

THE INFLUENCE OF INDUSTRIAL STRUCTURE
ON FEMALE LABOUR FORCE PARTICIPATION IN
CANADIAN URBAN AREAS

by

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ABSTRACT

An understanding of the factors influencing participation is important to planners both for manpower planning and related purposes and because of the implications for social and economic well-being. Although the participation rates of women, particularly married women, have risen dramatically in recent decades, wide regional differences remain. Most studies of participation in Canada have focussed either on individual characteristics or on the response to unemployment conditions. This study argues that, because women's employment is highly concentrated in a few industries and occupations, the industrial composition of local labour markets is likely to be an important factor, inhibiting participation where few jobs are available.

An attempt is made to measure this influence by including in a multiple regression analysis of 1971 Census data an index variable representing, for 101 Census Metropolitan Areas and Census Agglomerations, the extent to which industrial structure favours women's employment. This variable is expected to show a significant positive association with female participation rates; its inclusion is expected to increase the explanatory power of the model and to reduce the influence of the dummy variables reflecting 'independent' regional factors.

The analysis, however, provides only limited support for these hypotheses. A consistent positive association is revealed, but, for most age and marital status groups, this is not statistically significant. Regional influences appear to be

reflecting industrial structure factors only slightly and, in the case of Quebec, not at all.

Factors which may account for this disappointing result are discussed, in particular, shortcomings in the proxies themselves and the prevalence of strong relationships among the independent variables. The hypothesised relationship appears to be one which is not readily reflected in a study of this type; some suggestions are therefore made for further research. Consideration is nevertheless given to alternative policy measures applicable to areas where industrial structure does appear to inhibit participation, the conclusion being that, unless accompanied by vigorous application of equal opportunity and "equal pay for work of equal value" measures, the encouragement of "female-intensive" industries would provide only a partial solution.

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CHAPTER 1

Female Labour Force Participation In CanadaSection 1. Introduction.

This study is concerned with the determinants of female labour force participation rates, that is, with the proportion of a female population of working age which is either employed or actively seeking employment. More specifically, the study seeks to identify the extent to which female participation rates within urban areas are influenced by the industrial structure of those areas.

Why should the female participation rate be of interest to planners? Firstly, and most generally, changes in the unemployment rate--one of the major indicators of the economic 'health' of a region--are influenced by changes in the size of the labour force as well as by changes in the absolute number unemployed. To draw valid conclusions from unemployment statistics, and to formulate appropriate policies, an awareness of the factors influencing the size of the labour force is necessary.

Secondly, any attempt at manpower planning--the identification of future imbalances between labour supply and demand, in aggregate or in specific areas or occupations, and the taking of steps to correct these imbalances--must be based on an understanding of the determinants of labour supply. On a more practical level, large projects in relatively remote areas may face labour shortages, shortages which have traditionally been met by immigration but for which interest is increasingly

turning towards the attraction of a previously largely untapped female potential labour force (see, for example, Veit, 1976).

Thirdly, the level of female labour force participation clearly influences the demand for government services. The most obvious example is that of child care services, but educational and training facilities, employment programmes, and transportation services, to name but a few, will be influenced by, as well as themselves influencing, the level of female labour force participation. Equally, if not more, important are the implications of female participation for the general level of economic and social well being in a community. It is in this respect that the influence of industrial structure has particular relevance, for reasons which are discussed in section 5 of this chapter. To place these arguments in context, the following section describes recent trends and current variations in the level of female participation in Canada. The third section discusses the theory of participation on an individual level, thereby isolating those factors which may be expected to influence participation rates. The empirical evidence concerning these factors is presented in Section 4. The final section of this chapter describes the aims and objectives of the research.

Section 2. Recent Trends In Female Labour Force Participation In Canada.

The twentieth century, particularly the period since the Second World War, has seen a dramatic increase in female labour force participation. Table I illustrates the extent of this increase. In 1921, less than one fifth of working age females were in the labour force. By 1977, this proportion had risen to almost half.

TABLE IFemale Labour Force Participation In Canada By Age Group, 1921
To 1977

Year	Age Group								
	14-19	20-24	25-34	35-44	45-54	55-64	35-64	65+	14+
1921	29.6	39.8	19.5	12.2 ¹	n.a.	N.a.	12.0	6.6	19.9
1931	26.5	47.4	24.4	14.3	12.9	11.3	13.2	6.2	21.8
1941	26.8	46.9	27.9	18.1	14.5	11.1	15.2	5.8	22.9
1951	37.8	46.9	24.2	21.8	20.4	14.5	19.6	5.1	24.1
1961 ²	34.2	49.5	29.6	31.1	33.4	24.4	30.3	6.7	29.7
1971 ²	37.0	62.8	44.5	43.9	44.4	34.4	41.5	8.3	39.9
1976 ^{2 3}	47.9	69.8	54.2	52.9	47.8	31.9	45.2	4.0	45.4
1977	46.9	71.3	55.6	55.3	49.2	32.0	46.5	4.3	46.2

¹ Women 35-49² Women 15-19³ Labour Force Survey, May-June average.

Source: Ostry and Zaidi (1979, p. 41.)

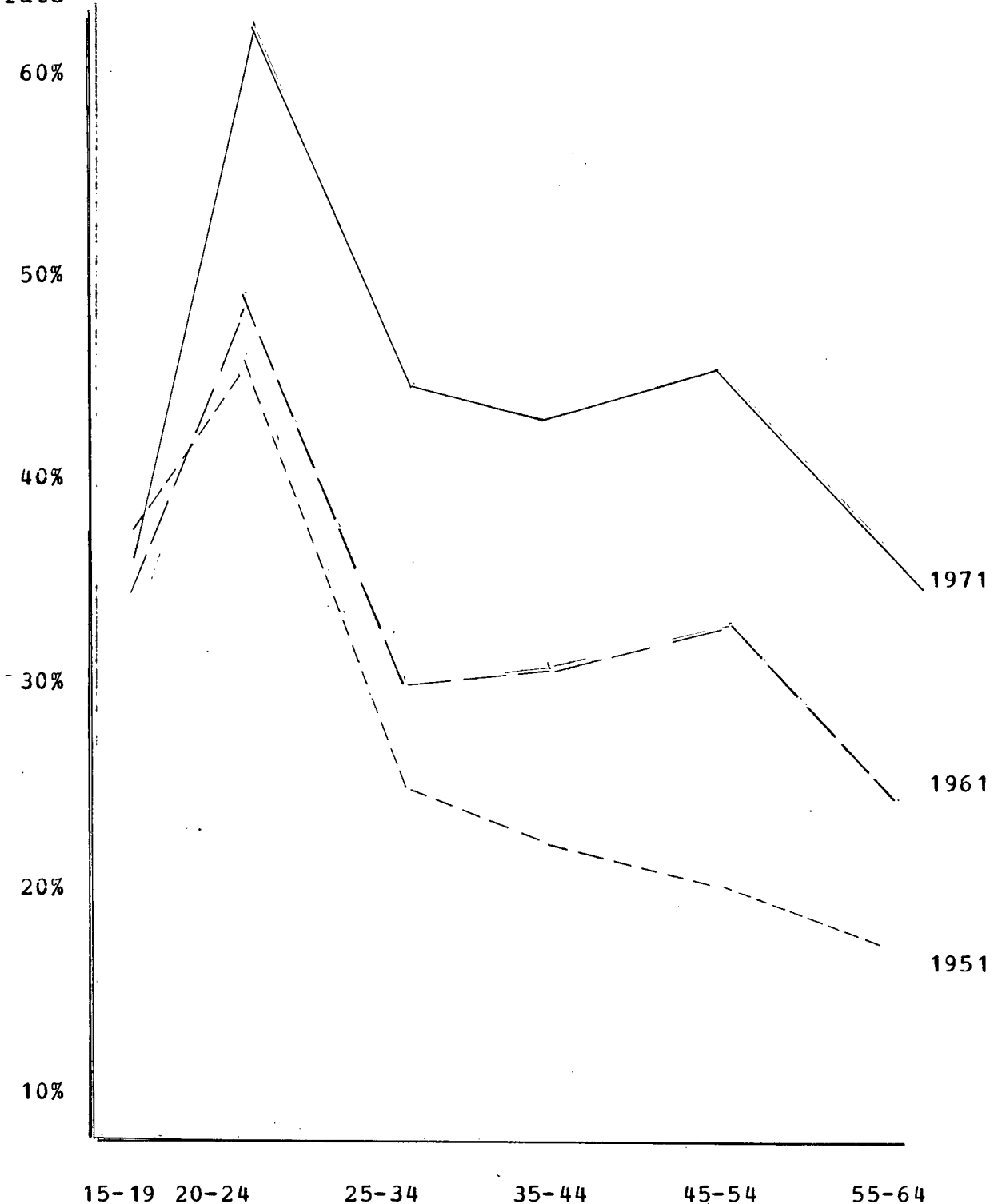
For years 1921-1941, taken from Denton and Ostry (1965); for 1951-1971, Census of Canada, 1971; for 1976-7, Revised Labour Force Survey.

These figures represent labour force membership during a particular survey week; a larger proportion of women would be labour force members at some time during any year.

Most striking has been the increase in participation by middle aged and older women. The proportion of women between 35 and 64 who were in the labour force almost quadrupled over this period, while the increase in participation by younger women was modest by comparison. In particular, the proportion of married women in the labour force has increased. Unfortunately, detailed historical statistics on participation by marital status do not exist; however, Ostry and Zaidi (1979) suggest that

Prior to World War Two, fewer than 3 or 4 percent of married women worked outside their homes. Even in 1951, only just over 10 percent had entered the labour market. (p. 42.)

By 1961 this proportion had risen to 22 percent; by 1971, 37 percent. The comparable figure for 1976 was 43.7 percent. The influence of increased labour force participation is illustrated in Figure 1. Prior to 1951, age-specific participation rates peaked in the 20 to 24 age group and declined thereafter. By 1961, a 'two-peaked' participation profile was apparent, with participation rates relatively low during the childbearing years from 25 to 34 and rising thereafter to a second, lower peak between the ages of 35 and 44, reflecting re-entry into the labour market. This change in the behaviour of married women led to an increase of more than 25 percent in the overall female participation rate between 1951 and 1961, despite a slight decrease in the participation of single females and despite changes in the age and marital status composition of the population which, alone, would have tended to depress rates

FIGURE 1**Female Participation Profiles By Age, Canada, 1951 To 1971**Participation
rate

Source: Statistics Canada, 1971 Census.
Volume 3 Part 1 Table 1

(Allingham, 1967a).

A number of factors have contributed to this increase in female labour force participation. On the supply side, decreased fertility and the greater availability of labour-saving devices have lightened domestic responsibilities. At the same time, the range of goods and services considered necessary for a 'reasonable' standard of living has expanded, providing a strong financial incentive towards market work (Connelly, 1976, 1978). Urbanization has facilitated access to employment opportunities, while the general increase in education levels may have both strengthened women's preferences for work outside the home and increased their attractiveness to employers (Ostry and Zaidi, 1979). On the demand side, structural changes in the economy have led to a more than proportional increase in those jobs generally considered to be suitable for women.¹ Growth in real incomes has increased the demand for services of various types, including professional services. Because service industries are in general labour intensive, offering limited scope for productivity increase, the demand for labour in these industries has risen relative to the economy as a whole. The increasing complexity of production and exchange, together with the expansion of the public sector, has led to a greater need for clerical workers. It is in these sectors that the majority of women work: in 1971, almost two thirds of the female labour force was in professional, clerical or service occupations. Between 1935 and 1961, the proportion of the labour force in

¹ The industrial and occupational distribution of the female labour force is discussed in more detail in section 5.

these three occupation groups increased from 22 percent to 34.7 percent (Meltz, 1965). According to the Economic Council of Canada (1976), of the net growth in employment between 1961 and 1974, 39 percent was in service industries, and a further 17.8 percent in trade.

Thus both demand and supply factors have encouraged female participation, while the demand for goods and services generated by women's increased participation has in itself created demand for the labour of other women. In addition, attitudes towards female employment have undoubtedly become more favourable, although whether this was a motivating factor behind the increased participation, or a result of it, is a matter for debate.

Although female participation rates have increased in all regions of Canada, wide regional differences occur and in some cases have persisted over most of the century. Table II shows female participation rates by province over the period from 1911 to 1976 (1951 to 1976 in the case of Newfoundland). Throughout the period, rates in the Atlantic provinces have been low relative to the national average, the only exception being in Prince Edward Island where they have increased rapidly since 1961, so that by 1976 they were close to the national average. Rates in Ontario and Manitoba have consistently been high, while both Alberta and Saskatchewan, where participation rates were low at the beginning of the period, experienced rapid growth in participation such that by 1976 the rates in Alberta were the highest in the country. Participation rates in British Columbia have grown at approximately the same rate as in the country as a

TABLE IIFemale Labour Force Participation Rates By Province, 1911 To 1976

	1911	1921	1931	1941 ¹	1951	1961	1971	1976
Canada	16.2	17.6	19.6	20.7	24.1	29.5	39.2	44.8
Nfld.	-	-	-	-	16.0	18.4	25.7	31.9
P.E.I.	12.3	13.5	15.0	16.1	18.5	24.7	38.1	43.9
N.S.	15.0	16.8	16.6	18.6	19.9	24.5	33.4	37.9
N.B.	14.7	16.2	17.1	18.2	20.5	24.8	33.6	38.6
Que.	16.2	18.7	21.9	22.9	25.0	27.9	33.9	41.2
Ont.	17.6	19.1	20.6	22.3	26.5	32.6	43.7	47.8
Man.	16.7	17.6	20.0	19.3	24.2	31.5	41.7	46.4
Sask.	10.9	12.6	14.3	14.9	18.7	26.4	38.6	46.4
Alta.	12.7	13.2	15.7	15.7	20.4	30.8	43.8	50.0
B.C.	17.1	16.2	19.5	18.6	23.4	28.3	39.8	44.9

¹ Including persons on active service

Source: 1911 - 1971: Statistics Canada 1971 Census
Volume 3 Part 1 Table 1

1976 Statistics Canada 1976 Census
Volume 5 Table 5

whole. In Quebec, which at the beginning of the period had the highest female participation of any province, participation grew relatively slowly and by 1976 rates there were below the Canadian average.

The absolute range of participation rates has widened somewhat, even excluding Newfoundland, while in relative terms there has been some slight tendency to convergence.

As Table III shows, a similar pattern is evident for all marital status groups, although the variation among single women is relatively small.

In addition to interprovincial differences, intraprovincial differences in participation rates may be observed between urban and rural areas, between rural farm and non-farm women, and between urban areas of different size. With a few exceptions, the tendency is for participation rates to be highest in metropolitan areas and lowest among rural non-farm women, the participation rates in smaller towns and for farm women being intermediate. The following section discusses some of the factors which may influence participation by individuals, and consequently which may account for some of these variations.

Section 3. The Theory Of Labour Force Participation.

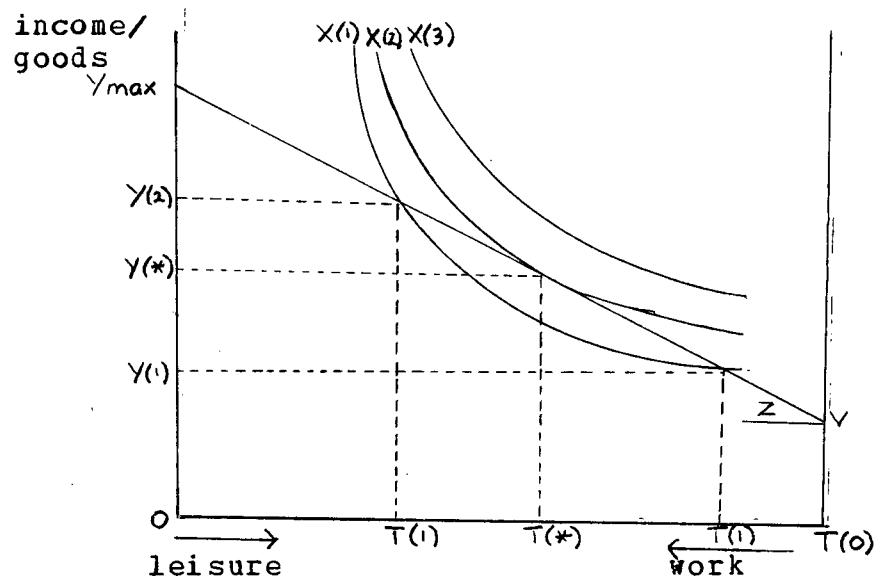
In traditional economic analysis, participation is viewed as an aspect of labour supply, other dimensions of labour supply being the hours supplied by labour force members, the intensity of effort and the particular skills offered. The tools of consumer choice are adopted to depict for an individual an optimal division of time between work and leisure, on the basis of the going wage rate and that individual's subjective preferences

TABLE IIIFemale Labour Force Participation Rates By Province And Marital Status, 1971.

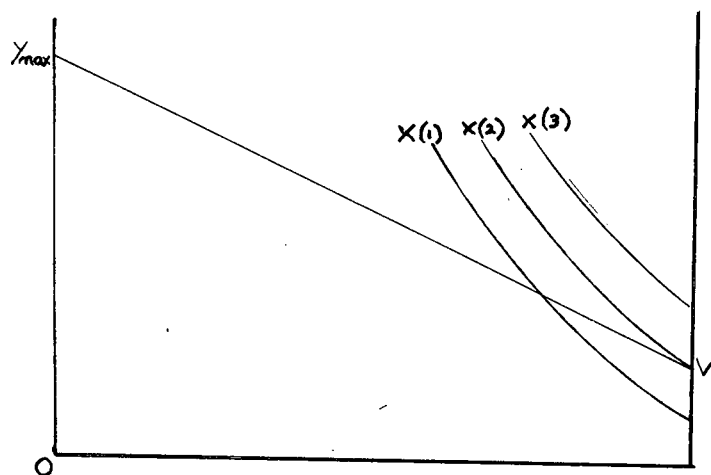
	Single	Married (includes separated)	Widowed and divorced
Canada	53.5	37.0	26.6
Nfld.	42.2	21.3	13.4
P.E.I.	47.4	38.2	26.6
N.S.	47.1	31.2	22.8
N.B.	45.0	31.9	22.5
Que.	52.2	28.4	20.8
Ont.	56.3	43.0	29.2
Man.	55.6	40.4	27.6
Sask.	46.5	39.5	24.9
Alta.	56.1	42.7	31.9
B.C.	56.6	37.4	30.3

Source: Statistics Canada 1971 Census.
Volume 3 Part 1 Table 5.

