NBER WORKING PAPER SERIES

INTER-COUNTRY COMPARISONS OF LABOR FORCE TRENDS AND OF RELATED DEVELOPMENTS: AN OVERVIEW

Jacob Mincer

Working Paper No. 1438

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
August 1984

I am grateful to the authors and discussants of the country papers for information and data supplied beyond the original call of duty. Special thanks to Richard Layard and to Mark Killingsworth for helpful comments on a first draft of this report. Thanks also to Machiko Osawa for patient and cheerful research assistance. The research reported here is part of the NBER's research program in Labor Studies. Any opinions expressed are those of the author and not those of the National Bureau of Economic Research.

NBER Working Paper #1438
August 1984

Inter-Country Comparisons of Labor Force Trends and of Related Developments: An Overview

ABSTRACT

This paper is a survey of analyses of women's labor force growth in 12 industrialized countries, originally presented at the conference in Sussex, England in June 1983. The main focus of the conference papers and of the current survey is on growth of the labor force of married women in the years 1960-1980. Trends in fertility, family mobility, and wages also receive attention as related developments.

Married women's labor force growth was observed in all countries, expect for the USSR after 1970, when labor force rates of women reached the level of men. Growth rates differ among countries. They apparently respond to growth in real wages and/or to growth in education, but response elasticities differ among countries. Estimates of these elasticities contained in the country paper were helpful in predicting the trends.

Other findings include: Ubiquitous declines in fertility and growth of divorce in the 1970s. Both developments are related to longer run labor force growth. In all countries wages of women were lower than wages of men. The 1960 average gap of 38% narrowed to 29% in 1980. Factors related to these trends, including public policy, are discussed in the survey.

Jacob Mincer
Economics Department
Columbia University
New York, NY 10027
(212) 280-3676

Jacob Mincer
Revised
July, 1984

Inter-Country Comparisons of Labor Force Trends and of Related Developments: An Overview

I. Recent Developments and the Economic Hypothesis

Between 1960 and 1980 labor force rates of women rose in most of the industrialized countries, continuing longer term though less apparent trends. These trends are due mainly to the growth of labor force participation of married women. As a comparison of the left and right panels of Table I indicates for the 12 countries under review,[1] the labor force rates of married women grew about twice as fast as the rates of all women.

Indeed, labor force rates of single women declined if women of school ages are included, and grew little beyond school ages. In the past the participation rate of single women was much higher than the rate of married women. Single women and other women not currently married usually worked in the labor market after completion of schooling and prior to marriage or remarriage. Their labor force rates, therefore, did not grow much over time, and in many cases declined as schooling lengthened. On the other hand, only a small proportion of married women was in outside employment at the turn of the century, to take the urban U.S. as an example. Most of them dropped out of the labor force after marriage or at the first pregnancy. As the century progressed and the economies and urban employment grew, especially in the service sector, increasing proportions of married women returned to the labor market for shorter or longer intervals after the childbearing and childrearing period. Concurrent, and not unrelated declines in fertility made it possible for these intervals of non-participation to decline in frequency and in duration. In the most recent stage of the evolution of women's labor force

participation, the alternations of labor market and of household activities is giving way to a more sustained commitment to the labor market. Roughly speaking, this stage was reached in countries where over half of married women are working. The most important manifestation of growing continuity of participation in these countries is that recent cohorts of women take much less time out of the labor market for child care. Thus, in the most recent decade the fastest labor force growth is observable among mothers of small children. To some extent, the greater continuity of market employment was achieved by a reduction in fertility and by a switch from part-period to part-time (short hours) employment: The latter grew most rapidly in the decade of the 70s when employment of mothers grew fastest. Nonetheless, these trends suggest a convergence which is already observable in the countries in which labor force rates are high: In the most recent stage, the demographic distinctions by marital status and presence of children produce greatly reduced differences among the labor force participation rates of these groups.

A trend to convergence among demographic groups does not mean that family status is no longer an important factor in women's labor supply. Although it is less important in affecting participation rates, it continues to influence the allocation of time and energy between market and household activities in terms of hours of work, work effort, and job choices. The substitution of part-time for part-period work and the rather universal persistence of the concentration of women's employment in so-called "female occupations" are indicative.[2] Even where differentials in labor force rates by marital status are small, the differentials by sex are still large. Only in the U.S.S.R. is the labor force rate of women nearly equal to that of men. This peak level was reached in 1970. In the countries we surveyed the average labor force rate of married women grew from 30 to 48 percent points between 1960 and

1980. At this pace it will take another half-century to reach 90 percent participation rates. It could take less time, if the relative rate of growth, 60% in the 1960-1980 period, does not decelerate -- an unlikely possibility on purely arithmetical grounds. The participation rate of Swedish married women surpassed 75% by 1980, but most of the growth there was in part-time work, in contrast to the U.S.S.R., where part-time work is negligible.[3] In Australia, Britain, France, Germany, and the U.S., labor force rates of married women crossed the 50% mark by 1980. A decade earlier, the typical married woman in all countries (with the exception of the U.S.S.R.), was primarily a homemaker. It is perhaps not coincidental that feminist movements in these countries spread just about when the 50% "tipping point" was reached in the 1970's. At the other end of the spectrum, in Japan, Spain, the Netherlands, and Italy the activity rates of married women are still quite low, despite rapid recent increases. In these countries married women have moved from the early stage of very low participation after marriage to the next stage of intermittent participation, in the past two decades.

It is important to note that our preferred definition of labor force participation is restricted to paid employment outside the home -- a definition which makes choices between household and market activities unambiguous. This definition rules out the possibilities of joint activities primarily in rural households and in cottage industries where paid work is performed at home. Self-employment is a more ambiguous category in this respect, and we tried to exclude it. It was not possible to adhere to these restrictions in all cases. However, inaccuracies created by a few deviations from the definition are minor, since the ruled out sectors are small. The exception is Japan: A relatively large proportion of Japanese women are still household workers, on the farm, in cottage industries, or in family

businesses. Since these groups are declining in importance, while employment outside the household is growing, data which do not single out the latter show a horizontal, or more precisely a mild U-shaped trend with the upturn observable only since the mid-seventies. Here, the focus on outside employment is desirable not only on theoretical grounds but also as a study of the vanguard of future developments.

Japan is also illustrative of a much larger group of countries not included in our collection. The shrinkage of the farm and of other household-based employment with economic development obscures much of the rise of paid employment of urban married women in LDCs which are experiencing economic growth, when both groups are defined as labor force participants. The resulting U-shaped trends in aggregate women's labor force rates take a long time to materialize.[4] The very rapid postwar economic growth of Japan telescoped these developments into a much shorter interval, so the U-shaped aggregate change is observable within the comparatively short period of two decades, 1960-1980.[5]

Two widespread and far-reaching developments which appear to be associated, at least temporally, with the growth of married women's labor market activities have been declines in fertility, and increases in divorce (or separation) rates. Although fertility had long-term downward trends in most of the industrialized countries since the 19th century or even earlier, these trends were resumed in the late 1960s after interruptions by postwar "baby booms." The decline in fertility rates was ubiquitous (Table 2)[6] and accelerated in the 1970s, at which time also divorce and separation rates rose in an unprecedented fashion (Table 3), while marriages were delayed and marriage rates declined. Although the declines in fertility might be viewed as a symmetric downward phase ("baby bust") of the baby boom, these declines

are by now of much longer duration then the upswings were. They also appear to be independent of the timing and amplitude of the demographic cycles across the countries we studied. It is therefore more plausible to view the shrinkage of family size and of duration of marriages as a trend, the pace of which may vary, rather than as a cyclical phase.

That the declines in family size and in duration of marriage provide an increased scope and motivation for greater labor market commitment of women is a reasonable conclusion. However, economists do not view this relation between family and labor force trends as unidirectional.[7] Some degree of mutual causation and feedback is also plausible: Fertility and marriage patterns adjust to greater labor force commitments. Conversely, exogenously caused reductions in fertility, due to more efficient and less costly fertility control, encourage labor force participation, and so does the prospect of family instability. Moreover, even without a direct link between fertility and labor force participation, both may be viewed as jointly dependent variables: That is, both are simultaneously influenced by other variables, notably by the process of economic growth. Especially important in this process are: the growth of real wages, growth of education, and of urbanization. Superimposed on economic growth are also legal-institutional developments, including laws pertaining to the family, equal pay legislation, and taxation. These developments were likely to affect trends in some of the countries, regardless of whether the public policies were specifically designed to affect them.

