normative, average pattern, or they merely reflect the effects of variables which have not been included in the function. It would be possible to test the latter hypothesis with a larger data set, including some of the variables missing from the present analysis.

The occupational structure macro variables, CWRAG and CWPRW, have only limited significance. Agricultural activities are associated with higher labour force activities, especially in urban areas, but this is presumably only measuring the extent to which the definition of "urban" includes areas which are structurally rural. The only significant relationship with CWPRW, which is basically a measure of the extent of manufacturing employment, concerns self-employment in rural areas, which is higher where CWPRW is higher, probably because of the possibilities for small-scale artisanal work.

The one other measure of economic structure is THX, which indicates the extent to which men are in wage employment, and is thus an additional indicator

of the mode of production. The variable is significantly (negatively) associated with rural self-employment, but otherwise does not add to the explanation provided by the corresponding female work status macro-variables, with which it is collinear.

(x) Premarital work experience (YLFNF). As is to be expected, premarital non-family work experience is positively associated with current wage labour work, and also, in other urban and especially rural areas, with higher self-employment levels. However, the over-all labour supply impact is smaller than the sum of LFW and LFS would suggest, because some of the increase in these merely reflects substitution from unpaid family work.

Labour force participation prior to marriage will affect or be associated with a number of other variables, including fertility, husband's occupational choice, marital status, etc. In the present model this causes multicollinearity, and ideally a fuller model which separates out these different effects should be specified.

The over-all explanatory power of the model is quite respectable. The R^2 for self-employment is fairly low (.09 to .10), but for the other groups it ranges between .12 and .27 - the latter figure is quite high for this type of analysis. The functions also conform quite well to other hypotheses developed in Section 3 above. The main exceptions concern the impacts of fertility and family size, and migration, which are quite weak. In the case of migration, this is probably because of the incomplete nature of the independent variable, but in the case of fertility this is unlikely to be true. A further test of the impact of fertility is made below, in a function which takes as dependent variable the cessation of work after marriage. Among the other demographic variables, age is widely significant. But it is not clear whether the function shifts, with unchanged coefficients, with age, or whether there are more fundamental changes in the relationships in the course of the life cycle. One easy way to test this is to disaggregate the sample by age, and this is done below.

Table 11 gives the results of these two further tests. The first takes CMLFNF, the cessation of non-family work since marriage, as dependent variable, using the same explanatory variables as in Table 10, with the exception that YLFNF, work experience prior to marriage, is omitted. There is little theoretical reason to expect an effect of YLFNF on CMLFNF, in contrast to the effect on LFA, LFW or LFS which is expected and found in Table 10. Tests with YLFNF in the CMLFNF functions confirmed that there was no statistically significant relationship.

With this exception, the relationship for cessation of work is similar in pattern (with the signs reversed) to that for labour supply. Pregnancy is not significant, and age again has a significant urban, but no rural impact. The marital status indicators are important in Lima, less so elsewhere. Divorce and separation have smaller effects than would be expected from the labour supply function. This result can lead to some interesting speculations. If divorced and separated women work more now, but this is not associated with

equivalently less cessation of work since marriage, this indicates a generally higher post marriage work rate of those currently divorced and separated. In this case, it may well be that the causation is for working women to be more likely to divorce or separate, rather than for divorcees to be more likely to work. To check on this we would need to know more about the temporal distribution of work since marriage.

The family structure variables, which we expected to have a greater impact on CMLFNF than on, say LFW, do not in fact do better over-all. Results in Lima are very weak; in urban areas they are somewhat stronger, with the expected pattern, especially for children less than two and aged 9 to 14, and larger coefficients than in the case of current labour force participation. In rural areas a stronger impact of children aged less than two emerges, but other variables are not clearly stronger than in the labour supply functions, while the interaction term C04F14 is highly significant but with the opposite sign to that expected. We cannot say more with these results than we could for labour supply - if family size and structure has an effect, it is evidently weak.

The effects of education on cessation of labour force activity are broadly similar in pattern and significance to those on current labour force participation (with the sign reversed, of course), but the coefficients of EDW3 and EDW4 tend to be smaller. On the whole, the pattern of impact of husband's characteristics is also similar, although husband's self-employment has a smaller effect. The macro variables have comparable effects in urban areas, but in rural there is a shift in impact away from regional work status to regional production structure.

On the whole then, the analysis of cessation of labour force activity adds few new elements. A breakdown by age, on the other hand, does cast a fresh light on some results discussed earlier. Functions are estimated separately, for LFA, for the age group 30 years or less, and over 30. In the former group the age variable itself becomes insignificant, whereas it retains its significance, non-linearity, and to a fairly good approximation, turning point in the 30+ age group, in urban areas at least. Pregnancy has no significant effect in either age group, and the effects of marital status are not greatly different. However, a tendency for early widowhood to have a greater (positive) impact on labour supply at younger ages can be discerned in urban areas, while the reverse appears to be the case in rural areas. The effect of migration is not significantly differentiated by age group, and the same is true of family structure - in both cases significance levels are too low for safe conclusions to be reached. The effects of education, on the other hand, do appear to be differentiated by age. Higher education levels have a more positive effect on labour supply in the older group, a result which could perhaps be traced to the fact that average education levels are higher among the less than 30 year olds, so that the labour market advantage conferred by higher education at the time of labour market entry will have been less among this group. The effect can be observed at all education levels, with the lower education level EDW0 showing some weak signs of the same relationship (in reverse, since EDW0 indicates education lower than the omitted class). The effects of husband's education are also