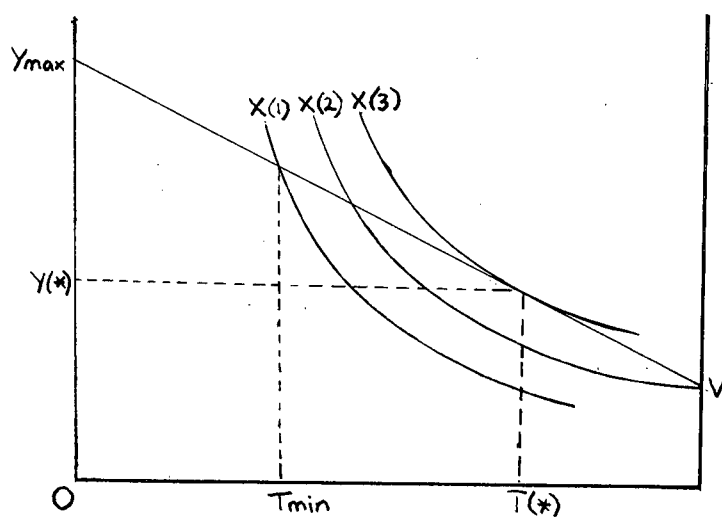
between leisure and the goods earned by market work. This optimum is depicted graphically in Figure 2(a). The vertical axis represents income or goods, the horizontal axis time. $T(0)$ indicates the total time available, with hours of leisure measured rightwards from the origin, and hours of work leftwards from the point $T(0)$. $X(1) \dots X(n)$ represent the individual's indifference curves, each one showing the various combinations of goods and leisure which will yield equal utility. At any point on a curve, the slope indicates the marginal rate of substitution of leisure for goods, that is, the amount of goods which would be traded for an additional unit of leisure. The 'rational' individual will seek to maximise utility, subject to the constraints imposed by time and income. The potential income available is represented by the line VY_{max} , the slope (z) of this line being the wage rate. Non-labour income available to the individual is shown by $T(0)V$. Working all available hours will yield an income of Y_{max} . Working $(T(0)-T(1))$ hours yields an income of $Y(1)$; in this position, the wage rate exceeds the marginal rate of substitution and the individual can increase his utility (move to a higher indifference curve) by working longer hours. Conversely, working $(T(0)-T(2))$ hours, the marginal rate of substitution exceeds the wage rate, and the individual's utility will be increased by working fewer hours and 'consuming' more leisure and fewer goods. At $T(*)$ hours of work, the marginal rate of substitution equals the wage rate (the income line is tangent to the indifference curve) and the individual is therefore attaining the maximum utility compatible with the given wage rate and 'tastes'.

FIGURE 2The Individual Labour Supply Function

(a)



(b)



(c)

If the preference for leisure is such that the marginal rate of substitution of leisure for goods everywhere exceeds the wage rate, then the optimal hours of work will be zero and the individual will not participate in the labour force (Figure 2(b)).

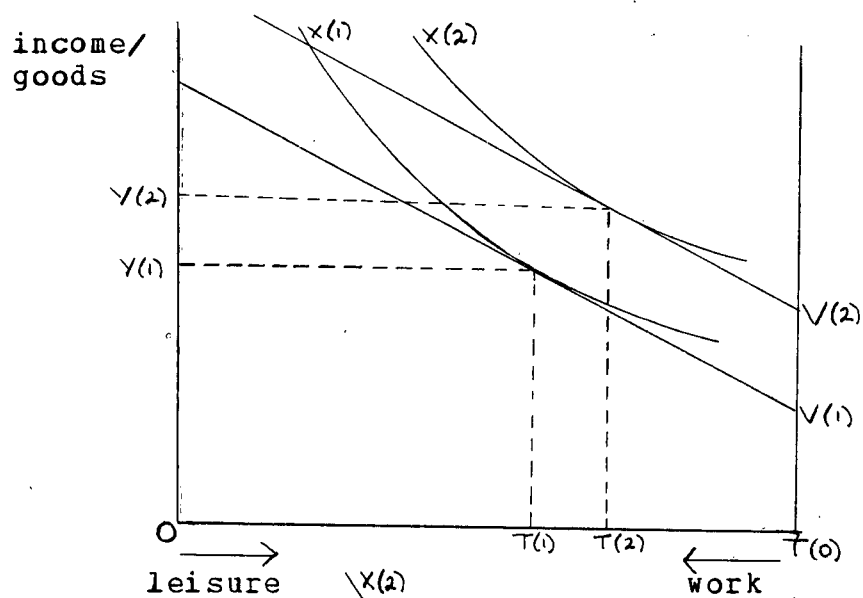
If the individual is not free to vary continuously the hours of labour supplied and must work some institutionally determined minimum if he or she works at all, then utility may again be maximised by remaining outside the labour force. This is shown in fig. 2(c). Since the preferred work-leisure combination $T(*), Y(*)$ is not available, a higher level of utility is obtained by working zero hours (utility = $x(2)$) than by working the minimum hours $T(\min)$ (utility = $x(1)$).

Figure 3 illustrates the effect of changes in nonlabour income and wages on labour supply. Assuming that leisure is a 'normal' good, that is, has a positive income elasticity of demand, then an increase in non-labour income from $T(0)V(1)$ to $T(0)V(2)$ will cause the consumption of leisure to increase and the hours of labour supplied to fall, from $(T(0)-T(1))$ to $(T(0)-T(2))$. (Figure 3(a)).

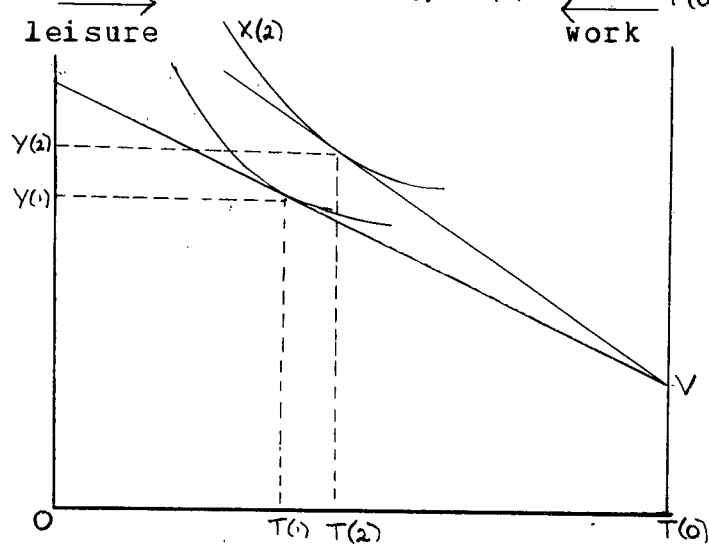
A change in the wage rate may, however, increase or decrease the labour supplied. Since the income which can be earned from a given number of hours worked has increased, the individual can afford to 'purchase' more leisure, as in the previous case. On the other hand, since the 'cost' of leisure, in terms of earnings foregone, has increased, making goods cheaper relative to leisure than formerly the individual may wish to substitute goods for leisure, working longer hours. In

FIGURE 3

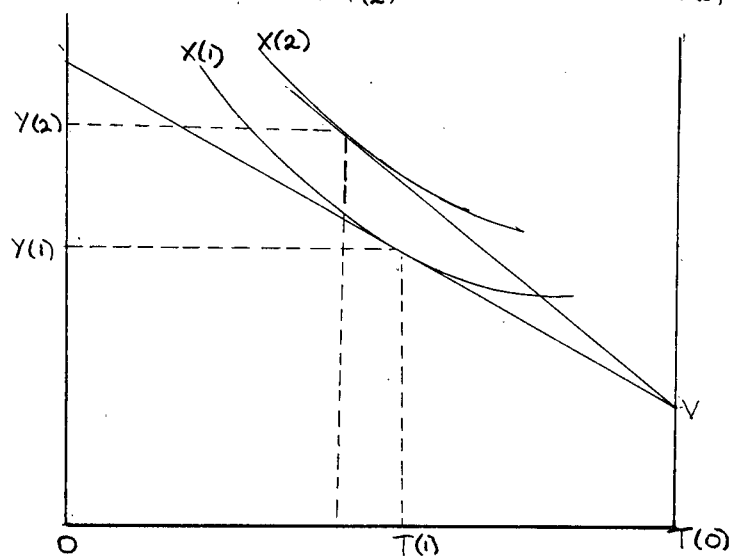
The Effect Of Wage And Income Changes On Individual Labour Supply



(a)



(b)



(c)

Figure 3(b) the negative 'income effect' on labour supply prevails, in figure 3(c), the positive 'substitution effect'.

Confining the analysis to the participation decision--the choice between supplying zero and some positive quantity of hours to the market--an increase in non-labour income will tend to have a deterrent effect on participation. An increase in the wage rate, however, will tend to encourage participation, since a person not currently participating in the labour force will experience no income effects although the "cost" of leisure will still be increased. A wage increase may therefore draw a non-participating individual into the labour market or leave participation unchanged but, in this simple model, cannot reduce participation. Conversely a wage decrease may cause workers to leave the labour force, but, since there will be no income effect on those outside the labour force there will be no offsetting tendency for participation to increase. According to this simple model, therefore, the likelihood of participation will vary directly with the wage rate, inversely with non-labour income, and will be largely determined by the subjective preferences for leisure as opposed to goods.

This analysis is primarily suited to marginal response to small changes rather than to the either/or participation decision. To extend it, it is necessary to consider the factors influencing preferences, and to introduce a number of refinements. Firstly, the work/leisure dichotomy of the simple model is clearly inappropriate. For most individuals and particularly for married women, the allocation of time will instead involve a tripartite choice: between market work,

leisure and 'nonmarket work', which includes all types of work in the home as well as education. While the income derived from market work can provide substitutes in the form of paid child care, restaurant meals, and so on, in general, the greater the extent of work in the home the higher will be the wage at which participation in the labour market becomes worthwhile. In particular, the presence of young children is likely to inhibit participation. In the theory of labour supply, this has led to the concept of the 'asking wage' or 'reservation wage', reflecting the individual's productivity in the home and consequently the opportunity costs of taking a job. If this reservation wage is not met or exceeded, then the individual will not participate in the labour force. We can therefore predict that the greater the extent of an individual's 'home productivity', or the greater the extent of domestic or similar responsibilities, the less likely that he or she will participate in the labour force.

Secondly, the labour supply decisions of family members are likely to be taken on a joint rather than an individual basis. In the case of married women, if it is assumed that the husband's labour supply decision is primary and independent, with the wife's decision conditional, then the nonlabour income analysis described above is appropriate and it can be predicted that the probability of a married woman's participation will vary inversely with her husband's income. If it is assumed that the labour supply decisions of both or all family members are interdependent and are therefore simultaneously determined, then a more complex analysis based on the respective home and market

productivities of both members is called for. In general, though, the former assumption has been made.

In addition to the earnings of family members, the family's asset and debt position may be relevant. Physical as well as financial assets may be thought of as yielding nonlabour income, and may also be converted to cash to sustain consumption during periods of temporary hardship. Other things being equal, then, the higher a family's level of asset holdings the less likely is the wife to be in the labour force.

Thirdly, the question arises of whether 'permanent' or 'transitory' income is the relevant variable on the basis of which supply decisions are taken. Mincer (1960), dealing specifically with the participation of married women, suggests that the total quantity of labour supplied to the market over a woman's married life is made on the basis of the family's long-run or permanent income, excluding her own earnings. However, the timing of market activities will be adjusted to reflect the influences operative at a particular time. Some of these influences will vary according to 'life cycle' influences. Thus participation by married women is likely to be higher in the early years of marriage when the husband's income is below its expected long run level, lower when the presence of young children temporarily increases the reservation wage. The timing of participation will also be influenced by,

...cyclical and random variations in wage rates, employment opportunities, income and employment of other family members, particularly of the head.
(Mincer, 1960, p. 68.)

The reference to cyclical conditions brings us to a fourth

amendment necessary to the simple model. The implicit assumption is made of an infinitely elastic demand for labour, precluding the possibility of unemployment. In reality, a labour force member may of course be employed or unemployed, and the level of unemployment is itself likely to exert an influence on the size of the labour force. The direction and magnitude of this influence have been matters for much debate. The 'discouraged worker' hypothesis suggests that high unemployment rates will cause the labour force to shrink. Some writers, for example Swidinsky (1969) have referred to the discouraged worker effect as reflecting directly the substitution effects of cyclical changes in (or structural differences in) the level of wages. Mincer (1960) also attributed the discouraged worker effect to changes in wage rates, suggesting that the 'rational' woman would time her labour force participation to coincide with times of market prosperity when work offers greater rewards.

A somewhat preferable theoretical explanation for the discouraged worker effect--preferable in that it does not rest on the assumption of wage rates which are flexible in both directions--was developed by Kunin (1970). In Kunin's model, the marginal worker takes the decision to participate in or remain outside the labour force on the basis of the expected costs and benefits of a job search. In times of high unemployment, even with constant wages, there will be a reduced incentive to participate in the labour force by seeking or continuing to seek work, since, with fewer vacancies, both the time and money costs of a job search will be increased, while the probability of finding work will be reduced.

The added worker hypothesis, by contrast, suggests that the labour force will expand rather than shrink during times of high unemployment. This hypothesis suggests that, as 'primary workers' become unemployed, other family members--married women, retired persons, teenagers--will enter the labour force in order to maintain family incomes. Using Mincer's terminology, the added worker response is a reaction to negative transitory income induced by unemployment. Of course, both effects may occur simultaneously, the net response of the labour force to changes in unemployment depending upon which effect is stronger.

The response of the labour force to variations in labour demand is of particular interest in its implications for economic policy. Predominant discouraged worker behaviour would suggest that, in times of heavy unemployment, significant disguised unemployment exists as well. That is, there are more people without work who would like to work than are indicated by unemployment statistics. Where regional variations in unemployment exist--either as differences in the level of structural unemployment or as differences in the level of cyclical severity--then the presence of disguised unemployment in the more severely affected regions is likely to lead to an underestimate of the extent of regional disparities. The adoption of policies aimed at full employment becomes complicated since, as employment expands, those who were 'discouraged workers' will re-enter the labour force in response to improved conditions, perhaps leaving the level of open unemployment little changed.

Conversely, dominant added worker behaviour may lead to an

overstatement of the real cyclical severity of, or regional disparities in, unemployment. In this case, the actual shortage of jobs will be less than the numbers unemployed, since the new entrants to the labour force in times of unemployment will need work, not in addition to those unemployed, but only for the duration of their unemployment, and will withdraw from the labour force when conditions improve.

The theory outlined above provides the rationale for most of the empirical studies which are discussed in the following section. It predicts--not unexpectedly--that the greater a woman's earning power, and therefore her education and other skills, the more likely she is to be in the labour force. The higher the family's other income and asset holding, and the greater the extent of her domestic responsibilities, the more likely she is to be outside it. Unemployment exerts both positive and negative influences, the net effect being a matter for empirical determination. There remains within the theory a role for personal tastes and preferences, some of which may be reflected as differences in behaviour of groups of women differing in ethnic, religious or residential characteristics.

It should be pointed out that this consumer choice based approach to labour force participation has been the subject of considerable attack by more radical writers: attack based both on its limitations and on its underlying assumptions. McFarland (1976) comments that the empirical works discussed in the following section

...show little familiarity with any of the women's literature, which suggest that the three most important factors a wife's decision about whether or not to work

would be the attitude of those around her to her working, particularly that of her husband; how she perceives her possibilities in the labour market--specifically, the extent of discrimination she will have to face and the limits to her upward mobility; and lastly, the availability of daycare facilities at a reasonable cost.
(p. 30.)

Marsden (1977) criticises the standard assumption that women will inevitably be secondary workers with childrearing their central concern. At the same time she questions the automatic acceptance of the prime age male work pattern as a norm, which neglects to examine the power relationships which have led it to be regarded it as such while largely denying access to this norm to married women. In a more extensive analysis from a Marxist standpoint, Connelly (1978) argues that women have filled the role of a reserve army of labour in capitalist production, providing a cheap and readily available source of workers for periods of expansion. Fear by male workers of their competition exerting a downward pressure on male wages has largely segregated them in 'female' occupations and, because of changes in the structure of the economy, these have been characterised in recent decades by constant expansion. She comments,

In rejecting the consumer choice model I have essentially rejected an approach that centres on subjective conditions and individual choices to explain behaviour. The consumer choice approach reduces the difficulties working women face to individual problems and by implication directs women to seek primarily individual solutions.

She suggests instead that

Women's participation in wage labour is not a matter of immediate situational factors, but rather of prestructured alternatives which direct the decisions women are compelled to make.
(p. 76.)

While recognising the validity of these criticisms, in

defence of the consumer choice theory it might be said that, in general, it pretends no more than an analysis of current behaviour. Examining patterns of behaviour within a given structural context need not be inconsistent with recognition of the factors which have contributed to the development of that context. The difference lies mainly in emphasis, and if the consumer choice theory has led to an obscuring of such wider influence then this is a weakness less in the theory itself than in those who have applied it.

Section 4. Empirical Studies Of Female Labour Force

Participation In Canada.

This section summarises the evidence concerning influences on female labour force participation provided by the empirical studies carried out in Canada in recent years. These studies fall roughly into two groups. The first five, of which four were carried out under the auspices of Statistics Canada or its predecessor, are concerned only with women and, in all but one case, only with married women. They provide a fairly general overview of the influences at work, considering social, demographic and economic factors. The other studies investigate the labour force behaviour of both sexes, are concerned specifically with economic factors and, in particular, with the effects of unemployment on participation.

The first of the studies considered (Allingham, 1967b) used special cross-tabulations from the 1961 Census to examine the influence of age, education and marital status on female labour force participation. Tabulating the participation rates of women in different age groups, controlled for education, Allingham

reached the conclusion that marital status was the single most important variable but that education exerts a very strong positive influence. In particular, the more educated women showed a more strikingly two peaked participation profile, reflecting a higher initial level of participation, a stronger tendency for childbearing to be concentrated in the 30 to 34 age group, and a greater proportion returning to work after this age. The influence of age as an independent variable was relatively slight.

Allingham and Spencer (1968), using the same data source, extended this analysis to investigate in addition the influences of child status, residence and husband's education on married women's participation. Multiple regression analysis using dummy variables was used to derive an estimate of the independent influences of each characteristic. For women under 44, child status was found to be the most important factor, the presence of children under 6 exerting a strong negative influence. This effect was particularly strong for women in urban areas, which the authors suggest reflects a higher cost of childcare services. Education exerted a strong positive influence on women in all age groups, and was the most important factor for women over 45. The influence of education was most pronounced for women in smaller urban centres, perhaps indicating high demand for such women's labour relative to their supply. Husband's education, used here as a proxy for income, exerted a negative influence for all age and residence groups.