The basic economic model which is the starting point of economists' analyses of women's labor supply[8] centers on the family context of work and leisure decisions. Family members are seen to divide their time among leisure, market work, and home work. Historically, women had primary

responsibility in household production, including especially child care. While an increase in family income increases the demand for leisure, the distribution of work between home and market depends on the individual's relative productivities in the two sectors: The greater the market wage relative to home productivity (at zero hours of market work) the greater the shift to market work. In this simplest formulation, growth of women's labor force over time is directly related to economic growth: A rise in market wages relative to "home" or "shadow wages" induces women into the labor force, if the positive substitution effect of the increased market wage is stronger than the negative effect (on market work) of increased family income.

Early studies of cross-section data in the U.S. revealed a dominance of the substitution over the income effects in analyses of labor supply of married women. Cross-section as well as longitudinal analyses of other countries in the present volume also show, for the most part, positive substitution effects of women's wages which exceed in absolute size the negative effects of family, or husbands' incomes.[9] The exceptions, in which the two effects roughly cancel are found in Japanese studies,[10] in one of the several British cross-section samples, and in the Italian cohort analysis, but not in the cross-section. The dominance is also small in the German cross-section sample for labor force participation, but large for hours of work. When all country estimates (Table 6) of women's wage elasticities are averaged, a figure close to unity is obtained. The average income elasticity was much smaller, about -.4. On average, these findings are consistent with the upward trends in married women's labor force participation in the countries we studied.

The present collection of studies in twelve countries is designed to provide insights into labor force trends, their causes and consequences, in

each of the countries. It also provides an opportunity to test the viability of the economic hypothesis not merely on average, but also on a cross-national basis. With only twelve observations on trends, generalizations from the findings can be only tentative. Nevertheless, the findings describe developments during the past two decades in most of the industrialized world. The value of the much richer findings in each of the country analyses is not affected by the outcome of the experiments reported in this cross-national overview.

II. Trends in Labor Force Rates

(a) Country Analyses:

Although the underlying economic model is basically common to all the studies in this volume, estimates of labor supply (in terms of labor force participation rates) of married women differ in methodology, specification of variables and of functional forms, and in some of the data definitions. Most of the estimates are based on cross-sections, and a few (U.S., Britain, Italy) on cohort data. The explanatory variables included were wages (W_F) of wives in cross-sections, but wages of all women in cohort data and in time series, wages (W_M) of husbands in cross-sections, but of all males in cohort data and in time series. Women's education levels (E) served as alternative or additional variables to their wage. Income from sources other than earnings (Y_O) was an additional variable to wages or earnings of husbands. Presence of pre-school (N) children in the household was another variable alternately excluded or included in the estimates. Although the magnitudes of effects differed from country to country, the signs of the variables were consistent with the economic hypothesis and with previous research in the U.S. and elsewhere. The substitution variables (wages of women or their education) had

strong positive effects on labor force participation in most cases, and in most cases the positive wage elasticities exceeded the negative income elasticities[11] by a sizable margin. Pre-school children had a negative effect on participation. The partial endogeneity of fertility behavior does, of course, make these "effects" questionable. Their estimated effect represented in most cases a relatively minor contribution to the variation in labor force participation. This variable was left out for time-series prediction, in any case. Educational attainment of women was strong when used in lieu of the wage variable, but remained positive and significant in some of the studies when used as an additional variable. A few studies used an alternative concept of labor force participation for the dependent variable, when work histories were available in the sample of wives. It is measured by the ratio of years spent working to number of years elapsed since completion of schooling. This variable (called RELP) approximates more closely the concept of life-time labor force participation.

The basic relation $P=f(W_F, W_M, E, Y_O, \ldots)$ was estimated in each study, but methodological differences involved alternative techniques such as two-stage procedures (the first being a wage equation) or OLS, and forms such as logit, probit, or linear probability equations. Most of the studies tried to apply the estimated parameters to the observed changes over two decades (1960-1980) in order to "predict" or "explain" the trends observed in the time series in the respective countries. Several of the papers exhibit alternative techniques or functional forms within the same country, yielding alternative parameter estimates. Some also cite or borrow cross-section estimates from other studies of their country data.

The following table indicates in summary form the procedures used in each country study in estimating parameters of the P-function, and their predictive

performance in time series. Pairs of alternative estimates are listed for 6 countries (Australia, Britain, France, Spain, Japan, and the U.S.). Out of the 18 sets of predictions, 9 performed fairly well. Only Britain (1) and Japan (1) yielded wrong signs; all others predicted upward trends. Apart from Germany where the trend was underpredicted, estimates usually erred on the high side.

It is worth noting that predictions were more successful in those few cases where information on past work experience was available and used to estimate cross-section parameters. (France (2), Japan (2), Spain (2), and U.S.) Such information apparently reduces the estimates of wage elasticities to a more correct size.[12]

Country Estimates: Procedures and Predictions

Country	Procedure	Prediction	Source[a]
Australia	Linear Probability	overpredicts	Table 6
	(1)instrumental variables		
	(2)OLS	underpredicts	
Britain	(1)Probit	wrong sign	supplement
	(2)Logit	fair	Table 14, Layard,et al(1980)
France	(1)Logit	overpredicts	Table 6, eq. 1
	(2)RELP	good	Table 6, eq. 3
Germany	Tobit	underpredicts	supplement
Israel	Logit	fair	Table 8
Italy	Probit	overpredicts	supplement
Japan	(1)Logit	wrong sign	Table 9
	(2)RELP	good	Osawa(1984)
Netherlands	Probit	good	Table 5
Spain[b]	(1)Logit	overpredicts	Table 7
	(2)RELP	good	Table 9
Sweden	Probit	good	Table 6 (1967 data)
U.S.	(1)Linear Probability	fair	Table 19, Panel B
	(2)RELP	good	Cain(1966)
U.S.S.R.	Logit	overpredicts	Table 5

[a] Tables in the country papers. Supplement = numerical estimates provided by authors. Japan(2) and U.S.(2) are from external sources, not provided by the authors.

[b] Wages not available by sex. Predictions restricted to the 1970-1980 decade.

The relative success of the econometric models in close to half of the country studies makes the economic hypothesis a serious contender for primacy in explaining the pervasive social trends of our time. Nevertheless, the success is only partial, and the differences in data, methodology, and in econometric specification may raise doubts about generalizations.

What can we learn from the collection of studies going beyond the enumeration of findings in each of them? One simple exercise is to look at mean values of the basic variables across the 12 countries. During the 1960-1980 period the average per country growth in participation of married women was 2.84% per year. The average growth of men's wages,[13] $\dot{W}_M = 4.37\%$ per year and of women $\dot{W}_F = 5.15\%$ per year. Applying the average income elasticity $\alpha_2 = -.37$ and the average wage elasticity $\alpha_1 = 1.02$,[14] we obtain

$$\hat{\dot{P}}_i = 1.02 \times 5.15 - .37 \times 4.37 = 3.64\%$$

an overprediction of the actual average rate of growth of the labor force of married women (73% compared to 57% growth over the two decades). However, if growth of women's wages is measured by the growth of men's wages,[15] the prediction is quite accurate! $\hat{\dot{P}}_i = (1.02 - .37) \times 4.37 = 2.84\%$.

These calculations are based on Japan(a) in Table 1. When Japan(b) is used, the average $\dot{P} = 3.05\%$. The predicted growth, using average elasticities of col. 2, Table 6 is now 3.50% when $\hat{\dot{P}} = \alpha_1 \dot{W}_F + \alpha_2 \dot{W}_M$, an overprediction, and 2.80 when $\hat{\dot{P}} = (\alpha_1 + \alpha_2) \dot{W}_M$, a milder underprediction. On average, it appears that the economic model works rather well. However, averages can conceal as well as reveal. A more demanding question is whether differences among countries in observed trends can be explained by the same hypothesis.

(b) Cross-National Analysis

In its simplest formulation, the cross-section labor force equation is

most conveniently written as:

$\ln P_i = \alpha_0 + \alpha_{1i} \ln W_{Fi} + \alpha_{2i} \ln Y_i$, where i = country index, and the α_i's are elasticities.

Denoting growth over time by a dot over the variable:

$$\dot{P}_i = \beta_0 + \beta_1 \dot{W}_{Fi} + \beta_2 \dot{Y}_i, \quad i = 1,\ldots,12 \qquad (1)$$

(1) could serve as the time series equation, where $\dot{Y}_i$, $\dot{W}_{Fi}$ measure growth of family income and of women's wages in each country.

If structural parameters do not differ significantly among countries, there is no subscript on the β's in (1), which are simply averages of the α_i. Otherwise, the estimated α_i have to be applied to (i.e., multiplied by) the independent variables so that the estimating equation is:

$$\dot{P}_i = \delta_0 + \delta_1(\alpha_{1i} \cdot \dot{W}_{Fi}) + \delta_2(\alpha_{2i} \cdot \dot{Y}_i) \qquad (2)$$

The predictions based on (2) are unbiased if $\delta_0 = 0$, and $\delta_1 = \delta_2 = 1$. If δ_1 and $\delta_2 < 1$ (while $\delta_0 = 0$), the (sum of) variables $(\alpha_{1i}\dot{W}_{Fi})$ and $(\alpha_{2i}\dot{Y}_i)$ overpredicts the observed trends, on average. In this case either the elasticities (α_1) or the rates of $\dot{W}_F$ are overstated, or α_2 and $\dot{Y}$ understated.

