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Sex and Earnings in Industrial Society: A Nine-Nation Comparison[1]

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A substantial difference in average earnings between men and women employed full-time is documented for each of nine industrial nations, and several hypothesized explanations for the earnings gap are explored: a human capital hypothesis—women earn less because they have less education and experience; a dual career hypothesis—women earn less because they adjust their work behavior to meet the demands of family obligations; and an occupational segregation hypothesis—women earn less because they are concentrated in low-level jobs. None of these hypotheses receives much support in any country, leaving open the possibility that the earnings differences are due to deeply entrenched institutional arrangements that limit women's opportunities and achievements.

Throughout the industrialized world, women earn substantially less than men for the work they do. Although fully systematic data are lacking, various estimates of the relationship between male and female average earnings have been published for a number of countries. In the United States, for example, the median annual earnings of women aged 14 and older were 43% of those of men in 1978 (U.S. Department of Labor 1980, table 53). Similarly, in Japan women's earnings averaged 50% of those of men in 1972 (Takahashi 1976). In some Eastern European countries, the gap is smaller—in the USSR in 1963, women earned 65% as much

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as men (Swafford 1978, p. 661), and in Poland in 1973, 68% as much (computed from Haavio-Mannila and Sokolowska [1978], p. 204). Even when only full-time workers are considered, women's earnings on average fall far short of those of men: in the United States the ratio is 57%, a ratio that remained essentially constant from 1960 through 1978 (U.S. Bureau of the Census 1980). Similarly, in Canada in 1972, full-time women workers earned 62% as much as male employees (Boyd and Humphreys 1979). As we shall see below, in most Western European countries the ratios tend to be somewhat higher, up to 74% in the Federal Republic of Germany. When hourly pay rates within particular occupational sectors are considered, the ratios are still higher, averaging 74% for manufacturing jobs in 10 industrialized European nations in 1977 (computed from International Labour Office [1977], table 19A).

How might we account for this gap? A variety of explanations have been proposed, which we review below. To date, most research on this topic has been restricted to the United States, leaving it unclear to what extent the degree and pattern of gender differences in income reflect idiosyncratic historical developments within this country and to what extent such differences reflect fundamental features of the organization of work and family life across industrial societies. While the evidence is fairly clear, if somewhat unsystematic, that across industrial societies men on average earn more than women, there has not as yet been any serious attempt to test the generality of alternative explanations for these differences on a comparative basis.

This paper represents a first attempt to address this issue systematically. We compare the incomes of men and women in nine industrial societies and then, insofar as data permit, attempt to account for the observed average differences by testing a variety of hypotheses. Because of the paucity of comparable cross-national data on gender differences in income and their determinants, we regard the descriptive aspect of our effort as particularly important and thus present the basic data underlying our analysis rather more fully than might otherwise have been necessary. Before turning to the presentation of the data and analysis, however, we review various explanations of the gap between the average earnings of men and women.

EXPLANATIONS FOR THE MALE-FEMALE EARNINGS DIFFERENTIAL

There are four major classes of explanations for the earnings differential between men and women: (1) women's productivity is lower than that of men because they have less accumulated human capital, (2) women's family responsibilities affect their earning capacity, (3) women do different work than men and the work women do pays less than the work men

do, and (4) women are subject to discriminatory market mechanisms other than occupational segregation that affect their earnings relative to men's.[2] We will be able to provide explicit, albeit partial, tests of the first three explanations; the validity of the fourth must be inferred indirectly from the results of the analysis.

Human Capital

Prominent among explanations of the gender difference in earnings is one derived from the human capital theory of economics.[3] Proponents of this theory argue that superior qualifications enhance the productivity of workers and that pay differences reflect differential productivity; those workers with the best qualifications will thus be the most highly paid. Because direct measures of productivity are seldom available, the two-step path from qualifications to productivity to earnings is virtually never empirically investigated. Instead, worker characteristics assumed to affect productivity, such as amount of formal education, on-the-job training, and labor force experience, are used to predict earnings. Thus, according to human capital theory, insofar as women have less of these attributes than men, they should earn less. In a general way, the American evidence bears this out—formal schooling, on-the-job training, and experience have been shown to be positively related to the earnings of individuals and to account partially for the gender difference in average earnings (Mincer and Polachek 1974, but see Sandell and Shapiro 1978; Kohen 1977; Treiman and Terrell 1975*b*, p. 196). Whether the link between education and experience, on the one hand, and earnings, on the other, is, in fact, explained by productivity differences is problematic and a matter of considerable controversy. We are unable to enter that debate here and restrict ourselves to investigating what part of the earnings gap between men and women in other industrialized countries can be attributed to gender differences in education and labor force experience.

Dual Career Responsibilities

While current family demands, or expectations about future family responsibilities, may affect decisions to invest in educational or on-the-job training (Mincer and Polachek 1974) and decisions about what occupation to enter, there are other more direct effects of women's family responsibilities on their earnings. Specifically, family responsibilities may affect

[2] For an extended discussion of these issues see Roos (1981*a*).

[3] For additional detail on human capital theory and its relation to explanations of gender differences in earnings, see Kahne and Kohen (1975), Blau and Jusenius (1976), Treiman and Hartmann (1981, chaps. 2 and 3), and England (1982).

a woman's choice of jobs within occupations and the time and energy she can devote to career advancement. Whether or not they work outside the home, women in industrial societies bear the primary responsibility for time-consuming home and family chores (Szalai 1972; Walker and Woods 1976). Because in industrial societies most market work is located outside the home, women who work must organize their family and work lives to balance these often conflicting demands on their time. For many married women, the existence of dual demands may require choosing jobs that minimize conflict with family responsibilities (e.g., jobs located near their home or those not requiring substantial overtime or travel) rather than those that maximize pay. Moreover, women may interrupt their labor force participation when working conflicts with family responsibilities and hence lose seniority rights and, as a result, find themselves in an inferior bargaining position when they return to the work force. Finally, even when married women remain in the labor force, their family responsibilities may make it difficult to perform on the job in such a way as to increase the probability and speed of pay increases and promotions.

Occupational Segregation

It is well-known that the American occupational structure is highly segregated by sex—indeed, much more highly segregated by sex than by race. The degree of segregation shows little sign of lessening (Gross 1968; Treiman and Terrell 1975*c*), and the small changes that have occurred can be attributed to the movement of men into traditionally female jobs and not to any change in the distribution of women across the occupational structure (Blau and Hendricks 1979).

Men and women tend to be concentrated in substantially different occupational sectors, with women overrepresented in clerical and service jobs and underrepresented in managerial, craft, and laboring jobs (Oppenheimer 1970). In particular, women tend to be concentrated in occupations that pay poorly relative to the average educational achievement of incumbents (Oppenheimer 1968; Treiman and Terrell 1975*c*). Even within occupational sectors, men and women are concentrated in different jobs, and the jobs women hold tend to pay less. For example, male physicians tend to be mainly in private practice, while female physicians work mainly in salaried positions (Kosa and Coker 1971, p. 199). Similarly, male professors are more likely to teach at major universities than female professors (Astin and Bayer 1975, p. 375). Even when job tasks are relatively homogeneous within occupations (e.g., accounting clerk, order clerk, tabulating machine operator), women tend to be paid less than men in the same occupation. Several studies have found that the higher the proportion of women doing a particular job within a firm, the

less that job pays relative to the same job in other firms (McNulty 1967; Buckley 1971; Blau 1977).

We are not concerned in the present analysis with accounting for occupational segregation by sex, which may result from a host of factors, but only with the consequences of occupational segregation for pay differentials by sex. In considering this question, it is useful to distinguish between occupational pay differentials based on job content and those based on other factors. It is widely accepted, both as a normative prescription and as an empirical description (Treiman 1977, chap. 1), that jobs requiring the highest degree of skill and responsibility will be most highly rewarded. Hence, to the extent that men do work that is more demanding than work done by women, we would expect them to be paid more on average. In addition, there are other factors that create differential pay rates—the scarcity of labor, sometimes manipulated by restricting the supply of eligible workers; the profitability of firms or economic sectors; the power of unions; legislated rates; tradition; and discrimination. It has been suggested that such factors are important in explaining the male-female earnings differential in the United States (Treiman and Hartmann 1981).

Discrimination

Finally, the social characteristics of individual workers may also affect their earnings. Sometimes pay differentials based solely on worker attributes (without regard to performance) are regarded as legitimate and sometimes they are regarded as discriminatory. In the United States, until 1963 it was legal, and widely accepted as legitimate, to pay women less than men doing exactly the same work. It is still regarded as appropriate to base pay differences on seniority.[4] Hence, insofar as male workers tend to have more seniority because of their more continuous work history, we would expect them to receive higher pay than female workers. In industrial countries it is no longer regarded as legitimate to base pay differentials on gender. Most industrial nations either have their own equal pay legislation or support article 1 of International Labour Office (ILO) Convention 100, which calls for equal pay for "work of equal value."[5] Still, progress toward equal pay has been slow, as the large observed gender disparity attests (see also Wallace 1976; Loeb, Ferber, and Lowry 1978; O'Kelley 1979).

There is every reason to suspect, therefore, that even when differences in the type of work performed, the qualifications of workers (including

[4] A seniority difference is one of the bases on which a sex differential in earnings can be justified according to the 1963 Equal Pay Act (29 U S. Code S206[d])

[5] Those countries belonging to the European Economic Community (EEC) are also subject to the provisions of the Treaty of Rome that call for "equal pay for equal work."

the amount of labor force experience), and the extent of family obligations are all taken into account, a substantial difference in the earnings of male and female workers will remain.

DATA AND METHODS

Data

This analysis compares the earnings of male and female workers in nine industrialized countries: Austria, Denmark, Finland, Germany (Federal Republic), Israel, the Netherlands, Norway, Sweden, and the United States. These countries are a subset of the approximately 30 countries for which representative sample survey data have been obtained in conjunction with an ongoing comparative study of social mobility (Treiman and Kelley 1974). This analysis, like that of the larger project, involves reanalysis of data originally collected for other purposes. Considerable effort was thus required to standardize the variables and samples in order to permit valid cross-national comparisons. These efforts will be described where relevant below (see Roos [1981*a*] for a more complete description of the data sets used and variable transformations made).

The sample of countries was restricted to industrial societies in order to minimize the problem of identifying the economically active population. Serious problems of noncomparability in measured rates of female labor force participation occur in developing countries since in those countries a large fraction of women are unpaid family workers and such workers are sometimes included in and sometimes excluded from the "economically active" population (Durand 1975, p. 11). Cross-national comparisons of nonindustrial and industrial societies would thus be seriously hampered by a lack of comparability in employment data.

In all cases the data are based on representative national probability samples of the adult population (sources of the data sets are given in the notes to table 1). Because of variability in the age groups included in the samples as well as variability in the age at which labor force participation normally begins, we have restricted the bulk of our analysis to the most economically active portion of the population, persons aged 20–64.

We have also restricted the analysis of earnings differences to the full-time employed population in each country. While this decision reduces substantially the number of female workers, the absence of data on hours worked by part-time workers gave us little choice since it is well-known that the earnings of part-time female workers are heavily dependent on the amount of time spent working (Treiman and Terrell 1975*b*).[6]

[6] There may, of course, be differences in hours worked even in the "full-time" labor force, but the variance will be reduced substantially relative to the total labor force Moreover, it is not evident whether hours worked matters among jobs that are defined as full-time.

Table 1 gives the distribution of employment status (full-time, part-time, or not in labor force) by sex for each country. Appendix A presents an elaboration of table 1, providing the percentage employed full-time by age and sex. As can be seen from the table, there is substantial variability across countries in the percentage of women working and their propensity to work full-time. In addition, the results in Appendix A suggest that there is cross-cultural variability in women's age patterns of labor force participation. These cross-cultural differences may in turn affect the kinds of occupations men and women enter and/or the earnings they receive. While we refer to these patterns at various points in discussing our results, a detailed analysis of why such differences exist, and what effect they have on occupational and income attainment, is beyond the scope of this paper. Readers interested in exploring these issues further are referred to the basic data presented in Appendixes A and B and in Roos (1981*a*).