Table 11

Labour force participation functions: Cessation of labour force participation (CMLFNF) and age group disaggregations

Region	Lima			Other urban			Rural		
Dependent	CMLFNF	LFA≤30	LFA>30	CMLFNF	LFA≤30	LFA>30	CMLFNF	LFA≤30	LFA>30
VPREG	.015	-.077	-.009	-.009	-.0036	.083	.090	-.042	-.0002
	(.098)	(.064)	(.140)	(.056)	(.049)	(.084)	(.075)	(.046)	(.063)
V010	-.060**	.019	.099^{+}	-.034^{*+}	.039	.124**	.001	.027	.013
	(.021)	(.069)	(.053)	(.014)	(.048)	(.041)	(.018)	(.047)	(.042)
WQUAGE[1]	.089**	-.0068	-.128^{+}	.050^{*+}	-.056	-.159**	.0004	-.046	-.011
	(.031)	(.143)	(.067)	(.020)	(.101)	(.051)	(.026)	(.101)	(.052)
WIDOW	-.304**	.566	.372**	.020	.356*$^{+}$	.097	-.148^{+}	-.029	.126*
	(.115)	(.454)	(.100)	(.072)	(.154)	(.069)	(.089)	(.170)	(.064)
DIVSEP	-.153**	.347**	.355**	-.031	.197**	.246**	-.075	.152*	.158*$^{+}$
	(.059)	(.079)	(.067)	(.039)	(.049)	(.048)	(.061)	(.066)	(.062)
UNION	.028	.024	.070	.053	.032	.006	.059	.044	-.002
	(.051)	(.049)	(.058)	(.033)	(.034)	(.040)	(.042)	(.033)	(.034)
WMIGUR	-	-	-	-	-	-	.093*	-.081*	-.042
							(.044)	(.039)	(.035)
WMIGRU	.016	-.033	.047	-.009	-.020	.005	-	-	-
	(.053)	(.053)	(.052)	(.032)	(.036)	(.033)			
WMIGUU	-.016	.086^{+}	.046	-.015	.034	-.016	-	-	-
	(.044)	(.046)	(.043)	(.031)	(.035)	(.038)			
C04F14	.045	-.026	-.016	-.055	.015	.072	.127**	-.128**	.0009
	(.055)	(.053)	(.061)	(.036)	(.042)	(.044)	(.048)	(.045)	(.038)
C0002	.015	-.057^{+}	.007	.136**	-.066**	-.124**	.086*	-.014	-.028
	(.042)	(.034)	(.053)	(.027)	(.025)	(.036)	(.037)	(.029)	(.030)
C0204	.012	-.033	-.019	.030	.028	-.039	-.051	.018	-.016
	(.040)	(.033)	(.047)	(.027)	(.027)	(.033)	(.036)	(.029)	(.030)
C0409	-.015	.018	.002	.002	.013	-.003	-.041^{+}	.036	(.015)
	(.023)	(.028)	(.021)	(.015)	(.020)	(.016)	(.022)	(.023)	(.015)
C0914	.038^{+}	-.034	-.024	.041**	-.007	-.018	-.029	.014	-.018
	(.022)	(.043)	(.019)	(.015)	(.029)	(.015)	(.024)	(.033)	(.015)
EDW0	.054	.037	-.038	.063^{+}	-.030	-.017	-.035	.095**	.004
	(.067)	(.094)	(.063)	(.036)	(.051)	(.036)	(.040)	(.035)	(.030)
EDW2	-.022	-.043	.089^{+}	.031	-.054	.033	-.030	.012	.110
	(.049)	(.049)	(.049)	(.038)	(.037)	(.049)	(.096)	(.085)	(.119)
EDW3	-.253^{*+}	.304*	.509**	-.170**	.357**	.474**	-	-	-
	(.107)	(.136)	(.123)	(.062)	(.097)	(.080)			
EDW4	-.141	.071	.476**	-.019	.084	.317**	-	-	-
	(.090)	(.099)	(.098)	(.066)	(.077)	(.093)			
EDW34	-	-	-	-	-	-	-.283^{+}	.307	.403^{+}
							(.160)	(.281)	(.214)
V802	.0023	.0058	-.017**	.0048	-.0037	-.0118^{*+}	.0139^{+}	-.0001	-.0072
	(.0063)	(.0073)	(.006)	(.0043)	(.0050)	(.0049)	(.0075)	(.007)	(.0066)
S002	-.0032	-.0028	-.0015	.0019	-.0030	-.0007	.0019	.0006	-.0017
	(.0030)	(.0035)	(.0028)	(.0021)	(.0027)	(.0021)	(.0026)	(.0028)	(.0018)
HS1	-.029	.048	.067	-.047	.034	.126**	-.005	.068^{+}	.109**
	(.048)	(.053)	(.049)	(.033)	(.039)	(.035)	(.041)	(.040)	(.036)

/continued...

[1] Coefficients and standard errors multiplied by 100.