Before we implement the inter-country regressions of type (1) and (2), consider the choice of independent variables: While levels of women's wages are not necessarily strongly correlated with husbands' or family incomes in the cross-section, over time wage and income growth of men and women are strongly correlated, especially across countries, even if the growth rates of women's wages differ somewhat from growth rates of men's wages within countries. But it is not only multicollinearity that makes the separation of the variables problematic. There is a more basic conceptual problem that might militate against the use of women's observed wage growth as a variable in time series: Although growth of market productivity in the economy potentially affects wage growth of men and women similarly in the long run,

the actual change in observed average wages of working women may be in part a result of changing labor force selectivity as women's labor force grows, rather than a cause of labor force growth. Changes in compositions of working women by education, age, and continuity of labor force experience affect the average growth rate of their wages differentially, even if potential market productivity of the average woman in the population were to grow at the same rate as the productivity of men.

The conceptually correct but difficult to measure variable is the average market wage of all women of working ages, not merely of those who are currently observed working. If it is assumed that market productivity of men and women grew at the same rate over the past several decades, the best approximation to the growth of all women's wages would be the growth of men's wages $\dot{W}_M$, where selectivity is a comparatively minor matter.[16] It is possible, however, that over relatively long stretches of time potential wages of women grew more rapidly than wages of men, in which case the use of observed wage growth of women may be preferable to the use of $\dot{W}_M$ as a substitute, especially if changes in selectivity of working women are not systematic or minor.

Our data (Table 3) show that wages of working women, grew, on average, faster than wages of men in most countries. These changes in relative wages are analyzed in section IV. It appears that the faster growth of working women's wages is in part due to selectivity by education in labor force growth, which leads to an upward bias in $\dot{W}_F$ of working women as an explanation of women's labor force growth. However, the faster observed growth of $\dot{W}_F$ than of $\dot{W}_M$ was also partly due to the faster growth of education in the population of women[17] (Table 10). No bias attaches to $\dot{W}_F$ on this account, if women's educational growth is viewed as largely exogenous.

Women's educational level in 1970, and growth 60-80 are shown in Table 4. A faster growth of education of women may be expected if (a) family income elasticity of the demand for educating daughters exceeds the income elasticity of demand for educating sons,[18] or if (b) increased investments in daughters' education is a response to an increasing probability of labor market participation of women. The latter possibility implies an endogeneity of the excess of educational growth of women compared to men, but the effect of increased enrollments on subsequent educational attainment of women takes a long time: about two decades between the average age of completion of schooling and the average age of potential working life. Consequently, the growth of all women's education, may serve as an alternative to growth of wages of working women, as an indicator of all women's gain in potential earning power. Of course, education may also affect labor force decisions for reasons other than potential earnings. As previous research suggests, such effects work in the same direction as wages. The strength of these additional effects is not clearly established in the literature.

In the regressions shown in Table 5 below, we experiment with the use of $\dot{W}_M$ wage growth of men, $\dot{W}_F$ wage growth of working women, and ΔE-growth of female education as alternative measures of growth of potential wages of all women. In view of the preceding discussion we may suspect $\dot{W}_F$ of an upward bias, and $\dot{W}_M$ of a downward bias when used as proxies for the correct growth of women's wages. Other variables we experimented with were: <u>levels</u> of women's education E_{70}, of urbanization (Urb_{70}), and of women's labor force participation (P_{70}), each measured in the mid-year 1970. The scope of market opportunities is likely to be wider the higher the level of women's education. The same is true of a more urbanized economy. Finally, at high levels of participation (such as are current in the U.S.S.R. or Sweden) there

is little room for further growth of labor foce rates: they cannot exceed 100%. This purely arithmetical factor, however, is not likely to matter in the middle ranges.

In Table (5) we show regressions of $\dot{P}$ (percent rate of growth of married women's labor force participation) on the variables discussed above, following specification (1) which ignores the structural differences in parameters (α_i) among countries. It should be noted that although the dependent variable is growth of labor force rates of married women, ages 20-59[19], the independent variables (except for P_{70}) are defined for all men and all women.

The results of regressions in Table 5 are suggestive. If growth of potential market earning power of women is measured by the growth of real wages of men ($\dot{W}_M$) alone, the variable is not significant. But when both wages of men and of women are included, both are significant -- especially $\dot{W}_F$; each has the expected sign, negative for $\dot{W}_M$, positive for $\dot{W}_F$, and the latter exceeds the former in size.

Levels of labor force participation (in 1970) serve as an arithmetic correction (col. 3) for the form of the dependent variable,[20] but were not significant when the U.S.S.R. was excluded. Urbanization levels were positively related to labor force growth, when the U.S.S.R. was excluded from the sample. The education variables were not significant.

As would be expected on theoretical grounds, the correlations are stronger when the Japanese labor force is restricted to married women who are paid employees (Japan (a) in Table 1).

If the differences in income and substitution elasticities (α) across countries are not merely noise, the next step is to take them into account, that is, follow specification (2) in analyzing inter-country differences in trends. This we proceed to do in Tables 6A and 6B. The cross-section

estimates from which the elasticities were calculated were described in the table of "Country Estimates: Procedures and Predictions" in the previous section. As was indicated, more than one set of estimates is available for some of the countries. Table 6 presents in col. (1) elasticity estimates which the authors produced or supplied and used in their predictions. These were listed in line (1) of "Country Estimates." Col. (2) lists the alternative estimates from line (2) provided for 6 countries in "Country Estimates." Four of these were supplied in the papers, and one each was added for Japan[21] and for the U.S.[22]

In each Table (6A and 6B), col. (1) assumes that market productivity of all women rose at the same rate as that of men. Hence the sum of husbands' income and wives' wage elasticities was multiplied by the rate of growth of men's real wages.[23] When levels of all women's educational attainment in 1970 (Ed_{70}) and of urbanization in 1970 are added (col. 1a) the correlation is strengthened. In col. (2) we use the cross-product of elasticities and of wage growth of men and women, ignoring the likely biases. Indeed, the R^2 is far stronger in col. (2) and reaches a maximum of .9 in (2a) where education level and urbanization are added. Column (3) substitutes annual growth in all women's educational attainment over the period (1960-1980) for growth in wages of working women. Here growth of men's wages is multiplied by income elasticities (α_2), while growth of education (in years) is multiplied by the wage elasticities (α_1). The result is significant. The relation in col (3) is stronger than in (1) and in (3a) is as strong as in (1a).[24]

Table 6B which utilizes alternative elasticities (col. 2 in Table 6) in half of the countries shows very similar results as Table 6A. The greater predictive power of this set of elasticity estimates <u>within</u> countries apparently contributes to higher R^2 in col. (1) and (2) of Table 6B compared

to 6A. This is not true, however, in col. 3 and in the columns marked (a), where other variables are added. Also, when the U.S.S.R. and Spain are left out, the correlations increase very little, not as in 6A.

In sum, a comparison of Table 5 and 6 (A and B) lead to the following conclusion: While growth rates of real wages across countries have a weak relation with the differential growth rates of married women's labor force, the relation is strong when country parameters are taken into account. In other words, labor force growth responds to growth in real wages, but the elasticity of the response differs among countries. Estimates of these elasticities are quite helpful in predicting the trends, despite the almost certain large errors they are subject to.

The prediction (in col. 1) of Tables 6 which assumes that potential wages of men and women grow equally is not unbiased. The intercept is not 0, and the slope of the relation is less than one-half, rather than unity. On average, however, the prediction is surprisingly good: Mean annual labor force growth was 2.8% per year, while the mean of $[(\alpha_1 + \alpha_2)\dot{W}_M]$ in Table 6A was 3.1% and 2.9% in Table 6B, the latter even closer to the actual. When growth of wages of men and of women is cross-multiplied by the respective elasticities, the correlation is stronger, and the bias appears to be greater. Here overprediction is clear: The mean of $(\alpha_1\dot{W}_M + \alpha_2\dot{W}_F)$ is 4.1% per year in Table 6A and 3.9% in Table 6B, one-third greater than the average actual growth of women's labor force.[25]

As was noted, the wage growth variable $\dot{W}_M$ was calculated on an annual basis for the period 1960-1975, the period of sustained growth in all of the Western economies. Since the mid (or early) 1970's growth of real wages slackened and almost ceased in most of the countries. Unemployment rates grew substantially over this period (see Table 7). Table 8 indicates that growth

of women's labor force rates in the 1970-80 decade was slowed by this rather lengthy recession. The greater the decline in the rate of growth of men's wages $\Delta\dot{W}_M$ (measured by the differences between the average rate of growth in 1960-75 and the subsequent rate in 1975-80), and the greater the increase in standardized unemployment rates, the greater the slowing of married women's labor force growth. The dominance of the "discouraged" over the "added" workers in female labor force growth appears to be upheld on an international basis.