Table 1 also serves as a good illustration of the difficulties inherent in the secondary analysis of data for comparative purposes and suggests the

TABLE 1

LABOR FORCE STATUS, BY SEX, for NINE INDUSTRIALIZED COUNTRIES (%)

Country	Employed Full-Time	Employed Part-Time	Not in Labor Force	Total	*N*
Females:					
Austria	31 5	9.1	59.5	100.1	867
Denmark	34.1	22.3	43.6	100.0	560
Finland	55.0	16.3	28.7	100.0	509
Federal Republic of Germany	18.7	15.4	65.9	100.0	1,294
Israel	16.0	13.6	70.4	100 0	15,013
Netherlands	25.0	9 3	65.7	100.0	471
Norway	21.4	21.9	56.7	100.0	462
Sweden	28.0	37.7	34 3	100.0	554
United States	30.3	11.9	57.8	100.0	3,067
Males·					
Austria	79.5	.5	20.1	100 1	683
Denmark	83.0	7.0	10.0	100 0	458
Finland	70 9	14 5	14.7	100.1	484
Federal Republic of Germany	72 9	3.3	23.8	100.0	889
Israel	54.4	12.9	32.6	99 9	13,220
Netherlands	68.5	1.8	29.7	100.0	663
Norway	77 5	10.1	12.4	100.0	516
Sweden	77 8	14.3	7.9	100.0	468
United States	60.8	8.8	30.3	99 9	2,837

SOURCES —Austria, Netherlands (Political Action An Eight-Nation Study 1973–76 [1979]), Denmark, Finland, Norway, Sweden (Scandinavian Welfare Survey 1972 [1977]), Federal Republic of Germany (Zumabus 1976 [1976]), Israel (Israel Labor Mobility Survey 1974 [1977]), United States (NORC General Social Surveys 1974–77 [1977])

NOTE —See n 7 for the definition of the labor force status variable

necessity of exercising caution in the interpretation of results. Because the variables from which we constructed our measure of employment status differ from country to country, the construction of a single variable that would be comparable across countries required a number of (sometimes arbitrary) assumptions.[7]

Analytic Strategy

Our basic approach is to estimate regression equations separately for males and females in each country, predicting income from a variety of variables identified in our discussion. In a second step, we use a regression standardization procedure to disaggregate the male-female income gap into a component due to differences in male and female means on the independent variables included in the regression analyses and a component due to differences in the rate of return to these variables.

Variables

Four determinants of earnings are analyzed—educational attainment, experience, marital status, and occupational position. We discuss these in turn, showing their relationship to the explanations for the earnings gap reviewed in the preceding section.

Educational attainment.—Education and experience are used as (imperfect) indicators of human capital investments. We measure educational attainment by years of school completed. While amount of schooling does not fully capture variation in the quality of education in countries that have complex educational systems (see Treiman and Terrell [1975*a*] for a detailed discussion regarding the measurement of educational attainment in Great Britain and the United States), we restrict ourselves to this variable because we lack more detailed data for most of the countries considered here. Moreover, our main focus is on the comparison of males and females within countries and not on comparisons between countries,

[7] The labor force status variables were defined as follows: Austria, the Netherlands ("full-time" = currently working full-time; "part-time" = currently working part-time; "not in labor force" = former workers, housewives, retired and disabled, those who have never worked, those in school, and those in the military); Denmark, Finland, Norway, Sweden ("full-time" = full-time nine or more months during 1971; "part-time" = part-time work all year or full-time work less than nine months during 1971; "not in labor force" = those who did not work at all during 1971, e.g., students, pensioners, housewives, persons under institutional care); Federal Republic of Germany ("full-time" = gainful employment full day; "part-time" = gainful employment half day or incidentally gainfully employed; "not in labor force" = not gainfully employed); Israel ("full-time" = employed full-time last week; "part-time" = employed part-time last week for at least 15 hours a week or temporarily absent, worked during year; "not in labor force" = unemployed, worked less than 15 hours a week, or not in civilian labor force, e.g., army, unpaid family workers); the United States ("full-time" = full-time last week; "part-time" = part-time last week or temporarily absent; "not in labor force" = unemployed, retired, in school, or housewife).

and it is unlikely that years of school completed is a more valid measure of educational attainment for one sex than for the other.[8]

We expect education to have a strong positive effect on the earnings of both men and women. The earnings gap between males and females thus could simply reflect differences in achieved education. Although in the United States men and women tend on average to have equal amounts of schooling (Treiman and Terrell 1975*b*), schooling differences may account for gender differentials in earnings in other industrial societies. Insofar as this is so, the earnings gap could be viewed as legitimate. However, if males and females have different rates of return on their investments in education, the human capital hypothesis is called into question.

Experience.—Because the data sets available to us do not have any direct measures of experience or seniority, we include a measure of potential experience, estimated by the conventional formula:

$$\text{potential experience} = \text{age} - \text{years of schooling} - 6.$$

Although this measure provides a reasonably good estimate of the total years of experience for men, since most men work full-time continuously after completing their schooling, it does not provide an equally adequate estimate of women's experience. While never-married women tend to have continuous attachment to the labor force (Treiman and Terrell 1975*b*), the participation of married women tends to be part-time and intermittent.

The bias introduced by using this measure may not, however, be as great as is often assumed. Reeve Vanneman, using data from the 1972–73 Quality of Employment Survey (1975), has shown (personal communication, 1981) that although the "potential experience" variable substantially overestimates actual labor force experience for women (and not for men), regression equations using actual and potential experience produce substantially similar results. In particular, the differences between equations estimated for males and females using either measure of experience are much larger than the differences between the equations for each sex using the alternative measures.[9]

[8] It is an open question whether, for a given number of years of school completed, quality of education is more differentiated for males or for females and whether such differences as exist are consistent across countries. With respect to postsecondary education in the United States, curriculum is undoubtedly important—few would dispute that a B.A. in engineering is worth more financially than a B A. in history or that an A A. (two-year) certificate in medical technology is worth more than an A.A in marketing. But it is by no means obvious whether the courses of study dominated by men are more differentiated than those dominated by women, or vice versa.

[9] For national samples of males and females employed full-time, the pertinent regression estimates are:

For males:

$$\hat{Y} = -3{,}204 + 482(E) + 1{,}827(M) + 57\ 3(S) + 415(X) - 6.37(X^2), \quad R^2 = .232,$$

$$\hat{Y} = -3{,}938 + 499(E) + 1{,}615(M) + 61\ 2(S) + 451(X') - 6\ 75(X'^2), \quad R^2 = .242.$$

Because it is well-established that the cross-sectional relationship between experience and earnings is curvilinear, with older workers experiencing a reduction in earnings relative to those in midcareer, we include a squared term for experience in our estimation equations. Specifically, we include the variable $(X - k)^2$, where X is our potential experience variable and the constant, k, is chosen to make the squared term orthogonal to the experience variable.[10] The advantage of doing this is that it makes it possible to interpret the effects of experience and the squared term independently. A curvilinear relation between experience and earnings may arise in a number of ways: for some occupations, productivity may fall with age after a peak is reached, owing to declining physical capabilities; in others, skills acquired as part of formal education may depreciate to a point that more than offsets increases in productivity associated with experience. Alternatively, there may be no decline in earnings within any particular cohort; the observed curvilinear cross-sectional relationship may simply reflect cohort differences in earnings, each cohort starting and ending with higher earnings than previous cohorts (for an example of this process as it pertains to occupational status see Jackson, Thompson, and Treiman [1979]). While we will be unable to decide among these possibilities here, the inclusion of the squared term for experience is necessary to specify the estimation equation properly.

Marital status.—Marital status is a dummy variable, with those who have never married assigned a value of 1 and others a value of 0. Its utility in the present analysis is in testing the hypothesis that women's family and work obligations affect earnings negatively. Insofar as the dual burden faced by working women with families results in occupational decisions or performances that reduce earnings, never-married women

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For females

$$\hat{Y} = -2{,}083 + 353(E) + 50.8(M) + 47.3(S) + 211(X) - 3.54(X^2), \quad R^2 = 334,$$
$$\hat{Y} = -2{,}509 + 370(E) + 240(M) + 52\ 5(S) + 184(X') - 2.71(X'^2), \quad R^2 = .327.$$

Here Y = annual income, E = years of school completed, M = 0 if never married and 1 if ever married, S = the Duncan SEI score for current occupation, X = the actual number of years worked since age 16, and X' = potential number of years worked, estimated as age minus years of schooling minus 4. The means for X and X' are 20.8 and 22.5 for males and 15.9 and 22.3 for females. Although the potential experience variable overestimates actual labor force experience much more severely for females than for males, the impact on the regression coefficients is less substantial. Even in the female equation, only one coefficient changes substantially, the statistically insignificant coefficient for marital status. More important, the conclusions regarding gender differences in the determinants of income that one would draw from a comparison of the equations using the estimated experience variable are the same as the conclusions one would draw from a comparison of the equations using the actual experience variable.

[10] Kent Smith has shown (personal communication, 1981) that choosing k equal to one-half the slope coefficient associated with the zero-order regression of X^2 on X will make X and $(X - k)^2$ orthogonal. This is a special case of the procedure discussed in Smith and Sasaki (1979).

should earn more than ever-married women, net of other factors. The distinction has been drawn between never- and ever-married women, rather than between currently married and not currently married women, because the effect of a dual career is likely to persist even if a marriage is dissolved—career disruptions may have a permanent negative effect on earnings even when a full-time career is resumed. Moreover, children often remain from a former marriage, and traditionally they are the mother's rather than the father's responsibility. Empirical evidence confirming the similarity between currently and formerly married women in their earnings attainment and the dissimilarity between never- and ever-married women is provided by Treiman and Terrell (1975*b*, p. 189).[11]

Whereas marriage may be regarded as a burden for working women, it is likely to be an advantage for working men. The fact that responsibility for household maintenance largely falls to the wife (Szalai 1972; Walker and Woods 1976) leaves the husband free to pursue his career single-mindedly. Of course, the added financial burden of maintaining a family may lead men, more than women, to seek jobs that maximize their incomes (see Oppenheimer 1974).

Occupation.—Our data permit two measurements of occupational position: prestige and a classification of occupations into the seven major categories of the *International Standard Classification of Occupations* (International Labour Office 1969).

Consider prestige first. Recall the suggestion that occupational pay differentials can be divided into those based on job content and those based on other factors. In the present context we can regard the prestige of occupations as a summary indicator of those aspects of job content that are the major bases of compensation. This view derives from Treiman's (1977, chap. 1) theoretical work that identifies as major determinants of prestige various aspects of power: economic control, authority, and expertise. Interestingly, these conform closely to the major compensable factors in formal job evaluation schemes. Although skill, effort, responsibility, and working-conditions factors are generally included in such schemes, invariably major weight is accorded to skill and responsibility and only minor weight is accorded to effort and working conditions (Treiman 1979). Prestige is measured by the Standard International Occupational Prestige Scale (Treiman 1977, chap. 8) by assigning prestige scores to the detailed occupational categories into which data were coded in each of the nine countries. Such assignments have been shown to be highly reliable, and the resulting prestige scores have been shown to have high validity (Treiman 1977, chap. 9).

[11] Interestingly, available evidence for the United States indicates that the presence or number of children has virtually no impact on the earnings of ever-married women (Treiman and Terrell 1975*b*, pp. 190, 195). Unfortunately, most of our samples do not contain the data necessary to test this possibility in other countries.