Table 11 (continued)

Region	Lima			Other urban			Rural		
Dependent	CMLFNF	LFA≤30	LFA>30	CMLFNF	LFA≤30	LFA>30	CMLFNF	LFA≤30	LFA>30
HS2	-.149*	.188*+	.151*	-.062	.096+	.111*+	-.024	.027	.136*+
	(.066)	(.073)	(.070)	(.042)	(.055)	(.046)	(.064)	(.060)	(.053)
HRAG	-.068	-.052	-.008	-.077*	.086*	.045	.025	.003	.015
	(.109)	(.106)	(.102)	(.035)	(.041)	(.036)	(.043)	(.047)	(.041)
HSALES	-.120*	.082	.117*	-.081*	.148**	.062	.078	-.219**	-.066
	(.053)	(.056)	(.056)	(.041)	(.047)	(.048)	(.086)	(.081)	(.078)
TWN	-	-	-	.358**	-.328**	-.625**	.037	-.715**	-.921**
				(.102)	(.111)	(.115)	(.145)	(.146)	(.130)
TWF	-	-	-	.295+	-.012	-.149	-.022	.277+	.009
				(.176)	(.189)	(.180)	(.184)	(.162)	(.143)
CWRAG	-	-	-	-.166+	.183+	.148	-.232*	-.070	.034
				(.092)	(.102)	(.100)	(.117)	(.115)	(.101)
CWPRW	-	-	-	.002	-.081	-.035	-.321*+	.054	-.059
				(.088)	(.099)	(.087)	(.126)	(.118)	(.104)
THX	-	-	-	.063	-.006	.054	.131	-.088	.190*+
				(.081)	(.089)	(.082)	(.109)	(.099)	(.081)
YLFNF	-	.036	.041	-	.094**	.074**	-	-.013	.064+
		(.041)	(.038)		(.029)	(.028)		(.036)	(.033)
Constant	1.482	-.110	-1.44	.389	-.072	-1.53	.116	.363	.591
N	703	579	710	1118	1111	1157	452	875	1144
R^2	.076	.131	.129	.090	.137	.170	.151	.247	.224
$\bar{Y}$	.368	.323	.400	.228	.382	.580	.166	.550	.634
Maximum and joint significance of age function/1	33.8**	139.7	38.7	33.6	34.6	38.9**	170.4	29.0	59.7
Joint F for education dummies	2.09	2.62*	9.81**	3.39**	5.11**	10.49**	1.21	2.62*	1.43
Joint F for husband's activities	3.57**	3.44**	3.65**	3.87**	4.95**	6.54**	.25	2.81*	3.53**

[1] In the case of CMLFNF, minimum.

differentiated - more education of the husband is associated with less labour force participation among the older group, but not among the younger. Again, this might reflect the relative education of the husband - i.e., relative to his age group. Among the other variables measuring husband's characteristics, there seems to be some tendency for the self-employment of the husband to have a greater impact on labour supply among older women, and for husband's work in sales to be more important for younger women in rural and urban areas other than Lima.

Among the macro variables, the most interesting result is the significantly larger impact of TWN for older women - other things equal, older women are more likely to conform with the regional norm for labour supply. Significant patterns are difficult to discern among the other macro variables, but there are indications of a more positive effect of THX among older women, in rural areas at least. Finally, the relationship of current labour supply with pre-marriage work experience does not appear to differ by age in urban areas, but is significant only for older women in rural areas.

6. Conclusion

Most of the results of this analysis are fairly straightforward, and support standard hypotheses about the determinants of labour force participation. Three major empirical conclusions stand out: (i) the determinants of different types of employment - principally wage, self, or family employment - are distinct; (ii) fertility and family structure variables have relatively weak effects; (iii) structural and community factors have important influences on behaviour. Methodologically, an important conclusion is the validity and usefulness of discriminant analysis in reaching the first of these results, as well as the significance of macro or contextual variables in reaching the third. But we must ask several other questions. Firstly, do these functions help us to understand the labour force participation of women - i.e., can we validly regard the associations as causal, and do they encompass the main causes? Secondly, what are the main shortcomings of the models and of the data base? Thirdly, can the techniques used here be legitimately extended to international comparisons in order to use more fully the World Fertility Survey data base?

With respect to the first question, the issues are much more complex than it might at first appear. If the objective is to predict labour force participation as values of the independent variables change over time, then it is necessary to make the brave assumption that cross-sectional relations will be reflected in temporal differences. This will be true in general only if the societal and historical factors determining particular patterns of social organisation are adequately taken into account - and while the macro-variables are a step in this direction, they have rather obvious limits. The basic point is that while micro-models may give reasonably accurate predictions about marginal responses to external stimuli, patterns of behaviour must also be analysed in the context of social change. Thus the impact of the marital status variables depends on the evolution of societal perceptions of the family

and on the economic rights and obligations which it involves; the impact of pregnancy depends on maternal leave and other social security provisions; the impact of husband's work pattern on that of the wife depends on the nature of the job access (or lack thereof) that this provides, on income effects, on status effects, and so on, all of which are modified over time. By abstracting from all these detailed relationships the model necessarily weakens its ability to interpret marginal changes and to predict non-marginal ones. Thus, results should be used with extreme care - only when the same conclusion is reached using several different techniques and several different data sources should one treat it with a degree of confidence. In the meantime, results such as those in this paper can be regarded as indicative of causality, especially if they strongly support a priori reasoning, but only provisionally so pending support from other sources.