Ostry (1968) also analysed 1961 census data, using cross-tabulations, multiple regression with dummy variables and

analysis of variance. In addition to confirming the results of previous studies concerning the effects of education and children, and the relatively minor independent influence of age, her results indicated a negative association between participation and husbands income, the relationship being particularly strong above a threshold of \$5,000. Ostry included regional dummy variables in the regression analysis. The coefficients suggested that, while the region of residence was a less important influence on participation than child status, education, or husband's income, the likelihood of participation did appear to differ significantly for women of different regions, independently of the other factors considered. Married women of all ages in the Atlantic Provinces and Quebec were less likely to be in the labour force than women in Ontario, the Prairie provinces, or, to a lesser extent, British Columbia.

Spencer and Featherstone (1970) used data collected by the Dominion Bureau of Statistics from a sample of non-farm households used initially for a Survey of Consumer Finances in 1964. Multiple regression was used, the dependent variable taking on a value of 1 where the wife was in the labour force, 0 otherwise. The findings of this study regarding the major variables confirmed previous results. Women with unemployed husbands were more likely to be in the labour force, providing evidence of added worker behaviour. Significant regional influences, in the same directions as in the previous study and particularly strong for older women, were also apparent.

The influence of the family's asset and debt position was also considered. Higher holdings of various short and long term

financial assets were associated with reduced probability of participation, while a positive association between participation and debtholdings was apparent. Another factor considered in this study was the presence of additional adults. A priori, the influence of this factor on participation could be positive or negative, depending upon whether the additional household member was contributing to, or generating additional, household tasks. The net effect proved weakly positive.

Skoulos (1974) undertook an extensive econometric analysis of the labour force participation of married women in Canada, using two data sources. The first was a sample of non-farm families with husband and wife present, obtained by merging Statistics Canada's 1968 Survey of Consumer Finances with the Labour Force Survey for the corresponding period. The second consisted of aggregate data from the 1961 Census, examining participation rates for 174 cities, towns and municipal subdivisions.

Analysing the micro data, Skoulos used regression analysis to estimate the parameters of a family utility function, utility being a function of the wife's housework, the total family income and the leisure of both partners, subject to time and budget constraints. The extent of housework was proxied by variables representing the number and age of children, the presence of other adults in the household, and owner/renter status (homeowners being assumed to have a higher preference or need for housework). The wife's education was taken as a proxy for her potential market earnings, with other influences on family preferences reflected by the inclusion of variables

representing the wife's age and immigration status, the husband's occupation and employment status, and the family's place and region of residence. Separate regressions were run for the sample as a whole and for subsamples defined in turn by age, income group, residence and region. Again the coefficients of the variables representing child status, education and family income were significant and had the expected sign. Participation was higher for recent immigrants, women in urban areas and those with a third adult in the home. Participation was inversely related to the number of weeks unemployment the husband had experienced during the previous year. However, since the income variable referred to the same time period, the influence of unemployment would also be reflected in reduced income, tending to increase the likelihood of participation. Since the income effect was the stronger, Skoulos suggested a net positive impact of unemployment on participation, again offering some support for the existence of net added worker behaviour among married women. Similar results applied to women with husbands outside the labour force for a significant part of the preceding year.

When separate regressions were run by region, the results for the Atlantic Provinces and Quebec were found to differ considerably from those arrived at for the rest of the country. In the Atlantic provinces, the influence exerted by the husband's education, a husband outside the labour force, and home ownership, were stronger, the influences of age and child status less important. In general, the equation bore a strong resemblance to that derived from the sample of rural women only. In Quebec, age, education and immigration status appeared to

have a stronger effect than in the rest of the country.

Skoulos's analysis of aggregate Census data provided similar results, again providing support for the added worker hypothesis. A wage variable, defined as average earnings of females working full time was also included. Its effect was positive, and exceeded the negative influence exerted by other family income. Both wage and income effects declined with age, which the author interprets as indicating that a strong inducement, in the form of need or incentive, is required to bring about participation by married women in the childbearing years.

The final study in this group was undertaken by Gunderson (1977) using a sample of individual observations (non-farm women, husband present) from the 1971 Census to undertake an analysis of female labour force participation. Analyses were carried out for each region and for the country as a whole. The expected relationship between the probability of participation and education, residence, child status and family income were obtained for all regions. Age exerted some independent influence, strongest after the age of 45. The effect of age was considerably stronger in Quebec than in the other regions; in addition, the deterrent effect of school age children was greater there. The positive impact of education was greatest in the Maritimes. For statistical reasons, the influence of an unemployed husband was evaluated only for the all-Canada case. Since, unlike in the previous study, the income and unemployment variables referred to different time periods, the coefficient on the unemployment variable could be interpreted as representing

the net effects of unemployment rather than only a part of the effects. Because an individual's employment status is influenced by many factors besides local employment conditions, it would tend to reflect added worker behaviour more readily than discouraged worker behaviour, and was therefore expected to have a positive sign. However it proved significantly negative. Gunderson interpreted this result as strongly indicating the absence of added worker behaviour, although he warned that caution should be used in taking it as evidence of a discouraged worker effect.

In summary, all the studies discussed above confirm theoretical expectations with respect to most of the major influences on female participation, notably, the presence of children, family income, the woman's potential earnings. Where regional factors are considered, a clear distinction is apparent between those regions where factors not explicitly considered appear to favour participation--Ontario and the Prairie Provinces and, to a lesser extent, British Columbia--and those where an independent negative influence on participation is apparent--the Atlantic provinces and Quebec. The studies provide conflicting results concerning the influence of unemployment on participation; a conflict which becomes still more apparent when the studies which focus specifically on this subject are considered.

The first such study was carried out by Proulx in 1969. Proulx used annual time series data from the Labour Force Survey, regressing the labour force participation of various age-sex groups on, in some cases, the aggregate unemployment

rate, in other cases, an index variable of excess demand. Proulx's results provided support for the additional worker hypothesis in the case of men in aggregate and males ages 20 to 24, and women aged 45 to 64 and 65 and over. Discouraged worker behaviour was apparent among women aged 20 to 24 and men aged 14 to 19. Results were not reported for the other age-sex groups, presumably being statistically insignificant.

Officer and Anderson (1969), using quarterly Labour Force Survey data, regressed age-sex specific participation rates on various measures of male unemployment, the measures increasing in the 'intensity' reflected from the number currently unemployed to those seeking work for six months or longer. Secular changes were reflected by the inclusion of variables representing real per capita income, consumer credit and, for females, the birth rate. Contrary to the findings of Proulx, the discouraged worker effect was found to predominate for all male age groups. Although the labour force response to current unemployment was positive in some cases, this was outweighed by a strongly negative response to long-term unemployment. The same pattern was observed for teenage females, all other females exhibiting added worker behaviour.

Swidinsky (1969) used time series data from the Labour Force Survey and cross-section data from the 1961 Census. The time series estimates regressed group participation rates on the lagged aggregate employment to population ratio. A dominant added worker effect was indicated for males aged 20 to 24 and 25 to 44 years, and for females over 45 years. The discouraged worker effect predominated for males of 14 to 19 and 65 and

over, and for females between 20 and 44. The net aggregate impact of unemployment on the labour force was relatively slight. By contrast, the cross-section estimates, using as independent variables the aggregate unemployment rate and a number of socio-demographic control variables in 44 labour market areas, suggested a dominant discouraged worker effect in almost every group, whether grouped by age, marital status or level of education. The responsiveness of females to unemployment was generally weaker than that of males. Among women, it was strongest among single females, stronger for married women than for widows. When disaggregated by education it proved strongest among those with elementary education only, negligible for women with a university education. Using the cross-section coefficients, Swidinsky calculated disguised unemployment amounting to some 271,000 in Census week 1961 resulting from the difference between the actual open unemployment rate of 7.5 percent and its assumed full-employment level of 4 percent.

Kunin (1970) also used aggregate data from the 1961 Census, analysing participation rates for both sexes by census tract, and focussing particularly on differences in behaviour by residents of high, medium and low income census tracts. Summarising the results of the regressions for females, Kunin found, as expected, that the participation rate was inversely associated with the proportion married, with the average number of children, and with male earnings. The latter variable was not statistically significant in low income tracts, suggesting, as did the previous works, the existence of some threshold effect

in the impact of income on participation. The expected positive association between female earnings and participation was confirmed, the relationship proving strongest in the middle income group. The author interprets this as suggesting that lower income women will, through necessity, tend to work at whatever wage prevails, while upper income women will be more influenced by non-pecuniary factors. Regressing female participation on the total unemployment rate negative coefficients were obtained throughout suggesting a dominant discouraged worker effect; however, evidence of added worker behaviour was indicated in the statistically significant positive association between the participation of women in medium and upper income tracts and the male unemployment rate. For all income groups, participation was lower in tracts where a high proportion of the population were of French origin, or were of neither English nor French origin. The same effect was found when the proportion of immigrants was used, contradicting the findings of Skoulos who found participation higher among immigrants.

A later study by Kuch and Sharir (1978), using monthly Labour Force Survey data, also provided support for the discouraged worker hypothesis. The authors regressed participation rates for age-sex groups on variables reflecting, firstly, that group's own employment rate and secondly, the ratio of employment to population in all other groups. A positive coefficient representing the discouraged worker effect was expected for the first variable, a negative coefficient reflecting the added worker effect for the second. The expected

results were obtained for all groups. However, for males between 25 and 44 neither effect was statistically significant, while for younger and older men only the discouraged worker effects were significant. For women, both effects were significant in all age groups, with the discouraged worker effect predominating. Women's responsiveness to the unemployment rate was lowest in the 20 to 24 age group, which the authors suggested indicated that such women should be thought of as part of the primary workforce rather than as secondary workers. The strength of the added worker effect appeared to decline with age. Estimating the net cyclical effects, a discouraged worker effect was found for all males except teenagers, and for females 25 to 44 and 65 plus, the net response for other groups being indeterminate.

The work by Swan (1974), as the only one of the 'economic' studies to deal explicitly with regional factors, is of particular interest. Swan tested and strikingly rejected the hypothesis that in the regions where unemployment falls least in recessions (Ontario and the Prairie provinces) the discouraged worker effect was operating more strongly, substituting disguised for open unemployment. Quarterly data from the Labour Force Survey were used, covering the period from 1953 to 1971. In each region, male participation was regressed on the unemployment rate in a neighbouring region, while male unemployment was the independent variable in the female regressions. These adjustments were made to reduce the statistical bias introduced by common measurement error in dependent and independent variables. Other variables included

were wages and salaries per employed person, regional birth and marriage rates and seasonal and trend variables.

In Ontario and Quebec, significant additional worker effects were indicated, while in the Prairies and the Atlantic region, the regression for men showed an additional worker effect but no net effect was apparent for women. In British Columbia, unemployment appeared to exert no effect on participation. Swan then calculated the extent to which unemployment would rise in each region following a fall of 1 percent in employment, with and without additional worker effects. In Ontario, he estimated the increase in measured unemployment to be some 50 percent greater than it would be without the additional worker effect. In the Atlantics, the increase was about 20 percent and in British Columbia, there was no difference. Swan commented that, in the Atlantic provinces and British Columbia

Not only are more people out of work than in the rest of Canada, it is also the case that more of those who are looking for work actually need it, in that more of them will actually take a job when employment oportities improve.
(p. 428.)

And he concluded that,

Any adjustment to measured unemployment rates to allow for the responsiveness of labour supply to demand would reveal even greater differences across regions in sensitivity to recession than were previously thought to obtain.
(p. 432.)

To summarise, there is a considerable degree of conflict regarding the influence of unemployment on participation. Looking only at that part of the evidence relating to women, the results of the studies by Swan and Officer and Anderson, and, for older women, that of Proulx and the time series work of

Swidinsky, would suggest a dominant added worker response. This conclusion is supported by some of the more general studies which were discussed first. On the other hand, a net discouraged worker effect is in general indicated by Swidinsky's cross-section work and by the studies of Gunderson, Kunin and Kuch and Sharir.

It is usual to interpret time series studies as reflecting response to short run changes, and cross-section changes as reflecting response to long run or structural differences. It is to some extent possible to reconcile the evidence by suggesting an added worker response to short run changes in the level of unemployment, while discouraged worker behaviour predominates as a response to long run unemployment. This interpretation is theoretically and intuitively reasonable; however, it fails to account for all the conflicts, in particular, the dominant discouraged worker effect found by Kuch and Sharir, as well as the added worker response found in Skoulos' analysis of 1961 Census data.

In general, then, the conclusion to be drawn from this review of the second group of studies must be that our understanding of the relationship between labour supply and demand remains very limited.

Section 5. Female Labour Force Participation And Industrial Structure.

The basic hypothesis of this study is that, just as there will be a tendency for workers to become discouraged and leave the labour force when high unemployment reduces the chance of finding work--a tendency which may or may not be offset by the

entry into the labour market of other individuals--so there will be a tendency for married women to remain outside the labour force where the demand for female labour is low. In theoretical terms, following the job search approach, we may say that the low probability of finding work and the high costs of time and effort which would be expended in seeking work would reduce the expected utility of a job search to a level short of the reservation wage--whatever the average market wage. In more intuitive terms, where women know that little work is available, only the most determined will seek work, the rest remaining outside the labour force even where they would like to work. The distinction between this effect, called here the industry mix effect, and the more conventional discouraged worker effect is that the resulting low participation rates stem from a shortage of a specific kind of job rather than from a low demand for labour in general.

The assertion that an industrial structure may be more or less favourable to female employment, and consequently participation, requires further elaboration. The first column of Table IV shows the proportion of the Canadian labour force in each industry group which, in 1971, was female. This proportion is sometimes known as the degree of sex-typing in an industry. Excluding the 'industry unspecified' category, an above average proportion of the labour force was female in three major industry groups: retail trade; finance, insurance and real estate; and community, business and personal services. In the forestry, fishing and mining industries, less than 10 percent of the labour force was female. The second and third columns show

TABLE IVMajor Industry Groups Showing Percentage Of Workforce Female And Proportions Of Female And Male Labour Force, 1971

Industry	Females as % of industry labour force	% of total female labour force	% of total male labour force
Agriculture	23.2	3.8	6.5
Forestry	4.5	0.1	1.2
Fishing	3.6	-	0.4
Mining	6.8	0.3	2.3
Manufacturing	24.6	13.7	23.0
Construction	4.9	0.9	9.0
Transport, communications, utilities	17.0	0.4	
Wholesale trade	22.8	2.7	4.8
Retail trade	42.0	13.1	9.4
Finance, insurance, real estate	51.4	6.2	3.1
Community, business, personal services	57.6	39.7	15.3
Public administration and defence	25.5	5.5	8.4
Unspecified	44.2	10.2	6.7
ALL INDUSTRIES	33.4	100.0	100.0

Source: Calculated from Statistics Canada 1971 Census.
Volume 3 Part 4 Table 2.

the proportion of the female and male labour forces respectively in each industry group. The former is sometimes known as the degree of female concentration in an industry. The three 'female intensive' industries contained almost 60 percent of the female labour force, compared with less than 30 percent of the male labour force. Primary industries and manufacturing contained 4.2 and 13 percent of the female labour force, compared with 10.4 and 23.0 percent of males. A more detailed breakdown shows the extent of both sex-typing and female concentration to be greater than that revealed by the aggregate figures. For example, a breakdown of the community, business and personal services sector shows that in the category 'health and welfare services' the proportion of females was 75.1 percent, in 'personal, services', 69.1 percent. These two groups alone accounted for 17.2 percent of the female labour force. Within manufacturing, the textile and clothing industry, with a workforce almost 60 percent female, contained 3.5 percent of the female labour force as compared with 1.3 percent of the male labour force.

A similar pattern is apparent when an occupational rather than an industrial breakdown is examined. Table V, adapted from Gunderson (1976) shows the 25 major female-employing occupations, ranked in descending order and showing also the percentage of the total female labour force in each group. Over 60 percent of females who were in the labour force in 1971 held one of these occupations. In a third of these occupations, the proportion of female workers is over 50 percent; in all but three it exceeds 50 percent.

There is, then, strong evidence of a segregated labour

TABLE VLeading Female Occupations, Canada, 1971

Occupation	Females as percent of occupation	Percent of female labour Force
Secretaries/stenographers	97.4	8.1
Sales clerks	66.0	5.4
Bookkeepers/accounts clerks	67.6	4.6
Elementary teachers	82.3	4.1
Waitresses	82.9	3.6
Tellers and Cashiers	91.3	3.5
Farm workers	46.2	3.2
Nurses,graduate	95.8	3.1
Typists, clerk typists	95.6	2.9
General office clerks	62.2	2.7
Sewing machine operators	90.1	1.9
Personal service n.e.c.	92.0	1.9
Janitors/cleanerss	32.4	1.9
Nursing aids & orderlies	74.4	1.8
Secondary teachers	44.5	1.7
Other clerical n.e.c.	62.0	1.5
Receptionists	92.6	1.4
Supervisors,sales	16.8	1.4
Chefs & cooks	50.2	1.3
Packaging n.e.c.	56.3	1.3
Barbers &hairdressers	63.2	1.2
Telephone operators	95.9	1.3
Library & file clerks	82.2	0.9
Labour & elemental work	47.0	0.8
Babysitters	96.6	0.7
total in 25 leading occupations	65.9	61.7

Source: Gunderson, 1976, p. 114-115.

(Taken from Statistics Canada, 1971 Census).

market, with females disproportionately represented in a few industry and occupational groups, which are, to a large extent, female dominated. In general, there will be more employment opportunities for women in areas where a relatively high proportion of total economic activity is directed towards these industries or occupations. Conversely, where these sectors are relatively poorly represented in the economy of a local labour market, or where much production takes place in the primary or heavy manufacturing sectors, female employment opportunities will be relatively limited. We focus here on industrial rather than occupational structure because the demand for labour in specific occupations will be largely contingent upon industrial structure, even though the proportion of females in any industry will itself be a reflection of the extent to which the occupational structure of that industry is oriented towards the traditionally female occupations.