Of course, job content, as measured by prestige, is not the only basis for occupational differentials in pay rates (Bridges and Berk 1974; McLaughlin 1975; Talbert and Bose 1977). In fact, the use of prestige alone would be inappropriate. It is well-known that men and women tend to work in substantially different kinds of jobs even though on average they work in jobs of equivalent prestige (England 1979). The use of prestige as a measure of occupational attainment is limited in analyses of sex differences in earnings precisely because it fails to distinguish between the kinds of jobs in which men and women work (Roos 1981*b*). Because we expect occupational sectors to differ in their level of compensation as a consequence of differences in their mode of organization (degree of unionization, effective control of the supply of labor, etc.), and because the labor force is so highly segregated by sex, sectoral differences in compensation levels could themselves produce substantial male-female earnings differentials. While the limitations of our data do not permit us a very fine-grained consideration of these various effects, we can make a first approximation by distinguishing among the seven major groups of the *International Standard Classification of Occupations* (International Labour Office 1969). While it would have been preferable to use a more detailed classification, such as the 14-category classification proposed by Treiman (1977, chap. 9), the small samples available to us precluded this. However, by scoring each respondent with both the prestige of his or her occupation and a dummy variable representing the major group in which the occupation is located, we are able to capture both sectoral differences in income levels net of prestige and prestige differences in income within major occupational sectors.

Income.—Our dependent variable is income. As the reader will note, we have been using "income" and "earnings" somewhat interchangeably. Our data are sometimes earnings (Austria, Germany, Israel, the Netherlands, and the United States) and sometimes income (Denmark, Finland, Norway, and Sweden). Fortunately, for practical purposes the distinction is unimportant. Except for the extreme ends of the distribution, the overwhelming bulk of income derives from earnings, at least in the United States. Only the very poor, who subsist largely on transfer payments, and the very rich, who have substantial returns from investments, have enough outside income to affect the analysis.[12] In sample surveys of the kind we have available, these extreme groups are likely to be represented by only a few cases, if at all.

The exact information elicited on income varies from country to country, including net or gross monthly earnings, gross annual earnings, and gross annual income (see the note to table 4). After converting categorical

[12] In the United States in 1972, 84% of gross income derived from wages and salaries and over 90% from wages and salaries or profits from farms, partnerships, and businesses (computed from U S. Internal Revenue Service 1974, table 1.4).

variables to an interval scale by assigning each category its midpoint and estimating the midpoint of the open-ended upper categories by means of a Pareto transformation (Miller 1966), we converted each income variable into its natural logarithm. Doing this effectively standardizes the income variables across the countries: when the dependent variable is the natural log of income, the metric regression coefficients can be interpreted as indicating approximately the proportional increase in income that would be expected from a one-unit increase in the associated independent variable.[13] A further justification for logging income, in addition to its interpretive convenience, is that the distribution of earnings tends to be lognormal.

ANALYSIS

The analysis will proceed in four steps: first, we examine gender differences in occupational composition in all nine countries; second, we examine gender differences in income; third, we estimate a regression model of income determination separately for males and females; and, finally, we use the results of our regression analyses to decompose the gender differences in income into a number of factors, as a way of testing alternative explanations for the observed income gap.

Occupational Composition

It is evident that in industrial societies men and women do different work. Table 2 presents the distribution by sex of the entire labor force (both full- and part-time) over the 14 categories of Treiman's (1977, pp. 203–8) International Occupational Classification.[14] While there is some variability in the degree of occupational segregation of the labor force by sex, with indexes of dissimilarity ranging from 38 in Austria to 60 in Sweden, the general pattern is one of very substantial segregation in all nine countries.

[13] This approximation holds for values of b (the net regression coefficient) up to about .2. For higher values of b the proportional increase is underestimated by successively larger amounts: $b = .2$ implies an increase of 22%, $b = .3$ implies an increase of 35%, $b = .4$ implies an increase of 49%, and $b = .7$ implies an increase of 101%.

[14] This classification, which was formed by dividing the seven-category *International Standard Classification of Occupations* (International Labour Office 1969) on the basis of prestige, effectively captures major variations in the organization of work, e.g., dividing "professional, technical, and related occupations" into high-prestige professions (which correspond to the classical liberal professions) and low-prestige professions (which correspond to the technical and semiprofessions). Such a distinction is particularly important in comparing the earnings of men and women, given the greater likelihood of women's concentration in low-prestige professions (e.g., primary school teaching, nursing, and librarianship). Similar distinctions are drawn throughout the labor force. In tables 2 and 3 the categories are arranged in order of their average prestige

In order to see more clearly how women are distributed throughout the labor force, that is, in which sectors they are overrepresented and in which they are underrepresented, we turn to table 3. This table presents the percentage female in each occupational category expressed as a deviation from the percentage female in the entire labor force. This standardization adjusts for the fact that in some countries women are much more likely to work than in others. For example, in Norway the percentage of high-prestige professionals who are female is 6% lower than the percentage female in the labor force as a whole. Similarly, in Sweden the percentage of high-prestige professionals who are female is 8% lower than the percentage female in the Swedish labor force. Hence, we conclude that women are about equally underrepresented among high-prestige professionals in Norway and Sweden, even though 21% (= 27% − 6%) of high-prestige professionals in Norway are women and 35% (= 43% − 8%) of high-prestige professionals in Sweden are women.[15]

Inspection of the table shows the degree of similarity across countries to be striking. In nearly all countries, women are substantially overrepresented in high-prestige clerical occupations and in low-prestige sales and service occupations; slightly overrepresented in low-prestige professional occupations, high-prestige service occupations, and low-prestige clerical occupations; slightly underrepresented in high-prestige professional, sales, and agricultural occupations and in low-prestige production occupations; and substantially underrepresented in administrative occupations, in high- and medium-prestige production occupations, and in low-prestige agricultural occupations. Of 126 possible comparisons, only nine (or 7%) have a sign opposite the major trend for the row (these are indicated by boldface), and in almost all cases these deviations are very small.[16] Clearly, there is a characteristic pattern of men's work and wom-

[15] Our samples were adjusted to account for the fact that in many of the countries, working men and women were sampled at different rates (owing mainly to differential response rates). Without such an adjustment, the computation of percentage female in each occupational category of table 3 would have produced incorrect estimates. To correct this bias, we weighted the data so that the total percentage female in each sample equals the percentage female in the labor force reported in the 1977 *Yearbook of Labour Statistics* (International Labour Office 1977), except in the case of the United States, for which a 1976 Current Population Survey estimate was used (U.S. Bureau of the Census 1977). Care was taken to select a census date that was close to the date of the survey. This correction assumes that within each country the differential response by sex is the same for each occupational category. Since the remainder of our analysis involves separate analyses by sex, the weighting procedure affects only the results presented in table 3.

[16] There is only one truly anomalous statistic in the entire set—the substantial overrepresentation of German women among low-prestige production workers. We suspect that this may reflect a peculiarity of the German sample survey design. The German survey organization that did the field work, ZUMA, includes only German nationals in its samples. Hence, the *Gastarbeiter* ("guest worker") population, which formed 11% of the total labor force in 1972 (Federal Republic of Germany, Federal Institute for Population Research 1974, p. 32), is excluded. This population, which is largely male, is concentrated in the lowest-

en's work in industrial societies. While it is beyond the scope of the present paper to attempt to account for this pattern, its existence does suggest that in our investigation of the earnings differential we are concerned with very fundamental features of the organization of work in industrial societies.

Income

Table 4 simply confirms what the material presented in the introductory section suggested—even among full-time workers, women earn substantially less than men. Moreover, the gender gap in earnings is greatest in the United States: during the period 1974–77, women who worked full-time earned an average of 51% of what men earned per year.[17] At the other extreme, the gap is smallest in the Federal Republic of Germany, where women earned an average of 74% of what men earned. The nine-country average is 64%—in these countries the average woman working full-time earned less than two-thirds of what her male co-workers earned. We now turn to discussion of why this very large gender discrepancy exists.

Determinants of Earnings

Our first step in accounting for the average earnings gap between male and female workers is to predict earnings separately for full-time workers of each sex within each country. We thus estimated 18 equations (two sexes by nine countries) of the form:

$$\hat{\ln Y} = a + b(E) + c(X) + d(X'^2) + e(S) + f(P) + \Sigma g_i D_i , \quad (1)$$

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status jobs Hence, it may well be the case that in Germany, as elsewhere, low-status production work is done mainly by men but by *foreign* rather than *German* men. This possibility is supported by the data in table 2 showing that the proportion of the male labor force in low-prestige production occupations is lower in Germany than in any of the other eight countries.

[17] The U.S ratio may well be a lower-bound estimate The discrepancy between our ratio of 51 and that of 59, the average of the ratios reported in the Current Population Surveys (CPS) for the same years (computed from U S. Department of Labor 1979, table 1) can perhaps be accounted for by the difference in the definition of "full-time" work in the NORC surveys we used and the CPS The NORC surveys asked only whether the individual worked full-time in the week preceding the survey. The CPS asked how many hours the respondent worked in the reference week and also how many weeks the respondent worked in the past year; full-time year-round workers are defined as those who worked 50–52 weeks in the past year and 35 or more hours in the past week. Since the CPS definition is more restrictive, the ratio of female to male earnings is bound to be somewhat higher in the CPS data. For example, primary school teachers—an occupational category with more female than male incumbents—would be counted as full-time workers in the NORC data but not in the CPS data

where $\ln Y$ = natural log of income; E = years of school completed; X = potential experience, estimated by age − years of schooling − 6; $X' = X - k$, with k chosen to make X and X'^2 orthogonal (see the discussion above); S = 1 for those who have never married, and 0 otherwise; P = the prestige of the respondent's occupation; and each D_i = 1 for occupations in the ith major group of the *International Standard Classification of Occupations,* and 0 otherwise. The first category, professional and technical occupations, is omitted from the equation to avoid a linear dependency. The means, standard deviations, and correlations among the included variables are given in Appendix B, which also includes the linear form of the income variable and the omitted dummy variable for professional and technical occupations. The regression estimates are given in table 5. We discuss the coefficients of each variable in the order in which we introduced them above.

Education.—While education has a positive effect on income for men, the same is not true for women. In all nine male equations the coefficient associated with years of school completed is positive and statistically significant;[18] on average, each year of schooling increases income nearly 5%, net of other factors. For women the return to education is much less consistent. In six of the nine countries, the return to education for women is less than that for men, and, indeed, in five of these countries—the United States constituting the only exception—the educational coefficient for women is not significantly different from zero. In Germany and Norway, in contrast, the education coefficients for females are substantially larger than those for males in any country and imply a 9% increase in income for each additional year of schooling. The variability in the return to education for men and women within each country calls seriously into question a simple differential investment explanation of the earnings gap.

Experience.—We expect a positive relationship between experience and earnings. Given what we know from U.S. data, however, we allow for the possibility that the relationship is curvilinear. Indeed, it is. In all 18 equations the slope of the squared term is negative, and in 16 of the 18 equations it is significantly so. Surprisingly, however, the linear term for experience behaves in a much less consistent way. Although most of the slopes are positive, only two of those for males and five for females are statistically significant. Thus, for males the picture is generally one of income increasing until the middle of the career and then falling as far as it has risen. For females, in contrast, in about half the countries the linear term for the experience variable is positive, although there is substantial curvature in the earnings trajectory for females as well. The

[18] In the following discussion, we refer to regression coefficients as statistically significant if they exceed twice their standard error. The exception is the set of dummy variables representing occupational categories, which we regard as significant if they significantly increase R^2 ($P < .05$).