Deficiencies in the analysis, some inherent in the model itself, some a result of data constraints, impose further grounds for caution. First, the functions which are estimated are neither labour supply nor labour demand functions, but an uneasy mixture of the two. Labour demand information, and data on labour market conditions (wages, unemployment, etc.) are lacking, so an ideal model cannot be estimated. The linear combination of supply and demand factors of which the model consists is a second-best solution which necessarily implies specification error. Secondly, the community and macro-level variables are specified very crudely. This subject is given more attention in Appendix C. Thirdly, the employment of women cannot be divorced from the domestic, familial and community divisions of labour in which they participate. These issues would imply a need to analyse female labour force participation alongside the work rates of men and children, as well as a need to investigate in much greater detail the nature of different types of work. Fourthly, certain other key variables are missing. For instance, an adequate chronology of women's work in relation to birth history is not available; questions on the nature of work are incompletely specified; migration data are too limited to be of great value; questions on the presence or absence of family members in the household are missing; and so on. Some of these gaps can be filled by a more complete utilisation of the data collected in Peru, but this would reduce comparability with other countries.

These various problems and desiderata raise evident questions about the strategy for international cross-cultural analysis. Since the primary objective of this paper is to contribute to such an analysis it is worth dwelling briefly on this issue. Clearly, if each country analysis abstracts from the dynamic of its social context this imposes a major constraint on cross-cultural analysis. Only the macro-variables offer a glimmer of hope - but more work needs to be done on their definition and estimation. It would be desirable to explore other sources of community variables in order to strengthen this aspect of the analysis. In one sense, though, the international comparisons may help to resolve this problem. In so far as countries follow similar paths of economic and social development, comparisons between them can give indications of the likely temporal pattern within individual countries. This is something

which should if possible be tested through combined analyses of national cross-section, national time series, and international cross-section.

A second point of some importance concerns the specification error caused by the omission of key variables. For international comparisons using the World Fertility Survey, standardised data will be available only for the variables used in the discriminant and regression analyses above. It would therefore be desirable to extend specific national analyses where additional data are available to encompass other important variables, in order to assess the impact of this specification error on the value of analysis using the limited World Fertility Survey data file.

The various problems outlined above indicate that international comparative analysis of women's work using the WFS will inevitably be partial and restricted in its conclusions. A much more detailed data base is ideally required - and indeed one is presently being compiled for particular countries in another ILO project.[1] But having recognised these constraints, scope for useful comparative analysis remains. In this, the main advantage of the WFS is the large number and wide economic and social range of countries covered. In so far as some meaning can be assigned to analysis of work patterns using the limited, standardised data set - and our net conclusion must be that the results are meaningful if interpreted with proper caution - then comparative analysis using these data will add a new and previously unexplored dimension to analysis of the determinants of female labour force participation.

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[1] See R. Anker: Research on Women's Roles and Demographic Change: Survey Questionnaires for Households, Women, Men and Communities with Background Explanations (Geneva, ILO, 1980); C. Oppong: Seven Roles and the Status of Women (Geneva, ILO, forthcoming).

Appendix A
Logit Functions

OLS estimates of labour supply functions suffer from various statistical imperfections. In particular, values for the dependent variable may lie outside the range (0,1), and heteroscedascity is present by virtue of the discrete nature of the observations. Logit functions, in which the dependent variable is transformed to the form $\log \frac{1-Y}{Y}$, do not have these disadvantages. Table A.1 gives logit estimates corresponding to Table 10 in the text. It can be seen that the results are very similar to those of Table 10, in that the signs and significance of the coefficients are much the same. Coefficients change in absolute size, of course, because of the transformation of the dependent variable. The OLS coefficients have greater intuitive appeal, and OLS is easier to apply, so the similar results using the two methods suggest that the case for using the theoretically superior logit form is weak.