The existence of the industry mix effect has not, of course, been unrecognized. In the United States, Oppenheimer (1970) identified the major cause of the increased participation by women between 1940 and 1960 as the response to the increased demand for labour in 'female' occupations. Connelly (1978), quoted in Section 3 of this chapter, views female participation as being primarily determined by the requirements of capitalist producers. In general, however, most economic analyses of the subject have given somewhat cursory treatment to the influence of industrial structure. Its importance in the historical context is usually recognised, and the concentration of 'female' industries in urban areas is often assumed to contribute to

higher participation rates there. But most cross-section studies have treated industrial structure, like 'tastes' and 'culture' as a kind of residual factor to partially account for that portion of observed variation which cannot be attributed to economic or demographic factors. A few studies have addressed the industry mix effect directly. In the United States, Bowen and Finegan (1969) undertook a major cross-sectional study of labour force participation in Standard Metropolitan Statistical Areas (SMSA's). An industry mix variable reflecting the extent to which the industrial structure of each SMSA was oriented towards female employment² was included in regressions for women by age and marital status. Also included were other labour market variables, including the unemployment rate and female earnings, and a number of control variables such as age and average education. The industry mix variable proved strongly significant for married women especially those under 24 and over 45, and for widowed and separated women, but not for single or divorced women.

King(1978) elaborated on Bowen and Finegan's study, using 1970 Census data. King examined the hypothesis that female participation was positively related to the variability of hours of work within a labour market, the rationale being that market work and domestic responsibilities may be more easily combined where flexible working hours and widespread opportunities for part-time work exist. The mean and variance of the predicted distribution of hours in each SMSA were calculated on the basis

² The formulation of this industry mix variable was the same as that used here, which is discussed in the following chapter.

of that city's inter-industry employment distribution and of the national hours of work by industry. The results indicated that the distribution of hours was indeed significant for women with pre-school children, whether as a substitute for or in addition to Bowen and Finegan's industry mix variable. For other groups, however, the hours distribution variables were significant in neither case, and the author concluded that

...The industry mix variable owes its significance to factors other than the variability in hours characteristics of particular industries.
(p. 406.)

In Canada, two of the studies discussed in the previous section which used aggregate 1961 Census data included variables reflecting the proportion of an area's labour force in certain industry groups to reflect the industry mix effect on participation. Swidinsky (1969) used three variables representing respectively the proportion in manufacturing, trade and services. For most age groups, the effect of each variable was positive, but not significant, probably because these groups were too highly aggregated to reflect employment conditions adequately. Skoulos (1974) represented industrial structure by the proportion of the labour force in managerial and professional and technical, clerical and sales occupations. This variable was found to be significant for most age groups and particularly so for the under 25 and 55 to 64 age groups. Its influence was also stronger in low income areas than in middle or high income areas.

Nakamura et al (1979) examined labour supply behaviour using data on individuals from the 1971 Census Public Use Sample

Tapes. This sample provides geographic information by province and urban/rural residence only, consequently the 'opportunity for jobs' index used in this study related to regional rather than local labour markets. The index was constructed by calculating the ratio between the expected number of jobs for women and the total number of women 15 years and older in each province and place of residence. The expected number of jobs for women was derived from the proportion of women in each occupation group in Canada as a whole, and the breakdown of the labour force by occupation in each province and place of residence. This variable was then included with personal and family characteristics, and the provincial unemployment analysis in a probit analysis of married female participation. Somewhat surprisingly in view of the fact that provincial and not local labour market conditions were reflected, the variable was found to be quite strongly significant.

Section 1 suggested, in general terms, why the labour force participation rate should be a matter of concern to planners and policy makers. Having outlined the major determinants of participation at the individual level, including the influence of industrial structure, some more specific reasons may now be given.

A high female participation rate is in no sense necessarily preferable to a lower one. Low participation rates in an area may be a reflection of demographic factors, such as above average fertility or a relatively high proportion of the female population in age groups where participation is low because of retirement or school attendance. They may reflect the prevalence

of traditional values placing a heavy emphasis on domestic and childbearing roles. They may indicate a relatively prosperous society in which those families who can afford to live on one income can afford to do so.

On the other hand, participation rates may be depressed by factors outside the control of the individual, so that women who would like to work are unable to do so. One such factor is a shortage of employment opportunities in aggregate, reflected by the discouraged worker phenomenon; another is the shortage of specific employment opportunities we have termed the industry mix effect. Similarly, participation may be depressed by a lack of necessary skills, by the lack of adequate daycare arrangements, by poor physical accessibility to employment, and so on. Low female participation rates may therefore represent the existence of social and economic problems on several levels. At the individual level, an absence of employment opportunities may represent not only loss of earnings but also of the chances for social interaction and self-realization which may be associated with work outside the home.

At the family level, low female participation arising from 'involuntary' causes may indicate an increased incidence of poverty as well as greater inequalities of income distribution. Since the participation of married women declines with increases in the husband's income, a higher proportion of low income families have more than one wageearner, so that the distribution of family incomes in general indicates less inequality than does the distribution for individuals. Evidence suggests that the majority of wives who work do so largely out of financial need,

while many low income families may be beyond the poverty line only because of the wife's income. (Connelly, 1976; Gunderson, 1976; Armstrong and Armstrong, 1976.)

To the regional economy, a low female participation rate may indicate an underutilisation of resources and, consequently, an overall standard of living falling short of its potential. The loss of purchasing power resulting from involuntary nonparticipation may in itself contribute to a shortage of aggregate demand, further inhibiting the development of employment opportunities, particularly since working women are more likely to create a demand for the services of other women. The problem may thus present characteristics of a 'vicious circle'.

In general, then, low female participation resulting from an unfavourable industrial structure may be thought of as representing a problem of disguised unemployment, with costs analogous to those of open unemployment.

Section 6. Study Objectives.

The direct aims of the research described in the following chapter are as follows:

- (1) To develop a measure of the degree to which the industrial structure of local labour markets is favourable towards the employment of women;
- (2) To measure and compare the influence of industrial structure on the labour force participation of women in different age and marital status groups;
- (3) To investigate whether and to what extent this influence varies between regions;

(4) To investigate whether differences in industrial structure can account for a portion of the previously unexplained variation in participation between regions.

These aims are expressed as specific research hypotheses in the following chapter. In interpreting the results, the aim is to consider how industrial structure, through its influence on participation rates, affects social and economic welfare and, therefore, the policy measures which might be adopted to deal with the effects of an adverse industrial structure.

CHAPTER 2

Methodology And Data DescriptionSection 1. Introduction.

This chapter provides a description of the basic model adopted, the data source and the operational dependent and independent variables.

The next section outlines the general model, together with the specific research hypotheses to be tested. Section 3 discusses the nature of the data and the level of aggregation used for the analysis. The final section defines the proxies used to represent the influences allowed for in the general model.

Section 2. The Model.

The purpose of the study was to examine the influence of industrial structure on female labour force participation in urban areas, while controlling to the extent possible for inter-urban differences in other factors known or thought to influence participation. The technique used was stepwise multiple regression analysis, with the dependent variable the labour force participation rate of the i 'th group of women, groups being defined by age and marital status. The following basic model was used:

$$LFP_i = b_0 + b_1 X_{1i} + b_2 X_{2i} + b_3 C + b_4 R + b_5 IM + u$$

where;

X_{1i} represents those personal, social and demographic factors for the i 'th group which are known to influence

women's willingness to participate;

X_{2i} represents those labour market factors influencing the rewards to participation for the i 'th group;

C, R represent the 'independent' influences of residence factors, defined as city size and region;

IM represents the influence of industrial structure;

u is a statistical disturbance term.

In the first step, labour force participation rates for each group were regressed on proxies representing factors X_1 through R , discussed in the following section. In the second step, the variable reflecting industrial structure was added to the regression. Changes in the explanatory power of the model and in the b coefficients, particularly that of R , were examined, the specific research hypotheses being,

(1) A positive, statistically significant relationship exists between the dependent variables and the variable IM ;

(2) Inclusion of the IM variable will lead to an increase in the explanatory power of the model and a reduction in the apparently independent influence of region on labour force participation.

Separate regressions were performed for the participation rates of all women between the ages of 15 and 64, and for married (including separated), single (never married), and 'other' (widowed and divorced) women in the same age group. In the case of married women, the sample was further divided into three age groups: 15 to 24, 25 to 44 and 45 to 64. This was done to allow for changing influences over the 'life cycle', as well as for attitudinal differences between women in different age

groups. Unfortunately the same breakdown was not possible in the case of single and other women. In many of the smaller areas, the number of such women in any age group was too small for the participation rate to be a meaningful figure, while excluding such areas would have resulted in too small a sample size.

Some comment on the assumptions underlying the model should be made. In general, the use of multiple regression analysis requires that the following assumptions be adopted;

(1) The disturbance terms u are independently distributed with a mean of 0 and a constant variance;

(2) The variables $X_1 \dots X_n$ are fixed (non-random) numbers, linearly related to the dependent variables; no exact linear relationship exists between any of the X variables and their effects are additive.

The extent to which the data justify these assumptions is considered in the following chapter.

Section 3. Data Source.

Data were obtained from the User Summary Tapes made available by Statistics Canada from the 1971 Census. Although more recent data would have been preferable in view of continuing increases in female participation, successive censuses provide the only source of much of the social and demographic information required, while the decennial census gives the only detailed and comprehensive breakdown of the labour force by industry and sex for sub-provincial areas.

Use of aggregate data (participation rates) as opposed to the analysis of individual participation rates--a technique in many ways preferable--was dictated by the fact that the Public

TABLE VIDistribution Of CMAs And Census Agglomerations

	Prairies	Atlantic	Ontario	Quebec	B.C.	Total
CMA's	5	3	9 ¹	3	3	22
Census Agglomerations						
50,000- 100,000	-	2	7	3	-	12
25,000- 50,000	1	3	3	13	6	26
10,000- 25,000	2	8	10	6	5	31
5,000- 10,000	1	3	2	3	1	10
Total	9	19	31	28	15	101

¹Including Ottawa-Hull.

Use Sample Tapes containing detailed information on individual Census respondents do not contain precise geographic identification. An accurate reflection of labour market conditions would therefore be impossible to obtain.

The level of aggregation chosen for the analysis was that of the Census Metropolitan Area and Census Agglomeration. Census Metropolitan Areas (CMA's), of which there are 22, are defined by Statistics Canada as the main labour market area of a continuous built-up area having 100,000 or more population. Known by the name of the largest city, they contain whole municipalities or census subdivisions. The main labour market area, corresponding to a commuting field, includes those municipalities lying within the continuous built-up area or, subject to certain conditions, within a 20 mile radius of the limits of this area.

The Census Agglomeration is defined as,

A statistical area having an urban core of over 1,000 population with an adjacent built-up area of at least 1,000 population and a minimum density of 1,000 persons per square mile. The largest urban area and its adjacent urban core must be in two different municipalities and constitute a continuous built-up area with no separation greater than one mile. The population of the urbanized core must be at least 2,000. Areas with an urbanized core of 100,000 or more are Census Metropolitan Areas.

The distribution of CMA's and Census Agglomerations is shown in Table VI.

Section 4. Description Of Variables.

4.(i) Dependent variables (PRWU65, PRSFU65, PROFU65, PRYGMF, PRMFU65, PRMAMF, PROLMF)

The dependent variables were calculated as the ratio of labour force members to total population in a given group of women. The exact definition of the labour force used in successive censuses has varied somewhat; in 1971, labour force members were defined as

Non-inmates, 15 years and over, who, in the week prior to enumeration, worked for pay or profit, helped without pay in a family business or farm, looked for work, were on temporary lay-off, or had jobs from which they were temporarily absent because of illness, vacation, strike, etc. Persons doing housework in their own home or volunteer work only, are excluded from the labour force. Also excluded are female farm workers who indicated that they worked without pay in a family farm or business for less than 20 hours.

PRWU65, PRSFU65, PROFU65, PRMFU65 refer respectively to the participation rates of all women, single women, other and married women between the ages of 15 and 64. PRYGMF, PRMAMF, PROLMF refer respectively to the participation rates of married women aged 15 to 24, 25 to 44 and 45 to 64.

4(ii) 'Personal' factors

4(iii)a. Education (xxFED12; xxFUNI)

A positive association between education and participation was expected, reflecting both higher potential earnings and a greater 'taste' for market work on the part of more highly educated individuals.

Two sets of variables were used to reflect education levels in urban areas: ALLFED12, YGFED12, MAFED12, OLFED12 measure the percentage of each age group having an education above Grade 11. ALLFUNI, YGFUNI, MAFUNI, OLFUNI measure the percentage of all

women and of each age group having at least some university education.³

4(ii)b. Ethnic Composition (PCTOTH)

This variable was included with no a priori expectations regarding the direction of influence, to allow for the effects of cultural differences. PCTOTH measures the percentage of working age population for whom the 'language most often spoken at home' was neither English nor French.

It was originally intended to include also the percentage of the population which was French speaking, however, the degree of collinearity between this variable and the dummy variable representing Quebec (see section 4(iv)a.) was such as to preclude its use.

4(ii)c. Children (PCTCHDN, PCTNOCH, FERTxx)

A negative relationship was expected between the presence of children and the participation of married and divorced and widowed females. The influence of young children was expected to be the strongest, however, to the extent that raising children involves interruptions to a woman's working experience and consequently to the wage she can expect to earn, an independent negative relationship between children ever born and participation is expected. PCTCHDN measures the percentage of all families in which there is at least one child under the age of 6 years. PCTNOCH measures the proportion of all families in

³ Ideally, age and marital status specific measures of education should be used, since women in one marital status group may have a systematic tendency to have a higher or lower level of education from women in the same age group but with different marital status. However, such measures were not available.

which there are no children under the age of 19 years.

FERTALL, FERTYG, FERTMA, FERTOL measure the number of children ever born per thousand women ever married aged respectively 15 to 64, 15 to 24, 25 to 44 and 45 to 64.

4(iii) Labour market factors

4(iii)a. Female wages (AVFWAG)

A positive relationship between female wages and female participation was expected. No measure of wage rates as such was available, only earnings data being provided. As a rough proxy, to minimise the influence of differences in hours and weeks worked, the average earnings of women who worked full-time for between 40 and 52 weeks during the preceding year was used.

4(iii)b. Male income (AVEMMY)

A negative relationship between male income and female participation was expected for married women and, tentatively, for other women. AVEMMY measures the average income (from all sources) of married men during the preceding year.

4(iii)c. Unemployment (FUR, MUR, PCMFT70)

Three variables were used to represent the influence of unemployment on participation. FUR measures the percentage of the female labour force unemployed during enumeration week; a negative association, representing discouraged worker behaviour, was expected. The coefficient of MUR, the percentage of the male labour force unemployed, may reflect both added and discouraged worker effects; there were therefore no firm expectations regarding its sign.

PCMFT70 measures the percentage of the male experienced labour force which worked between 40 and 52 weeks in 1970. This

variable was intended as an indicator of long-term labour market conditions, reflecting the extent of persistent and seasonal unemployment. Male rather than female unemployment was used to minimise the extent to which periods spent voluntarily outside the labour market were reflected. Again, the direction of influence could be positive or negative. To the extent that a generally poor or highly seasonal labour market deters female participation, a positive association reflecting discouraged worker behaviour would be expected. To the extent that interruptions in male employment induce women to enter the labour market, a negative association indicative of added worker behaviour was expected. However, since the latter effect will already be reflected by the variable AVEMMY, covering the same period, PCTMFT70 is likely to be more sensitive to discouraged worker effects.

4.(iii)d. Schooling (PCSCHFT)

Since for a large number of young women the major alternative to market work is continued education, it was thought necessary to control for this factor, even though the decision to stay in school may itself be influenced by labour market factors. A negative association is expected between participation and PCSCHFT , which measures the percentage of all women aged 15 and over receiving full-time education.

4.(iv) Residence factors

4.(iv)a. Region (DATL, DQUE, DPRA, DEC)

To account for unexplained regional differences in tastes, cultural factors and other influences not explicitly allowed for, dummy variables were included. Thus, DATL is set equal to 1

for areas in the Atlantic provinces, to 0 otherwise. The influence is assumed to be independent of the independent variables explicitly included, and so the coefficient is interpreted as the difference in the intercept of the regression line relative to the base case--in this instance, Ontario. Prior work would suggest, at least for married women, a negative sign for the coefficients of DATL, DQUE and to a lesser extent, DBC.

4(iv) b. City_size (DCMA, D2550, D1025, D510)

Similarly, four dummy variables were used to reflect the 'independent' influence of city size, the reference case being a census agglomeration with 50,000 to 100,000 population.

4(v) Industrial structure (INDMIX)

A positive association between female participation and the extent to which an area's industrial structure is oriented towards the employment of females was expected. Since the actual proportion of total employment (or labour force) which is filled by women will be influenced by a variety of factors besides industrial structure, including, of course, the participation rate itself, an independent measure was required. The measure used was that developed by Bowen and Finegan (1969). Canada's total experienced labour force was divided into 26 industry groups, and the proportion of the labour force which was female in each industry group was calculated. For each city, the actual (male plus female) labour force in each industry group was multiplied by this ratio, and summed across industry groups. This total was divided by the area's total experienced labour force, and expressed as a percentage. This index value may be thought of as the proportion of females in the total labour

force of an area expected on the basis of that area's industrial structure.

CHAPTER 3

ResultsSection 1. Introduction.

This section presents the results of the series of regressions which were carried out as described in the previous chapter.

Section 2 discusses the results of estimating the basic model, with and without inclusion of the industry mix variable. On the whole, these results proved disappointing, only slight support being provided for the hypotheses. The third section therefore considers possible explanations for the generally poor performance of the industry mix variable which are consistent with an underlying influence of industrial structure on labour force participation. It also describes briefly the results of alternative specifications of the model which were estimated in order to investigate the validity of these explanations.

Section 3 summarises the conclusions which may be drawn from the analysis, making comparisons, where relevant, with previous work on female labour force participation.

Section 2. The Basic Model.

The results of the estimation of the basic model, without inclusion of the industry mix variable, are summarized in Table VII. The regressions showed moderately high R squares, mainly in the range from .8 to .9, except in the case of single women, where it was considerably lower (.68). The performance of each set of variables in the Step 1 regression is discussed briefly, before the effects of adding the variable INDMIX are commented on.