TABLE 2

OCCUPATIONAL DISTRIBUTION OF EMPLOYED PERSONS, BY SEX, FOR NINE INDUSTRIALIZED COUNTRIES (%)

OCCUPATIONAL CATEGORY*	AUSTRIA		DENMARK		FINLAND		FEDERAL REPUBLIC OF GERMANY		ISRAEL	
	F	M	F	M	F	M	F	M	F	M
1. High-prestige professional and technical	1.4	5.1	3.2	5.4	3.1	3.5	3.5	7.5	7.9	6.7
2. Administrative and managerial	.5	3.3	.0	3.8	1.2	2.4	.0	2.7	1.0	4.2
3. High-prestige clerical and related	12.7	3.7	24.1	3.8	14.8	.8	31.7	18.4	25.7	8.2
4. High-prestige sales	4.3	8.4	2.4	4.7	3.1	3.3	4.3	5.8	2.1	6.7
5. Low-prestige professional and technical	6.0	4.5	14.5	6.6	10.2	7 1	11.0	6.0	21.4	7.5
6. High-prestige agricultural	19.2	15.0	17.3	22.1	24.7	22.8	1.9	4.6	2.0	3.6
7. High-prestige production and related	3.5	16.7	3.6	15.3	3.1	10.6	5.3	23.3	5.0	19.6
8. High-prestige service	4.6	3.9	4.4	1.4	4.3	1.9	5.8	5.0	6.4	2.9
9. Medium-prestige production and related	7.3	19.8	3.6	22.4	6.2	28.3	4.6	18.2	4.9	18.5
10. Low-prestige clerical and related	10.6	7.6	2.8	2.6	4.6	2.7	9.1	4.5	3.0	4.0
11. Low-prestige sales	7.6	.8	6.4	1.9	6.5	.5	12.1	1.2	6.3	2.5
12. Low-prestige agricultural	1.9	3.3	.4	1.6	1.9	5.7	.7	.4	.7	2.3
13. Low-prestige service	12.5	.6	14.9	.5	13.3	1.4	5.1	.8	10.2	4.4
14. Low-prestige production and related	7.9	7.4	2.4	8.0	3.1	9.0	5.0	1.6	3.5	9.1
Total	100.0	100.1	100.0	100.1	100.1	100.0	100.1	100.0	100.1	100.2
N	342	541	281	393	319	373	386	642	4,407	8,791
Index of dissimilarity	37.6		50.4		41.2		42.6		45.8	

* Standard International Classification (Treiman 1977, chap. 9).

TABLE 2 (*Continued*)

Occupational Category*	Netherlands		Norway		Sweden		United States	
	F	M	F	M	F	M	F	M
1. High-prestige professional and technical	6.3	7.3	5.8	8.3	6.2	8.5	6.7	11.1
2. Administrative and managerial	.5	8.0	2.3	4.8	.4	5.2	3.0	10.4
3. High-prestige clerical and related	27.3	11.7	18.1	6.0	26.3	2.4	22.9	2.4
4. High-prestige sales	3.9	10.0	1 2	5.0	1.1	4.7	1.5	4.4
5. Low-prestige professional and technical	18.0	9.0	13.5	12.1	17.2	10.7	15.6	6.5
6. High-prestige agricultural	5	4.6	16 4	14.9	1.1	7.6	.1	3.4
7. High-prestige production and related	.5	12.9	.0	10.8	2.2	17.3	4.5	18.4
8. High-prestige service	3.4	4.4	2.9	3.5	5 5	3.8	8.8	5.0
9. Medium-prestige production and related	4.4	20.2	4.1	19 4	3.6	23.7	8.5	19.1
10. Low-prestige clerical and related	5.9	3.9	4.1	2.5	5.5	2.8	10.3	4.7
11. Low-prestige sales	11.2	1.5	12.9	1.5	10.6	2.1	5.3	5.1
12. Low-prestige agricultural	1.5	2.7	.6	2.0	.0	3.3	.4	1.7
13 Low-prestige service	15.1	1.2	15 2	1.3	18.2	1 4	10.4	2.9
14 Low-prestige production and related	1.5	2.7	2.9	7.8	2.2	6.4	2.0	5.0
Total	100.0	100.1	100.0	99.9	100.1	99.9	100.0	100 1
N	160	456	155	413	299	397	1,298	1,939
Index of dissimilarity	50.2		41.8		60.0		46.8	

* Standard International Classification (Treiman 1977, chap 9)

TABLE 3

PERCENTAGE FEMALE IN EACH OCCUPATION GROUP EXPRESSED AS A DEVIATION FROM PERCENTAGE FEMALE IN THE TOTAL LABOR FORCE, FOR NINE INDUSTRIALIZED COUNTRIES

Occupational Category*	Austria	Denmark	Finland	Federal Republic of Germany	Israel	Netherlands	Norway	Sweden	United States	Nine-country Average†
1. High-prestige professional and technical	−24	−12	−3	−16	**+4**	−3	−6	−8	−11	−9
2. Administrative and managerial	−29	[−42]	[−16]	[−38]	−23	−24	−12	−38	−24	−25
3. High-prestige clerical and related	+30	+40	+48	+13	+28	+19	+26	+46	+46	+33
4. High-prestige sales	−14	−15	−1	−7	−20	−14	−19	−28	−21	−15
5. Low-prestige professional and technical	+7	+19	+9	+15	+26	+15	+2	+12	+22	+14
6. High-prestige agricultural	**+6**	−6	**+2**	−18	−11	−22	**+2**	−33	−39	−13
7. High-prestige production and related	−27	−27	−26	−25	−22	−25	−27	−34	−26	−27
8. High-prestige service	+4	[+27]	+20	+3	+19	**−4**	[**−4**]	+9	+14	+9
9. Medium-prestige production and related	−20	−31	−30	−24	−22	−19	−20	−32	−17	−24
10. Low-prestige clerical and related	+8	[+2]	+13	+17	**−6**	+9	[+11]	+16	+19	+11
11. Low-prestige sales	+47	+29	+45	+48	+22	+47	+49	+36	+1	+36
12. Low-prestige agricultural	−12	. . .	−24	. . .	−21	[−10]	. . .	[−43]	−28	−21
13. Low-prestige service	+54	+54	+43	+42	+21	+55	+55	+48	+30	+45
14. Low-prestige production and related	**+2**	−24	−23	**+28**	−17	[−10]	−15	−22	−19	−11
Total percentage female	39	42	46	38	33	26	27	43	40	37

NOTE.—Figures of sign opposite pattern for row are boldface. Percentages based on fewer than 10 cases not shown, percentages based on 10–19 cases shown in brackets.

* Standard International Classification (Treiman 1977, chap. 9)

† Bracketed percentages not included in average.

TABLE 4

MEAN AND STANDARD DEVIATION OF INCOME BY SEX, FULL-TIME WORKERS AGED 20–64, FOR NINE INDUSTRIALIZED COUNTRIES

COUNTRY	MEAN		FEMALE INCOME AS A PERCENTAGE OF MALE	RATIO OF MALE TO FEMALE INCOME	STANDARD DEVIATION		*N* CASES	
	Female	Male			Female	Male	Female	Male
Austria	4,586	6,932	66	1.51	2,337	3,368	216	475
Denmark	31,524	55,503	57	1 76	24,693	53,198	132	331
Finland	10,665	15,796	68	1.48	6,914	10,362	184	303
Federal Republic of Germany	1,674	2,276	74	1.36	711	1,019	169	520
Israel	11,335	17,388	65	1 53	6,072	8,391	1,147	3,175
Netherlands	1,028	1,569	66	1.53	605	927	91	386
Norway	25,047	39,818	63	1.59	11,097	22,249	78	377
Sweden	25,125	36,292	69	1.44	16,338	15,750	142	344
United States	7,333	14,243	51	1.94	4,880	9,312	810	1,515

NOTE —Income given in local currency· Austria, Netherlands (net monthly earnings), Denmark, Finland, Norway, Sweden (gross annual income); Federal Republic of Germany (gross monthly earnings), Israel, United States (gross annual earnings)

TABLE 5

COEFFICIENTS OF A MODEL OF INCOME ATTAINMENT FOR FULL-TIME WORKERS AGED 20–64, BY SEX, FOR NINE INDUSTRIALIZED COUNTRIES
(Dependent Variable is Natural Log of Income)

	AUSTRIA		DENMARK		FINLAND		FEDERAL REPUBLIC OF GERMANY		ISRAEL	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
	Metric coefficients									
Years of schooling	.0161	.0418	0420	0639	0308	.0558	0870	.0211	.0474	.0231
Years of potential experience	−.000245	.000238	00154	.00431	00669	00271	.00886	.00275	.0154	.00110
Experience squared*	−.000694	− 000183	−.000868	−.000804	− 00103	−.000313	−.000646	−.000298	−.000618	−.000592
Never married	−.0130	−.227	.203	− 0939	−.0327	−.363	−.102	−.292	−.0899	−.247
Prestige of current occupation	.0000210	.00311	−.0292	0137	− 0256	.00308	.0150	.00801	.0123	.00791
Administrative occupation†	.000748	.428	0 0	0526	− 378	.0852	0.0	.211	.0876	−.0137
Clerical occupation	−.407	−.103	−.115	− 0936	−1 05	−.191	.214	−.188	−.0598	−.176
Sales occupation	−.350	.0354	−.758	−.186	−1 53	−.171	.177	.174	−.118	−.246
Service occupation	−.731	− 257	−1.23	−.0432	−2.20	−.380	.555	−.0890	−.144	−.229
Agricultural occupation	−1.04	−.563	−1.31	− 119	−1.99	−.705	.157	−.111	−.0430	−.361
Production occupation	− 762	−.130	− 945	−.104	−1 68	−.330	.171	− 166	−.200	−.250
Constant	8.89	8 42	11.7	9 74	11.2	9.36	5.53	7.16	8.11	9.44
Standard error of estimate	.440	412	.594	516	447	.490	387	.365	.575	.412
	Standardized coefficients									
Years of schooling	.047	.168‡	.121	225‡	102	.188‡	.401‡	113‡	.253‡	.185‡
Years of potential experience	−.005	006	.029	.089	.116‡	055	.253‡	.069	.308‡	.030
Experience squared*	−.179‡	−.152‡	−.190‡	− 188‡	− 206‡	−.077	−.222‡	−.092‡	−.148‡	−.214‡
Never married	−.010	− 166‡	105	−.051	−.017	− 250‡	−.101	−.218‡	−.062	−.168‡
Prestige of current occupation	.000	.073	− 389‡	.263‡	−.403‡	.060	.349‡	.225‡	.221‡	.207‡
Occupation categories§	.588‡	427‡	.773‡	087	.975‡	.383‡	.252‡	.257‡	.101	.193‡
R^2	384	.379	395	301	648	.387	.399	.313	.310	.364
Adj. R^2	.350	364	.337	.275	.622	363	.357	.298	.304	.362

NOTE.—Means, SDs, and correlations given in Appendix B

* Adjusted to be orthogonal to experience, see text for details.

† "Professional and technical" is the omitted category

‡ Coefficient is at least twice its standard error

§ Heise's (1972) sheaf coefficient Significance measured by F-ratio for increment to R^2

TABLE 5 (*Continued*)

	Netherlands		Norway		Sweden		United States	
	Female	Male	Female	Male	Female	Male	Female	Male
	Metric coefficients							
Years of schooling	.0100	.0423	.0899	.0540	−.00164	0533	0525	.060
Years of potential experience	.00831	.00588	−.00194	.00346	.00636	00229	.0137	.0139
Experience squared*	− 000552	−.000730	− 000954	− 000312	−.000188	−.000440	−.000393	−.00103
Never married	−.0152	−.271	− 157	−.269	160	−.0770	−.0343	−.300
Prestige of current occupation	.0224	00816	−.0288	−.00105	.0197	.000852	.0191	0119
Administrative occupation†	−.359	.199	280	.0623	−.644	.137	−.154	.316
Clerical occupation	.136	−.0240	−.356	−.0714	−.132	−.115	− 128	.0778
Sales occupation	.115	−.0391	−.782	−.127	− 265	−.107	−.171	.240
Service occupation	.289	−.0842	−1.29	.0300	−.689	−.0595	−.172	.0285
Agricultural occupation	.00408	−.192	−1 05	−.438	−2.41	−.418	−.367	.163
Production occupation	.196	−.157	−1 35	− 172	−.0490	−.151	.0214	.196
Constant	5 66	6.56	11.3	10.2	9.18	10.1	7.07	7.85
Standard error of estimate	.369	.323	323	.389	.577	298	.690	.601
	Standardized coefficients							
Years of schooling	.054	.265‡	.398‡	.330‡	− 006	.386‡	176‡	.271‡
Years of potential experience	.237‡	.166‡	−.049	.097	.102	.076	.234‡	.253‡
Experience squared*	−.184‡	−.264‡	−.293‡	−.107‡	−.037	−.178‡	−.081‡	−.228‡
Never married	−.018	−.217‡	−.121	−.175‡	.078	−.068	−.016	−.141‡
Prestige of current occupation	.631‡	230‡	−.616‡	−.029	.333‡	.029	.310‡	.214‡
Occupation categories§	.244	.224‡	.932‡	.327‡	.482‡	.337‡	.101	.141‡
R^2	.333	551	.704	329	.476	.427	.229	.315
Adj. R^2	.240	.538	.644	.306	.422	.407	.218	.310

NOTE.—Means, SDs, and correlations given in Appendix B

* Adjusted to be orthogonal to experience, see text for details.

