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SHORT-RUN AND LONG-RUN PROSPECTS FOR FEMALE EARNINGS

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"Short-Run and Long-Run Prospects for

Female Earnings"

by

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This paper discusses the prospects for female earnings relative to male earnings. The determinants of the general level of earnings (female and male) are not considered. I concentrate on hourly earnings as being the best measure of the price of labor from both the demand and supply points of view. One can easily extend the discussion to annual earnings by taking account of annual hours. (In 1970 on average employed women worked about 3/4 as many hours per year as employed men.)

The estimates of hourly earnings to be presented are calculated from the 1/1000 samples of the 1960 and the 1970 Censuses of Population. (See Fuchs, 1968, for a discussion of the strengths and shortcomings of this source.) The Census samples provide much useful data on employed persons including such characteristics as sex, schooling, age, race, marital status, and class of worker. I have excluded agricultural and unpaid family workers because of well-known difficulties in estimating their earnings and hours of work. All other persons who were at work during the Census week and who had earnings in the year preceding the Census are included. Total annual earnings in 1959 (or 1969) are calculated for workers classified by a variety of characteristics. Total annual hours are estimated by multiplying

the weeks worked in 1959 (or 1969) by the hours worked in the Census week in 1960 (or 1970) (for each worker) and summing across all the workers in a classification. Average hourly earnings for each classification are obtained by dividing the total earnings by total hours. This is equivalent to calculating the mean of individual average hourly earnings weighted by annual hours.

Because of limitations of time and space the focus of this paper is on the sex differential in earnings for whites only. It is noteworthy, however, that the sex differential among blacks and the color differential between blacks and whites narrowed appreciably from 1959 to 1969. During the decade black female earnings, adjusted for age and schooling, rose 82 percent compared with 68 percent for black males and 53 percent for white females. By 1969 less than 15 percent separated the earnings of black women and white women of comparable age and schooling. For women with more than 12 years of schooling the adjusted differential between blacks and whites had practically disappeared.

What are the prospects for female earnings? In order to answer this question one needs a clear understanding of the factors that account for the sex differential as well as the ability to predict how these factors will change over time. In my view, neither inherent physical or mental differences nor employer discrimination can explain most of the differential. (See Fuchs, 1971, also, Mincer and Polachek, and Malkiel and Malkiel.) This is not to

deny the existence of some discrimination by many employers and a great deal by some, but those who discriminate do pay a price. (See Becker.) For most employers the desire for profit or the fear of loss make them unwilling or unable to absorb the 30 to 40 percent difference in labor costs that is implied if the differential in earnings is attributable only or principally to employer discrimination.

The major explanation, it seems to me, is role differentiation, which begins in childhood and eventually affects labor force attachment, choice of occupation, location and hours of work, post-school investment and consumer and fellow employee attitudes. This role differentiation was functional at a time when men worked long hours at heavy jobs in mining, manufacturing, transportation, and construction while women specialized in work at home including the bearing and raising of many children. Such differentiation is less functional now, and much of the recent tension regarding sex roles probably arises from the lagged adjustment of the law, customs and institutions to technologic and economic changes. These changes include sharp reductions in infant and child mortality, dramatic improvements in birth control and major shifts in requirements of the job market.

The effects of these changes on female earnings for given labor market productivity can be analyzed with the familiar tools of demand and supply, supplemented by attention to changes in the relative market productivity of men and women that are not captured by adjustment for age and schooling. In the demand-supply analysis price is the wages of females relative to males, and quantity is employment of females relative to males. (See Figure 1.)