III. Decline in Fertility and Growing Family Instability

In the decade of the 1970's all countries experienced declines in fertility. On average, the Total Fertility Rate (TFR) dropped from 2.42 in 1970 to below replacement level 1.85 in 1980 (Table 2). The largest declines were observed in the Netherlands where both wage growth and women's labor force growth were among the steepest. The smallest declines were noted in Spain and Japan, where labor force growth was small to moderate, but wage growth steep; in Sweden where both labor force growth and wage growth were moderate -- but where child care and provisions for parental leave may have slowed the fertility decline; and in the U.S.S.R. where labor force growth of women and fertility declines stopped in 1970[26] Comparative declines in the Total Fertility Rate over the decade are analyzed in Table 9. Arithmetical declines in fertility rates, rather than percentage changes were used as dependent variables.

The regressions in Table 9 show negative, but not insignificant effects of male wage growth (in col. 2 and 3), but a significant positive relation between growth of married women's labor force rates and declines in fertility (TFR) in the 1970's.

Labor force growth is significant on a longer-term (1960-1980) basis, whichever labor force definition is used when Japan (cols. 1 and 2). It is significant on a concurrent basis (1970-1980) only when Japan (b) was used. None of the other variables were significant. Tnese findings are consistent with the hypothesis of mutual causation of labor force growth and fertility declines in the short run and with the notion that fertility declines follow labor force growth. Effects of wage and of educational growth are not discernible with these statistics. Such effects may be diffuse and largely indirect at this level of analysis mainly by causing shifts of women to the labor market.

Divorce rates accelerated from previous levels in all countries. Over the decade 1970-1980, they tripled in frequency. The smallest increases were noted in Japan and in Israel where labor force growth was small and average, respectively; the largest increases were experienced in the Netherlands, Australia, Britain, and the U.S. where labor force growth of married women was above average. Table 10 summarizes inter-country regression of growth in divorce (or separation rates) in the 1970s (measured in percent changes).[27] The independent variables: growth of male wages and of women's labor force cover the longer period from 1960 on. Labor force growth over the longer period, rather than concurrent, was positive and significant while men's wage growth was not significant. Neither growth of women's wages nor declines in fertility were significant. However, increases in unemployment during the seventies significantly acelerated the growth of divorce.

In sum, both fertility declines and the growth of family instability appear to represent lagged effects of longer-term developments in the labor force of women. Although feedbacks are very likely, growth of divorce rates clearly lag behind labor force growth, while fertility is sensitive both to

longer run and to current labor force growth. It is plausible that changes in family stability are concurrent with changes in family size, a variable that lags current fertility change, but the data were not available for verification. These findings are, in general, consistent with economic theories of family behavior, but data and degrees of freedom are lacking for attempts to analyze more variables or to provide a clearer delineation of direction and strength of causal arrows among the variables.[28]

IV. Trends in the Gender Wage Gap

Wages of women are lower than wages of men in all countries. The (female to male) wage ratio ranged from 54% in Japan to 90% in Sweden in 1980. This rather large variation is, in part, overstated because it is sensitive to differences in definitions of wages (per week, month, or hour), of coverage (all workers, full time workers, workers in the private economy, in a particular sector, etc.). In general, the closer the definition to an hourly wage and the narrower the coverage (e.g. within manufacturing, or within the public sector) the smaller the wage differential.

Some interpret the differential in pay between men and women as evidence of ubiquitous and persistent discrimination -- traceable back to biblical times. However, the existence of the "wage gap" does not by itself prove the existence or extent of discrimination. Thus a number of sociologists and economists have ascribed the sex differential in wages to the household's division of labor, in which women have historically had the major responsibility for household production, especially in child rearing. In the past, this division of labor, especially under high fertility regimes resulted in almost complete specialization of women to household tasks. Even in the 20th century industrialized Western countries, where the demographic

transition neared completion, the sexual division of labor permitted only a partial commitment of married women's time and energy to labor market activities and, therefore, to the acquisition of work-related skills, especially on the job. According to this reasoning, lower wages of women reflect the resulting differences in market productivity.

The wage ratios shown in Table 3 are gross, in the sense that they do not measure wage differentials for similar types of labor. When wages are standardized by marital status, age, education, work experience and its continuity, job training, hours of work, and other distinguishing characteristics of workers the gross wage gap is reduced to a smaller residual. This residual is, in turn, viewed by some as a pure measure of discrimination, as it indicates different wages for "the same" labor. Others see it as a measure of ignorance, since many of the relevant characteristics, some of which were listed above, are not available in the data. Most of the authors in the present collection of studies analyzed factors determining wages of women as a step in their analysis of labor supply, and were able to measure the resulting reduction in the gross wage gap. Similar studies are available in the literature in a number of countries. Reductions in the gap range from a little over 10% in some of the Swedish and British studies to over a half in some of the U.S. studies. The variation certainly reflects the kind and amount of information available and applied in the wage functions.[29] Much of the gap is attributable to differences in hours of work and in the continuity of work experience, where such data are available. But, even if proper standardization were to account fully for the wage gap, reasons for the sex differences in factors affecting wages would still be subject to debate. However, the discussion would be much better informed.

Several papers focus on the wage gap issue: Becker's theoretical analysis

links the wage gap and its persistence to the division of labor in the family. Persistence of the wage differential in the U.S. over several decades motivates also the empirical studies of O'Neill and of Smith-Ward.

A reason for the puzzle over the apparent stability of the U.S. wage gap lies in the human capital interpretation of earnings or wage profiles of men and women. According to this interpretation, if increased market activity of women translates into lengthened work experience in the market as it ultimately must,[30] the sex differential in wages should eventually narrow for at least two reasons: (1) Even if shapes of female wage profiles remained unchanged, lengthening of women's work experience should contribute to an increase in their wages, so long as the profiles slope upward. This effect is reinforced, if lengthened experience denotes greater continuity of work. Losses due to depreciation of skills which result from interruptions would be reduced. (2) Increased length and continuity of work produce a longer payoff period to human capital investments, hence an incentive for women to seek more market oriented schooling, more job training, and occupational choices with greater career orientation. If so, the longer female wage profile would also become steeper.

However, given limited budgets of time and energy, commitments to market work and to market-oriented human capital investments require major reductions in women's responsibilities for household production, especially of those related to child-bearing and child-care. The tension between family and market commitments is resolved or reduced by reductions in fertility, postponement and shorter duration of marriages, and greater capital intensity of household work -- all observed in most countries. On the other side of the accomodation is the commitment to market work which, although greatly increased, remains far from complete: Much of the growth in labor force

participation, most spectacular in Sweden and in Australia, has been in part-time jobs. Moreover, most of the increases in market employment have been in the more traditional women's occupations in the service sectors, in jobs with lesser training components and with shorter or more flexible hours.

The reality of this accomodation is most readily apparent where it might be expected least: in the U.S.S.R., where women's labor force participation has reached the same level as that of men by 1970, and where part-time work is practically not available. Fertility declined sharply by 1970 and divorce rates continued to grow. Nevertheless, "occupational segregation," which is less narrow in the U.S.S.R. than in the West (primarily because of much greater employment of women in manual work, but also in some of the professions) is pronounced and unchanging.[31] The wage ratio at 70% is comparable to that in the West, despite continuous life-time participation in market work at full-time jobs. In their studies of the subject, in this volume and elsewhere, Ofer and Vinokur conclude, that the time and energy burden of household work, which remains highly labor intensive in the U.S.S.R., leads Soviet wives to relatively undemanding jobs.

That the almost equal commitment of time of men and women to the labor market did not result in a changing division of household chores among the sexes is evident from the time budget data supplied by McAuley:[32] In addition to full time in outside employment, married women in the U.S.S.R. spent between 20-30 hours a week on housework. Their husbands spent a half or fewer hours on household work. Total hours of work are thus very long for Soviet wives (over 60 hours per week), and more burdensome in the relative absence of household appliances. According to U.S. time budget studies[33] the conditions are easier, though somewhat comparable for U.S. women full-time workers. Their total weekly hours add up to about 50 hours, but their burden is

lessened at home and at work by shorter hours, less-continuous participation, and household equipment. The implication of lesser work effort in the market is plausible, and more plausible for Soviet women, than for working women in the U.S.