TABLE VII

Results of Step 1 Regression: Excluding INDMIX

	All Women 15-64	Married Women 15-64	Single Women 15-64	Other Women 15-64	Married Women 15-24	Married Women 25-44	Married Women 45-64
DATL	-4.032* (4.66)	-4.761 (3.57)	-3.182 (1.15)	2.675 (0.41)	-9.458* (8.12)	-5.812* (6.61)	-1.074 (0.13)
DQUE	0.184 (0.02)	-4.189* (4.65)	5.618* (5.58)	-8.046* (6.20)	-3.414 (1.55)	-5.505* (6.46)	-0.238 (0.01)
DPRA	-4.515* (8.28)	-4.351* (4.23)	-5.161* (4.21)	-1.414 (0.16)	-1.180 (0.17)	-4.755* (5.12)	-1.518 (0.37)
DBC	-5.580* (17.64)	-6.648* (13.77)	-3.981 (3.64)	1.731 (0.34)	-5.584* (5.60)	-7.151* (15.65)	-2.152 (1.15)
DCMA	0.065 (0.00)	-0.549 (0.15)	0.663 (0.14)	-1.570 (0.45)	-1.364 (0.43)	-0.615 (0.18)	-0.573 (0.10)
D2550	0.858 (0.65)	-1.382 (0.93)	0.020 (0.00)	0.295 (0.02)	-0.459 (0.05)	1.446 (0.98)	1.042 (0.34)
D1025	0.979 (0.86)	2.287 (2.58)	-1.729 (1.03)	1.745 (0.54)	-2.687 (1.61)	2.114 (2.08)	3.139 (3.20)
D510	-6.808* (25.61)	-7.097* (15.31)	-6.506* (8.53)	0.172 (0.00)	-14.011* (25.12)	-8.698* (22.23)	-4.057 (3.10)
MUR	-0.130 (1.09)	-0.286 (2.92)	-0.036 (0.04)	-0.257 (0.85)	-0.492 (3.97)	-0.319 (3.51)	-0.347 (2.71)
FUR	-0.741* (24.82)	-0.751* (14.02)	-0.166 (0.54)	-0.648 (3.77)	-1.078* (15.64)	-0.633* (10.11)	-0.913* (14.76)
PCMFT70	-0.064 (0.57)	0.008 (0.01)	-0.002 (0.00)	0.895* (21.97)	0.077 (0.29)	0.060 (0.31)	0.035 (0.06)
AVFWAG	-0.002 (2.39)	0.000 (0.04)	-0.005* (6.28)	0.004 (1.61)	0.002 (0.78)	0.001 (0.20)	0.000 (0.01)
AVEMMY	-0.003* (16.59)	-0.004* (16.54)		-0.004* (6.55)	-0.003* (6.67)	-0.004* (15.42)	-0.004* (11.97)
PCSCHFT	-0.523 (2.78)	-0.371 (0.77)	-1.907* (29.38)	-1.262 (3.23)	-0.739 (2.78)	-0.446 (1.87)	0.613 (1.92)
PCTCHDN	0.093 (0.43)	0.018 (0.01)		-0.168 (0.28)	-0.097 (0.14)	-0.018 (0.01)	0.347 (1.43)
PCTNOCH	-0.151 (0.20)	-0.186 (0.17)		-0.443 (0.34)	-0.118 (0.03)	-0.069 (0.02)	-0.438 (0.53)
FERTxx	-0.006* (7.65)	-0.006* (4.13)		-0.004 (0.53)	-0.015* (5.33)	-0.004 (2.52)	-0.009* (13.64)
PCTOTH	0.115* (4.67)	0.117 (2.64)	0.161 (3.49)	0.007 (0.00)	-0.137 (1.62)	0.139 (3.85)	0.128 (1.62)
xxFED12	0.438* (25.57)	0.445* (14.47)	0.193 (2.33)	0.475* (5.97)	0.117 (1.15)	0.372* (15.72)	0.459* (7.21)
xxxFUNI	0.495* (4.56)	0.287 (0.84)	1.464* (15.69)	0.386 (0.55)	0.755* (8.48)	0.103 (0.20)	-0.104 (0.06)
CONSTANT	93.047	84.419	85.085	44.626	96.796	75.796	77.341
R ²	.898	.876	.680	.873	.781	.858	.859

FIGURES IN PARENTHESES SHOW F VALUES; COEFFICIENTS MARKED '*' ARE SIGNIFICANT AT 5%.

Considering first the 'personal' variables, both sets of education variables showed, with only one exception, the expected positive relationship with participation. The variables xxFED12, reflecting the proportion of a given group with education above Grade 11 were significant at the 5% level for all groups except single women and young married women. Conversely, the variables xxFUNI, reflecting the proportion with some university education were significant only for these groups in the disaggregated regressions. This result is not surprising in view of the generally higher level of educational attainment among younger women who of course, form also the majority of single women.

The coefficient of the ethnic composition variable PCTOTH was positive in 6 of the 7 cases, suggesting, other things being equal, higher participation by women from backgrounds other than French or English speaking. It was significant at the 5% level for women as a whole, but not in any of the disaggregated regressions, though significant at the 10% level for single women and married women in the middle age group.

The variables FERTxx measuring the number of children born to ever-married women showed the expected negative sign in each of the regressions in which they appeared. They were significant at 5% for women as a whole and for married women as a whole, and for young and older married women, but not for other women or, rather surprisingly, for married women in the middle age group. The performance of the other variables reflecting child status was uniformly poor. PCTCHDN was in no case significant and showed an unexpected positive sign in 3 of the groups. PCTNOCH,

again not significant, showed an unexpected negative sign in every case. These surprising results are attributed partly to collinearity between the variables, making the separate effects hard to distinguish, partly to the fact that they were not age specific. PCTNOCH may therefore be reflecting the age structure of the population and be only loosely related to the presence of children within any age group.

Considering next the labour market variables, male income, AVEMMY, showed the expected negative sign and was significant in each case. However, the performance of the female wage variable AVFWAG was puzzling. In no case was the sign significantly positive, and in 2 of the 7 groups, women as a whole and single women, it showed an unexpected negative sign, which, for the latter group, was significant at 5%. It would not be appropriate to draw from this the conclusion that participation is unaffected by, or responds negatively to, changes in wage rates. There are several reasons why these results may be consistent with an underlying positive influence of wages on individual participation. AVFWAG, representing as it does earnings rather than wages as such, is a poor proxy for the average wage rate. Intercity differences in weeks worked within the range 40 to 52 would cloud the relationship between wages and earnings, and, if there were a systematic tendency to work fewer weeks with higher average wages, would impart a downward bias to the coefficient. It may be that real rather than money wages would be more appropriate. No correction was made for inter-city cost of living differences which, if positively related to money wages, would again lead to a downward bias to our estimate of the

influence of wages on participation. Even without these problems, the average wage rate might itself be a poor indicator of the potential wages faced by inhabitants of an area, particularly if the distribution of wages is highly skewed, or if the characteristics of women working full time, on whom the variable is based, differ systematically from those of the remainder. Thus a weak relationship between participation and our measure of wage rates is not really surprising.

The effects of collinearity should also be pointed out. A strong simple correlation between male income and female earnings was apparent. This was to be expected, and would be absent only if men and women faced fully separate labour markets. However, it does make the separate effects of the variables difficult to distinguish. Omitting the male income variable led to a significant negative coefficient for AVFWAG in every case but one, reflecting the influence of the omitted variable and confirming its stronger influence. It was also suspected that the wage variable might itself be reflecting the influence of industrial structure. Since the major female industries are predominantly low wage, a negative correlation between the female orientation of industry and both AVEMMY and AVFWAG was expected, and was evidenced by negative, although not particularly large, simple correlations between INDMIX and both of these variables. Thus wage and industry effects might be offsetting. However, subsequent addition of the variable INDMIX showed that the number of cases in which the coefficient of AVFWAG was negative actually increased when this factor was controlled for. The significant negative coefficient obtained in

the regression for single females is also hard to explain since, although AVEEMY was omitted from this equation for theoretical reasons we have no reason to expect this omitted variable to influence strongly the participation of single women. We can only suggest that the negative sign reflects a tendency to substitute education and other non-market activities for market work in areas of general prosperity, and that, for some reason, this is not adequately reflected by inclusion of the variable PCSCHFT.

Of the other labour market variables, the female unemployment rate FUR showed the expected negative sign for all groups and was significant at the 5% level for women as a whole and for each of the married groups. The male unemployment rate MUR was also negative in each group. It was nowhere significant at the 5% level but was significant at 10% for each group of married women except those over 45. PCTMFT70 showed a positive sign in all cases except that of women as a whole, however, it was significant only for other women, where it was strongly so. We thus find no evidence of any net added worker behaviour, and considerable support for the existence of a net discouraged worker effect.

PCSCHFT, as expected, showed a negative association with participation which was significant at 5% for single females only.

Finally, we consider the performance of those variables reflecting residence factors. Region of residence proved a significant influence on participation for all groups except for older married women. Residence in the Atlantic provinces was

associated with lower participation by women as a whole, by single women and by each group of married women; for other women, the effect was positive, although not significantly so.

Residence in Quebec was also associated with lower participation by married women, particularly in the middle age group, and by widowed and divorced women. For single women, the effect was significantly positive; it was also positive, though small, for women as a whole, presumably reflecting an above average concentration of high participation single women.

Location in the Prairie provinces was associated with lower participation relative to the base case of Ontario, for each of the 7 groups. The effect was significant for four groups: all women, single women and married women in aggregate and in the middle age group.

The influence of British Columbia was also generally negative, the coefficient being negative for all groups except other women, and significant for women as a whole and for each group of married women except those over 45.

Of the variables reflecting city size, only that representing a Census Agglomeration with population of 5,000 to 10,000 showed significant differences relative to the base case, a Census Agglomeration with population of 50,000 to 100,000. In this case, a strong negative influence was exerted on participation for all groups except other women. The signs on the coefficients of the other dummy variables varied between groups, but these were in no case significant. Somewhat surprisingly, in 5 out of the 7 groups, the sign on the coefficient of the CMA dummy variable was negative, while those

on D2550 and D1025 were each positive in most of the groups. However, these effects were in general slight.

Calculation of the industry mix variable INDMIX showed a range between 22.5 (Labrador City, Nfd.) and 45.2 (Magog, Que.), with an overall mean of 33.8. The distribution of values by city size and region is shown in Table VIII. There was a general tendency for lower values to be associated with smaller urban areas, while, overall, the values were highest in Quebec and lowest in British Columbia.

The results of adding INDMIX to the basic model are shown in Table IX. The coefficient of INDMIX was positive for every group, but was significant at the 5% level only for women as a whole, which would seem to suggest that, although industrial structure does have some influence on participation, its independent contribution is relatively minor and, for the disaggregated groups, is outweighed by other factors and by random influences. Increases in R squares were negligible, and our expectations of a general reduction in the magnitude and significance of the regional dummy variables were fulfilled only to a limited extent. In the case of the Atlantic provinces, the Prairies and British Columbia, addition of INDMIX did bring about some reduction in those cases, the majority, where coefficients were negative. There was a slight increase in the magnitude and significance of the positive coefficients for other women in B.C. And the Atlantics. This suggests that the negative regional effects are partly reflecting industry mix effects and, where the influences are positive, they are so despite an unfavourable industrial structure, so that the

TABLE VIIIDistribution Of Variable INDMIX.

	Prairies	Ontario	Quebec	Atlantic	B.C.	Total
CMA's	35.3 (1.7)	33.2 (2.9)	35.5 (1.9)	35.5 (1.3)	35.1 (1.7)	34.6 (2.3)
Census Agglomerations:						
50,000- 100,000	-	34.8 (4.0)	37.6 (3.5)	31.7 (1.5)	-	35.0 (3.9)
25,000- 50,000	34.9 (0.0)	31.6 (2.8)	35.8 (4.2)	34.3 (3.9)	30.5 (3.5)	33.9 (4.3)
10,000- 25,000	33.7 (11.4)	33.9 (3.2)	35.8 (6.9)	33.2 (5.0)	29.2 (2.3)	33.3 (5.1)
5,000- 10,000	26.0 (0.0)	32.2 (4.5)	32.9 (2.9)	33.5 (3.7)	29.9 (3.7)	32.0 (0.0)
Total	33.9 (5.1)	33.6 (3.2)	35.6 (4.3)	33.6 (3.9)	30.6 (3.3)	33.8 (4.1)

Figures in parentheses show standard deviations.

Results of Step 2 Regression: Including INDMIX

	All Women 15-64	Married Women 15-64	Single Women 15-64	Other Women 15-64	Married Women 15-24	Married Women 25-44	Married Women 45-64
DATL	-2.716 (1.95)	-4.155 (2.40)	-2.988 (0.96)	4.181 (0.89)	-8.616* (6.59)	-4.838 (3.98)	-0.674 (0.05)
DQUE	-0.311 (0.05)	-4.417* (4.98)	5.496* (5.14)	-8.612* (6.90)	-3.683 (1.81)	-5.634* (6.77)	-0.697 (0.06)
DPRA	-4.216* (7.43)	-4.213 (3.90)	-5.159* (4.16)	-1.072 (0.09)	-1.120 (0.15)	-4.395* (4.28)	-1.688 (0.45)
DBC	-5.028* (14.26)	-6.394* (12.13)	-3.815 (3.11)	2.361 (0.60)	-5.343* (5.15)	-6.484* (11.59)	-2.119 (1.11)
DCMA	0.178 (0.03)	-0.498 (0.12)	0.703 (0.16)	-1.443 (0.38)	1.229 (0.35)	-0.554 (0.15)	-0.486 (0.07)
D2550	1.241 (1.37)	1.558 (1.13)	0.078 (0.00)	0.733 (0.09)	-0.069 (0.00)	1.756 (1.40)	1.394 (0.58)
D1025	1.434 (1.83)	2.497 (2.92)	-1.692 (0.98)	2.267 (0.87)	-2.166 (1.02)	2.336 (2.50)	3.624 (3.90)
D510	-5.441* (13.49)	-6.467* (10.02)	-6.237* (7.07)	1.737 (0.26)	-12.485* (17.40)	-7.559* (12.76)	-2.980 (1.32)
MUR	-0.092 (0.56)	-0.269 (2.50)	-0.032 (0.03)	-0.214 (0.58)	-0.433 (3.02)	-0.289 (2.80)	-0.313 (0.21)
FUR	-0.645* (17.69)	-0.707* (11.17)	-0.148 (0.40)	-0.538 (2.36)	-0.934* (10.33)	-0.555* (6.92)	-0.819 (0.26)
PCMFT70	-0.059 (0.50)	0.011 (0.01)	0.010 (0.01)	0.901* (22.26)	0.065 (0.21)	0.072 (0.46)	0.027 (0.04)
AVFWAG	-0.002 (3.22)	0.000 (0.02)	-0.005* (5.52)	0.004 (1.31)	0.001 (0.25)	0.001 (0.10)	-0.000 (0.00)
AVEMMY	-0.002* (4.31)	-0.003* (7.93)		-0.003 (2.02)	-0.002 (1.63)	-0.003* (4.67)	-0.003* (6.59)
PCSCHFT	-0.450 (2.11)	-0.338 (0.63)	-1.879* (26.43)	-1.179 (2.78)	-0.627 (1.96)	-0.392 (1.41)	0.662 (2.20)
PCTCHDN	0.031 (0.05)	-0.011 (0.00)		-0.239 (0.55)	-0.177 (0.43)	-0.075 (0.16)	0.339 (1.36)
PCTNOCH	-0.273 (0.65)	-0.241 (0.27)		-0.584 (0.57)	-0.251 (0.14)	-0.013 (0.08)	-0.497 (0.67)
FERTxx	-0.006* (6.42)	-0.006 (3.69)		-0.003 (0.35)	-0.012 (3.17)	-0.003 (1.23)	-0.009* (13.98)
PCTOTH	0.145* (7.16)	0.131 (3.04)	0.167 (3.54)	-0.042 (0.11)	-0.103 (0.87)	0.164* (4.88)	0.145 (1.99)
xxFED12	0.424* (24.74)	0.438* (13.87)	0.187 (2.13)	0.459* (5.54)	0.099 (0.82)	0.356* (14.04)	0.458* (7.14)
xxFUNDI	0.311 (1.61)	0.202 (0.36)	1.438* (14.26)	0.175 (0.10)	0.645* (5.70)	-0.019 (0.00)	-0.176 (0.15)
INDMIX	0.258* (4.12)	0.112 (0.46)	0.054 (0.10)	0.295 (1.03)	0.344 (1.89)	0.219 (1.21)	0.176 (0.84)
CONSTANT	78.200	77.584	81.612	27.636	79.079	60.505	69.017
R ²	.903	.877	.680	.875	.786	.860	.860

FIGURES IN PARENTHESES SHOW F VALUES; COEFFICIENTS MARKED '*' ARE SIGNIFICANT AT 5%.

regional effect here becomes stronger once this factor has been allowed for. In the case of Quebec, the reverse was true. For women as a whole, the sign on the dummy variable changed from positive to negative, while the positive influence on single women was reduced and the negative influences indicated for each group of married and other women were increased. It seems therefore as though the negative influences on the participation of these women in Quebec occur despite its favourable industrial structure.

It must be stressed, however, that these changes are very small, in most cases less than one percentage point. In only three cases would addition of INDMIX cause a coefficient formerly significant at 5% to appear insignificant at this level. It would therefore hardly be justified to draw any firm conclusions from these results.

Section 3. Shortcomings Of The Analysis.

This section considers the extent to which shortcomings in the data and methodology may account for the rather disappointing results which were obtained.

Firstly, we consider how far the data justified the use of a linear regression model, examining evidence related to the assumptions of homoskedacity, linearity and the independence of the explanatory variables.

A visual examination of the pattern of residual terms showed some evidence of heteroskedacity, that is, of unequal variances. The variance appeared considerably larger for the smaller urban areas. This is hardly surprising, since the smaller the number of individuals on which the calculation of

participation rates is based, the greater will be the influence of random factors. Heteroskedacity does not, in general, bias the estimates of coefficients, but does lead to estimates which are inefficient, that is, estimates which have an unnecessarily large standard error. Heteroskedacity which follows this kind of pattern may be corrected for by weighting each observation proportionately to the square root of the factor which is inversely associated with variance. The model was therefore adjusted by giving each case a weight proportional to the square root of the adult female population. The results from this set of regressions are presented in Appendix 1a. Apart from a slight increase in the overall explanatory power of the regressions, the results were effectively identical with those of the basic model. INDMIX was again significant only in the case of women as a whole.

The assumption of a linear relationship between the dependent and independent variables implies that a given change or difference in the level of an independent variable will have an equal effect whatever the level of that variable. Plotting the values of each independent variable against the dependent variables showed no obvious violations of the linearity assumptions. Using the logarithm of INDMIX as the independent variable, which would imply an underlying curved relationship between INDMIX such that a given absolute change is relatively more important at lower levels, we again obtained very similar results, INDMIX being once more significant only for women as a whole. (Appendix 1b.)