Figure 1

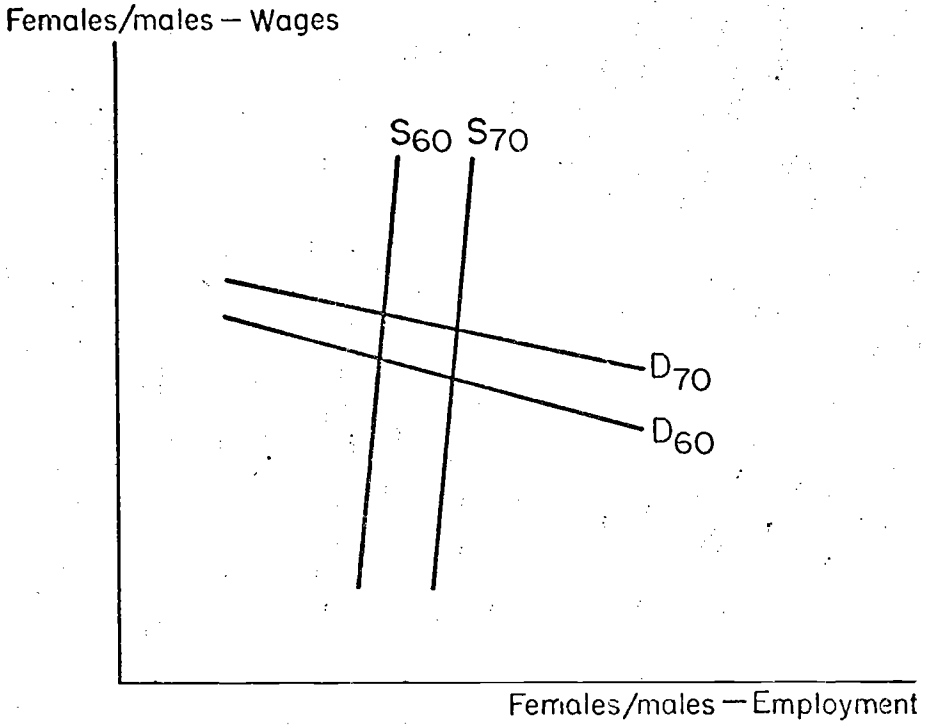
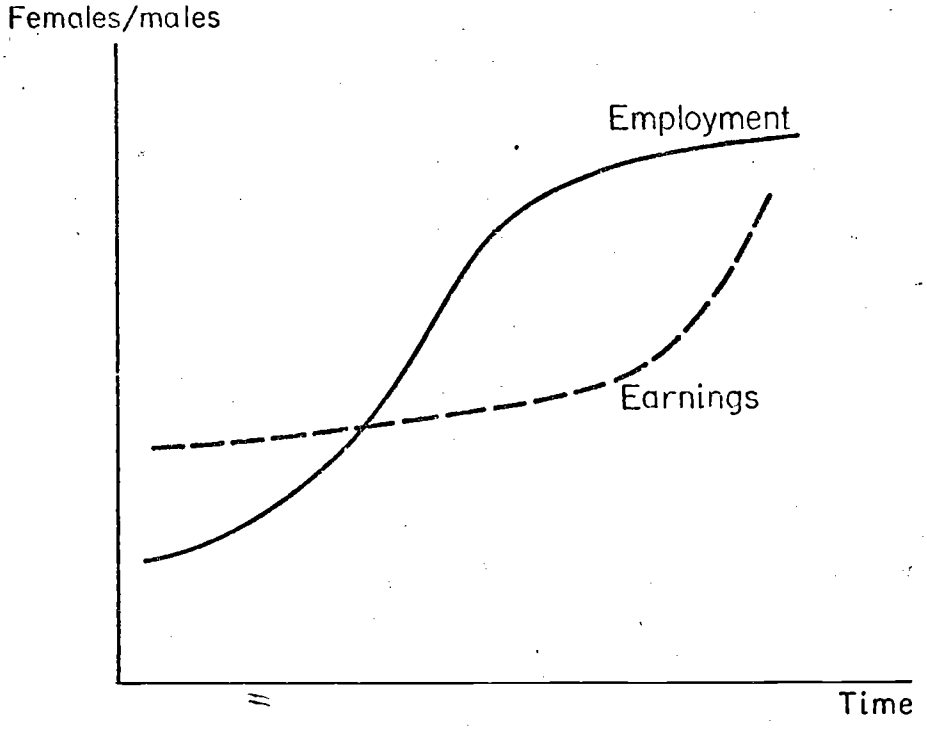


Figure 2



Because the sexes are not perfect substitutes, the demand curve is not completely elastic; it is probably becoming more elastic over time. The demand curve shifts over time as a result of changes in the industrial and occupational mix of the economy. In particular, the growth of a service economy and the decline in the importance of heavy manual jobs tend to move the demand curve to the right. Demand is affected also by the removal of legal and institutional barriers to women and by the greater acceptance of women by consumers and other employees in a variety of occupations and roles.

