PROGRESS OR REGRESSION? - A LOOK AT FEMALE/MALE EARNINGS DIFFERENTIALS DURING THE SIXTIES

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During the decade of the 60's a policy of active government involvement to assure equal employment opportunity for women as well as minority groups was developed. Controversy has raged since then over the implementation techniques of the policy. Such issues as goals, quotas, and affirmative action have been featured in public debate. Elements in implementing this policy are still being developed through the interaction of sometimes contradictory judicial decisions, legislative acts and executive orders.

Given the current state of flux in policy regarding equal employment of women it would appear to be important to provide data and analysis on the changes in the economic status of women since implementation began. Such analysis would allow us to see if any significant changes have occurred. Of particular value should be the identification of the determinants of earnings which help explain why women's earnings are usually lower than men's. For example, the policy implications would be different if the earnings differences by sex were attributed to different age distributions of male and female earners than if the differences were caused by employer discrimination. The specific purpose of this paper is to investigate the determinants of individual earnings given the current social and economic climate and to compare the earnings of males and females in 1960 and 1970 analyzing any changes which have taken place during this time.

The difference between male and female earnings can be shown by the median or mean earnings figures given in Census reports. Table I shows that both groups' earnings increased significantly over the decade but that a large part of the increase was due to inflation. Men had a thirty percent gain over the decade when 1960 earnings are adjusted to reflect the purchasing power of 1970 dol-Women's gains ranged from 23 to 40 lars. percent depending on whether the mean or median earnings are considered. It is clear that while the distribution of male earnings did not change much during this period the female earnings distribution did. The large increase in median income and smaller increase in mean income may imply that more women entered the labor force at the earnings range between the mean and median. The narrowing of the gap between these two measures of central tendency also implies that female

earnings tended to concentrate at a slightly higher level but these earnings are still bunched around the mean. Other evidence indicates that female earnings are not dispersed as widely as male earnings.¹

The obvious lack of earnings parity; the decrease in the earnings ratio of female to male earnings (FMER) over the decade from 0.52 to 0.49; and the significant change in female earnings patterns all suggest that investigating the reasons behind such changes is crucial for policy makers. This paper sheds some light on the questions surrounding the female-male earnings differential.

The paper is divided into four sections. The first section reviews the previous work in this area and relates those findings to this study. In the second section, a model of individual earnings determination is developed. The third section presents empirical results of testing the model in this study. The final part of the paper is a summary of the attempt to analyze the determinants of earnings and of the economic position of women relative to men.

I. Relation to Previous Findings

Much of the research on earnings differentials has focused on differences between black and white males. Our intent is to apply the techniques developed in that research to the problem of earnings differences between men and women.

Most of the empirical work in both the white/nonwhite area or the male/ female area have used the ratio of incomes as their summary statistic. This technique allows one to ignore the time series effect and view relative earnings as the most appropriate comparison. When no consideration of underlying differences in earnings characteristics is used, the ratio is the unadjusted ratio. If statistical techniques, such as multiple regression, are used to adjust for differences in the underlying population, the resulting ratio is referred to as the adjusted earnings ratio. For example, Sutor and Miller(19) have analyzed a group of men and women who were 30-44 years old with incomes. By accounting for occupation, education and work experience they were able to increase the female to male adjusted earnings ratio to about 62 percent. In six econometric studies of male/female earn-ings patterns reviewed by Sawhill⁽¹⁰⁾, the remaining earnings differences after adjustment ranged from 29 to 43 percent.

	1959 (1959 dollars)	1959 (1969 dollars)	1969 (1969 dollars)	Percent Change
Median Income Women Men	\$2362 4081	\$2976 5142	\$4187 6670	40.7% 29.7
Mean Income Women Men	\$2557 4926	\$3223 6207	\$3 960 8139	22.9% 31.1
Female/Male Mean Earnings Ratio - FMER	0.52		0.49	-6.3%

Source: Median Income figures are from <u>U.S. Census of Population -- 1960</u>, Subject Report "Occupation by Earnings and Education," and <u>U.S. Census of Population</u> -- 1970, Subject Report "Earnings by Occupation and Education." Mean Income figures and FMER were derived from the U.S. Census of Population Public Use Samples -- 1960 and 1970, 15%. In these statistics persons without earnings and without hours worked in 1970 were excluded.