The problem of multicollinearity has already been alluded

to. Multicollinearity exists when an independent variable is linearly related to one or more of the others. In the extreme case, where the relationship is perfect or almost so, coefficients cannot be computed. In less extreme cases, the following may result;

- (1) The coefficients will tend to have very large standard errors, leading to inaccurate estimates and to the appearance of insignificance even where an underlying relationship is strong;

- (2) While either one of two related variables may singly appear significant, if both are included one or both may appear insignificant.

- (3) Relatively small modifications to the data or to the structure of the equations may bring about large changes in the coefficients.

The effect of multicollinearity is, then, to make the separate effects of each variable difficult to distinguish. As mentioned in the previous section, this led to problems with the wage and income variables. Although none of the simple correlation coefficients between INDMIX and the other independent variables were large enough to give cause for concern, the linear relationship between it and the set of other independent variables, obtained by regressing INDMIX on the other variables, was strong, the negative association with the male income variable being particularly significant. There were also fairly strong relationships with the dummy variables representing British Columbia, the Atlantic provinces and the set of Census Agglomerations with populations of 5,000 to

10,000--an inevitable reflection of the industrial structure of these areas.

To test for the existence and effects of multicollinearity, further regressions were run omitting, firstly, AVEMMY, secondly, the regional dummy variables and thirdly the city size dummy variables. The results of these regressions, which are shown in Appendices 1c through 1e, are quite striking. Omission of AVEMMY resulted in a significantly positive coefficient for INDMIX in each of the regressions. Omission of the regional dummies increased the significance of INDMIX generally, making it significant at 5% for married women in the middle age group and at 10% for young married women. It was also significant for single women, though we suspect the latter association to be a largely spurious one reflecting the higher participation by single women in Quebec, which does not necessarily result from its more favourable industrial structure.

When the city size dummy variables were excluded, INDMIX again proved significant for women as a whole and for each group of married women except for those of 45 and over, for whom, it will be recalled, city size factors were themselves not important.

We interpret these results as suggesting that the underlying relationship between industrial structure and female labour force participation may be partly masked by its close association with other variables. The fact that in the absence of dummy variables industrial structure becomes quite strongly significant also suggests that, in the original specification, the coefficients of these dummy variables were partly reflecting

industrial structure. That, in the basic model, they remained significant when INDMIX was added implies the influence of other factors as well, so that the dummy variables provided a more powerful explanation than INDMIX alone. Because of the strong association between these variables, INDMIX itself therefore appeared largely insignificant.

Thus we again find some support for our hypotheses, although an estimation of the magnitude of the independent effects of industrial structure cannot be arrived at.

Next, we consider the possibility that weaknesses--either conceptual or methodological--in the variable INDMIX used to represent industrial structure may themselves have contributed to our somewhat inconclusive results. There are three possible sources of distortion; unfortunately, given the existing data, it is difficult to do more than speculate on the degree of error which may have been introduced by these weaknesses.

Firstly, the measure was based on the inter-industry distribution of the experienced labour force rather than of employment as such. The experienced labour force--which differs from the total labour force by the exclusion of those members who had never worked or who last worked prior to January 1 1970--includes unemployed as well as employed and is therefore an imperfect indicator of industrial structure. So long as unemployment is distributed approximately equally between industries, this is not important. If, however, unemployment were systematically higher in some industries, or if an industry's share of total regional unemployment differed systematically between regions, then a source of bias is

introduced. Higher unemployment in industries with a high proportion of females will lead to an overestimate of the favourableness of industrial structure, which will be greater the larger the proportion of an area's labour force is employed in that industry. The coefficient would then be lower than it would if a true measure were used. If unemployment were relatively higher in male-dominated industries, the reverse would be the case. It does not seem unreasonable to suppose that such errors would be largely offsetting and the net effect relatively minor.

Secondly, there is the possibility of aggregation bias. If within an industry there are two sub-sectors the first of which employs a higher proportion of females than the second, then the use of aggregate sector data will lead us to underestimate the favourableness of industrial structure in an area specialising in the first and to overestimate it in one specialising in the second.

Related to this, there may be intercity differences in the occupational composition of an industry's labour force, which will not be reflected by our measure. There may, for example, be a tendency to underestimate the favourableness towards female employment of C.M.A.'s because of what might be termed the head office effect: a relatively high demand for female clerical and administrative workers in industries which are, overall, male dominated. In both these instances, INDMIX will be an imperfect indicator and the true relationships will be to some extent clouded.

Thirdly, it may be that the response to industrial

structure varies systematically between regions. If in some regions employers are more willing to hire women, and women to be hired, outside the traditional occupations and industries, then we would expect the effects of industrial structure to be less marked there. Estimating its effects for the country as a whole will therefore lead to poor results. We allowed for this possibility by creating interaction terms between INDMIX and each of the dummy variables. The coefficients of these variables, INDATL, INDQUE, INDPRA, INDBC, represent differences in the response to industrial structure, or slope of the regression line, between each region and the base case of Ontario, a positive coefficient indicating greater, and a negative one lesser responsiveness. The results of adding these terms to the basic model are indicated in appendix 1 f.

The coefficient of INDATL was positive in every case but one, that of single women, and was significant at 5% for women as a whole. That of INDQUE was negative in every case except that of single women, and was significant for married women as a whole and in the middle age group. The coefficient of INDBC was negative for women as a whole and for each group of married women, but was significant in no case, while that of INDPRA showed no clear pattern.

Thus there is some indication that women in the Atlantic provinces are more readily deterred, and women in Quebec less so, by an unfavourable industrial structure. However, this interpretation should be made very cautiously in view of the problems of collinearity. The simple correlation coefficient between each of the dummy variables and its corresponding

interaction term was in the order of .99. The standard errors of the dummy variables became very large when the interaction terms were added, so that they remained significant in only 2 cases. Many of the signs changed and it was noticeable that a positive coefficient for the dummy variable was in every case matched by a negative sign on the corresponding interaction term, and vice versa. Moreover, when the dummy variables were omitted from the model, the coefficients for the interaction terms became quite different. (Appendix 1g.) The coefficients of the interaction terms were, in terms of size and significance, virtually identical with those of the simple dummy variables in the basic model, so that it was clearly regional differences in factors not specifically included being reflected rather than genuine differences in response.

Thus while we cannot rule out the possibility of a response differing systematically between regions, nor can we draw any firm conclusions.

Section 4. Summary Of Results And Relation To Previous Studies.

In this section, we summarise and comment on the results outlined above, and draw comparisons with previous studies.

Our 'personal' variables, used primarily as controls, require little comment. They showed the expected results with the exception of the poor performance of the aggregate child status variables. The finding of a positive association between participation and the proportion of the population neither English nor French speaking conforms with the results of Swidinsky (1969) and Skoulos (1970), though contrasting with those of Kunin (1970).

The demonstration of a dominant discouraged worker effect is, too, in conformity with the majority of Canadian cross-section studies. Considerable differences were found in the response to unemployment of the groups of women by different marital status. The response was least by single women and greatest by married women, particularly those in the 15 to 24 age group. This finding contrasts with the cross section study by Swidinsky, which showed the greatest response by single women. This difference may perhaps be attributed to a decline in the prevalence of offsetting added worker behaviour by married women by 1971, which would be consistent with the results obtained by Gunderson (1977), which demonstrated no evidence of this behaviour. Our inclusion of a variable reflecting the proportion in school would also tend to lessen the apparent sensitivity of single women.

Widowed and divorced women showed little responsiveness to unemployment, but, alone among the groups, were highly sensitive to our measure of the overall stability of unemployment, suggesting that, while more flexible than single women in their labour market attachment, they leave the labour force less readily than married women in response to current unemployment.

The lack of a significant positive response to the level of female wages seems to be without precedent. While, for reasons explained in section 2, this result cannot be used to draw inferences regarding individual behaviour, a similar aggregate measure was used by both Swidinsky and Skoulos, with the expected positive results. This difference may perhaps reflect a real weakening in the influence of wages since those studies

were carried out, or may merely indicate that for some reason the problems associated with its estimation have increased. Turning to the area of major interest, our analysis confirmed the existence of an influence of industrial structure on female participation, an influence in the expected direction, with the groups showing the most consistent response being married women in the 15 to 24 and 25 to 44 age groups. It provided some evidence to suggest that part of the 'unexplained' regional influence on participation, particularly the negative influence of the Atlantic provinces, may be attributed to industrial structure, and that, in addition, participation rates in the Atlantic provinces may be particularly sensitive to industrial structure. However, it is clear that other factors are also being reflected in regional differences, and, in particular, in the negative influence of Quebec despite its favourable industrial structure.

The close association between our measure of industrial structure and other variables made it impossible to estimate with any accuracy the relative importance of the effect of industrial structure; we can, however, assert that it appeared to explain less of the variation in participation rates than the level of education or, for married women, the more conventional measure of labour demand.

In the first chapter, we cited several instances where measures of industrial structure proved consistent and significant in explaining variations in female participation. The relatively poor performance of our variable therefore requires some comment. The stronger influence estimated for the

similar measure by Bowen and Finegan in their 1969 study may well reflect genuine behavioural differences between the United States in 1960 and Canada in 1971, stemming from a lesser degree of labour market segregation in the second instance. On the other hand, when either set of dummy variables were omitted from our analysis, the results were not dissimilar.

The poor performance of our measure relative to that used by Skoulos, representing the proportion of the labour force in white collar occupations may again be reflecting a lessening of the influence of industrial structure since 1961. Alternatively, it may reflect differences in the formation of the variable or in the level of aggregation at which the analysis was performed--in Skoulos's case, cities, towns and municipal subdivisions. Our measure should be 'superior' in both respects, in that it reflects the entire range of industrial structure rather than merely a white collar/other dichotomy, and in that it reflects conditions within an area which approximates a labour market rather than an administrative division. By using occupational rather than industry-based data Skoulos' measure will pick up the 'head office effect'; in doing so, it may also be that his measure reflects attitudinal influences rather than a 'pure' employment opportunity effect.

Nakamura et al (1979) used 1971 Census data, so that the possibility of a genuine shift in the influence of industrial structure does not arise. The greater significance of their 'opportunity for jobs' index may be in part attributable to their use of individual data, with a dichotomous dependent variable reflecting labour force participatio. Many of the

problems of multicollinearity involved when aggregate data were used would therefore be absent, which may have more than compensated for their use of province-wide rather than urban area data. It may also be that, since they did not control for 'independent' regional influences, their measure of job opportunities is reflecting these effects. The 'perverse' effects of residence in Quebec, with its low participation despite favourable industrial structure, would be largely reflected in the negative coefficients which resulted for dummy variables reflecting religion (Roman Catholic) and language (French); it may therefore be that their variable is picking up the kind of miscellaneous influences which, in our analysis, were reflected by the regional dummy variables.

CHAPTER 4

ConclusionsSection 1. Introduction.

The results described in the previous chapter showed that, while a consistent positive association between the female labour force participation rate in a labour market and the extent to which that labour market's industrial structure is oriented towards the employment of females was indicated, this factor did not appear to be a major influence. In explaining the variation in participation rates, its performance proved inferior to that of the already well-documented influences of education, aggregate labour demand and, for married women, fertility and male income. Furthermore, allowing for differences in industrial structure did not significantly reduce the role of the 'independent' influence of region on participation rates, although we showed that, with the exception of Quebec, there was evidence to suggest that the regional influences on the participation of married women were partly reflecting industrial structure. We also showed that statistical problems--both weaknesses in the actual proxies used to represent the various influences, and the prevalence of collinearity between these proxies--may have been, in large part, the cause of these rather disappointing results. Thus the overall conclusion is, not that women's participation is little affected by industrial structure, but that the influence appears to be such as is not readily reflected by an aggregate, cross-section study of this type.

The issue examined was a fairly narrow one though, as the first chapter pointed out, it has considerable implications for welfare, and consequently for planning and policy making, at various levels. Even had the results provided more support for the hypotheses, it would still have been necessary to point out a number of caveats before making such inferences, while, given the inconclusive nature of the results, any discussion of policy issues must necessarily be limited to general terms. In the following section, therefore, we firstly consider these caveats and, secondly, place the issue in the wider context by discussing the two broad strategies which might be used to combat the influence of unfavourable industrial structure on participation. In the final section, some suggestions are offered for further data collection and research which might lead to a greater understanding of the issue.

Section 2. Policy Strategies.

It was stressed in the first chapter that a higher participation rate should not automatically be assumed preferable to a lower one. The issue should not be how to raise the participation rate within an area for its own sake, but rather how to deal with those factors presenting involuntary constraints on participation.

To the extent that industrial structure does present such a constraint, it may be only one of a number of factors. Its relaxation will bring about a desired increase in participation only to the extent that other conditions such as child-care facilities, training provisions, physical mobility and the level of aggregate demand permit women to respond.

While the influence of industrial structure has been viewed in terms of its influence as a factor encouraging or inhibiting participation, it must be remembered that the participation rate itself is a crude measure, giving no indication of the extent to which labour force members are fully employed. A high participation rate within a labour market may still be combined with problems of high unemployment or underemployment, the latter either in the form of women working part-time who would prefer full-time work, or of women employed in work below their capability and preference.

Bearing in mind these factors, if the segregation of women into jobs in certain industries and occupations results in involuntary non-participation where an area is under-endowed with such jobs, then, logically, there are two ways to combat this state of affairs: by encouraging the provision of such jobs, or by breaking down the segregation through encouraging entry into other types of employment.

To the extent that this second approach is encompassed by broader anti-discrimination and equal opportunity measures, it has long been an object of government policy. In 1964, the Federal Government ratified an International Labour Convention concerning discrimination in respect of employment and occupation, imposing the obligation to

...pursue a national policy of promoting equality of opportunity and treatment in respect of employment without discrimination on a number of grounds, including sex.

(Women's Bureau, 1974, p.24.)

The Employment Convention ratified two years later called for policy designed to promote full, productive and freely chosen employment, such that

The fullest possible opportunity should be provided for each worker to qualify for and use individual skills in a job, irrespective of sex.
(Labour Canada, 1979, p.5.)

The Canadian Human Rights Act passed in 1977 prohibits discrimination in employment or employment policies, including advertisements relating to employment. By 1979, each province and territory had passed similar legislation, though varying somewhat in coverage. The Royal Commission on the Status of Women was established in 1967, its basic terms of reference 'to recommend what steps might be taken by the Federal Government to ensure for women equal opportunities with those of men'. Its recommendations covered a wide range of issues under federal jurisdiction, including the taking of measures to reduce sex-typing within the Civil Service. (Royal Commission on the Status of Women in Canada, 1970).

Following the publishing of this report, a Federal Government minister was given responsibility for the Status of Women. This office, in 1979, published a Plan of Action which contained the first significant commitment to affirmative action, the three basic principles being,

(a) All persons should enjoy equal rights, opportunities and responsibilities without regard to differences of sex and marital status, and these rights should be protected by law.

(b) Both men and women should have the opportunity to make free and informed choices about how they live. Therefore, neither laws, nor society, should impose sex-stereotyped roles on women or men.

(c) There shall be no special treatment on the basis of sex, with two exceptions: measures relating to maternity, and short-term measures to reduce or eliminate disadvantages suffered by women due to past discrimination.

(Status of Women, 1979, p.9.)

This same report admits that,

Removal of discriminatory language from legislation will not alone achieve our objectives. Equality, in practice, requires attitudinal and economic changes which will affect all our relationships. ...although there has been a dramatic increase of women in many of the professions, we must recognise that most women in Canada still work in the traditional occupations of stenographer, typist, sales clerk, baby sitter, maid, service worker, school teacher, seamstress, waitress, nurse, nursing assistant and aide, telephone operator, janitor and cleaner. Improvement in women's wages and in the nature and condition of their work will come neither easily nor quickly.
(p. 11.)

We do not propose to question the desirability of the policy objectives implied here. However, to achieve any significant results, a far greater commitment than has been accorded such statements in the past will be necessary. The limited impact of a decade and more of equal opportunity measures is partly illustrated by Table X, which compares the distribution of employment by major industry group and sex for 1971 and 1979. Though the proportion of women in every industry group did as more women entered the labour force, over 70 percent of female workers were still in the three 'female' industry groups. It remains to be seen whether the recent policy statements will bring about any more far-reaching changes.

To comment on the desirability of the other strategy, the encouragement of 'women's jobs', it is necessary to examine some of the characteristics of these jobs. In general, most are low skill, low productivity and low pay. Looking first at the industrial distribution of earnings, Table XI shows average weekly earnings for major industry divisions in 1979. Service industries and retail trade, the largest employers of female labour, show the lowest weekly earnings. Within the manufacturing industry, the leather, clothing and knitting

TABLE X

Distribution of Employment by Major Industry Group and Sex 1971 and 1979.

Industry	1971 ¹			1979 ²		
	%	% of	% of	%	% of	% of
	Female	Female	Male	Female	Female	Male
		Labour	Labour		Labour	Labour
		Force	Force		Force	Force
Agriculture	14.6	2.7	7.9	25.2	3.0	4.7
Other Primary Industries	3.8	0.3	4.1	8.7	0.5	2.6
Manufacturing	23.9	15.8	25.6	26.5	13.6	20.0
Construction	4.4	0.8	9.2	8.0	1.3	6.2
Transport, Communication & Utilities	15.4	4.0	11.0	20.6	4.5	8.7
Trade	36.3	17.9	15.9	42.2	18.9	17.4
Finance, Insurance & Real Estate	51.9	6.9	3.2	59.3	8.2	5.3
Community, Business & Personal Services	59.7	46.9	16.1	59.7	43.7	28.4
Public Administration	25.3	4.7	7.0	34.8	6.1	6.8
All Industries	33.7	100.0	100.0	38.8	100.0	100.0

¹ Average, September to December 1971² Annual Average, 1971

Source: Statistics Canada, Labour Force Survey.

September 1971 to December 1971 and December 1979 Issues.