† "Professional and technical" is the omitted category.

‡ Coefficient is at least twice its standard error

§ Heise's (1972) sheaf coefficient. Significance measured by F-ratio for increment to R^2

results for the United States, which show significant effects of both the linear and squared terms for both men and women, appear to be somewhat deviant relative to other industrialized countries.

Although the trajectory for males in the United States shows substantially greater curvature than that for females, this pattern does not hold consistently across countries; in some countries the coefficient of the squared term is larger for females. While it might be surmised that the curvilinear relation between experience and earnings reflects cohort variations in income, each cohort starting and ending with higher income than the previous cohort, this possibility is inconsistent with the substantial variability in the relationship between the male and female curves in different countries—unless rather complicated and specific historical circumstances can be shown to account for these variations. Exploration of this possibility must be left for future research.

Marital status.—As expected, married men tend to earn more than single men. In all nine countries the coefficient of the never-married dummy variable is negative, and in seven it is statistically significant. In these seven countries the cost for men of never having married is substantial. Whether because of the benefits or the responsibilities of marriage, married men on the average earn about 20% more than single men, net of other factors. This differential cannot be accounted for by their greater experience or generally higher-status occupations because these factors are included in the prediction equation. However, employers may prefer to hire and promote married men because they view them as more stable and reliable than single men.

For women, of course, we expect just the opposite, at least if the dual career is an important deterrent to income. Married women should earn less than single women, net of other factors. Hence, a good test of whether the dual career faced by married women is an important determinant of the male-female income gap is whether the coefficient of the marital status variable is significant for women. The evidence, however, is conclusively negative. In none of the nine countries is the coefficient of marital status significant for females, and in seven of the nine its sign is opposite that expected under the hypothesis. Interestingly, this result directly contradicts the findings of Mincer and Polachek (1978, p. 120), who boldly assert that "*all* studies, whether of domestic or international data, find that marital status and family characteristics affect female wages."

In interpreting our result, however, we must keep in mind the fact that the sample is restricted to full-time workers. As evidenced by their full-time participation in the labor force, these married women, whether by choice or necessity, have worked out an accommodation between the demands of work and family. Once the necessary arrangements to work full-time have been made, these women are evidently not penalized by their

marital status. Although the results described above suggest that the dual career has no effect on the earnings of married women who work full-time, it may be that it affects earnings indirectly by influencing which women participate in the labor force and the kind of work they do. These issues are investigated further in Roos (1981*a*).

Occupation.—Occupational status as we have measured it here has a somewhat complex relation to income, although for all countries and both sexes there is a significant net association of some sort. The nine countries exhibit several different patterns of relationship between occupation and income, and the country differences are not consistent for males and females. Among men in Denmark and women in Israel, the Netherlands, and the United States, the occupational categories have no effect on income net of prestige, but the net effect of prestige is substantial, averaging a 1.7% increase in income for each prestige point. For example, net of education, experience, and marital status, a mathematician would be expected to earn about 20% more than a laboratory technician, also a professional worker, on the basis of their 11-point difference in prestige. In contrast, among men in Austria, Finland, Norway, and Sweden and among women in Austria, prestige has no effect on income within the major occupational groups, but differences between the groups in average income net of other factors are substantial. Among men in Germany, Israel, the Netherlands, and the United States, and among women in Germany and Sweden, both prestige and occupational group membership influence income. This is true also of women in Denmark, Finland, and Norway, except that in those countries the net effect of prestige on income is negative. This last result can be interpreted as reflecting a situation in which prestige and income are regarded as alternative forms of occupational remuneration, so that when one is relatively high the other will be relatively low. Insofar as the major occupational groups strongly differentiate occupations with respect to their qualifications and requirements, the groups should be strongly differentiated with respect to prestige as well. In this circumstance we would expect the net effect of prestige on income to be negative. This is because the effect of prestige as an indicator of occupational qualifications and requirements will be largely absorbed by the dummy variables for occupational groups, leaving only the effect of prestige as an alternative form of remuneration.[19] The trade-off between prestige and income is hardly unfamiliar, although it is most commonly observed with respect to different kinds of jobs within specific occupations (e.g., the higher prestige and lower salaries of social scientists employed

[19] As is consistent with this claim, the proportion of variance in prestige explained by the occupational categories (the squared correlation ratio) is higher for women from Denmark and Norway than for any other groups (.71 in both cases) and is nearly as high for Finnish women (.65)

in universities compared with social scientists employed in nonacademic settings).

In general, the variables we have measured account for a modest portion of the variance in income among workers of a given sex in each country. For three of the 18 equations, however, the proportion of variance explained is much larger than the average of about a third. Among Finnish women, but not Finnish men, average income differences between occupational categories are extremely large, and professional workers in particular earn much more than members of other occupational groups. As a consequence, nearly two-thirds of the variance in income among Finnish women can be accounted for, almost all of it due to differences in occupational status and experience. The situation is similar for Norwegian women, except that the income differences among occupational groups are not as dramatic and schooling contributes importantly to income, as it does not do in Finland. The equation for Dutch men, which accounts for over half the variation in income, is quite different from those for the Finnish and Norwegian women; in the case of Dutch men all of the variables in the model contribute in the expected way to the explanation of income, and no single variable dominates the model. Clearly, much more work needs to be done to clarify the nature of national differences in the determinants of income, including attention in particular to institutional features of labor markets that are beyond the scope of the present analysis.

Disaggregating Gender Differences in Income

We turn now to our final task—disaggregating the observed difference in the average incomes of men and women workers into components representing the effect of differences in the rate of return to each determinant of income and components representing the effect of gender differences in the average levels of these determinants. We make use of a multiplicative decomposition (suggested by Michael Sobel, private communication [1981]), which we derive as follows. Suppose our regression model is:

$$\widehat{\ln Y} = a + \Sigma b_i X_i , \tag{2}$$

and we estimate it separately for males and females. Then for the two sex groups it follows that

$$\overline{\ln Y}_m = a_m + \Sigma b_{im} \overline{X}_{im} , \tag{3}$$

and

$$\overline{\ln Y}_f = a_f + \Sigma b_{if}\overline{X}_{if} . \tag{4}$$

Now, the difference between these two equations (eq. [3] − eq. [4]) can be expressed as

$$\begin{aligned}\overline{\ln Y}_m - \overline{\ln Y}_f &= (a_m - a_f) + \Sigma(b_{im}\overline{X}_{im} - b_{if}\overline{X}_{if}) \\ &= (a_m - a_f) + \Sigma\overline{X}_{im}(b_{im} - b_{if}) + \Sigma b_{im}(\overline{X}_{im} - \overline{X}_{if}) \\ &\quad + \Sigma[(\overline{X}_{if} - \overline{X}_{im})(b_{im} - b_{if})] .\end{aligned} \tag{5}$$

Or, equivalently, as

$$\begin{aligned}\exp(\overline{\ln Y}_m - \overline{\ln Y}_f) &= \exp(a_m - a_f) \cdot \Pi\exp[\overline{X}_{im}(b_{im} - b_{if})] \cdot \\ &\quad \Pi\exp[b_{im}(\overline{X}_{im} - \overline{X}_{if})] \cdot \\ &\quad \exp[\Sigma\,(\overline{X}_{if} - \overline{X}_{im})(b_{im} - b_{if})] \qquad (6a) \\ &= \exp(a_m - a_f) \cdot \Pi\exp[\overline{X}_{if}(b_{im} - b_{if})] \cdot \\ &\quad \Pi\exp[b_{if}(\overline{X}_{im} - \overline{X}_{if})] \cdot \\ &\quad \exp[\Sigma(\overline{X}_{im} - \overline{X}_{if})(b_{im} - b_{if})] . \qquad (6b)\end{aligned}$$

Furthermore, the left side of equation (6) can be shown to equal the ratio of the geometric means of the dependent variable. Thus the difference in the (geometric) mean income of men and women[20] can be decomposed into multiplicative components representing, in order, a part due to differences in the intercepts, a set of coefficients indicating gender differences in the rate of return to each independent variable, a set of coefficients indicating gender differences in average levels of the independent variables (composition), and a coefficient indicating the effect of interaction between differences in rates of return and differences in composition (see Winsborough and Dickinson [1971] for an analogous decomposition when the dependent variable is in linear form).

The coefficients in the decomposition tend to center on unity, as table 6 illustrates. The rate coefficient for each variable can be interpreted as indicating the net contribution (to the ratio of geometric means) of differences in the rate of return to that variable for men and women. These contributions were evaluated at two points, the male mean and the female mean, to produce two estimates for each coefficient (see eqq. [6a], [6b]).

[20] Although the arithmetic mean is more familiar, the geometric mean (which has the arithmetic mean as an upper bound) is an equally appropriate measure of the central tendency of a variable

TABLE 6

DECOMPOSITION OF RATIO OF GEOMETRIC MEAN INCOME FOR MALE AND FEMALE FULL-TIME WORKERS AGED 20–64 IN EACH OF NINE INDUSTRIALIZED COUNTRIES

	Austria		Denmark		Finland		Federal Republic of Germany		Israel		Netherlands		Norway		Sweden		United States	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Ratio of geometric means...	*1.53*		*1.77*		*1.55*		*1.37*		*1.63*		*1.49*		*1.61*		*1.66*		*1.99*	
Effect of sex differences in rates of return to independent variables:*	*1.58*	*1.40*	*2.00*	*1.68*	*1.65*	*1.56*	*1.17*	*1.23*	*1.61*	*1.66*	*1.40*	*1 31*	*1.86*	*1.55*	*1.93*	*1.77*	*1.90*	*1.78*
Intercept	.63		.14		.15		5.10		3.77		2.46		32		2.41		2.18	
Years of schooling	1.29	1.27	1.19	1.20	1.22	1.22	.48	.49	.79	.77	1.39	1.40	.72	.73	1.62	1.65	1.11	1.11
Years of experience	1.01	1.01	1.08	1.07	.91	.89	.86	.88	.70	.78	.95	.97	1.16	1.15	.89	.91	1.00	1.00
Experience squared.....	1.10	1.07	1.01	1.01	1.12	1.12	1.04	1.07	1.01	1.01	.97	.97	1.12	1.12	.96	.96	.89	.89
Never married	.96	.95	.96	.95	.93	.94	.98	.94	.98	.95	.96	.87	.99	.98	.97	.96	.96	.96
Prestige of current occupation	1.13	1.12	5.54	5.48	3.06	3.01	.73	.74	.84	.83	.54	.54	3.26	3.16	.46	.45	.74	.73
Occupational group.....	1.61	1.52	2.07	1.78	3.11	3.03	.75	.75	.93	.92	.86	.86	1.93	1.66	1.30	1.18	1.24	1.18
Effect of sex differences in means on independent variables:	*1.09*	*.97*	*1.01*	*.86*	*.97*	*.94*	*1.12*	*1.17*	*.99*	*1.01*	*1.12*	*1.08*	*1.04*	*.87*	*.93*	*.87*	*1.11*	*1.04*
Years of schooling	1.03	1.01	.98	.99	.99	.99	1.01	1.03	.98	.95	.99	1.00	1.01	1.02	.98	1.00	1.01	1.01
Years of experience	1.00	1.00	1.01	1.01	.99	.98	1.01	1.04	1.01	1.11	1.05	1.08	1.01	1.00	1.01	1.02	1.01	1.01
Experience squared.....	.99	.97	1.03	1.03	1.00	1.00	1.02	1.05	1.00	1.01	1.00	1.00	1.00	1.01	.99	1.00	1.01	1.00
Never married	1.01	1.00	1.00	.99	.98	1.00	1.07	1.02	1.05	1.02	1.10	1.01	1.03	1.02	1.00	1.00	1.01	1.00
Prestige of current occupation	1.01	1.00	1.00	.99	1.00	.99	1.02	1.03	.99	.98	1.01	1.02	1.00	.97	1.00	.98	1.00	1.00
Occupational group.....	1.05	.99	.99	.85	1.01	.98	.99	.99	.96	.96	.97	.97	.99	.85	.95	.87	1.07	1.02
Interaction	*.89*	*1.12*	*.84*	*1.19*	*.97*	*1.03*	*1.04*	*.96*	*1.03*	*.97*	*.96*	*1.05*	*.83*	*1.21*	*.92*	*1.09*	*.94*	*1.06*

NOTE.—M indicates that males were used as the standard population (eq. [5*a*]), F indicates that females were used as the standard population (eq [5*b*]).