Gwartney and Stroup(10) have suggested that this remaining differential may be due in part to female preferences especially for married women. The market-nonmarket work decisions of married women, analyzed by Cain, Mincer and others, must also be a part of the analysis of earnings differences by sex.² Other possible variables, such as industrial structure, unionism, city size and length of trip to work have been shown by Fuchs(8) and Ashenfelter(1) to have only minor impact on the male/female earnings ratio.

All of these previous studies of earnings differentials by sex have either investigated a small group of earners or included only a few of the variables which are known to differ by sex. This study attempts to adjust for most of the appropriate earnings impacting variables that are available and includes in its sample all women and men who had earnings during a Census year and who worked during the Census week.

The paper does not deal with the important questions of labor force participation and occupational choice. While we know, from Oppenheimer's work(17) as well as Sutor and Miller, Kreps(15) and others, that occupational choices impact earnings and that women seem to be crowded into four to six lower paying occupations, we do not know whether this choice is a result of female realism or role acceptance.³ Waldman⁽²⁰⁾ suggests that the decision to participate in the labor force is also tied to occupational choice and notes the increase in the proportion of women in the labor force which rose from 23 percent of all 16+ women in 1920 to 42 percent in 1970. It is not clear yet why these changes in the labor force participation rate have occurred but it leads to speculation that changes in economic opportunities may have caused some of the change. This paper omits an occupational index because the occupational mix, while explaining earnings differences, is itself part of the social milieu which may be discriminating. Since the data base used here is employed people, the question of labor force participation rate is not raised.

A Model of Individual Earnings II. In order to investigate earnings differences it is useful to estimate an earnings function which contains those variables which on <u>a priori</u> grounds appear to affect an individual's earnings and can be measured. The number of possible variables is large. At one time we developed a list of more than 32 possible personal characteristics which affect an individual's earnings, including intelligence, motivation, luck, ability to relate to co-workers, cognitive and non-cognitive skills, health, etc. Unfortunately many of these characteristics are not readily measurable.

We can, however, group the factors which might influence an individual's earnings into four major categories. (1) Human capital - all the capabilities an individual brings to the labor market. (2) Skill utilization - the way these capabilities are utilized. If, for example, a physician preferred to fish rather than to practice medicine he is not using his human capital for maximum pecuniary benefits. (3) Market forces the interaction between the demand for and supply of certain skills which may cause them to lose their value or to become more monetarily rewarding. (4) Discrimination - defined here as the payment of different wages to people with identical skills who differ only by race, sex, religion, national origin, age or by some other non-rational basis.

In testing the usefulness of any specified earnings function, it is often necessary to use proxies for some of these four general factor categories. For example, years of schooling is often used to represent human capital. Experience has also been used as an indicator of an individual's human capital. However, like most empirical problems in the social sciences, the variables are complex, jointly determined and often subjectively measured. In addition, since Census data is the common source for the empirical development of the earnings functions the choice of variables is often limited to the data collected and released by the Bureau.

Using proxy variables to develop an individual earnings function has produced acceptable empirical results for most investigations. For example, while work experience is the more desirable measure of human capital, age is usually used, since work experience has not been collected in the decenial Census. For men, who are usually employed for most periods in their adult life, the age variable has been a reasonable proxy for experience in their earnings function. However, there is good reason to believe that it is an inadequate proxy when men and women are compared because women's age distribution and work experience distribution are not the same. If women leave the labor force for varying periods of time to specialize in home management or child rearing, both of which are nonmarket functions, their experience may not be transferable into market work experience. To the extent that experience and the related on the job training is important in wage determination, using age to represent human capital would bias the measurement of earnings differences. In particular, age would be expected to show a greater impact on men's earnings than women's earnings.

Having noted these weaknesses in the choice of proxy variables we will develop our earnings function and interpret the results in the light of the measurement difficulties. Previous studies and economic theory suggest that the four factor categories can be measured as follows:

Human capital is measured in this study by years of schooling completed and age. The first variable gives us an indication of the skills with which an individual first entered the labor market and the second is a proxy for the experience gained since entering. We have already discussed the inadequacies of this measure but feel that it is better to include some measure of experience even if inadequate. For men, veteran experience may be transferable into higher earnings and can be included also as a measure of their human capital.