TABLE XIAverage Weekly Earnings By Industry, 1979

Industry	\$ per week
Forestry	403.71
Mining	444.57
Manufacturing:	323.13
Durable	348.48
Non-durable	301.03
Food & beverages	294.15
Tobacco products	355.13
Rubber products	331.20
Leather products	204.33
Textiles	263.53
Knitting	204.55
Clothing	193.94
Wood products	334.43
Furniture & fixtures	241.12
Paper	382.55
Printing & publishing	303.94
Primary metals	386.33
Metal fabricating	333.60
Machinery	349.76
Transportation equipment	368.58
Electrical products	314.25
Non-metallic minerals	351.98
Petroleum & coal products	459.16
Miscellaneous manufactures	265.33
Construction	428.79
Transport, Communications, Utilities	349.36
Wholesale trade	298.25
Retail trade	187.63
Finance, Insurance, Real estate	279.46
Service industries	197.79

Source: Statistics Canada, "Employment, Earnings and Hours,"
December, 1979.

divisions, the three with more than fifty percent female employees, show lowest earnings. However, because of the greater prevalence of part-time labour among female employees, examining such data does not permit valid comparisons to be made. Hourly wage data are available neither by industry nor occupation for the full range of employment. For a comparable illustration of earnings differences it is necessary to examine again 1971 Census data. Table XII shows the average earning of persons who worked mainly full-time for the full year 1970, by major occupational groups arranged in descending order of the average earnings by both sexes. Earnings in the major female occupations, clerical and service, were the lowest of any group except for farming. Of course, these aggregate figures illustrate only part of the effect of occupational segregation. The ratio of female to male earnings is given in the final column, and ranges from 34.3 percent in Medicine & Health to 70.5 percent in teaching. To an extent, this is an illustration of the concentration of women in the lower pay, lower skill categories within each group. For example, the large difference within the Medicine and Health occupation derives partly from the fact that within the highly paid 'health diagnostic and treating' category, only about 8 percent of workers are female, in the lower paid nursing and related categories, over 80 percent. similar examples could be given in almost every group.

It is primarily the effects of occupational segregation with which we are concerned here, and consequently with such 'between-occupation' wage gaps. Even so, it should be pointed out that, in so far as the two can be separated, the role of

TABLE XII

Average Earnings for Persons Who Worked Mainly Full Time for the Full
Year 1970, by Occupation and Sex.

Occupation	Average Earnings (\$ per year)			Female Employees	Female Earnings/ Male Earnings (%)
	Both Sexes	Male	Female		
Managerial, Administrative	13157	14058	7193	46035	51.2
Social Sciences & Related	12295	14596	7377	17180	50.5
Mining, Quarrying	10775	10775	---		-
Natural Sciences, Engineering	10385	10437	6693	2485	64.1
Medicine & Health	9000	16437	5641	155885	34.3
Teaching & Related	8828	10507	7403	124985	70.5
Other Crafts, n.e.c.	7929	8304	4386	9000	52.8
Construction	7846	7862	5497	2510	69.9
Artistic, Literary	7453	8005	5087	4150	63.6
Machining & Related	7357	7506	4355	9225	58.0
Transport Equipment Operating	7249	7286	4504	3320	61.8
Sales	7244	8158	3756	95310	46.0
Forestry & Logging	6893	6914	4178	220	60.4
Processing	6726	7134	4087	33765	57.3
Product Fabrication & Assembling	6532	7238	3702	100555	51.2
Materials Handling	6427	6960	3968	22800	57.0
Service	5575	6685	3326	193920	49.7
Clerical & Related	5558	7059	4699	601190	66.6
Farming, Horticulture,	3960	4033	2661	15310	66.0
Animal Husbandry					

Source: Statistics Canada, 1971 Census.

Volume 3 Part 6 Table 18.

'within-occupation' wage gaps remains large, despite the advent of equal pay legislation. The 1977 issue of "Women in the Labour Force:Facts and Figures" lists, for selected occupations, narrowly defined, average male and female wage rates for 1976 and 1977. In the first year, the male wage rate exceeded the female in 48 of 52 occupations, in the second year, in 46 of 58. In a number of instances, the female:male wage ratio was in the order of 65 percent and, in almost half the cases, it actually declined between the two years. From such data, it is difficult to assess the contribution of differences in experience, education and other factors not directly related to sex to the discrepancy. However, detailed studies suggest the role of discrimination to be considerable. Gunderson (1977), using 1971 Census data, decomposed the earnings differential into 'productivity related' and 'wage discrimination' factors. Estimating the former involved controlling for differences in, among other things, education, training, experience, and occupational and industrial distributions, at least a portion of which might be classified as reflecting the results of cumulative discrimination. These factors together accounted for a little over one third of the differential, with the distribution contributing about one-half of this fraction. The remaining two-thirds was attributable to different rewards for comparable endowments, a result broadly comparable with those of

previous studies in the United States and Canada. * Apart from the prevalence of low wages, women's jobs are likely to be characterised by a low degree of control over work processes, and by poor opportunities for advancement. Marchak (1973) sampled 307 white collar workers in British Columbia, measuring eight dimensions of work in which workers could have different amounts of choice, discretion or control over their jobs. Each measure showed women to be over-represented at the lower end of the scale, men at the upper. A much smaller proportion of women than of men felt that they could realistically expect significant promotion, though the majority desired it. Connelly (1978) suggests that the female occupations

...provide horizontal rather than vertical career patterns for women; that is, women continue to teach, nurse and type, with increases in pay but not promotions.
(p. 42.)

and, as Gunderson (1976) comments,

Many of the predominantly female occupations have been characterized as dead-end jobs; they are not conducive to career advancement or to independent decision-making, and few are stepping stones to more challenging jobs. In addition, many jobs, such as cooking, cleaning or taking care of children, are extensions of household activities.
(p. 113.)

a study in Whitehorse, a city with a relatively high demand for labour in clerical and service occupations, and a high

* Although both industrial and occupational distribution made a considerable contribution to the earnings gap, in another study (Gunderson, 1977) the author points out that merely correcting for differences in broad category does not in itself itself lead to a reduction in the overall earnings gap, since this would involve shifting female employees from clerical and teaching occupations where the gap is relatively small, to primary and blue collar occupations where it is large.

participation rate, revealed that the limited range of jobs available was itself a major source of dissatisfaction among women. Although most women considered market work a necessity due to the high cost of living, the only jobs effectively open to them were in these low paid and low responsibility jobs. Even where women were employed outside the traditional occupations, their employment was generally confined to routine and poorly paid jobs unattractive to male workers. (Women's Research Centre, 1979).

Thus it seems that, where women are deterred from participating by a shortage of 'female' jobs, the mere provision of such jobs would provide at best a partial solution to the problem, perhaps attracting women into the labour force but, unless combined with an active commitment to the principles of equal opportunity and equal pay 'for work of equal value', tending to perpetuate the related problems associated with occupational segregation.

Section 3. Suggestions For Future Data Collection And Research.

Many of the statistical problems encountered could have been reduced or eliminated by the use of data providing detailed information on individual characteristics, and hence allowing analysis of the individual participation decision rather than of participation rates. This was the procedure followed by Gunderson (1977) and by Nakamura et al (1979), as well as a number of studies in the United States. The current policy of Statistics Canada is to release such data from the Census with geographic information limited to province and place of

residence. Thus there is necessarily a problem in carrying out a study of this type since the assumption of a homogeneous regional labour market, implicitly made in the study by Nakamura et al, seems scarcely justified. It would not seem unreasonable to suggest that the confidentiality requirements of Statistics Canada might be compatible with a somewhat more precise geographic identification, at least for residents of Census Metropolitan Areas.

It would also be useful to relate changes in participation over time to changes in industrial structure. Again, the extent to which this is possible on any systematic basis is limited by current data availability. In view of the periodic changes in Census questions, definitions and data presentation, comparison of decennial Census data would be unlikely to provide more than an illustration of the obvious fact that, as the demand for female labour has increased, so has female participation. Two Statistics Canada publications: The Labour Force Survey and Employment, Earnings and Hours would provide some of the required information, but the availability of control variables would be very limited. In addition, the latter provides information from larger firms only, and neither provides a detailed breakdown of employment by industry for sub-provincial areas.

Concerning all aspects of labour supply, including participation, one is struck by the greater sophistication of economic research in the United States which is permitted by the availability of detailed data concerning the behaviour of individuals over time such as exist in the National Longitudinal

Survey. These have been used, alone or with taxation statistics, in a variety of projects. The absence of such a data source has presented a constraint to economic research on the subject in Canada.

It may be, however, that there is less to be learned from sophisticated quantitative analysis than from more general studies at the local labour market level. From sample surveys, it would be possible to make some assessment of the magnitude of disguised unemployment and underemployment among women in an area, relating these problems to specific characteristics of the area's industrial structure and so provide a basis for the formulation of corrective policy measures. Such studies could form a bridge between two research approaches to participation now largely distinct: the technical and somewhat abstracted economic studies in the consumer choice framework, viewing labour supply decisions as a rational response to individual costs and benefits, and the more qualitative and descriptive studies which have focussed on women's problems in the labour market, within a tradition which sees such 'decisions' as, in large part, societally imposed.

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APPENDIX 1: RESULTS OF SUPPLEMENTARY REGRESSIONS

a. Weighted Regressions

	All Women 15-64	Married Women 15-64	Single Women 15-64	Other Women 15-64	Married Women 15-24	Married Women 25-44	Married Women 45-64
DATL	-2.618 (1.59)	-4.152 (2.40)	-2.915 (1.01)	4.171 (0.94)	-6.046 (3.88)	-3.996 (2.49)	-1.845 (0.36)
DQUE	-1.315 (0.85)	-4.511* (6.02)	2.522 (1.46)	-6.166* (4.36)	-4.446 (3.79)	-5.303* (7.16)	-1.752 (0.52)
DPRA	-2.845* (4.87)	-4.037* (5.91)	-2.119 (1.38)	0.761 (0.08)	-1.714 (0.67)	-4.249* (6.49)	-1.484 (0.69)
DBC	-4.425 (10.61)	-6.919* (15.63)	-1.701 (0.75)	2.384 (0.72)	-6.867* (9.95)	-6.740* (13.01)	-2.469 (2.06)
DCMA	-0.142 (0.03)	-1.021 (0.81)	0.966 (0.54)	-2.324 (1.63)	-1.364 (0.81)	-1.062 (0.83)	-1.023 (0.58)
D2550	1.624 (2.58)	1.900 (2.13)	0.971 (0.43)	0.227 (0.01)	1.405 (0.63)	2.059 (2.34)	1.825 (1.41)
D1025	1.291 (1.37)	2.463 (3.01)	-2.325 (2.38)	2.233 (0.96)	-0.477 (0.06)	2.293 (2.49)	3.731* (4.97)
D 510	-5.125* (7.97)	-6.109* (6.83)	-5.766* (4.90)	0.690 (0.03)	-10.031* (10.27)	-7.051* (8.35)	-2.501 (0.80)
MUR	-0.128 (0.74)	-0.289 (2.27)	0.011 (0.00)	-0.439 (2.04)	-0.306 (1.39)	-0.275 (1.91)	-0.321 (2.04)
FUR	-0.667* (14.22)	-0.679* (8.87)	-0.318 (1.77)	-0.470 (1.65)	-0.783* (7.28)	-0.584* (6.16)	-0.744* (8.21)
PCMFT70	0.047 (0.22)	0.130 (1.01)	0.171 (2.47)	0.825* (15.83)	0.119 (0.60)	0.166 (1.80)	0.163 (1.22)
AVFWAG	-0.002 (2.31)	0.001 (0.26)	-0.005* (7.35)	0.005 (2.96)	0.001 (0.11)	0.002 (0.80)	0.000 (0.02)
AVEMMY	-0.002 (2.90)	-0.004* (9.38)		-0.004* (4.40)	-0.002 (1.40)	-0.003* (5.80)	-0.003* (7.35)
PCSCHFT	-0.419 (1.56)	-0.394 (0.83)	-1.415* (18.60)	-1.092 (2.47)	-0.806 (3.71)	-0.416 (1.48)	0.580 (1.89)
PCTCHDN	0.038 (0.06)	-0.021 (0.01)		-0.587 (0.03)	-0.114 (0.19)	-0.120 (0.34)	0.374 (1.89)
PCTNOCH	-0.046 (0.01)	-0.115 (0.05)		0.090 (0.01)	-0.225 (0.12)	-0.124 (0.06)	0.008 (0.00)
FERTxx	-0.005 (3.27)	-0.004 (1.92)		-0.005 (0.79)	-0.019* (8.66)	-0.002 (0.47)	-0.007* (10.57)
PCTOTH	0.143* (7.55)	0.158* (5.55)	0.112 (2.23)	0.091 (0.71)	-0.027 (0.09)	0.175* (6.58)	0.209* (6.88)
xxFED12	0.361* (20.55)	0.395* (14.80)	0.182 (2.78)	0.428* (6.75)	0.179 (3.68)	0.319* (12.66)	0.403* (8.73)
xxxFUNI	0.352 (2.00)	0.443 (1.76)	1.001* (8.40)	0.418 (0.79)	0.567* (5.74)	0.180 (0.47)	0.194 (0.19)
INDMIX	0.314* (5.21)	0.111 (0.39)	0.244 (1.83)	0.086 (0.09)	0.394 (2.63)	0.198 (0.91)	0.173 (0.86)
CONSTANT	63.346	63.920	68.149	27.474	74.148	51.401	48.618
R ²	.910	.895	.779	.894	.819	.873	.895

FIGURES IN PARENTHESES SHOW F VALUES, COEFFICIENTS MARKED '*' ARE SIGNIFICANT AT 5%.

	All Women 15-64	Married Women 15-64	Single Women 15-64	Other Women 15-64	Married Women 15-24	Married Women 25-44	Married Women 45-64
DATL	-1.446 (0.59)	-1.780 (0.45)		6.170 (2.11)	-7.800* (5.56)	-3.072 (1.73)	0.221 (0.01)
DQUE	-0.559 (0.15)	-4.881* (5.64)		-9.001* (7.49)	-3.631 (1.75)	-5.536* (6.25)	-1.984 (0.46)
DPRA	-3.594* (5.39)	-3.049 (1.96)		-0.097 (0.00)	-0.593 (0.04)	-3.260 (2.40)	-1.258 (0.23)
DBC	-4.788* (12.51)	-5.944* (9.72)		2.739 (0.81)	-5.388* (5.19)	-5.605* (8.68)	-2.531 (1.50)
DCMA	0.165 (0.03)	-0.517 (0.12)		-1.459 (0.38)	-1.216 (0.34)	-0.579 (0.16)	-0.554 (0.09)
D2550	1.622 (2.31)	2.270 (2.28)		1.330 (0.31)	0.298 (0.02)	2.371 (2.54)	2.243 (1.44)
D1025	2.065 (3.97)	3.677* (6.34)		3.255 (1.94)	-1.423 (0.47)	3.057* (4.31)	5.290* (8.89)
D510	-4.261* (9.31)	-4.261* (4.69)		3.584 (1.30)	-11.312* (15.64)	-5.590* (8.19)	-0.519 (0.04)
MUR	-0.060 (0.22)	-0.207 (1.38)		-0.162 (0.33)	-0.381 (2.39)	-0.232 (1.78)	-0.238 (1.18)
FUR	-0.578* (14.29)	-0.582* (7.30)		-0.434 (1.58)	-0.851* (8.95)	-0.449* (4.57)	-0.663* (6.48)
PCMFT70	-0.099 (1.41)	-0.064 (0.30)		0.839* (20.10)	-0.014 (0.01)	0.024 (0.05)	-0.108 (0.64)
AVFWAG	-0.004* (8.24)	-0.002 (1.24)		0.002 (0.37)	-0.001 (0.08)	-0.001 (0.41)	-0.003 (1.71)
AVEMMY							
PCSCHFT	-0.467 (2.18)	-0.369 (0.69)		-1.205 (2.87)	-0.591 (1.73)	-0.362 (1.15)	0.632 (1.88)
PCTCHDN	-0.081 (0.36)	-0.219 (1.36)		-0.414 (1.88)	-0.296 (1.37)	-0.232 (1.70)	0.159 (0.30)
PCTNOCH	-0.425 (1.60)	-0.526 (1.23)		-0.821 (1.18)	-0.400 (0.37)	-0.256 (0.30)	-0.756 (1.49)
FERTxx	-0.005* (4.38)	-0.004 (1.66)		-0.001 (0.08)	-0.009 (2.11)	-0.001 (0.14)	-0.009* (12.23)
PCTOTH	0.164* (8.93)	0.165* (4.56)		0.070 (0.32)	-0.088 (0.64)	0.193* (6.64)	0.155 (2.13)
xxFED12	0.421* (23.35)	0.431* (12.37)		0.453* (5.34)	0.094 (0.72)	0.336* (12.06)	0.431* (5.93)
xxxFUNI	0.133 (0.32)	-0.131 (0.16)		-0.104 (0.04)	0.526* (4.28)	-0.255 (1.17)	-0.344 (0.55)
INDMIX	0.417* (16.37)	0.417* (8.25)		0.545* (5.49)	0.533* (6.95)	0.509* (11.47)	0.416* (5.78)
CONSTANT	69.555	61.414		14.098	71.962	40.538	63.454
R ²	.898	.864		.871	.782	.851	.849

	All Women 15-64	Married Women 15-64	Single Women 15-64	Other Women 15-64	Married Women 15-24	Married Women 25-44	Married Women 45-64
DATL							
DQUE							
DPRA							
DBC							
DCMA	0.170 (0.02)	-0.990 (0.44)	1.656 (0.79)	-3.252 (1.71)	-1.345 (0.40)	-1.092 (0.50)	-0.559 (0.10)
D2550	0.435 (0.16)	0.031 (0.00)	-0.198 (0.01)	-0.643 (0.07)	-0.779 (0.13)	0.572 (0.14)	0.889 (0.26)
D1025	0.848 (0.59)	1.758 (1.32)	-3.359 (3.81)	1.943 (0.58)	-2.103 (0.95)	1.304 (0.71)	3.354 (3.61)
D510	-5.806* (14.76)	-7.724* (13.51)	-6.643* (7.39)	-1.727 (0.24)	-12.155* (16.84)	-8.080* (13.63)	-3.474 (1.98)
MUR	-0.185 (2.34)	-0.375* (4.98)	-0.147 (0.56)	-0.404 (2.09)	-0.387 (2.62)	-0.363* (4.47)	-0.370 (3.66)
FUR	-0.791* (28.26)	-1.044* (25.47)	0.001 (0.00)	-0.867 (6.33)	-1.088* (15.48)	-0.786* (12.90)	-0.880* (13.54)
PCMFT70	-0.683 (0.66)	0.075 (0.42)	-0.038 (0.14)	1.039* (28.58)	0.139 (0.99)	0.211* (4.24)	0.036 (0.075)
AVFWAG	-0.002 (1.68)	0.000 (0.03)	-0.001 (0.09)	0.002 (0.23)	0.002 (0.49)	0.001 (0.16)	-0.000 (0.00)
AVEMMY	-0.001 (2.05)	-0.003* (8.47)		-0.005* (8.37)	-0.002 (0.97)	-0.162 (1.72)	-0.003* (7.97)
PCSCHFT	-0.019 (0.04)	0.148 (0.13)	-1.593* (19.29)	-1.757* (6.37)	-0.357 (0.62)	-0.171 (0.27)	0.784 (3.72)
PCTCHDN	0.014 (0.01)	-0.032 (0.03)		-0.013 (0.00)	-0.348 (1.83)	-0.221 (1.41)	0.345 (2.13)
PCTNOCH	-0.191 (0.33)	-0.177 (0.15)		-0.124 (0.02)	-0.451 (0.52)	-0.054 (0.01)	-0.453 (0.71)
FERTxx	-0.008* (10.01)	-0.008* (5.30)		-0.001 (0.02)	-0.015* (7.31)	-0.000 (0.02)	-0.009* (19.13)
PCTOTH	0.094* (6.09)	0.136* (6.60)	0.030 (0.22)	0.061 (0.47)	0.032 (0.16)	0.200* (12.97)	0.109 (2.94)
xxFED12	0.362* (25.07)	0.477* (22.50)	0.035 (0.13)	0.769* (21.03)	0.154 (2.02)	0.406* (25.51)	0.463* (14.15)
xxxFUNI	-0.218 (1.88)	-0.444* (4.05)	0.901* (12.48)	0.728 (3.92)	0.104 (0.25)	-0.589* (9.61)	-0.353 (1.19)
INDMIX	0.391* (12.45)	0.148 (0.92)	0.342* (4.63)	-0.349 (1.85)	0.492 (3.79)	0.417* (5.01)	0.178 (1.04)
CONSTANT	72.470	76.131	61.449	50.930	71.559	32.109	69.541
R ²	.884	.850	.614	.846	.755	.828	.858