* Includes intercept.

As can be seen in table 6, the two sets of estimates (labeled M and F) are generally very similar. The composition coefficient for each variable can be interpreted as indicating the net contribution of differences in the mean levels of the variable for males and females. Again, the effect of these differences was evaluated twice, once using the male rate of return and once using the female rate, and again the estimates are generally quite similar. The interaction component gives the effect of sex differences in rates of return and in composition considered simultaneously. It can be thought of as an inflator or deflator for the effect of differences in rates and in composition considered singly. Finally, the intercept coefficient gives the ratio of geometric mean income that would be expected if the value of each of the independent variables were zero. Like intercept terms in regression equations, it can be interpreted only if a true zero point is established, as we have not been able to do here. In the present case the intercept term also includes the effect of the omitted occupation category, professional and technical workers.

What does table 6 tell us about the determinants of income differences between male and female workers in the nine countries? First, we confirm that the ratios of geometric means are very close to the ratios of arithmetic means shown in table 4, so we are decomposing familiar quantities and thus should have no difficulties of interpretation. Note that the ratios range from 1.37 for Germany, indicating that on the average men earn about a third again as much as women, to 1.99 for the United States, indicating that on the average men earn about twice as much as women.

Inspecting the italicized summary rows of the table, we see that the greater income of men in each country is due mainly to their higher rates of return on the variables included in the model rather than to gender differences in the mean levels of these variables. The average rate effect (for the 18 columns) is 1.61, which is virtually identical to the average ratio of the geometric means for the nine countries (1.62). In contrast—and implied by the size of the rate effect—the average composition effect is 1.01, which indicates that gender differences in education, experience, marital status, and occupational position taken together do not contribute to the income gap at all.

Germany and the Netherlands are, however, exceptions to this pattern. In Germany the effect of composition is nearly as large as the rate effect, and in the Netherlands there is also a smaller than average rate effect and a larger than average composition effect. This appears to be due largely to the fact that the female labor force in these two countries is very young, since in both countries women tend to work only until they marry and then to leave the labor force permanently (see Appendix B).

The disaggregated coefficients show clearly that the greatest payoffs for men are associated with education and occupation. Consider education

first. In six of the nine countries the returns to schooling are substantially greater for men, averaging more than 30% higher. In Israel and Norway, however, and most notably in Germany, the returns to education are substantially smaller for men than for women. Recall that the return to schooling is higher for German and Norwegian women than for any other group, about 9% per year of schooling. Note also from table 5 that the return to education is lower for German and Israeli men than for men in any other country. What accounts for these patterns is unclear and warrants further investigation.

Gender differences in return to occupational position have already been anticipated in our discussion of table 5. Further elaboration is somewhat cumbersome since the coefficient associated with occupational group cannot be interpreted independently of the intercept coefficient because both coefficients are affected by the choice of omitted category in the regression estimation. Here it suffices to note that the product of the intercept term and the two occupation terms exceeds unity in all 18 sets of coefficients, averaging 1.78. Thus, in all countries men enjoy a greater return than women on either the prestige of their occupation or their occupational group membership, or both, and on average the difference in the rate of return is very substantial. In contrast, sex differences in occupational composition have no effect on the income gap in most countries. This fact undercuts a major hypothesis—that women are paid poorly because they are segregated into low-paying occupational sectors. While women may be segregated into low-paying *jobs,* differences in the distribution of men and women over the *major occupation groups* have virtually no effect on income. Sex differences in income are on average as large within each of the major occupation groups as they are for the labor force as a whole.

On the whole, neither experience nor marital status contributes much to the gender gap in income. Sex differences in the rate of return to experience vary from country to country in a not very systematic way and are never very large. Sex differences in the return to marital status are consistent but very modest: men benefit more than women because, as we saw in table 5, men experience a positive return to marriage while marital status has no effect on income for working women (the coefficients are less than unity because of the way the variable was coded). With the exception of Germany and the Netherlands, noted above, the effect of compositional differences in these variables is negligible. The lack of compositional differences for the experience variable may, of course, be due in part to the inadequacy of our measures.

DISCUSSION

This analysis represents a first attempt to investigate within a comparative framework why women workers in other industrial societies, as in the

United States, earn substantially less than their male counterparts. Four major hypotheses regarding gender differences in earnings, drawn from the American literature, were considered: (1) women have less education and labor force experience than men; (2) women's family responsibilities affect the time and energy they can devote to advancing within their employment; (3) women do different work from men, and the work they do pays less; and (4) women are subject to discriminatory market mechanisms that affect their earnings relative to men's. In this concluding section, we provide a summary of our major findings and assess the extent to which the data support the various hypothesized explanations for the gender differential in earnings. Only partial tests of these hypotheses could be made because of limitations in the kinds of variables available for analysis in the various countries. The analysis, does, however, address each of the explanations, with varying levels of success.

Our data show quite convincingly that men and women in industrial society work in very different kinds of jobs. Although the sex-segregated nature of the labor market is well-documented in the United States, hitherto there has been little systematic evidence that the same phenomenon occurs in other countries as well (see Gaskin 1979; Roos 1981*a*). We have shown not only that the general U.S. pattern of substantial occupational segregation by sex is characteristic of other industrial societies as well, but also that the degree of similarity across countries is striking. In all nine countries women are substantially overrepresented in high-prestige clerical occupations and in low-prestige sales and service employment; they are substantially underrepresented in administrative occupations and in high- and medium-prestige production occupations. Given these large and systematic gender differences in occupational distribution, any investigation of income attainment would be remiss if it did not attempt to incorporate measures of occupational segregation into the earnings equations.

The results of this study confirm unambiguously for the remaining countries what we already know about the United States—that women earn substantially less than men. Moreover, adjusting for gender differences in composition with respect to several variables thought to affect earnings failed in general to reduce the gap substantially. The adjusted earnings of women—what women would earn if on average they had the same characteristics as men—never exceeded a 17% increment over their actual earnings. The figure of 17% is the high estimate for the Federal Republic of Germany, which is the country for which the actual earnings of women came closest to those of men (see the summary row in table 6, "Effect of sex differences in means on independent variables"). In our data for Germany, male income exceeds female income by 37% (see the top row of table 6), so even for Germany the adjustment accounts for less than half of the earnings gap. At the other extreme, in the four Nordic

countries, adjusting for sex differences in composition would actually slightly reduce the expected earnings of women and hence increase the earnings gap. In the United States, where—in these data—men earn nearly twice as much as women on the average, adjusting for sex differences in occupational composition (the only variable of importance) would increase the earnings of women less than 10%.

These results require us to reject the first three hypotheses reviewed above—the human capital, occupational segregation, and dual burden hypotheses. The first two hypotheses each posit differences in the composition of the male and female labor force and similarities in rates of return to "investments." The human capital hypothesis suggests that men earn more than women because they have more education and experience but assumes that the rate of return to these characteristics will be similar for men and women, net of other identified factors. As we have seen, the effect of differences in average education and experience is very small (although, to be sure, the lack of difference in measured experience no doubt reflects the inadequacy of our measure) and the effect of differences in returns to education (although not to experience) is quite large. The occupational segregation hyopthesis posits that women are paid less than men because they are concentrated in low-paying sectors of the occupational structure but they enjoy equal returns to their occupational status. As we have seen, however, there is almost no effect of sex differences in average occupational prestige or in distribution over major occupation groups, but there are substantial, and complicated, differences in the rate of return to these characteristics for men and women. To be sure, this may be due in part to the crudeness of our classification. A more detailed occupational classification might show part of the gender difference in income to be due to the concentration of women in low-paying occupations, as has been suggested for the United States (Roos 1981*b*).

The dual career hypothesis must be rejected on somewhat different grounds. Our test of it requires that ever-married women exhibit a reduction in income relative to never-married women. This proves not to be the case: marriage has no impact on the earnings of women in the full-time labor force. It does, however, substantially benefit men. We regard these results as requiring more careful specification of "dual career" explanations for the earnings gap between men and women. Insofar as the dual demands of work and family make it difficult for women with families to maximize their earnings potential, we would have expected married women to earn less than single women. The fact that they do not suggests that, at least for those women who have been able to combine family life with full-time employment, family obligations do not inhibit earning power. Of course, married women are much less likely to work full-time; hence, full-time workers are a more highly selected subset of

married women than of single women. The major impact of marriage on earnings is apparently indirect, through its impact on labor force participation.

If the human capital, dual burden, and occupational segregation hypotheses cannot account for any substantial fraction of the earnings gap between men and women workers, what can we conclude? The failure of our data to support these hypotheses may certainly be due in part to the inadequacy of our measures. In particular, our reliance on a major group occupational classification means that we have been unable to measure occupational segregation as we would have preferred—at a relatively disaggregated level. The measurement decision we took has the consequence of including in our residual category those sex differences in earnings attributable to job (or even occupational) segregation. The earnings gap that remains thus includes such factors as lack of equal pay for the same job (wage discrimination) and the differential concentration of men and women in different jobs and occupations within major occupation groups and levels of prestige (whether the allocation occurs because of discrimination or self-selection). A more disaggregated occupational classification would thus help to estimate the relative importance of these two explanations for the earnings gap. However, while our failure to support any of the three hypotheses may be due in part to the crudeness of our measures, a more likely explanation is that the observed income differences reflect the legacy of traditional patterns of disadvantage and discrimination faced by working women, patterns that were legitimated and reinforced by law in most industrialized countries until very recently and that continue to pervade labor market institutions. In addition, of course, they may reflect deeply ingrained cultural definitions of appropriate behavior for men and women, definitions that are transmitted from generation to generation by both parental and societal socialization processes. While both institutional arrangements and cultural definitions are changing in many countries, the process of change is a slow one. Hence, closer attention to both structural and cultural factors specific to each country may help us to understand better both the gross pattern of similarity in all industrial societies that we have observed and the departures from this general pattern that we have found puzzling. This is the obvious next step in research on this topic.