Skill utilization must be measured by variables which represent an individual's own economic decisions. Hence, the number of hours worked may represent a conscious choice by the worker among leisure, non-market work and market work. Marital status may also impact a person's motivation to achieve in market work or to remain in non-market work. Finally, income from other family members may influence the way in which a female uses her skills and hence, this variable is included in the female equation.

Market forces may work in a number of ways. Three which we felt were essential to include were hours of work as a proxy for hours of work available, rural residence to account for reduced employment opportunities in these areas and Southern residence to include the costs of living differences which are reflected in earnings levels in Southern labor markets. Costs of living differences among other regions of the U.S. appear to be negligible.⁴

Finally, we need to confront the problem of measuring, or representing, discrimination. While some variables have been used on aggregate data for racial discrimination studies⁵ there are not readily apparent indices of discrimination which one can calculate except to indicate changes over time.⁶ Hence in this study we place discrimination with all other omitted variables in the residual term. If the other omitted variables, such as health, luck, and motivation are distributed in the same way for each sex then any uneven distribution could be assigned, at least in part, to discrimination.

part, to discrimination. In summary, then we can describe our earnings function model as follows:

III. Empirical Results

Separate earnings functions were estimated for men and women. The coefficients for the variables in the function appear in Table II.⁷ In general these results were encouraging from a statistical standpoint. Most of the variables are highly significant and the coefficient of determination is a reasonably high figure for individual analysis. The coefficients generally have the signs that a priori reasoning would have predicted. For our purposes

TABLE II - ESTIMATED COEFFICIENTS OF SEPARATE EARNINGS FUNCTIONS 1970 (t ratios in parentheses)

	Dependent	Variable -
Independent	Individual	Earnings
	<u>Females</u>	Males
Nace .	(5.6)	(16.3)
Schooling	302 (56.4)	518 (66.0)
Age (16-24)	-1104 (21.5)	-3732 (38.4)
Age (25-34)	-251 (5.7)	-1753 (23.0)
Age (45-54)	72 (1.5)	278 (3.6)
Age (55-64)	285 (5.2)	-2 (0)
Age (65+)	-349 (3.9)	-1503 (9.8)
Rural Residence	-379 (9.9)	-1155 (19.5)
Southern Residence	_464 (13.7)	-792 (14.1)
Married, Spouse Present	-384	1844
Once Married Spouse Not Present	-269 (5.1)	711 (5.7)
Other Family Income	-1014 (12.1)	
Nonveteran		-158 (2.8)
Hours Worked	1.80 (80.3)	1.80 (41.7)
Y-Intercept	-1940	-2029
R ²	• 34	• 32

Source: U.S. Census of Population -Public Use Sample 1960 and 1970. N = 25,117 females and 40,578 males.

the most interesting part of the regressions is the variation in the magnitude of the coefficients which is associated with the two functions.

First, there is a six and one half times greater difference within the male group between whites and nonwhites than within the female group. This result is similar to other work which has shown that white and nonwhite females are at or near parity after adjustments for earnings characteristics.⁶ While the male nonwhite to white earnings ratio is raised by other adjustments it never gets as close to parity as the female ratio.⁹ This result is consistent with several different hypotheses. For example, it may be that discrimination against black women is less than that against black men, or it could indicate that white women are discriminated against. It could also indicate that characteristics which are not included here but which affect earnings are different between white women and others.

Second, dollar returns for additional years of education are significantly greater for males than for females. This may, however, reflect the higher earnings base of men relative to women since a one year increase in education increases men's earnings by 6.4 percent and female earnings by 7.6 percent. Although a woman would not add as many dollars to her earnings for each year of education she acquires, there is still an incentive to increase her schooling since each year does increase her earnings.

Third, the age-earnings relationship is similar for males and females although the female peak in earnings occurs at a later age. This is consistent with both the later peak in earnings for clerical and sales workers and the labor force interruptions attributed to the average woman which would make experience a lagged variable with respect to age rather than a coincident one.

Fourth, the rural and Southern variables are very similar in magnitude for men and women. Since these variables represent cost of living variations, primarily, it is not surprising that they affect money incomes of both groups similarly.

While rural and Southern variables show a great similarity of impact in the earnings functions of men and women other variables do not. The impact of marital status on earnings appears to work in opposite directions for men and women. Married men had earnings which were more than \$1800 higher than single men after adjustments for the other earnings fac-Once-married men's earnings were tors. about \$700 higher than single men. Hence, married men earn, on average, 23 percent more than single men. Women who are married earn less than single women on the average. Married women have average earnings which are almost \$400 lower than single women's average earnings.