Table A.1

Logit functions for female labour force participation

Region	Lima			Other urban			Rural		
Dependent	LFA	LFW	LFS	LFA	LFW	LFS	LFA	LFW	LFS
VPREG	-.286 (.294)	-1.175*+ (.483)	.099 (.335)	-.062 (.197)	-.878** (.332)	.306 (.215)	-.094 (.188)	.018 (.477)	-.465+ (.283)
V010	.254** (.074)	.305** (.106)	.179* (.088)	.220** (.047)	.072 (.076)	.206** (.054)	.066 (.050)	.105 (.135)	.150* (.071)
WQUAGE[1]	-.342** (.107)	-.417** (.152)	.221+ (.001)	-.286** (.068)	-.081 (.110)	-.277** (.078)	-.067 (.073)	-.053 (.198)	-.196+ (.104)
WIDOW	1.687** (.474)	.419 (.577)	1.416** (.467)	.514+ (.293)	.364 (.426)	.184 (.294)	.618+ (.322)	1.022 (.682)	.627+ (.356)
DIVSEP	1.637** (.249)	1.528** (.255)	.575* (.254)	.963** (.161)	1.443** (.194)	.223 (.168)	.933** (.240)	.914* (.452)	.442+ (.249)
UNION	.222 (.174)	.846** (.236)	-.191 (.208)	.134 (.119)	.622** (.180)	-.026 (.133)	.038 (.118)	.256 (.300)	-.145 (.168)
WMIGUR	-	-	-	-	-	-	-.275* (.130)	.102 (.308)	.178 (.177)
WMIGRU	.046 (.178)	.022 (.243)	.086 (.208)	.014 (.113)	-.013 (.177)	.047 (.124)	-	-	-
WMIGUU	.293* (.149)	-.243 (.211)	.612** (.169)	.070 (.120)	.085 (.174)	.168 (.132)	-	-	-
C04F14	-.006 (.180)	-.084 (.255)	.050 (.210)	.190 (.133)	.439* (.207)	-.034 (.145)	-.287* (.140)	.802* (.386)	-.342+ (.192)
C0002	-.215 (.137)	-.392* (.191)	-.049 (.164)	-.388** (.097)	-.566** (.151)	-.096 (.110)	-.082 (.104)	-.858** (.277)	-.061 (.143)
C0204	-.155 (.130)	-.237 (.182)	-.034 (.153)	-.029 (.095)	-.415** (.152)	.189+ (.105)	-.021 (.104)	.004 (.264)	-.080 (.146)
C0409	.006 (.077)	-.177 (.109)	.107 (.086)	-.015 (.057)	.054 (.088)	-.002 (.062)	.106+ (.064)	-.198 (.179)	.030 (.086)
C0914	-.116 (.076)	-.293** (.112)	-.022 (.084)	-.042 (.058)	-.131 (.091)	.038 (.062)	-.063 (.067)	.114 (.116)	-.087 (.093)
EDW0	.007 (.241)	.204 (.357)	-.129 (.261)	-.075 (.134)	.155 (.214)	-.269+ (.144)	.179 (.114)	.218 (.306)	.247 (.156)
EDW2	.116 (.164)	.632** (.224)	-.296 (.191)	-.228+ (.137)	.845** (.195)	-.466** (.156)	.067 (.338)	.919 (.593)	-.431 (.491)
EDW3	2.040** (.453)	1.424+ (.757)	-2.013** (.726)	2.004** (.319)	-4.087** (.995)	-2.435** (.423)	-	-	-
EDW4	1.323** (.323)	1.665** (.365)	.010 (.400)	.608* (.275)	2.474** (.338)	-1.149** (.362)	-	-	-
EDW34[2]	-	-	-	-	-	-	1.931+ (1.055)	5.025** (129.1)	-2.687 (1.835)
V802	-.037+ (.022)	.014 (.029)	-.047+ (.026)	-.027 (.016)	-.006 (.024)	-.039* (.018)	-.039 (.024)	-.110+ (.059)	-.017 (.033)
S002	-.010 (.010)	-.015 (.014)	-0.003 (.012)	-.003 (.008)	-.021+ (.012)	.011 (.008)	-.008 (.008)	-.099** (.021)	-.016 (.011)

[1] Coefficients and standard errors multiplied by 100.

[2] Only seven observations fell in this category in rural areas: results are therefore unreliable.

Table A.1 (continued)

Region	Lima			Other urban			Rural		
Dependent	LFA	LFW	LFS	LFA	LFW	LFS	LFA	LFW	LFS
HS1	.302^{+} (.167)	-.516* (.247)	.539** (.182)	.396** (.120)	-.634** (.191)	.278* (.130)	.441** (.133)	-.884** (.316)	.132 (.185)
HS2	.837** (.233)	.180 (.306)	.706** (.254)	.481** (.163)	-.686** (.262)	.695** (.169)	.529** (.197)	-1.020^{+} (.574)	.290 (.262)
HRAG	-.122 (.354)	.702 (.454)	-.858^{+} (.439)	.266* (.124)	.237 (.195)	-.355** (.137)	.044 (.156)	-.491 (.314)	-.826** (.197)
HSALES	.470** (.182)	-.072 (.263)	.606** (.196)	.466** (.156)	.326 (.231)	.319* (.162)	-.654* (.288)	-1.710^{+} (.902)	-.076 (.347)
TWN	-	-	-	-2.133** (.377)	.932^{+} (.505)	-.373 (.495)	-4.205** (.496)	.068 (.819)	.495 (.578)
TWF	-	-	-	-.451 (.621)	-	-	.254 (.554)	-	-
TWS	-	-	-	-	-	2.031** (.745)	-	-	3.311** (1.219)
TWW	-	-	-	-	3.431** (.895)	-	-	8.035** (1.600)	-
CWRAG	-	-	-	.845*$^{+}$ (.337)	.732* (.352)	.066 (.353)	.181 (.374)	.404 (.670)	.257 (.703)
CWPRW	-	-	-	-.353 (.307)	.049 (.520)	-.298 (.366)	-.110 (.391)	-1.073 (1.091)	1.790** (.540)
THX	-	-	-	.030 (.286)	-.171 (.446)	-.390 (.310)	.399 (.316)	-.160 (.814)	-1.295** (.462)
YLFNF	.220^{+} (.131)	.623** (.187)	-.026 (.151)	.440** (.093)	.909** (.142)	.320** (.102)	.134 (.123)	1.505** (.266)	.710** (.155)
Constant	-4.842** (1.195)	-7.128** (1.715)	-4.833** (1.452)	-3.258** (.814)	-4.613** (1.243)	-5.094** (1.007)	.516 (.893)	-2.996 (2.242)	-4.480** (1.357)
N	1289	1289	1289	2268	2268	2268	2019	2019	2019
R^2	.1181	.1144	.0881	.1638	.1511	.0891	.2061	.0817	.0652