Similar conclusions about women's lesser commitment to market work despite rapid growth in their labor force in Sweden, are expressed by Gustafson and Jacobson. According to them "occupational segregation" of women has changed little in Sweden after decades of labor force growth which pushed the participation rate up higher than anywhere else in the West. As already mentioned, much of the growth has been in part-time jobs, which are more easily obtainable in the so-called female occupations in the service sectors. Commenting more generally on trends in the position of women in Scandinavia, authors of a recent article[34] describe it as follows:

> "Although ... men have assumed some responsibility for household chores, women still bear the main burden of housekeeping and child care -- gainfully employed or not. The solution to carrying the double burden of work inside and outside the home has been to work part-time at the latter. Many women who are employed full-time in the labor force are in reality overworked."[35]

> "Since the sixties, public authorities in the different Nordic countries have made various efforts to change the gender-based division of labor, but the results so far, apart from the increased participation of women in the labor force have been meager."[36]

According to the authors, "patriarchal traditions" and "male dominance" are in part responsible for the recalcitrant division of labor. But, they add:

> "Women, however, are not entirely blameless; by continuing to seek "women's" jobs, they also play an important part in perpetuating the present unequal division of labor. Some, of course, are genuinely interested in such work, but others, particularly young women, mainly consider such employment because these jobs combine fairly easily with the role they expect to have as wives and mothers. The working conditions of some traditional "men's" jobs do not tempt women, being either too rough, or demanding too great an involvement in the workplace."[37]

The hypothesis that increases in labor force participation ought to be

reflected in lengthened labor market experience of working women is unassailable from an individual viewpoint but it need not apply to an aggregate labor force which is changing, especially when it is trending upward. Average work experience lengthens, if the intensive margin (the same women staying longer in the market) dominates over the extensive margin, at which more women (with little experience, by definition) -- enter or reenter the market. Thus, growth of the labor force may produce some growth or decline in average work experience of working women, though the latter is more likely to be transitional. On this account labor force growth may produce a narrowing or a widening of the wage gap over stretches of time.

The studies of June O'Neill, Smith and Ward, and Claudia Goldin indicate a rather small, if any, increase in the length of work experience of U.S. working women over the past several decades. There also may have been some small and not easily discernible increase in the slope of wage profiles. But the small decline in the wage gap which eventually emerges in the data (since the mid 70's) was initially more than counteracted by an adverse movement of educational differentials between men and women workers prior to the 70's. This movement consisted of two components: In the population, educational attainment of men grew more rapidly than that of women between 1950 and 1970. At the same time, labor force rates of more educated women grew less rapidly than of less educated women before 1970, thereby depressing the growth of the average female wage rate. The consequent initial widening of the wage gap followed by a narrowing lent a rather mild U-shape to the U.S. pattern.[38] Additional positive and negative factors are analyzed and discussed in the U.S. studies.

The near-stability of wage differentials in the U.S., which provoked puzzlement and analysis, turns out to be an exception in our international

comparisons. Another exception is the U.S.S.R. where the wage ratio remains at 70%, despite the almost full equality of labor force rates of men and women, which undoubtedly also implies little difference in the length of work experience.

Wage differentials narrowed in all other countries over the past two decades (except that Japan's ratio narrowed in the 60's and stabilized in the 70's, and data for Spain are missing). On average the wage ratio rose from 62% to 71%, thereby closing almost one fourth of the gap.[39] It is interesting to find (in Table 11) that the narrowing was, indeed, positively correlated, across countries, with the rate of (married women's) labor force growth. We do not know whether this is because faster growth resulted in or from lengthened work experience, since data on the latter are not available. The French study indicates that married women employed in 1977 had spent about 80% of their post-school years working,[40] and a similar statistic appears in Swedish data. The figure (at about 60%) is lower for U.S. married women workers, which may explain, in part, why the U.S. wage gap is bigger. But the comparison of experience levels in a single year tells us nothing about changes in the wage ratios.

In Table 11 the dependent variable is percent change in the wage ratio. The positive correlation between labor force growth and narrowing of wage differentials shown in col. (1) may be due to factors which may have affected both, such as growth of women's education. Column (2) shows that growth of women's educational attainment (in the population) was, indeed, a positive and significant factor. The significance of labor force growth is attenuated but not neccessarily eliminated, when educational growth (ΔE) is included.

We tried two other variables which may have affected the wage ratios: the changing proportion of married couples in the population and the changing

labor force rates of men. A decline in the proportion of married occurred in the 70's, and a decline in the labor force rates of men was observed throughout the period, but especially in the 70's. Neither of the variables was significant, although the signs were plausible.[41]

Labor force growth, per se, may have had no effect, unless it lengthened the average work experience of working women, a matter on which we have no data, or unless more educated women increased participation more rapidly than the less educated ones. We have no extensive information on growth of educational attainment of working women as distinguished from all women. The former is clearly more closely connected with observed wages of women, hence also with the wage ratios. We do have information on changes in both educational distributions in some of the countries. These show that increases in labor force rates of more educated women were above average throughout the period in France, Israel, the Netherlands, also in Italy, Japan and in the U.S. after 1970. So the observed narrowing of the differentials was due both to catching up of women's with men's educational attainment in the population, as well as to a positive educational selectivity of women's labor force growth during this period.

V. Effects of Public Policy

Other developments which may have contributed to trends in labor force growth and to changes in the wage ratio are connected with public policy. Changes in laws receive special attention in the Swedish, Australian, and British studies. They are relevant in considering developments in the other countries as well although our information on these matters is not complete.

Public policy which affects labor supply, fertility behavior, and more generally the family institution does not necessarily emanate from a concern

with these matters[42] and is not necessarily designed to change them. Thus tax, social security, and other welfare provisions are not, prima facie, addressed to the issues under discussion. But they are certainly not neutral in their effects: Non-market (household) activities are exempt from taxes. Income-splitting among spouses for tax purposes encourages non-market actvities relative to tax treatment which is independent of family status. Social security provides dependent benefits which are not paid for, encouraging nonparticipation, while employment requirements for receipts of unemployment compensation encourage labor force participation. A change from income-splitting to individual treatment encourages labor force entry of wives, especially at high marginal tax rates. A shift from family-based to individual treatment in income taxation occurred in Sweden, the Netherlands, Italy, and Israel. It has been in existence for a longer period in Australia and Japan. Both a shift from family-based taxes to individual taxation and an increase in marginal tax rates in countries which tax individuals induces more married women into the labor force, especially spouses of higher-income husbands. Since the correlation between earning power of spouses tends to be positive, the tax changes are also likely to contribute to a narrowing of the observed male-female wage gap. The tax changes instituted in Sweden in the 60's, in the Netherlands and Italy in the 70's probably affected labor force growth and wages of working women in this fashion. This may have also happened to some degree in Australia and Israel.

Additional laws which were more specifically directed at the family were enacted in Sweden and in Israel: Long (one year) and subsidized parental leaves in Sweden, coupled with a guaranteed return to previous employment, and an increased supply of publicly provided day care permitted greater continuity in employment of mothers. Both higher levels of labor force participation and

higher wages resulting from more continuous employment are consequently observed. Though less generous in terms of pay, similar parental leaves were instituted in Israel during the 70's. In addition, tax credits for children were also introduced there. Parental leaves, day care subsidies and tax credits are basically pro-natalist. They may have contributed to slowing of the declines in fertility in Israel and in Sweden, as we already noted.

Another set of laws which are aimed at perceived or actual labor market discrimination ranges in the degree of government intervention from "equal pay for the same job" to "equal pay for comparable work" on the wage side, and from "fair employment laws" to "affirmative action programs" on the employment side. The less intrusive laws provide mechanisms for bringing suits against discriminating employers. The more recently enacted (in the U.S.) "affirmative action" programs, and currently debated and even litigated "comparable worth" principles call for active designation of numerical employment "goals" and of "comparable" pay scales. Most countries enacted some form of the usually less intrusive laws.

The U.K. study attributes a 15% rise of the relative wage of women between 1973 and 1976 to the Equal Pay Act which was passed in 1970. Although the growth of women's employment slowed in the late 70's both in numbers and more so in hours, and real wages stopped growing after 1975, the study concludes that the Equal Pay Act had no adverse effects on women's employment relative to that of men. This was, in part, due to rapid growth of women's employment in the public sector during the 1970s, but the conclusion is held to be valid also for the private sector.

Most interesting is the Australian experience with pay scales, more specifically with wage floors set by federal tibunals. Prior to 1969 the floors were set in an unequal manner: The tribunals explicitly differentiated

occupations as "male" and "female" and put lower floors for "female" occupations and for women's wages in mixed occupations. The relative floors were raised from 56% to 75% after the second World War. In the years 1969 to 1972 the principle of "equal pay for equal work" was enacted which affected women working in mixed occupations. In the 1972-75 period the federal tribunal introduced the principle of "comparable worth," or "equal pay for work of equal value."