Several non-mutually exclusive reasons for such a difference have been suggested. One study suggests that it may, in part, be a revealed preference by married women for jobs with high nonpecuniary features relative to pecuniary ones.¹⁰ Other possible reasons are that the results reflect discrimination against married women by employers or that it is the result of household decisions which joint-maximize their family income.

The difference between married men and women's earnings might also reflect a measurement error in the earnings variable. Married men's earnings may be enhanced by the non-market work of their wives. She may keep his records, handle business calls when he is out, substitute for him or other missing employees, all without additional cost to her husband. This type of work assistance tends to be reflected in higher earnings for the married man than would be expected of someone without a wife. Income potential is also improved for a person if his normal household (or non-market work) responsibilities are minimal. This situation contrasts with that of single men, who often either use normal working hours to carry out household errands or select jobs that have flexibility as a non-pecuniary benefit. Married men's earnings, then, can reflect others' productivity in addition to their own.

By contrast married women have, in our society, traditional responsibilities for non-market work which are much greater than those of married men. At least part of their working time during business hours is used for household tasks marketing, delivering, chauffeuring, nursing, etc. In addition to this reduc-tion in their earnings potential married women do not usually have anyone available to organize, substitute or act as accountant, secretary or receptionist when necessary. Since she must perform these tasks herself she cannot maximize her earnings by doing only the high income producing activities and leaving the other, necessary but lower skill level tasks to others. For once-married women with children this problem is compounded.

Although the mechanism is not clear, the result is that married women's earnings would be an average of \$2300 less than married men, if single men and women earned the same average income.

The last variable, hours worked, is pertinent to both men and women. The estimated coefficient for this variable can be interpreted as the hourly wage rate after the effects of race, education, age, geographic area, and marital status are accounted for. Both groups show an identical \$1.80 an hour for this variable. This result may have important policy implications. Despite the different occupational distributions of men and women the amount earned per hour after adjustment appears to be nearly the same. Equal pay for equal work may not be as crucial an issue as equal opportunity for employment in the entire occupational structure.

IV. Summary

We have shown, in this study, that men and women's earnings are not near parity but that adjusting for earnings impacting characteristics does raise the ratio. With a low, unadjusted ratio of 0.48 in 1970, if female earners received the same payoffs as men, they could reach 0.85 of male earnings even when they keep their own group's earnings characteristics.

Over the decade the only changes in the labor force characteristics which have occurred have worked against female/ male earnings equality. The addition to the female labor force of substantial numbers of young, married women, especially in the South, has not raised the average female earnings relative to men.

Finally, differences in earnings payoffs and in hours worked appear to be the two strongest influences on the female-male earnings differential in this model. For policy makers these results are difficult to handle. In the first place it is not clear whether the hours worked by women is a choice made by women to meet their own interests and traditional responsibilities or whether it is forced on them by employers who offer little else to women seeking work in certain occupations. Second, it is not clear whether the differential payoffs for age and/or experience are the result of employer choice or employee career and occupational decisions. Female age earnings profiles tend to be flatter than males. This may be because females populate those occupations with easy entry and exit and with higher entry earnings but which put little value on the job experience and continuity and more value on initial training. If women wish to maximize lifetime earnings, and recognize a high probability of an interrupted market work history they may have chosen careers with fairly flat but initially high age/earnings profiles. However, this is a testable hypothesis and the impact on earnings of these decisions has yet to be adequately measured.

FOOTNOTES

- 1. The standard deviation for male earnings, for example, is larger than female earnings.
- See Cain and Mincer, for example, for an analysis of the market/nonmarket work decisions.
- 3. See Bergman and Adelman⁽³⁾.
- 4. See Haworth and Rasmussen⁽¹²⁾.

- 5. Bergman and Lyles's measure of the Wallace vote in 1968, for example.
- 6. For example, the probability measure described in Gastworth, pp. 133.
- 7. The coefficients for 1960 are similar and have not been reproduced in detail in this paper.
- 8. See Haworth, Technical Report II.
- 9. A discussion of this ratio for males can be found in Welch and Haworth, Gwartney and Haworth, and Chiswick among others.
- 10. Gwartney and Stroup, pp. 577.

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