Appendix B
Variable Names, Means and Standard Deviations

C0002	:	number of living children aged 0-2
C0204	:	number of living children aged 2-4
C0409	:	number of living children aged 4-9
C04F14	:	1 if the woman has living children aged 0 to 4 and girls aged 4-14
C0914	:	number of living children aged 9-14
CMLFNF	:	1 if the woman worked after marriage outside the family but not now; 0 if the woman works now outside the family; -1 other possibilities
CWPRW	:	% of women production workers among active women in the PSU
CWRAG	:	% of women active in agriculture among active women in the PSU
DIVSEP	:	1 if the woman is divorced or separated
EDW0	:	1 if woman has no schooling
EDW1	:	1 if woman has primary education (completed or not)
EDW2	:	1 if woman has secondary education (completed or not)
EDW3	:	1 if woman has post-secondary education (completed or not)
EDW4	:	1 if woman has university education (completed or not)
EDW34	:	1 if woman has post-secondary or university education (completed or not)
HHHS	:	1 if husband's occupation is or was household or service worker
HPRC	:	1 if husband's occupation is or was professional or clerical worker
HRAG	:	1 if husband is or was working in agriculture
HS1	:	1 if husband is or was self-employed without employees
HS2	:	1 if husband is or was self-employed with employees
HSALES	:	1 if husband's occupation is or was sales
HSKL	:	1 if husband's occupation is or was skilled production worker
HUNSKL	:	1 if husband's occupation is or was unskilled production worker
LFA	:	1 if the woman is currently working
LFS	:	1 if the woman is currently self-employed
LFW	:	1 if the woman is currently a wage worker
S002	:	age of husband
THX	:	% of husbands active in wage work among husbands in the PSU
TWF	:	% of women currently active in family work among all women in the PSU
TWN	:	% of women currently not working among all women in the primary sampling unit (PSU)
TWS	:	% of women currently self-employed among all women in the PSU
TWW	:	% of women currently active in wage work among all women in the PSU
UNION	:	1 if the woman is in consensual union
VPREG	:	very pregnant: 1 if woman is pregnant six months or more
V010	:	age of the woman
V109	:	age at first marriage
V802	:	years of schooling of husband

WIDOW : 1 if the woman is a widow
WMIGRU : 1 if woman migrated from rural to urban area since her childhood
WMIGUR : 1 if woman migrated from urban to rural area since her childhood
WMIGUU : 1 if woman migrated from town to city or city to town
WQUAGE : age of the woman squared
YLFNF : 1 if woman worked outside the family before marriage

Table B.1
Variable means and standard deviations

	Lima		Other urban		Rural	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
C0002	.38	.55	.45	.57	.50	.56
C0204	.38	.56	.41	.54	.43	.55
C0409	.85	.95	.94	.98	1.05	.97
C04F14	.24	.43	.31	.46	.38	.49
C0914	.70	.96	.79	.96	.80	.92
CMLFNF	.37	.48	.23	.42	.17	.37
CWPRW	.18	-	.17	.16	.18	.18
CWRAG	.02	-	.27	.28	.60	.25
DIVSEP	.07	.26	.10	.30	.06	.23
EDW0	.08	.27	.18	.39	.49	.50
EDW1	.46	.50	.53	.50	.48	.50
EDW2	.38	.49	.22	.41	.03	.16
EDW3	.02	.15	.03	.18	.002	.05
EDW4	.05	.22	.04	.19	.001	.04
EDW34	.07	.26	.07	.26	.004	.06
HHHS	.09	.29	.07	.25	.01	.10
HPRC	.29	.46	.20	.40	.03	.17
HRAG	.03	.18	.24	.43	.80	.40
HS1	.20	.40	.29	.45	.61	.49
HS2	.07	.26	.10	.30	.09	.29
HSALES	.14	.35	.12	.32	.04	.20
HSKL	.34	.47	.22	.42	.07	.25
HUNSKL	.10	.30	.14	.35	.04	.20
LFA	.37	.48	.49	.50	.60	.49
LFS	.20	.40	.25	.43	.12	.32
LFW	.14	.35	.13	.34	.04	.19
S002	38	10	37	10	38	11
THX	.72	-	.54	.22	.29	.22
TWF	.02	-	.15	.19	.36	.26
TWN	.63	-	.51	.19	.40	.22
TWS	.20	-	.21	.11	.15	.10
TWW	.15	-	.12	.09	.05	.07
UNION	.16	.37	.21	.41	.26	.44
VPREG	.06	.23	.06	.24	.08	.28
V010	33	8	32	9	33	9
V109	20	4	19	4	19	4
V802	8	4	6.3	4.1	2.9	2.6

/continued...