The authors of the Australian study note that female relative to male employment continued to increase despite the 30% relative wage increase which they attribute to the introduction of equal pay.[43] However, even more than in Britain, the increase in relative employment was largely due to the growth of women's employment in the public sector. In the private sector growth of relative employment (measured in hours) stopped after 1972. The authors find no evidence of excess demand for female labor before the equal pay decisions, but claim that an excess supply exists since then. They are puzzled, however, by the observation that the (relative, by sex) ratio of mean wages to wage floors did not change throughout the period.

Even if relative employment of women did not decline, its growth certainly slowed (especially in terms of hours worked) since 1975, below levels expected from secular and cyclical trends.[44] This is consistent with the author's finding (Table 6) that the estimated cross-section parameters underpredicted the growth of participation befor the equal pay acts and overpredicted it afterwards.

We may conclude that tax laws, parental leaves, and child-care subsidies induced both an accelerated labor force growth of wives and mothers and a relative growth in their wage rates. The equal pay laws apparently contributed also to the narrowing of the wage gap in Britain and Australia,

but probably slowed women's labor force growth.

What can we conclude about the future narrowing of the wage gap based on 1960-1980 international experience? Some evidence was shown, that narrowing occurred partly because of (1) women's educational growth in the population, and more so in the labor force (2) changes in tax and other laws pertaining to the family, and (3) equal pay laws in Britain and Australia. The evidence is not secure, and more intensive research of the apparent effects is very much to be desired.

Most of the changes which affected the wage ratio are self-limiting. This is true of women's educational catch-up, of tax changes, and of other legal changes. Ultimately, without labor market discrimination and with equal educational attainment, the wage gap can be eliminated only when sex differences in life-time work experience vanish, provided differences in investments in job market skills and work effort also disappear. Whether this will happen, or to what extent the wage gap will narrow is a question of economic and technological change as it affects work hours, location, and flexibility of both, as much as it is a question of how the same forces will affect the family institution.

FOOTNOTES

1 These are: Australia, Britain, France, Germany, Israel, Italy, Japan, Netherlands, Spain, Sweden, U.S., U.S.S.R.

2 A closer picture of time allocation is given in time budgets. Only two such surveys were available (the U.S. and the U.S.S.R.), supplied in Becker's Appendix, and in McAuley's comments.

3 One half of a percent, according to McAuley.

4 For an analysis of such trends in LDC's, see Hill (1983).

5 Rates for all women began to rise in Japan in the mid-70's. The upward trend for paid employees is clear and strong (Japan^{b} in Table 1). The distinction between aggregate labor force participation and work outside the home of Japanese women is emphasized and analyzed by Anne Hill (1983, 1984).

6 In the U.S.S.R. the decline was much steeper before 1970, than the subsequent rise, which is entirely due to the increasing numerical weight of the Moslem population (see Ofer and Vinokur).

7 See Kingsley Davis (1982), and Mincer (1963).

8 The model was originally formulated and applied by Mincer (1962). Further developments are due to Becker (1965,1981), Cain (1966), Kosters (1966), Heckman (1974,1978,1980) and Gronau (1977).

9 A strong substitution effect in the labor supply of women is explainable by substitutability of market goods and services for home production. See Mincer (1962), and Gronau (1977).

10 However, a sample restricted to wives who are paid employees in the Tokyo area show a dominance of substitution effects (Hill, 1983; Osawa, 1984).

11 For purposes of time-series estimation, income elasticities were calculated as sums of elasticities of labor force growth with respect to growth of men's wages (W_M) and to growth of other income (Y_O) -- assuming equal rates of growth.

12 This can be seen by comparing the α_1 in col. (2) and col. (1) in Table 6, for France, Japan, and Spain. Both U.S. estimates utilized information on work experience.

13 Annual growth of men's wages was calculated from the 1960-75 period. See discussion in the next section.

14 Parameters from col. (1) of Table (6), corresponding to upper rows of the "Country Estimates" in the text.

15 See next section for an argument.

16 The selectivity problem is well recognized in cross-section micro-data analyses. However, there is no reason for men's (husbands?) wages to constitute an estimate of women's (wives?) wages in cross-sections.

17 The faster growth of relative wages of women was also ascribed to legal changes in some of the papers. However, the effects of such changes on labor force growth are ambiguous.

18 Evidence on this is apparent in comparisons of sex differentials in school enrollment rates among countries differing in levels of income (e.g. World Development Report, 1980). The difference may be much smaller within the group of high income countries. In the 20th century the U.S. differential in enrollment rates existed only at post-high school levels. It widenened after the Second War (most likely as a result of GI Bills) and vanished before 1970. Differential change, if any, was uni-directional in European countries.

19 Exceptions in definition are noted in Table 1 for 4 countries.

20 The use of (ΔP) instead of P in Tables 5 and 6 (A and B) resulted in weakened correlations of all variables, except the level of P_{70} which became positive and significant. Apparently, the relative growth of labor force participation was inverse to level at the extremes of the range but absolute change was positively related to levels throughout most of the range. At any rate, our double log specification of the labor force equation (1) and (2) fits better than a linear specification.

21 In their paper, Shimada and Higuchi estimated cross-section elasticities for a large sample of women in employee households. These elasticities (col. 1 of Table 6) are supplied to explain growth of the labor force of such women (data shown for Japan (a) in the right-hand panel of Table 1). M. Osawa (1984) using RELP information estimated elasticities for a smaller sample of married women who were paid employees in the Tokyo area. These elasticities (col. 2 of Table 6) are applied to the growth of labor force of married women who are paid employees (data for Japan (b) in the right-hand panel of Table 1).

22 The alternative U.S. estimate is the first ever RELP estimates, calculated from micro-data by Cain (1966, Table 29, col. V).

23 As is indicated in Table 3, annual rates of growth of men's wages were based on the period 1960-75, prior to the world-wide stagnation that set in the mid-70's. Additional effects of the stagnation on labor force growth in the 1970's are analyzed in Table 7. Income elasticities were calculated as sums of elasticities with respect to Y_0 and W_M, on the assumption that over time $Y_0 = W_M$.

24 Not surprisingly, the correlations are increased when the U.S.S.R. and Spain are left out. R^2 rises from .43 to .72 in col. (1), from .79 to .84 in col. (2), and from .39 to .71 in col. (3). Also (ΔE) in col. (2) becomes significant even without the α_1 coefficient in the set of 10 countries (not shown).

25 Note that these predictions are calculated as averages of products (of elasticity times wage growth) rather than products of averages as on p. 13 above.

26 See footnote 6.

27 Data for Spain were missing.

28 For an attempt at such an analysis of U.S. data, see R. Michael's contribution in this volume.

29 For a more detailed survey see June O'Neill (1984).

30 But work experience need not lengthen before that stage is reached, and the wage gap may even widen over the transition period.

31 According to McAuley's comment. See also Ofer and Vinokur (1983).

32 His comments at the Sussex Conference.

33 See Appendix Table in Becker's paper.

34 T. Skard and E. Haavio-Mannila (1984).

35 Op. cit., p. 152.

36 Ibid., p. 159.

37 Ibid., p. 160.

38 The reversal started in the mid 70's, not visible in our Table 3.

39 At this pace the gap would fully close in the middle of the next century.

40 Table 5, bottom row, in Riboud's paper.

41 The decline in the fraction of married couples could plausibly narrow the wage ratio, since marital status has a positive effect on wages of men and an opposite effect on wages of women. The decline in the labor force rates of men, which occurred mainly at both ends of the wage spectrum could widen the differential.

42 Potential policy implications of these issues are discussed in Glen Cain's paper. Not surprisingly, views on normative issues differed widely in Conference discussions.

43 For industry details see also Gregory and Duncan (1981).

44 It should be noted that labor force rates of men declined in the 70s in Australia (by 4.3 points), as they did in Britain (3.5 points) and in most of the other countries (the decline was 3.8 points in the U.S.), according to comments by Axel Mittelstädt. This biases the relative employment of women upwards. Also, slowing of married women's female labor force growth in recessions was counteracted, in part, by the Australian law which

denies unemployment compensation to wives of spouses whose earnings exceed a (low) level. The "added worker" effect in recessions is, thereby, strengthened.