APPENDIX A

PERCENTAGE EMPLOYED FULL-TIME BY AGE AND SEX, FOR NINE INDUSTRIALIZED COUNTRIES

Age	Austria	Denmark	Finland	Federal Republic of Germany	Israel	Netherlands	Norway	Sweden	United States
Females:									
< 20	26.1	23.7	21.9	53.1	5.3*	36.5	11.4	12.1	23.3
20–24	58.0	56.9	54.7	51.0	27.0†	72.0	23.5	33.3	40.2
25–29	33.8	42.2	55.6	31.4	23.9	31.6	21.0	33.3	37.9
30–34	28.0	35.6	58.5	20.0	17.5	18.0	20.3	33.3	36.9
35–44	42.5	33.7	78.0	18.2	15.6	13.3	21.7	31.7	35.8
45–54	42.6	35.3	65.2	14.9	19 4	15.3	27.3	35.5	36.5
55–64	21.5	23.6	49.0	13.6	10.1	8.0	20.3	12.9	30.5
65 +	2.7	. . .	. . .	2.0	2.3	3.0	. . .	. . .	3.1
Total	31.5	34.1	55.0	18.7	16.0	25.0	21.4	28.0	30.3
Males:									
< 20	41.9	31.9	25.8	50.3	11.7*	31.8	13.5	14.6	32.5
20–24	89.7	75.7	65.2	66.6	31.4†	67.9	57.8	53.3	57.6
25–29	96.6	86.0	89.3	74.0	72.0	91.8	89.3	85.7	75.3
30–34	98.8	92.1	88.7	87.5	76.2	91.5	96.1	90.9	80.8
35–44	98.6	100.0	92.3	97.5	79.4	93.7	94.7	92.3	81.1
45–54	96.4	88.9	78.5	94.9	81.6	85.5	92.1	93.1	80.1
55–64	62.5	82.8	56.2	66.4	73.5	70.6	70.9	77.5	60.1
65 +	17.2	. . .	. . .	5.3	17.8	5.8	. . .	. . .	8.9
Total	79.5	83.0	70.9	72.9	54.4	68.5	77.5	77.8	60.8

* 14–17.
† 18–24.

APPENDIX B: MEANS, STANDARD DEVIATIONS, AND CORRELATIONS OF ALL VARIABLES FOR NINE INDUSTRIALIZED COUNTRIES

Austria	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Means Female	Means Male	Standard Deviation Female	Standard Deviation Male
1. Years of schooling		-.212	.080	.081	.404	.437	.152	.349	.092	-.191	-.387	-.187	.404	.417	9.19	9.93	1.58	2.08
2. Years of potential experience	-.203		.009	-.303	-.038	-.074	.079	-.231	.074	.067	.154	-.019	-.011	-.108	26.1	24.4	11.8	12.4
3. Experience squared[a]	-.128	-.002		.155	.040	.104	-.001	.029	.050	.092	-.115	-.106	-.099	-.089	140	179	140	430
4. Never married	.046	-.394	-.060		-.090	.055	-.046	.122	-.026	.034	-.147	-.004	-.012	.043	.228	.172	.420	.378
5. Prestige of current occupation	.558	-.042	.014	-.081		.480	.199	.193	-.008	-.410	.128	-.348	.315	.234	36.9	39.3	10.8	12.1
6. Professional occupation	.462	-.074	-.031	.005	.525		-.026	-.155	-.114	-.127	-.172	-.140	.204	.222	.083	.093	.276	.291
7. Administrative occupation	.246	.052	-.014	-.057	.366	-.061		-.044	-.032	-.036	-.049	-.040	.116	.106	.007	.035	.085	.184
8. Clerical occupation	.025	.013	-.008	.030	.066	-.114	-.068		-.196	-.218	-.294	-.239	.150	.223	.209	.112	.408	.315
9. Sales occupation	.084	-.026	.142	-.057	.184	-.096	-.057	-.107		-.161	-.217	-.176	.229	.192	.126	.083	.333	.276
10. Service occupation	.037	.018	-.008	-.047	-.104	-.070	-.042	-.078	-.066		-.241	-.196	-.153	-.104	.152	.046	.359	.209
11. Agricultural occupation	-.286	.199	.071	.027	-.095	-.151	-.090	-.167	-.142	-.103		-.264	-.227	-.428	.246	.182	.431	.386
12. Production occupation	-.217	-.131	-.101	.030	-.431	-.290	-.173	-.320	-.271	-.197	-.426		-.177	-.101	.177	.449	.382	.498
13. Income in local currency	.463	.028	-.112	-.180	.435	.211	.430	-.012	.148	-.036	-.298	-.131		.896	4586	6932	2337	3368
14. Log income	.401	-.028	-.178	-.179	.341	.177	.300	.044	.133	-.031	-.432	.005	.905		8.30	8.73	.546	.517
N[b]															216	475		
Denmark																		
1. Years of schooling		-.387	.129	.268	.650	.463	- - -[c]	.221	-.056	-.261	-.287	-.162	.339	.296	8.45	8.11	2.11	2.13
2. Years of potential experience	-.199		.001	-.267	-.261	-.265	- - -	-.197	.178	-.003	.358	-.016	-.159	-.243	24.8	28.2	13.8	12.5
3. Experience squared[a]	-.053	-.002		.164	.097	.042	- - -	-.001	-.047	-.126	.074	.029	-.123	-.174	191	156	160	141
4. Never married	-.125	-.170	.150		.190	.179	- - -	.018	-.068	.002	-.168	.024	.088	.159	.172	.125	.378	.331
5. Prestige of current occupation	.649	-.057	.020	-.146		.585	- - -	.318	-.039	-.570	-.229	-.225	.264	.273	39.7	39.9	9.74	11.6
6. Professional occupation	.615	-.085	-.026	-.115	.556		- - -	-.292	-.148	-.214	-.281	-.168	.039	.102	.210	.120	.409	.325
7. Administrative occupation	.267	-.013	-.057	-.078	.355	-.076		- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	.041	- - -	.198
8. Clerical occupation	.005	-.012	.049	.054	-.003	-.098	-.055		-.163	-.234	-.308	-.184	.178	.320	.242	.066	.430	.249
9. Sales occupation	-.000	.043	-.008	.111	.070	-.100	-.056	-.072		-.119	-.157	-.094	.108	-.024	.076	.069	.266	.253
10. Service occupation	-.025	-.022	-.046	.000	-.119	-.053	-.030	-.038	-.039		-.226	-.135	-.150	-.113	.146	.020	.355	.141
11. Agricultural occupation	-.233	.284	.100	.052	.004	-.211	-.118	-.152	-.155	-.083		-.177	-.253	-.456	.229	.247	.422	.432
12. Production occupation	-.299	-.194	-.053	-.022	-.509	-.325	-.182	-.235	-.240	-.127	-.505		-.011	-.064	.096	.438	.295	.497
13. Income in local currency	.352	.015	-.138	-.099	.394	.239	.168	-.056	-.040	-.031	.088	-.242		.779	31524	55503	24693	53198
14. Log income	.444	.028	-.208	-.175	.452	.335	.216	-.013	-.024	-.018	-.073	-.224	.853		10.1	10.7	.730	.606
N[b]															132	331		
Finland																		
1. Years of schooling		-.359	-.075	.051	.653	.591	.251	.112	-.074	-.177	-.277	-.147	.555	.427	8.08	7.86	2.41	2.07
2. Years of potential experience	-.300		.053	-.142	-.097	-.123	-.037	-.104	-.076	.023	.267	-.090	-.052	-.078	28.4	25.0	12.6	12.5
3. Experience squared[a]	.073	.017		.130	-.090	-.044	-.009	.058	-.063	.082	-.059	.038	-.214	-.208	157	159	146	150
4. Never married	-.078	-.295	.193		.056	.084	.024	.170	-.067	.031	-.163	-.038	.038	.073	.176	.232	.381	.423
5. Prestige of current occupation	.476	.039	.040	-.122		.564	.235	.192	-.034	-.511	-.053	-.260	.491	.361	38.4	38.9	11.4	11.9
6. Professional occupation	.377	-.070	-.045	-.070	.505		-.049	-.186	-.119	-.152	-.267	-.157	.444	.373	.134	.126	.341	.332
7. Administrative occupation	.411	.024	.022	-.095	.313	-.066		-.059	-.038	-.048	-.085	-.050	.139	.116	.015	.029	.123	.168
8. Clerical occupation	.022	.044	.001	-.064	-.047	-.073	-.033		-.143	-.183	-.322	-.189	.072	.184	.183	.036	.388	.185
9. Sales occupation	.089	-.107	.171	.064	.114	-.082	-.038	-.042		-.117	-.206	-.121	-.075	-.011	.084	.045	.278	.208
10. Service occupation	.085	-.057	.019	-.057	-.133	-.069	-.032	-.035	-.040		-.263	-.154	-.210	-.214	.130	.032	.337	.177
11. Agricultural occupation	-.199	.228	.121	.121	.083	-.220	-.100	-.111	-.126	-.106		-.272	-.219	-.448	.317	.252	.466	.435
12. Production occupation	-.293	-.114	-.158	-.009	-.496	-.365	-.166	-.185	-.209	-.176	-.558		-.137	-.040	.137	.481	.345	.500
13. Income in local currency	.442	.020	-.105	-.265	.419	.330	.333	.088	.031	-.028	-.230	-.173		.865	10665	15796	6914	10362
14. Log income	.386	.001	-.138	-.357	.288	.332	.245	.073	.056	.012	-.386	-.029	.854		9.06	9.49	.727	.614
N[b]															184	301		

NOTE —Males below the diagonal, females above

[a] Adjusted to be orthogonal to experience, see text for details

[b] Missing cases deleted pairwise, lowest number of cases reported

[c] There are no female administrators in the sample.

[d] None of the female agricultural laborers in Israel and the Netherlands reported income, nor did any of the female administrators in Sweden