Table B.1 (continued)

	Lima		Other urban		Rural	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
WIDOW	.02	.14	.03	.16	.03	.17
WMIGRU	.19	.39	.27	.45	-	-
WMIGUR	-	-	-	-	.21	.41
WMIGUU	.31	.46	.23	.42	-	-
WQUAGE	1143	572	1123	591	1199	613
YLFNF	.66	.48	.47	.50	.24	.43
N	1289	-	2268	-	2019	-
N*	703	-	1118	-	452	-

* for CMLFNF = 1 or 0

Appendix C
The Definition of Macro-variables

An important issue in the use of "macro" or "contextual" variables is the interpretation to give to their apparent effects. Our assumption is that they effectively measure demand side variables or job opportunities, together with some aspects of normative behaviour or social tendencies towards which individuals will gravitate. If this interpretation is to be viable, then the groups over which the macro variables are measured must correspond in some way either to local labour markets (for labour demand) or to community patterns of behaviour which might be taken as a reference. In the survey we have no clear guide as to how to define clusters of individuals which would correspond to these groups. However, it is arguable that fairly small localities - villages, towns - would be most appropriate because these would define job availability without migration, while fairly small neighbourhoods would tend to define norms of behaviour. In the survey, the ultimate areal unit for sampling and the primary sampling unit or stratum are alternative candidates for local level measurement. The ultimate areal unit consisted of groups of 25 to 100 households, which appears to be small for the definition of group norms, and especially for the specification of labour market variables. In addition, in over a quarter of such units there were five or less observations sampled from the households in the unit, giving a very limited data base for the calculation of macro-phenomena. The stratum is much larger. Average over-all population size, is 110,000, although this varies considerably from locality to locality. In rural areas at least this might be considered too large. But taking into account the sample size in each stratum (less than 10 in 15 per cent of the 124 cases) the stratum seems a reasonable compromise for the calculation of macro variables.

The argument has been put by various colleagues that even at the level of the stratum, there are too few observations for acceptable estimation of macro variables. Some experiments have therefore been carried out at two higher levels of aggregation: (i) regrouping strata on the basis of region, degree of urbanisation and language of interview to achieve (as far as possible) a minimum of 20 observations in each group. This procedure brought down the number of strata from 124 to 102. (ii) Using much larger areal units based on geographical and natural region and city size. This gave 10 observations for each macro variable in rural areas and 15 in urban.

The outcomes of these experiments are reported in outline only; details are available from the author. In general, procedure (i) tended to raise standard errors of macro variables, leave their coefficients unchanged or somewhat reduced, and thus to lower significance levels. These results are consistent with the view that only statistical noise is added. There is no support for the procedure of regrouping.

Procedure (ii) also tended to generally lower significance levels, in that F values and R^2s were reduced. Effects on the significance of individual variables were erratic - sometimes the pattern found using the stratum was reproduced, sometimes all variables became insignificant, sometimes there was a shift in significance from one variable to another. There was no obvious pattern in these changes, which would be consistent with the problems of multi-collinearity and of large standard errors which plague statistical analyses with few observations.

In short, these results do not give any grounds to question the selection of the stratum as the basis for calculation of macro-variables. However, it should be stressed that macro-phenomena should in principle be identified and measured separately over areas which correspond to their theoretical properties. The method used here is no more than a first approximation in the absence of better information.

Appendix D
Other Formulations

The results reported in the bulk of this paper reflect experiments with a number of alternative model specifications. Some of these are referred to above, some not. Here we briefly note the formulations tried and dropped in the course of the empirical analysis.

(i) Region. In addition to the urban/rural/Lima breakdown, experiments with two other regional breakdowns were undertaken: natural region (coast, mountain, jungle); and geographic region (North, South, Centre, etc.). Neither of these gave consistently significant results, nor could the outcomes be usefully interpreted.

(ii) Family structure and fertility. A more disaggregated structure, separating male and female children, and also children aged 0-1 and 1-2, added nothing to the function; a variable measuring children aged 14-49 did not give coherent results, probably because no information was available on whether or not they were present in the household. A measure of breastfeeding was dropped because it was (obviously) highly correlated with the presence of young children. A macro variable measuring regional fertility, and a variable which measured deviations from regional fertility, standardised for age, did not prove at all significant.

(iii) Other demographic variables. Husband's migration was too closely correlated with wife's migration to be useful, and the effects of wife's migration appeared to be larger; head's age was tested for non-linearity; age at marriage, although sometimes significant, appeared to be collinear with absolute age and family size, as well as with pre-marital work experience. Since the theory relating age at marriage to labour supply was weak, the variable was dropped.

(iv) Ethnicity. The language in which the interview was conducted appeared not to affect the results.

(v) Husband's characteristics. Husband's education was tested for non-linearity, without positive findings. A more detailed breakdown of husband's occupation did not produce results significantly better than those with the limited breakdown retained.

(vi) Other macro variables. A more detailed breakdown of the occupational and work status structure at the macro level did not produce better results. Average education levels, or the deviation of individual's education from the local mean, were not significant.

(vii) Dependent variables. Functions explaining non-family labour force activity were tried, but eventually dropped because they added nothing to the separate analysis of the two major components of non-family work, wage and

self-employment. A function explaining the cessation of all labour force activity (CLFA) as opposed to post-marriage cessation of non-family labour force activity (CMLFNF) was dropped since it added little of note.