Table 1

Labor Force Participation Rates

All Women and Married Women, 1960, 1970, 1980.
12 Countries

	All Women[1]			Married Women[2]			
Country	(1) 1960	(2) 1970	(3) 1980	(1) 1960	(2) 1970	(3) 1980	(4) growth per annum
Australia	29.5	42.8	55.4	19.2	36.5	50.8	4.86
Britain	43.4	54.6	62.3	33.7	48.8	57.2	2.64
France	44.5	47.1	57.0	35.6	41.5	52.6	1.95
Germany	46.5	50.9	56.2	36.5	42.7	54.4	2.00
Israel	29.0[a]	32.0[b]	39.2	25.7[a]	36.0[b]	43.5	2.63
Italy	35.2	33.8	39.9	18.5	24.2	35.4	3.24
Japan[a]	47.7[c]	50.0	52.7	36.0[c]	39.5	41.9	1.00
Japan[b]	21.9	27.0	29.5	12.6[d]	18.3	26.0	4.02
Netherlands	49.0	43.9	34.9	7.6	17.3	30.6	6.96
Spain	22.7[a]	26.1	33.2	n.a.	16.3	26.0	2.37
Sweden	51.0[a]	60.1	76.9	43.1	56.2	75.6	2.31
U.S.A.	37.8	43.4	51.3	30.5[a]	40.8[a]	50.1[a]	2.48
U.S.S.R.	77.4	89.4	88.2	77.4	89.4	88.2	.66

[1]Over 15 years of age, exceptions noted
[2]Ages 20-59, exceptions noted
Israel (a) 1961 (b) 1975, all ages
Japan (a) All Women, ages 20-64, in nonagricultural households and Married Women in employee households
(b) Paid employees, all ages
(c) 1965
(d) 1962
Spain (a) 1964, all Women, ages 20-59
U.S. (a) All ages
U.S.S.R. All Women, ages 20-54

Sources: Country papers and authors.
Japan: Bureau of Women and Youth, Ministry of Labor, Status of Women, Tokyo, Ministry of Finance Printing Office, 1982.

Table 2

Total Fertility Rates and Divorce Rates,
12 Countries, 1970, 1980

Country	TFR[2] 1970	TFR[2] 1980	Divorce Rates[2] 1970	Divorce Rates[2] 1980
Australia	2.56	1.90[a]	.98	2.62[c]
Britain	2.44	1.89	1.17	3.01
France	2.48	1.97	.79	1.59[c]
Germany	2.02	1.38	.51	.63
Israel	3.41	2.76	.81	1.14
Italy	2.42	1.84	.74[d]	1.73[c]
Japan	2.16	1.77[b]	.93	1.21
Netherlands	2.58	1.61	.79	1.69[c]
Spain	2.84	2.65	n.a.	n.a.
Sweden	1.92	1.68	1.61	2.39
U.S.	2.48	1.86[c]	3.51	5.19
U.S.S.R.	1.77	2.04	2.62	3.50

Notes to Table 2: TFR=Total Fertility Rate = sum of age-specific birth rates of women at each age group 15-49.

1. a) 1981
   b) 1978
   c) 1979
   d) 1971

Sources: Australia, U.S.S.R.: The World Bank, World Development Report, 1983.
Israel: CBS, Statistical Abstract; reference in this volume.
Japan: Prime Minister's Office, Japan Statistical Yearbook; in this volume.
Sweden: SOS BefolkningsförÄndringar; in this volume.
U.S.: U.S. Bureau of Census, Statistical Abstract of the U.S., 1982.
others: Statistical Office of the European Community, Demographic Statistics, 1981.

2. Number of final divorce decrees granted under civil law, per 1000 population. Exception: Germany, per 10,000 marriages.

Source: U.N. Demographic Yearbook, 1972, 1981.

Table 3

Wage Growth and Wage Ratios
12 countries, 1960-1980

Country	Annual Growth Rates of Real Wages (%)		Ratio of Women's to Men's Wages[3]		
	Men[1]	Women[2]	1960	1970	1980
Australia	3.60	6.20	.59	.59	.75
Britain	3.46	4.18	.61	.61	.79
France	3.92	4.32	.64	.67	.71[a]
Germany	4.67	5.35	.65	.69	.72
Israel	3.26	3.31	n.a.	.70	.78
Italy	5.14	5.75	.73	.74	.83
Japan	6.46	7.79	.46	.54	.54
Netherlands	6.39	8.07	.60	n.a.	.71
Spain[4]	7.60	7.60	n.a.	n.a.	n.a.
Sweden	3.14	4.51	.72	.84	.90
U.S.	2.23	2.12	.66	.65	.66
U.S.S.R.	2.30	2.30	.70	.70	.70

Notes:
1. Calculated for the period 1960-1975
   Exceptions based on:
   - Australia 1961-1976
   - Spain 1964-1975
   - Netherlands 1960-1970
   - Sweden 1963-1981
2. Calculated for the period 1960-1980
   Exceptions based on:
   - Australia 1961-1976
   - France 1960-1978
   - Israel 1970-1980
   - Netherlands 1960-1978
   - Sweden 1963-1981
3. Hourly wages, aggregate, except:
   - Australia: Weekly, full time workers
   - Britain : Hourly, manual workers
   - France : Annual, full time workers
   - Italy and Sweden: Hourly, in manufacturing
4. Classification by sex not available for Spain.
   Wage growth of women assumed equal to wage growth of men.

Sources: Country papers and authors

Table 4

Educational Attainment of Women
(Average Years of Schooling)

Country	Average in 1970[1]	Increase 1960-1980[1]
Australia	8.20	1.51
Britain	10.32	1.04
France	8.60	1.80
Germany	10.40	1.53
Israel	8.40	2.38
Italy	6.05	2.04
Japan	10.26	1.72
Netherlands	7.75	2.82
Spain	n.a.	n.a.
Sweden	8.80	2.30
U.S.	12.20	.70
U.S.S.R.	7.20	2.54

Notes to Table 4

1 Average Educational Attainment (25+) exceptions noted.

Australia:	population 15+
Britain:	all except those in school
Germany:	all except those in school
Israel:	all except those in school
Italy:	1971 population 21+
U.S.:	population 18+
U.S.S.R.:	population 10+

Sources: Country papers and authors.

Table 5
Annual Growth of Labor Force Rates
of Married Women, 1960-1980

Variables	(1a)	(2a)	(1b)	(2b)
c	.018	.013	.012	.006
	(1.3)	(1.1)	(1.0)	(.7)
$\dot{W}_M$	.22	-1.08	.42	-1.04
	(.7)	(1.7)	(1.6)	(2.3)
$\dot{W}_F$		1.20		1.35
		(2.2)		(3.5)
R^2	.05	.25	.11	.38

Notes:

1. Regressions (a) and (b) contain alternative labor force sectors in Japan: (a) pertains to labor force growth of married women in employee households, (b) pertains to labor force growth of married women who were paid employees. Sources in Table 1.

2. $\dot{W}_M$ assumed equal to $\dot{W}_F$ for Spain, where a breakdown by sex is not available for wages.

3. R^2 is adjusted for degrees of freedom.

Table 6

Cross-section Estimates of Elasticity Parameters

	(1)		(2)	
	α_1	α_2	α_1	α_2
Australia	1.83	-.66	.93	-.39
Britain	.35	-.36	.49	-.04
France	1.15	-.32	.58	-.17
Germany	.72	-.63	.72	-.63
Israel	.61	-.04	.61	-.04
Italy	1.66	-.42	1.66	-.42
Japan[a]	0	-.20		
Japan[b]			1.21	-.43
Netherlands	2.02	-.37	2.02	-.37
Spain	1.79	-.64	.54	-.23
Sweden	.80	-.24	.80	-.24
U.S.	.82	-.52	.73	-.07
U.S.S.R.	.53	+.01	.53	+.01
Mean	1.02	-.37	.90	-.26

Notes to Table 6:
Japan[a]: Based on national samples of employee families (Shimada, et al., 1981).
Japan[b]: Based on sample of wives who were paid employees in the Tokyo area (Osawa, 1984).

Table 6a

Annual Growth of Labor Force Rates
of Married Women, 1960-1980
Intercountry Regression (1)

Variables	(1)	(1a)	(2)	(2a)	(3)	(3a)
c	.018 (3.6)	-.045 (1.4)	.015 (4.0)	-.044 (2.0)	.008 (1.3)	-.056 (2.4)
$(\alpha_1+\alpha_2)\dot{W}_M$	.321 (3.1)	.551 (5.8)				
$\alpha_1\dot{W}_F+\alpha_2\dot{W}_M$			.301 (4.7)	.415 (9.0)		
$\alpha_2\dot{W}_M$					-.380 (1.0)	.156 (.4)
$\alpha_1(\Delta E)$					.164 (3.8)	.248 (5.1)
(ΔE)		n.s.		n.s.		
E_{70}		.0025 n.s.		.003 (1.7)		.0035 (1.5)
Urb_{70}		.0005 (1.3)		.0003 (1.7)		.0005 (1.5)
R^2	.43	.82	.66	.91	.68	.81

Note:

Col. (1a), (2a), (3a) exclude Spain for which education data are unavailable.