The relative supply curve is dominated by changes in female labor force participation because the supply of male labor tends to be fixed. Shifts in the curve are related to the decreases in infant and child mortality, the improvements in birth control, the increase in the absolute level of wages, and the desire of women to achieve greater autonomy through maintenance and enhancement of labor market skills.

During the 1960's there was a very large increase in female employment, which I interpret as primarily a shift in the relative supply curve. This shift tends to depress female earnings in the short run not only because increased quantity lowers price but also because the new entrants tend to have less schooling and less labor market experience. As Reuben Gronau has shown, they are probably less able (in labor market terms) than those already at work.

In this same decade, however, there was increased demand for female labor due to the rapid growth of industries such as health and education that traditionally have been large employers of women. The beginning of legal and institutional changes within industries and occupations also contributed to the increase in demand.

The net effects of these shifts on female earnings are presented in Table 1. The female/male earnings ratio adjusted for age and schooling (R) is calculated in the following way:

$$R = (F/\hat{F} + \hat{M}/M)/2$$

where F = average hourly earnings of females,

M = average hourly earnings of male,

H = total annual hours worked by females,

K = total annual hours worked by males,

subscripts $\underline{a}$ and $\underline{s}$ = age group $\underline{a}$ and schooling group $\underline{s}$,

$$\hat{F} = \sum_{as}(M_{as} H_{as}) / \sum_{as} H_{as} \quad \text{and}$$

$$\hat{M} = \sum_{as}(F_{as} K_{as}) / \sum_{as} K_{as} .$$

It is, therefore, an average of the results obtained by standardizing female hours on male wage rates and male hours on female wage rates across 49 age-schooling cells. The percentage change in the ratio from 1959 to 1969 is $(100)(R_{70} - R_{60}) / R_{60}$ (calculated from unrounded data).

TABLE 1

Sex Differentials in Hourly Earnings,

White Non-Farm Employed, 1959 and 1969

	Average hourly earnings, 1969		Female/male ratio, hourly earnings adjusted for age and schooling		Percent change in female/male ratio of adjusted hourly earnings from 1959 to 1969
	Females	Males	1959	1969	
All	2.70	4.46	.61	.64	4.8
Northeast	2.92	4.71	.63	.66	5.2
North Central	2.68	4.52	.61	.62	2.2
South	2.41	3.98	.60	.63	5.8
West	2.89	4.78	.60	.64	6.4
$\leq$ 12 years of schooling	2.41	3.84	.61	.62	1.5
$>$ 12 years of schooling	3.44	5.75	.59	.66	11.4
$<$ 35 years of age	2.64	4.19	.71	.74	3.1
$\geq$ 35 years of age	2.79	4.84	.57	.59	4.2
Married, spouse present	2.69	4.67	.59	.61	3.0
Never married	2.72	3.06	.81	.86	6.0
Other	2.71	4.04	.65	.69	6.0
$<$ 35					
Married, spouse present	2.64	4.46	.73	.70	-3.4
Never married	2.59	2.90	.81	.86	6.1
Other	2.73	3.87	.71	.80	13.0
$\geq$ 35					
Married, spouse present	2.76	4.94	.56	.57	3.0
Never married	3.25	3.86	.78	.80	2.9
Other	2.69	4.22	.64	.67	4.5
Private Wage and Salary	2.52	4.27	.59	.62	5.2
Government	3.43	4.44	.79	.77	-2.4
Self-employed	2.71	5.68	.51	.57	11.4

Table 1 (cont'd.)

	Average hourly earnings, 1969		Female/male ratio, hourly earnings adjusted for age and schooling		Percent change in female/male ratio of adjusted hourly earnings from 1959 to 1969
	Females	Males	1959	1969	
<35					
Private Wage and Salary	2.48	4.02	.71	.73	2.2
Government	3.29	4.26	.82	.84	3.2
Self-employed	2.74	5.51	.73	.69	-5.4
≥35					
Private Wage and Salary	2.59	4.68	.54	.57	5.1
Government	3.64	4.66	.76	.72	-5.4
Self-employed	2.69	5.81	.50	.57	13.9

Source: 1/1000 Sample, 1960 and 1970 Census of Population. Calculations by author.