	All Women 15-64	Married Women 15-64	Single Women 15-64	Other Women 15-64	Married Women 15-24	Married Women 25-44	Married Women 45-64
DATL	-2.093 (0.81)	-3.741 (1.41)	-3.014 (0.89)	3.167 (0.53)	-6.715 (3.18)	-2.903 (1.03)	-3.391 (1.14)
DQUE	-1.629 (0.96)	-6.573* (8.49)	6.126* (6.58)	-9.753* (9.80)	-5.010 (2.75)	-7.405* (8.35)	-4.542 (2.51)
DPRA	-4.278* (5.29)	-4.253 (2.84)	-6.693* (6.81)	-0.852 (0.06)	-2.375 (0.54)	-3.549 (1.96)	-2.562 (0.94)
DBC	-3.881* (6.32)	-4.700* (5.05)	-4.497* (4.62)	3.198 (1.23)	-4.938 (3.60)	-3.267 (2.25)	-1.112 (0.30)
DCMA							
D2550							
D1025							
D510							
MUR	-0.033 (0.52)	-0.115 (0.35)	-0.052 (0.07)	-0.240 (0.79)	-0.221 (0.65)	-0.129 (0.42)	-0.202 (0.86)
FUR	-0.520* (8.20)	-0.550 (4.99)	-0.038 (0.03)	-0.547 (2.59)	-0.608 (3.59)	-0.368 (2.21)	-0.788* (8.44)
PCMFT70	0.021 (0.04)	0.125 (0.88)	0.099 (0.98)	0.936* (25.89)	0.132 (0.67)	0.190 (2.32)	0.126 (0.74)
AVFWAG	-0.002 (1.64)	0.001 (0.23)	-0.004 (3.99)	0.004 (2.17)	0.000 (0.01)	0.001 (0.36)	0.002 (0.56)
AVEMMY	-0.001 (0.48)	-0.002 (3.23)		0.004* (4.87)	0.000* (0.01)	0.001 (0.24)	-0.003* (10.36)
PCSCHFT	-0.198 (0.29)	-0.029 (0.50)	-1.733* (21.31)	-1.209 (3.06)	-0.144 (0.08)	0.047 (0.02)	0.647 (1.93)
PCTCHDN	-0.145 (0.74)	-0.229 (1.01)		-0.231 (0.54)	0.354 (1.36)	-0.395 (3.31)	0.284 (0.86)
PCTNOCH	-0.659 (2.70)	-0.749 (1.90)		-0.655 (0.76)	-0.600 (0.65)	-0.672 (1.53)	-0.656 (1.05)
FERTxx	-0.005 (3.07)	-0.005 (1.49)		-0.003 (0.23)	-0.015* (4.13)	-0.001 (0.03)	-0.008* (10.56)
PCTOTH	0.147* (5.54)	0.110 (1.69)	0.223* (6.51)	-0.019 (0.03)	-0.033 (0.08)	0.173* (4.10)	0.063 (0.37)
xxFED12	0.334* (10.89)	0.316* (5.29)	0.190 (2.11)	0.431* (5.17)	0.049 (0.16)	0.195 (3.17)	0.253 (2.15)
xxxFUNI	0.251 (0.73)	0.120 (0.09)	1.642* (17.71)	0.164 (0.09)	0.567 (3.47)	-0.245 (0.66)	0.227 (0.25)
INDMIX	0.555* (17.07)	0.467* (6.56)	0.235 (1.90)	0.206 (0.67)	0.844* (10.37)	0.748* (13.74)	0.241 (1.81)
CONSTANT	59.356	55.545	61.288	34.951	47.785	25.422	61.560
R ²	.851	.816	.630	.870	.705	.787	.833

	All Women 15-64	Married Women 15-64	Single Women 15-64	Other Women 15-24	Married Women 15-24	Married Women 25-44	Married Women 45-65
DATL	-2.566 (1.76)	-3.958 (2.18)	-3.029 (0.98)	4.485 (1.023)	-8.310* (6.19)	-4.664 (3.72)	-0.558 (0.003)
DQUE	-0.322 (0.05)	-4.467* (5.14)	5.533* (5.23)	-8.671* (7.061)	-3.698 (1.86)	-5.594* (6.72)	-0.778 (0.073)
DPRA	-4.056* (6.90)	-4.099 (3.68)	-5.144* (4.13)	-0.847 (0.057)	-0.911 (0.10)	-4.219 (3.91)	-1.634 (0.42)
DBC	-4.907* (13.63)	-6.279* (11.65)	-3.844 (3.13)	2.561 (0.71)	-5.184* (4.90)	-6.305* (10.85)	-2.073 (1.07)
DCMA	0.090 (0.01)	-0.535 (0.14)	0.679 (0.15)	-1.538 (0.43)	-1.339 (0.43)	-0.634 (0.20)	-0.538 (0.64)
D2550	1.274 (1.46)	1.610 (1.22)	0.061 (0.00)	0.808 (0.11)	0.042 (0.00)	1.805 (1.49)	1.466 (4.19)
D1025	1.509 (2.04)	2.578 (3.11)	-1.700 (0.98)	2.399 (0.98)	-1.953 (0.84)	2.397 (2.64)	3.757 (1.14)
D510	-5.304* (13.01)	-6.272* (9.50)	-6.332* (7.23)	2.028 (0.36)	-12.063* (16.50)	-7.355* (12.16)	-2.749 (1.13)
MUR	-0.094 (0.60)	-0.267 (2.49)	-0.034 (0.03)	-0.516 (0.58)	-0.426 (2.99)	-0.289 (2.84)	-0.310 (2.13)
FUR	-0.634* (17.28)	-0.692* (10.75)	-0.153 (0.43)	-0.516 (2.17)	-0.894* (9.61)	-0.540* (6.55)	-0.798* (9.54)
PCMFT70	-0.055 (0.08)	0.013 (0.01)	0.008 (0.00)	0.906* (22.62)	0.064 (0.20)	0.077 (0.53)	0.027 (0.04)
AVFWAG	-0.002 (0.00)	0.000 (0.01)	-0.005* (5.51)	0.003 (1.30)	0.001 (0.18)	0.001 (0.09)	-0.000 (0.01)
AVEMMY	-0.002 (0.00)	-0.003* (6.99)		-0.002 (1.61)	-0.002 (1.10)	-0.002 (3.91)	-0.003* (5.96)
PCSCHFT	-0.461 (0.00)	-0.338 (0.63)	-1.886* (26.77)	-1.186 (2.84)	-0.614 (1.92)	-0.399 (1.49)	0.655 (2.19)
PCTCHDN	-0.029 (0.05)	-0.017 (0.01)		-0.246 (0.58)	-0.181 (0.47)	-0.080 (0.18)	0.340 (1.38)
PCTNOCH	-0.267 (0.64)	-0.249 (0.29)		-0.586 (0.59)	-0.247 (0.14)	-0.115 (0.06)	-0.494 (0.67)
FERTxx	-0.006* (6.12)	-0.006 (3.52)		-0.003 (0.30)	-0.011 (3.00)	-0.003 (0.99)	-0.009* (13.88)
PCTOTH	0.149* (7.61)	0.135 (3.27)	0.166 (3.48)	0.049 (0.16)	-0.091 (0.69)	0.169* (5.16)	0.149 (2.12)
xxFED12	0.419* (24.37)	0.343* (13.64)	0.188 (2.12)	0.451* (5.38)	0.092 (0.71)	0.350* (13.55)	0.456* (7.13)
xxxFUNI	0.294 (1.46)	0.177 (0.28)	1.445* (14.42)	0.137 (0.06)	0.612* (5.20)	-0.037 (0.02)	-0.193 (0.18)
LOGINDMIX	9.637* (5.12)	5.283 (0.80)	1.381 (0.057)	11.893 (1.48)	14.643 (3.14)	8.727 (1.68)	7.218 (1.27)
CONSTANT	51.455	61.619	78.928	-6.705	36.68	34.858	48.414
R ²	0.904	.877	.680	.875	.789	.861	.861

	All Women 15-64	Married Women 15-64	Single Women 15-64	Other Women 15-64	Married Women 15-24	Married Women 25-44	Married Women 45-64
DATL	-21.996* (6.45)	-16.552 (1.92)	-11.104 (0.59)	15.517 (0.56)	-21.081 (1.38)	-11.436 (0.87)	-26.082 (2.97)
DQUE	8.206 (1.20)	20.229 (3.82)	-13.523 (1.07)	9.858 (0.30)	14.932 (1.03)	27.460* (7.01)	16.669 (1.83)
DPRA	-3.021 (0.11)	2.348 (0.03)	-11.267 (0.49)	-18.321 (0.70)	-6.146 (0.11)	14.304 (1.28)	-1.302 (0.01)
DBC	-3.245 (0.12)	0.873 (0.01)	-16.007 (1.00)	1.321 (0.00)	3.105 (0.03)	-2.242 (0.03)	8.070 (0.25)
DCMA	-0.433 (0.17)	-1.215 (0.72)	0.689 (0.13)	-1.823 (0.54)	-1.782 (0.67)	-1.280 (0.80)	-1.434 (0.61)
D2550	0.630 (0.37)	0.952 (0.44)	0.091 (0.00)	1.055 (0.18)	-0.528 (0.06)	1.199 (0.71)	0.398 (0.05)
D1025	0.724 (0.49)	1.648 (1.33)	-1.575 (0.79)	2.315 (0.87)	-2.794 (1.67)	1.533 (1.17)	2.420 (1.76)
D510	-6.583* (19.33)	-7.984* (14.93)	-5.943* (5.74)	2.180 (0.37)	-13.396* (18.11)	-9.724* (20.66)	-5.157 (3.64)
MUR	-0.132 (0.97)	-0.289 (2.42)	-0.078 (0.12)	-0.012 (0.00)	-0.364 (1.63)	-0.381* (4.12)	-0.343 (2.06)
FUR	-0.598* (15.79)	-0.673* (10.51)	-0.114 (0.21)	-0.630 (3.05)	-0.928* (9.66)	-0.530* (6.65)	-0.701* (7.24)
PCMFT70	-0.044 (0.27)	0.073 (0.38)	-0.021 (0.04)	1.027* (25.50)	0.108 (0.50)	0.117 (1.19)	0.095 (0.42)
AVFWAG	-0.002 (3.19)	-0.000 (0.02)	-0.004 (3.77)	0.003 (0.92)	0.001 (0.10)	-0.000 (0.06)	-0.001 (0.05)
AVEMMY	-0.002* (4.34)	-0.003* (8.24)		-0.003 (2.18)	-0.002 (1.68)	-0.003* (6.47)	-0.003* (7.86)
PCSCHFT	-0.806* (6.31)	-0.907* (4.19)	-1.765* (20.56)	-1.430 (3.45)	-1.005* (4.19)	-0.914* (6.91)	-0.038 (0.01)
PCTCHDN	0.178 (1.35)	0.145 (0.47)		-0.272 (0.55)	-0.037 (0.01)	0.205 (0.92)	0.430 (2.05)
PCTNOCH	0.011 (0.00)	0.093 (0.04)		-0.501 (0.35)	0.044 (0.00)	0.429 (0.77)	-0.146 (0.05)
FERTxx	-0.005* (4.89)	-0.004 (1.71)		-0.002 (0.15)	-0.012 (3.20)	-0.201 (0.20)	-0.007* (8.52)
PCTOTH	0.146* (7.28)	0.162* (4.73)	0.139 (2.20)	0.090 (0.48)	-0.082 (0.54)	0.195* (7.24)	0.176 (3.01)
xxFED12	0.451* (29.35)	0.501* (18.98)	0.171 (1.67)	0.501* (6.27)	0.120 (1.16)	0.424* (21.55)	0.559* (10.71)
xxxFUNDI	0.167 (0.49)	-0.009 (0.00)	1.561* (15.32)	0.103 (0.03)	0.513 (3.36)	-0.084 (0.12)	-0.328 (0.53)
INDMIX	0.292 (2.43)	0.403 (2.42)	-0.255 (0.74)	0.476 (1.12)	0.508 (1.88)	0.610* (4.72)	0.262 (0.79)
INDATL	0.581* (5.36)	0.383 (1.22)	0.227 (0.28)	-0.321 (0.29)	0.380 (0.51)	0.164 (0.22)	0.768 (2.89)
INDQUE	-0.239 (1.33)	-0.691* (5.84)	0.538 (2.21)	-0.506 (1.04)	-0.531 (1.65)	-0.911* (10.44)	-0.497 (2.05)
INDRRA	-0.010 (0.00)	-0.177 (0.23)	0.186 (0.16)	0.485 (0.58)	0.156 (0.08)	-0.550 (2.19)	0.002 (0.00)
INDBC	-0.041 (0.19)	-0.194 (0.23)	0.360 (0.51)	0.053 (0.06)	-0.242 (0.16)	-0.090 (0.05)	-0.321 (0.39)
CONSTANT	70.426	58.871	89.500	16.495	70.618	37.328	59.957
R ²		.916	.892	.689	.880	.797	.883

	All Women 15-64	Married Women 15-64	Single Women 15-64	Other Women 15-64	Married Women 15-24	Married Women 25-44	Married Women 45-64
INDATL	-0.050 (0.78)	-0.100 (1.69)	-0.091 (1.04)	0.097 (0.58)	-0.234* (5.58)	-0.135 (3.95)	0.010 (0.01)
INDQUE	-0.014 (0.13)	-0.140* (7.06)	0.157* (5.77)	-0.262* (8.90)	-0.121 (2.56)	-0.187* (10.70)	-0.034 (0.18)
INDPRA	-0.115* (6.43)	-0.117 (3.60)	-0.148* (4.11)	-0.008 (0.01)	-0.036 (0.19)	-0.130* (4.49)	-0.045 (0.39)
INDBC	-0.160* (13.93)	-0.197* (11.44)	-0.125 (3.35)	0.104 (1.16)	-0.172* (5.19)	-0.192* (10.16)	-0.080 (1.511)
DCMA	0.405 (0.15)	-0.277 (0.04)	1.019 (0.34)	-1.805 (0.06)	-0.982 (0.23)	-0.358 (0.06)	-0.405 (0.05)
D2550	1.342 (1.60)	1.692 (1.37)	0.124 (0.01)	0.501 (0.04)	0.264 (0.02)	1.897 (1.70)	1.469 (0.65)
D1025	1.517 (2.05)	2.516 (3.05)	-1.561 (0.85)	1.868 (0.61)	-1.917 (0.81)	2.315 (2.55)	3.659* (4.04)
D510	-5.240* (12.69)	-6.294* (9.90)	-6.200* (7.09)	1.095 (0.11)	-11.982* (16.47)	-7.333* (12.78)	-2.924 (1.31)
MUR	-0.099 (0.69)	-0.262 (2.57)	-0.093 (0.25)	-0.245 (0.82)	-0.396 (2.69)	-0.272 (2.73)	-0.315 (2.33)
FUR	-0.613* (15.68)	-0.699* (10.12)	-0.117 (0.25)	-0.544 (2.42)	-0.911 (9.92)	-0.530* (6.49)	-0.768* (8.72)
PCMFT70	-0.083 (1.00)	0.000 (0.00)	-0.021 (0.05)	0.924* (24.56)	0.060 (0.18)	0.061 (0.35)	0.019 (0.02)
AVFWAG	-0.002 (2.78)	0.000 (0.02)	-0.005* (5.41)	0.003 (1.23)	0.001 (0.25)	0.001 (0.08)	0.000 (0.00)
AVEMMY	-0.001 (2.87)	-0.003* (6.57)		-0.003 (2.23)	-0.002 (1.41)	-0.002* (4.11)	-0.003* (5.87)
PCSCHFT	-0.418 (1.85)	-0.360 (0.74)	-1.795* (24.42)	-1.331 (3.66)	-0.598 (1.79)	-0.375 (1.40)	0.574 (1.58)
PCTCHDN	-0.020 (0.02)	-0.054 (0.08)		-0.134 (0.18)	-0.230 (0.74)	-0.097 (0.29)	0.256 (0.81)
PCTNOCH	-0.396 (1.39)	-0.329 (0.52)		-0.316 (0.17)	-0.352 (0.28)	-0.173 (0.15)	-0.612 (1.04)
FERTxx	-0.006* (6.17)	-0.006 (3.36)		-0.003 (0.28)	-0.013 (3.69)	-0.003 (1.53)	-0.008* (11.93)
PCTOTH	0.150* (8.47)	0.135 (3.73)	0.156 (3.52)	0.023 (0.04)	-0.090 (0.72)	0.168* (5.85)	0.152 (2.45)
xxFED12	0.425* (26.19)	0.435* (14.82)	0.197 (2.54)	0.450* (5.74)	0.096 (0.78)	0.334* (13.40)	0.467* (7.43)
xxxFUNI	0.211 (0.73)	0.102 (0.09)	1.469* (5.08)	0.152 (0.07)	0.615* (4.97)	-0.068 (0.08)	-0.251 (0.30)
INDMIX	0.345* (7.30)	0.276 (2.52)	0.027 (0.02)	0.373 (1.67)	0.466 (3.43)	0.398* (4.33)	0.229 (1.34)
CONSTANT	76.013	72.249	82.65	20.729	77.148	56.007	67.343
R ²	.902	.879	.683	.876	.786	.828	.862