Germany (Fed. Rep.)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Means		Standard Deviations	
															Female	Male	Female	Male
1. Years of schooling		-.329	-.057	.113	.427	.469	- - -[c]	.022	-.101	-.189	-.130	-.192	.419	.374	10.8	11.1	2.22	2.34
2. Years of potential experience	-.262		.015	-.450	-.151	-.107	- - -	-.189	.007	.144	.195	.159	.170	.143	20.2	24.2	13.8	10.9
3. Experience squared[a]	-.021	.048		.266	-.144	-.172	- - -	.124	-.031	.131	.022	-.076	-.264	-.266	194	120	166	134
4. Never married	-.025	-.434	.301		-.041	-.008	- - -	.067	-.037	.010	-.106	-.004	-.255	-.237	.347	.119	.477	.324
5. Prestige of current occupation	.612	-.100	-.026	-.079		.434	- - -	.268	-.094	-.309	-.093	-.448	.482	.414	42.5	44.4	11.2	12.2
6. Professional occupation	.501	-.155	.017	-.021	.507		- - -	-.389	-.164	-.112	-.080	-.184	.184	.161	.152	.134	.360	.341
7. Administrative occupation	.269	-.014	-.010	-.015	.283	-.067		- - -	- - -	- - -	- - -	- - -	- - -	- - -	- -	.028	- -	.165
8. Clerical occupation	-.009	-.010	-.027	.023	.192	-.216	-.093		-.357	-.244	-.173	-.400	.105	.066	.458	.232	.499	.422
9. Sales occupation	.025	-.040	.004	-.004	.035	-.103	-.045	-.144		-.103	-.073	-.169	-.118	-.072	.131	.064	.338	.246
10. Service occupation	-.078	.014	.043	.038	-.152	-.099	-.043	-.138	-.066		-.050	-.115	.032	.024	.066	.059	.248	.236
11. Agricultural occupation	-.106	.057	.017	.107	-.048	-.088	-.038	-.123	-.059	-.056		-.082	-.013	-.042	.034	.047	.182	.213
12. Production occupation	-.359	.110	-.016	-.062	-.531	-.345	-.149	-.482	-.230	-.220	-.196		-.251	-.193	.159	.435	.366	.496
13. Income in local currency	.442	.055	-.153	-.233	.464	.307	.276	-.078	.259	-.066	-.034	-.308		.925	1674	2276	711	1019
14. Log income	.343	.079	-.158	-.297	.408	.270	.222	-.061	.179	-.043	-.045	-.251	.905		7.32	7.64	.482	.436
N[b]															169	520		
Israel																		
1. Years of schooling		-.425[b]	-.148	.015	.642	.449	.075	.157	-.134	-.398	-.128	-.230	.433	.339	10.6	9.56	3.67	4.11
2. Years of potential experience	-.419		.000	-.529	-.257	-.119	.021	-.229	.208	.267	.086	-.007	.125	.158	17.7	24.5	13.8	14.0
3. Experience squared[a]	-.098	.003		.180	-.109	-.059	-.056	-.002	-.009	.067	-.063	.056	-.282	-.231	206	198	165	186
4. Never married	.021	-.435	.306		-.072	-.093	-.036	.128	-.098	-.077	-.058	.120	-.286	-.272	.353	.142	.478	.350
5. Prestige of current occupation	.577	-.156	-.082	-.076		.554	.186	.178	-.099	-.504	-.067	-.364	.483	.400	41.5	39.8	12.4	13.5
6. Professional occupation	.473	-.197	.005	-.010	.484		-.059	-.421	-.163	-.222	-.076	-.232	.369	.285	.234	.137	.423	.344
7. Administrative occupation	.160	.047	-.085	-.084	.361	-.087		-.082	-.032	-.043	-.015	-.045	.135	.104	.011	.045	.106	.208
8. Clerical occupation	.139	.044	-.045	-.013	.052	-.151	-.083		-.224	-.307	-.105	-.320	-.000	.024	.368	.126	.482	.332
9. Sales occupation	.001	.073	.029	-.025	.060	-.124	-.068	-.118		-.118	-.041	-.123	.011	-.000	.080	.088	.271	.284
10. Service occupation	-.166	.128	.054	-.016	-.249	-.110	-.060	-.105	-.086		-.056	-.169	-.199[d]	-.172	.139	.071	.346	.257
11. Agricultural occupation	-.162	.063	.023	.007	.052	-.096	-.053	-.092	-.075	-.067		-.058	- - -[d]	- - -	.019	.055	.136	.229
12. Production occupation	-.325	-.048	.006	.070	-.448	-.381	-.208	-.363	-.297	-.264	-.231		-.282	-.229	.149	.477	.356	.500
13. Income in local currency	.435	-.057	-.282	-.199	.483	.276	.278	.034	-.021	-.126	-.102	-.253		.868	11335	17388	6072	8391
14. Log income	.416	-.035	-.310	-.269	.451	.265	.216	.067	-.015	-.103	-.099	-.260	.902		9.16	9.65	.688	.515
N[b]															1147	3175		
Netherlands																		
1. Years of schooling		-.273	.034	.077	.459	.363	.022	.013	-.239	-.210	-.136	.005	.192	.198	10.4	10.1	2.29	2.98
2. Years of potential experience	-.430		-.003	-.318	.054	-.025	.172	-.140	.138	.074	.104	-.110	.205	.249	14.1	23.1	12.1	13.4
3. Experience squared[a]	-.019	.007		.141	.097	.116	.042	-.108	.039	-.020	-.091	-.019	-.120	-.147	192	185	141	172
4. Never married	.122	-.422	.283		.032	.131	-.097	.032	-.207	.016	-.097	.059	-.083	-.094	.536	.176	.501	.381
5. Prestige of current occupation	.546	-.092	-.100	-.102		.600	.170	.095	-.199	-.591	-.020	-.233	.365	.466	42.6	43.7	11.9	13.4
6. Professional occupation	.561	-.192	.019	-.027	.512		-.057	-.461	-.278	-.261	-.057	-.143	.156	.192	.288	.173	.455	.379
7. Administrative occupation	.091	.079	-.153	-.144	.471	-.142		-.065	-.039	-.037	-.008	-.020	.015	.042	.008	.088	.090	.284
8. Clerical occupation	.001	.008	.087	.077	-.071	-.194	-.132		-.316	-.297	-.065	-.163	-.004	.086	.344	.152	.478	.360
9. Sales occupation	-.062	.053	.034	.002	.043	-.169	-.115	-.156		-.179	-.039	-.098	.004	-.108	.160	.120	.368	.325
10. Service occupation	-.110	.087	-.002	-.043	-.179	-.106	-.072	-.098	-.085		-.037	-.092	-.140	-.192	.144	.051	.353	.220
11. Agricultural occupation	-.201	.125	.017	-.051	-.159	-.130	-.088	-.120	-.105	-.066		-.020	- - -[d]	- - -	.008	.075	.090	.263
12. Production occupation	-.299	-.046	-.021	.096	-.494	-.330	-.224	-.305	-.266	-.166	-.204		-.108	-.126	.048	.341	.215	.475
13. Income in local currency	.396	.095	-.282	-.287	.546	.261	.398	-.034	.013	-.072	-.136	.326		.898	1028	1569	605	927
14. Log income	.383	.119	-.372	-.379	.566	.289	.389	-.020	.011	-.056	-.140	-.358	.942		6.83	7.23	.423	.475
N[b]															91	386		

APPENDIX B (*Continued*)

Norway	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Means		Standard Deviations	
															Female	Male	Female	Male
1. Years of schooling		-.497	.090	-.001	.693	.419	.238	.232	-.097	-.317	-.315	-.119	.582	.553	8.79	9.05	2.40	2.85
2. Years of potential experience	-.415		.000	.014	-.347	-.112	-.080	-.357	.073	.169	.306	-.033	-.194	-.351	25.5	27.6	13.6	13.1
3. Experience squared[a]	.009	.029		-.093	-.010	-.020	-.110	.121	-.058	.154	-.095	-.126	-.182	-.249	183	170	166	160
4. Never married	.038	-.194	.145		.081	.034	.134	.013	-.033	.177	-.182	-.107	-.073	-.067	.221	.102	.417	.303
5. Prestige of current occupation	.672	-.247	-.041	.051		.524	.327	.202	-.177	-.527	-.155	-.271	.454	.423	41.4	42.6	11.6	12.7
6. Professional occupation	.531	-.198	-.005	-.039	.565		-.098	-.282	-.168	-.200	-.267	-.098	.209	.242	.192	.209	.396	.407
7. Administrative occupation	.271	-.055	-.028	-.038	.306	-.121		-.115	-.069	-.082	-.110	-.040	.375	.255	.038	.052	.193	.223
8. Clerical occupation	.084	-.112	.116	.158	.009	-.157	-.072		-.199	-.237	-.316	-.115	.164	.254	.250	.085	.435	.280
9. Sales occupation	-.022	-.070	-.106	-.023	.041	-.142	-.065	-.085		-.141	-.188	-.069	.008	-.002	.106	.071	.309	.258
10. Service occupation	-.014	.125	.028	.007	-.166	-.117	-.054	-.070	-.063		-.225	-.082	-.330	-.367	.144	.050	.353	.217
11. Agricultural occupation	-.240	.206	-.022	.068	.052	-.230	-.105	-.137	-.124	-.102		-.110	-.333	-.415	.231	.168	.424	.374
12. Production occupation	-.421	.078	.013	-.085	-.611	-.390	-.178	-.232	-.210	-.173	-.340		-.136	-.092	.038	.365	.193	.482
13. Income in local currency	.436	-.054	-.126	-.146	.341	.304	.165	-.015	.014	.064	-.225	-.187		.903	25047	39818	11097	22249
14. Log income	.427	-.079	-.118	-.213	.258	.307	.190	.026	.012	.094	-.351	-.141	.846		10.0	10.5	.542	.467
N[b]															78	343		
Sweden																		
1. Years of schooling		-.436	.155	.049	.673	.451	-.039	.114	-.132	-.338	-.104	-.310	.521	.343	9.15	8.77	2.75	2.80
2. Years of potential experience	-.402		.001	-.087	-.204	-.146	.185	-.030	.034	.073	.081	.064	-.040	-.043	24.1	27.5	12.2	12.9
3. Experience squared[a]	.080	-.013		.123	.099	-.097	.265	.108	-.076	.006	-.076	-.041	-.096	.009	147	166	151	157
4. Never married	-.055	-.214	.096		-.105	-.089	-.038	.099	.003	.032	-.054	-.047	-.032	.033	.162	.137	.370	.344
5. Prestige of current occupation	.643	-.259	.016	-.120		.635	.118	.062	-.121	-.586	-.062	-.217	.639	.532	42.5	41.3	12.8	13.3
6. Professional occupation	.523	-.137	.118	-.126	.560		-.053	-.489	-.131	-.304	-.075	-.172	.465	.353	.272	.207	.446	.406
7. Administrative occupation	.239	-.003	-.134	-.095	.340	-.122		-.069	-.018	-.043	-.011	-.024	- - -[d]	- - -	.007	.054	.086	.226
8. Clerical occupation	-.021	.042	-.007	.014	-.071	-.119	-.055		-.172	-.398	-.098	-.225	-.032	.139	.390	.051	.489	.220
9. Sales occupation	.018	-.031	.026	-.045	.035	-.137	-.064	-.062		-.107	-.026	-.061	-.091	-.039	.044	.067	.206	.251
10. Service occupation	-.000	.042	-.022	-.060	-.150	-.122	-.057	-.055	-.064		-.061	-.140	-.365	-.477	.199	.054	.400	.226
11. Agricultural occupation	-.165	.095	-.046	.209	-.072	-.180	-.084	-.082	-.094	-.083		-.034	-.131	-.362	.015	.110	.121	.314
12. Production occupation	-.432	.034	-.008	.058	-.482	-.469	-.219	-.213	-.246	-.219	-.323		-.067	.007	.074	.457	.262	.499
13. Income in local currency	.579	-.082	-.164	-.205	.449	.360	.304	-.021	.039	.029	-.247	-.296		.798	25125	36292	16338	15750
14. Log income	.523	-.111	-.149	-.212	.416	.362	.293	-.001	.016	.047	-.332	-.246	.936		9.92	10.4	.759	.388
N[b]															125	333		
United States																		
1. Years of schooling		-.395	-.062	.161	.585	.580	.015	-.038	-.032	-.273	-.004	-.329	.384	.290	12.5	12.7	2.62	3.24
2. Years of potential experience	-.413		-.000	-.362	-.166	-.159	.101	-.068	.020	.125	-.010	.087	.050	.111	20.2	21.0	13.3	13.2
3. Experience squared[a]	-.139	.008		.265	-.036	-.020	-.003	-.011	-.009	.064	.037	-.025	-.138	-.112	182	177	161	161
4. Never married	.096	-.325	.269		.087	.086	-.049	.011	-.016	.009	-.025	-.085	-.043	-.067	.164	.135	.370	.342
5. Prestige of current occupation	.593	-.093	-.092	-.058		.569	.162	.133	-.008	-.473	-.066	-.414	.403	.396	42.8	42.6	12.6	13.0
6. Professional occupation	.536	-.120	-.035	.056	.665		-.101	-.418	-.110	-.239	-.031	-.247	.349	.293	.232	.184	.422	.388
7. Administrative occupation	.127	.013	-.102	-.064	.306	-.170		-.139	-.037	-.080	-.010	-.082	.081	.061	.032	.114	.178	.318
8. Clerical occupation	.002	-.024	.029	.007	-.084	-.132	-.100		-.153	-.331	-.043	-.341	-.080	-.024	.366	.072	.482	.258
9. Sales occupation	.083	-.067	-.028	.018	-.047	-.151	-.114	-.088		-.088	-.011	-.090	-.025	-.025	.039	.092	.193	.289
10. Service occupation	-.113	.040	.072	.106	-.229	-.134	-.101	-.078	-.090		-.024	-.196	-.183	-.220	.160	.074	.366	.261
11. Agricultural occupation	-.126	.113	.051	-.013	-.091	-.097	-.073	-.057	-.065	-.058		-.025	-.037	-.046	.003	.040	.056	.196
12. Production occupation	-.442	.071	.036	-.068	-.490	-.408	-.308	-.239	-.273	-.242	-.176		-.139	-.102	.168	.424	.374	.494
13. Income in local currency	.320	.146	-.306	-.215	.372	.171	.274	-.079	.042	-.143	.006	-.224		.841	7333	14243	4880	9312
14. Log income	.272	.175	-.330	-.287	.344	.150	.215	-.061	.036	-.150	-.032	-.157	.860		8.66	9.35	.780	.723
N[b]															810	1515		

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