Table 6B

Annual Growth of Labor Force Rates
of Married Women, 1960-1980
Intercountry Regression (2)

Variables	(1)	(1a)	(2)	(2a)	(3)	(3a)
c	.017	-.023	.016	-.012	.014	-.039
	(4.0)	(.7)	(4.7)	(.4)	(2.3)	(1.2)
$(\alpha_1+\alpha_2)\hat{W}_M$	.443	.463				
	(4.2)	(4.2)				
$\alpha_1\hat{W}_F+\alpha_2\hat{W}_M$			.374	.410		
			(5.8)	(5.4)		
$\alpha_2\hat{W}_M$					-.223	.031
					(.6)	(.1)
$\alpha_1(\Delta E)$					.151	.202
					(2.5)	(2.9)
ΔE						n.s.
E_{70}				.002		n.s.
				(1.5)		
Urb_{70}		.0006		.0004		.0004
		(1.7)		(1.3)		(1.1)
R^2	.60	.62	.75	.77	.48	.54

Note:

See Table 6A.

Table 7

Slowdown in Men's Wage Growth, 1970 to 1980
Increases in Unemployment Rates 1974-1980

Country	Decline in Wage Growth[1]	Increase in Unemployment[2]
Australia	0	3.8
Britain	4.0	3.7
France	0.7	3.8
Germany	2.6	1.7
Israel	1.5	2.0
Italy	2.4	2.7
Japan	4.5	.7
Netherlands	3.6	2.0
Spain	2.8	8.0
Sweden	4.7	.7
U.S.	2.0	2.4

Notes on Table 6

1. Calculated as : $\dot{W}_M$ (60-75) - $\dot{W}_M$ (75-80), annual rates.
   Exceptions noted for the second term:
   France : $\dot{W}_M$ (75 - 78)
   Sweden : $\dot{W}_M$ (78 - 81)
   Netherlands : $\dot{W}_M$ (70 - 78)
   Also see notes in Table 3 for exceptions
2. Calculated as differences between age and sex standardized unemployment rates in 1980 and in 1974. (ILO, World Labor Report, 1984).

Table 8

Regressions of Married Women
Labor Force Growth, 1970-1980

Variables	El.(1)		El.(2)	
c	.011	.019	.021	.024
	(1.8)	(2.3)	(7.0)	(3.3)
$(\alpha_1+\alpha_2)\hat{W}_M$	.488	.470	.319	.289
	(3.4)	(3.5)	(4.8)	(5.6)
$\Delta\hat{W}_M$		-.315		-.213
		(1.4)		(2.9)
ΔU				-.0023
				(1.8)
ΔE				.094
				(1.8)
R^2	.55	.59	.71	.92

$\Delta\hat{W}_M = \hat{W}_M(60\text{-}75) - \hat{W}_M(75\text{-}80)$

U.S.S.R. and Spain excluded

Table 9

Declines in Total Fertility Rates, 1970-1980

Variables	(a) (1)	(b) (2)	(3)
c	-.042	-.044	-.038
	(2.2)	(2.5)	(2.0)
$\dot{W}_M$	-.237	-.460	-.518
	(.6)	(1.3)	(1.4)
$\dot{P}(60-80)$	-.79	-.98	
	(2.2)	(2.5)	
$\dot{P}(70-80)$			-1.34
			(2.5)
R^2	.22	.30	.31

Dependent Variable:

(a) Using $\dot{P}$ in Japan (a)
(b) Using $\dot{P}$ in Japan (b)
U.S.S.R. excluded

Table 10

Growth of Divorce Rates, 1970-1980

Variables	(1)	(2)
c	-.024 (.7)	-.022 (.7)
$\dot{W}_M$	.274 (.5)	-.196 (.3)
$\dot{P}(60-80)$	.72 (1.6)	1.08 (1.9)
ΔU	.02 (2.8)	.02 (3.4)
R^2	.55	.62

(1) $\dot{P}$ in Japan (a)
(2) $\dot{P}$ in Japan (b)
Spain and U.S.S.R. excluded

Table 11

Changes in Wage Ratios
10 Countries, 1960-1980

Variables	(a) (1)	(a) (2)	(b) (1)	(b) (2)
c	.0035 (1.5)	-.002 (.7)	.002 (.8)	-.002 (.9)
$\dot{P}$(60-80)	.139 (2.0)	.064 (1.1)	.169 (2.4)	.089 (1.4)
ΔE		.085 (2.7)		.080 (2.6)
ΔU				
R^2	.25	.58	.34	.62

U.S.S.R. and Spain excluded
(a) $\dot{P}$ in Japan (a)
(b) $\dot{P}$ in Japan (b)

Table 12

Means (μ) and Standard Deviations

Variable	μ	∂
$\dot{P}(60\text{-}80)^a$	2.84	1.54
$\dot{P}(60\text{-}80)^b$	3.05	1.61
$\dot{W}_M(60\text{-}75)$	4.37	1.70
$\dot{W}_M(60\text{-}80)$	3.90	1.44
$\dot{W}_F(60\text{-}80)$	5.17	2.01
$\Delta \dot{W}_M$	2.52	1.97
E_{70}	8.92	1.73
$\Delta E(60\text{-}80)$	1.85	.64
Urb_{70}	69.50	10.30
ΔU	2.68	2.03
$\dot{W}_R(60\text{-}80)$	.71	.43

Note:

Dot over variable denotes annual rate of growth
a -- based on Japan(a), b -- based on Japan(b)
$\dot{W}_R$ = annual rate of growth of female to male wage ratio

REFERENCES

Becker, Gary S. "A Theory of the Allocation of Time," The Economic Journal, September 1965.

_____. A Treatise on the Family, Harvard University Press, 1981.

Ben-Porath, Yoram. "Labor Force Participation Rates and the Supply of Labor," Journal of Political Economy, May-June 1973.

Cain, Glen. Married Women in the Labor Force, Chicago University Press, 1966.

_____. "The Economic Analysis of Labor Supply: Developments Since Mincer," University of Wisconsin, unpublished, November 1982.

Davis, Kingsley and Pietronella van den Oever, "Demographic Foundations of New Sex Roles," Population and Development Review, September 1982.

Gregory, Robert and R.C. Duncan, " Segmented Labor Markets and the Australian Experience of Equal Pay for Women," Journal of Post-Keynesian Economics, No. 3, 1981.

Gronau, Reuben. "Leisure, Home Production, and Work," Journal of Political Economy, December 1977.

Heckman, James. "Shadow Prices, Market Wages, and Labor Supply," Econometrica, July 1974.

_____. "A Partial Survey of Recent Research on the Labor Supply of Women," American Economic Review, May 1978.

_____. "Sample Selection Bias," in James P. Smith (ed.) Female Labor Supply, Princeton University Press, 1980.

Hill, Anne. "Female Labor Force Participation in Developing and Developed Countries," Review of Economics and Statistics, August 1983.

_____. "Female Labor Force Participation in Japan," Journal of Human Resources, Sprint 1984.

Goldin, Claudia. "Life-Cycle Labor Force Participation of Married Women," Working Paper, No. 125, NBER, December 1983.

Killingsworth, Mark. Labor Supply, Cambridge University Press, 1984.

Kosters, Marvin. "Income and Substitution Effects in a Family Labor Supply Model," Report P-3339, The Rand Corporation, December 1966.

Mincer, Jacob. "Labor Force Participation of Married Women," in Aspects of Labor Economics, H.G. Lewis, ed., Princeton University Press for NBER, 1962.

_____. "Market Prices, Opportunity Costs, and Income Effects," in C. Christ (ed.) Measurement in Economics, a Volume in Memory of Yehuda Gruenfeld, Stanford University Press, 1963.

_____ and S. Polachek. "Family Investments in Human Capital: Earnings of Women," Journal of Political Economy, Part II, March-April 1974.

McAuley, Alistair. Women's Work and Wages in the Soviet Union, London, Allen and Unwin, 1981.

Ofer, Gur and A. Vinokur. "Earnings Differentials by Sex in the Soviet Union," in S. Rosefield, ed., Economic Welfare and the Economics of Soviet Socialism: Essays in Honor of Abram Bergson, Harvard, 1983.

O'Neill, June. "Earnings Differentials: Empirical Evidence and Causes," in G. Schmid, ed., Discrimination and Equalization in the Labor Market, forthcoming, 1984.

Osawa, Machiko. "Women's Skill Formation, Labor Force Participation and Fertility in Japan," Ph.D. Thesis, University of Southern Illinois, 1984.

Skard, T. and E. Haavio-Mannila, "Equality Between the Sexes," Daedalus, Winter 1984.

Smith, James P.(ed.) Female Labor Supply, Princeton University Press, 1980.