Contrary to other reports which typically do not adjust for hours, age or schooling, the 1/1000 samples reveal that the female/male earnings ratio increased between 1959 and 1969. For all whites, the adjusted ratio rose from .61 to .64, a gain of 4.8 per cent. This increase, although small, was noteworthy given the unprecedented increase in the female/male employment ratio of almost 20 percent during the same decade. The improvement in female earnings was evident in all four regions, with all except the North Central showing gains of over five percent.

When the sample is disaggregated by schooling, we find that the rise in female earnings was very large for those with at least some college; the sex earnings ratio jumped 11.4 percent. For workers with 12 years of schooling or less the increase was only 1.5 percent. The explanation for this difference lies, I believe, in an exceptionally rapid growth of demand for well-educated women and a relative increase in supply of less educated women.

The demand phenomenon is illustrated in Table 2 which lists major industries and occupations in order of their rates of growth from 1960 to 1970. It is evident that those industries and occupations which were large employers of well-educated women in 1960 were precisely the ones that experienced the largest increases in demand for labor between 1960 and 1970. A simple projection based on 1960-70 industry group growth rates and 1960 sex-schooling distributions by industry group reveals an expected increase in demand between 1960 and 1970 of 47 percent for well-educated females compared with 28 percent for well-educated males and 20 percent for less educated females.

TABLE 2

Employment Change 1960 to 1970 and

College Educated Females as Percent of Labor Force, 1960,

By Major Industry and Occupation

	Employed (thousands)		Employment in 1970 as percent of 1960	College educated females as percent of labor force in 1960 /a
	1960	1970		
Major Industry Group				
Professional and related services	7,695	12,780	166	29.8
Business and repair services	1,607	2,253	140	5.0
Finance, insurance, real esstate	2.695	3,652	136	8.4
Public administration	3,086	4,056	131	7.9
Wholesale and retail trade	11,793	14,613	124	3.8
Entertainment and recreation	503	591	117	5.6
Manufacturing: durable	9,833	11,124	113	1.6
Construction	3,816	4,219	111	0.7
Transportation, communication, public utilities	4,458	4,906	110	2.5
Manufacturing:nondurable	7,681	7,756	101	2.4
Mining	654	605	93	1.4
Personal services	3,862	3,294	85	3.5
Major Occupation Group				
Professional and technical	6,986	10,831	155	27.0
Clerical and kindred	9,126	13,035	143	12.9
Service exc. private household	5,754	8,065	140	2.8
Sales workers	4,637	5,267	114	4.1
Craftsmen, foremen	8,945	9,996	112	0.3
Operatives	11,347	12,582	111	0.7
Managers and administrators	5,626	6,139	109	3.4
Laborers exc. farm	3,322	3,213	97	0.1
Private household workers	1,718	1,093	64	--

/a For industries: experienced civilian labor force over 14 years of age; for occupations over 25 years of age.

Sources: 1970 Census of Population; General Social and Economic Characteristics, PC(1)-C1 U.S. Summary, Tables 81 and 82, and 1960 Census of Population, Industrial Characteristics, PC(2)-7F Table 21 and Educational Attainment PC(2)-5B Table 8

On the supply side two aspects must be considered. First, what changes occurred in the relative number of females and males at the two schooling levels regardless of employment statistics? Second, what changes occurred in the relative number employed? We see in Table 3 that although the female/male ratio rose more rapidly for the less educated in both cases the differential between schooling groups was particularly striking for employment. Why did the relative employment of less educated women grow faster than that of the more educated when the latter's relative wages were increasing more rapidly?

It is probably true that the relative supply curve of the less educated is somewhat more elastic than that of the well-educated. The principal explanation, however, is differential shifts in the female labor supply in response to increases in the absolute level of earnings (and other reasons) rather than movements along relative supply functions in response to changes in relative earnings. An increase in the general level of wages has very little effect on male labor force participation rates at any level of schooling. It has some effect on well-educated females but a greater relative effect on the less educated ones because the well-educated females are already at a higher level of participation. Thus the female/male relative supply function shifts more for the less-educated in response to a rise in the general wage level.