Appendix E
A Brief Outline of Discriminant Analysis[1]

The problem of discrimination can be posed as follows: given that there are n categories into which a given population falls, find a rule which will maximise the likelihood that we will correctly classify individuals whose category is unknown, but on whose other characteristics we have some information. The problem is resolved by estimating discriminant functions of the form

$$D = \sum_j a_j X_j$$

where the variables X are the characteristics concerned and where the separation between groups on the discriminant function is maximised (i.e., the ratio of between class to within class variances is maximised). D and X_j are vectors with maximum dimension one less than the number of categories between which we are discriminating. X is most easily interpreted if it is standardised to zero mean and unity standard deviation: under these circumstances, the absolute values of the a_j can be interpreted as the relative contribution to the discriminant function concerned of each variable in the function. The relative contribution of each discriminant function as a whole can be assessed in terms of the eigenvalue of each function, compared with the sum of eigenvalues of all discriminant functions, which may be interpreted as relative contribution to the explanation of variance in the discriminating variables. Significance tests for the additional contribution to discrimination of successive functions can be derived, and the five per cent level is used as a cut-off for the presentation in the tables. The remaining statistic given in the text is the group centroid, i.e., the mean value of the standardised discriminant function for members of each category. Differences between group centroids give a measure of the success of each discriminant function in differentiating between specific categories.

The underlying assumptions of discriminant analysis are that the sub-populations concerned are multivariate normal with identical covariance matrices. While the former assumption is likely to be acceptable (asymptotically at least) the latter may not be justified, imposing caution on the interpretation of results.

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[1] The main sources for this discussion are M. Kendall: Multivariate Analysis (London, Charles Griffin, 1975), and W.R. Klecka: "Discriminant analysis", in N.H. Nie et al: SPSS, 2nd edn. (New York, McGraw Hill, 1975).

Selected Publications of the Population and Labour Policies Research Programme[1]

1. General Material on the Research Programme

ILO: World Employment Programme: Population and Development - A progress report on ILO research with special reference to labour, employment and income distribution (Geneva, February 1979), 2nd edition, Reference WEP 2-21/PR.5. (*)

This report includes a full bibliography. It is available in French and Spanish as well as English.

2. Books and Monographs

R. Anker: Research on Women's Roles and Demographic Change: Survey Questionnaires for Households, Women, Men and Communities with Background Explanations (Geneva, ILO, 1980). (*)

S. Braganca et al: The Simulation of Economic and Demographic Development in Brazil (Geneva, ILO, 1980). (*)

M.G. Castro, L.M. Fraenkel et al: Migration in Brazil: Approaches to Analysis and Policy Design (Brussels, Ordina, 1979). (***)

W.J. House and H. Rempel: The Kenya Employment Problem (Nairobi, Oxford University Press, 1978). (***)

A.S. Oberai: Changes in the Structure of Employment with Economic Development (Geneva, ILO, 1978). (**)

G. Pyatt and A. Roe: Social Accounting for Development Planning, with special reference to Sri Lanka (Cambridge University Press, 1977). (***)

M. Rasevic, T. Mulina, Milos Macura: The Determinants of Labour Force Participation in Yugoslavia (Geneva, ILO, 1978). (**)

G.B. Rodgers, M.J.D. Hopkins, R. Wéry: Population, Employment and Inequality: BACHUE-Philippines (Farnborough, Saxon House, 1978). (***)

G. Standing: Labour Force Participation and Development (Geneva, ILO, 1978). (**)

G. Standing and C. Sheehan (eds.): Labour Force Participation in Low-Income Countries (Geneva, ILO, 1978). (**)

M. Todaro: Internal Migration in Developing Countries (Geneva, ILO, 1976). (**)

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[1] Availability code: * available on request from ILO, Population and Labour Policies Branch; ** available for sale from ILO Publications; *** available for sale from a commercial publisher.

3. Articles

I. Adelman, M.J.D. Hopkins, S. Robinson, G.B. Rodgers and R. Wéry: "A comparison of two models for income distribution planning", Journal of Policy Modeling, Vol. 1, No.1, 1979.

R. Anker: "The effects of group level variables on fertility in a rural Indian sample", Journal of Development Studies, Vol. 14, No.1, October 1977.

-----: "An analysis of fertility differentials in developing countries", Review of Economics and Statistics, Vol. lx, No.4, February 1978.

R. Anker and G. Farooq: "Population and socio-economic development: The new perspective", International Labour Review, Vol. 117, No.2 (Geneva, ILO, 1978).

W.J. House and H. Rempel: "Labour market pressures and wage determination in less developed economies", Economic Development and Cultural Change, 1978.

A.S. Oberai: "Migration, unemployment and the urban labour market", International Labour Review, Vol. 115, No.2 (Geneva, ILO, March-April 1978).

A.S. Oberai and H.K. Manmohan Singh: "Migration, remittances and rural development: Findings of a case study in the Indian Punjab", International Labour Review, Vol. 115, No.2 (Geneva, ILO, March-April 1980).

-----: "Migration flows in Punjab's Green Revolution Belt", Economic and Political Weekly, Vol. XV, No.13, March 1980.

C. Oppong: "Household economic demographic decision-making: Introductory statement", IUSSP Proceedings of 1978 Helsinki Conference, 11 pp.

C. Oppong and E. Haavio-Mannila: "Women, population and development", in P. Hauser (ed.): World Population and Development: Challenge and Prospects (New York, Syracuse University Press, 1979).

P. Peek and G. Standing: "Rural-urban migration and government policies in low-income countries", International Labour Review, Vol. 118, No.6 (Geneva, ILO, November-December 1979).

G.B. Rodgers: "Demographic determinants of the distribution of income", World Development, Vol. 6, No.3, March 1978.

-----: "Income and inequality as determinants of mortality: An international cross-section analysis", Population Studies, Vol. 33, No.2, 1979.

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