Disaggregation by age reveals that the increase in female earnings was about the same for those below 35 as those above, but further disaggregation by marital status or class of worker reveals that this is the result of conflicting trends. When females and males

TABLE 3

Female/Male Ratios of Population and Employment, by Level of Schooling, Non-farm Whites, 1960 and 1970

	Female/male ratio 1960	1970	Percent change in female/male ratio from 1960 to 1970
Population 25-64			
≤ 12 years	1.12	1.17	4
> 12 years	.81	.79	-2
Employment 25-64			
≤ 12 years	.47	.58	23
> 12 years	.41	.44	7

Sources: for population 1960: U.S. Department of Commerce, Bureau of the Census, U.S. Census of Population: 1960. Vol. I, Characteristics of the Population Part 1, U.S. Summary, U.S. Government Printing Office, Washington, D.C., Table 173.

for population 1970: U.S. Department of Commerce, Bureau of the Census, U.S. Census of Population: 1970. Detailed Characteristics. U.S. Summary, U.S. Government Printing Office, Washington, D.C, Table 199.

for employment 1960: U.S. Department of Commerce, Bureau of the Census, U.S. Census of Population: 1970. Subject Reports. Educational Attainment, U.S. Government Printing Office, Washington, D.C., Tables 4 and 5.

for employment 1970: U.S. Department of Commerce, Bureau of the Census, 1970 Census of Population. Subject Reports. Earnings by Occupation and Education. U.S. Government Printing Office, Washington, D.C., Table 1 and 7.

are compared by marital status the smallest decrease in the sex earnings differential is found for married persons. This is not surprising given the huge increase in the labor supply of married women during the decade. The female/male labor force ratio increased 32 percent from 1960 to 1970 for married persons. The increases in the ratio for never married and "other" were 6 percent and 10 percent respectively. The increase in labor force participation of married women was particularly great among those under age 35, with a noticeable effect on the sex earnings differential as shown in Table 1. Of the six marital status-age classes only married persons under 35 showed a relative decrease in female earnings. Indeed, for the never married and "other" the increase was greater for those under 35 than for those above that age.

When the comparisons are made by class of worker, we find that in government, where female earnings have been relatively highest, there was actually a small decrease in the earnings ratio between 1959 and 1969. Further disaggregation by age reveals that this decrease was concentrated in the over 35 category. One possible explanation is that this is the result of the strong relation between earnings and seniority in government employment. Older women who entered government during the decade had less seniority than men of comparable age and therefore lower earnings. At younger ages seniority in government would be more comparable between the sexes, and in the private sector earnings are not so rigidly determined by seniority at any age.

One variable that highlights the effects of role differentiation on female earning power is employment status 5 years prior to the Census. Of the white males 25 and over who were employed in 1970 and in 1969 only 6 percent were not at work in 1965. The comparable figure for white females was 24 percent. Among married white females age 25-44 more than 36 percent were not at work five years earlier. The comparable figure for males is 8 percent. These differences are noteworthy because there is a very large differential in hourly earnings, about 18 percent, between employed persons who were at work 5 years earlier and those of comparable sex, color, age and schooling who were not. For white females in government this differential is almost 24 percent!

This preliminary reading of part of the evidence on recent changes does not constitute a rigorous test of a theory of female wage determination, but I think one conclusion is warranted. If, during a period of rapid increase in supply, female earnings were more than able to hold their own and for some groups show significant gains, the long-run prospects for women must be viewed as favorable.

In the decades ahead female labor force participation is likely to continue approaching the male rate, and at some point the growth in the female/male employment ratio will taper off as shown in Figure 2. Although in the short run the increased labor force participation of women tends to depress female earnings, in the long run it will raise them. Because they will expect to be in the labor force for a significant portion of their adult lives, women will be more

career-minded while attending school, choosing an occupation, and investing in themselves after they leave school. Employer expectations concerning continuity will also change with important implications for job and training opportunities.

The women who entered the labor force in large numbers in the 1960's did not have much labor market experience by 1969. After the transition, however, the average work experience of employed women will increase. Moreover, when female labor force participation rates stabilize at a high level, new entrants will consist primarily of young women who will have been less exposed to role differentiation at home and in school than those now in the labor force. The increasing acceptance of women in a variety of occupations, the narrowing of sex differences in experience and post-school investment, and a continued shift away from heavy manual jobs all augur well for female earnings.

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Footnotes

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