THE IMPACT OF MARRIED WOMEN AND RELATED FACTORS ON THE DISTRIBUTION OF FAMILY EARNINGS

Dissertation for the Degree of Ph. D.
MICHIGAN STATE UNIVERSITY
ROBIN LYNN BARTLETT
1974

This is to certify that the

thesis entitled

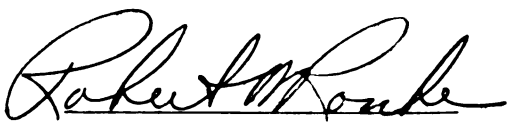
THE IMPACT OF MARRIED WOMEN AND RELATED FACTORS ON THE DISTRIBUTION OF FAMILY EARNINGS

presented by

Robin Lynn Bartlett

has been accepted towards fulfillment of the requirements for

Ph. D. degree in Economics



Major professor

Date February 22, 1974

O-7639

ABSTRACT

THE IMPACT OF MARRIED WOMEN AND RELATED
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By

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The purpose of this study was to examine some of the factors that affect the distribution of aggregate family earnings; that is, whether certain factors make the distribution of aggregate family earnings more or less disperse. Among the factors that were suggestions and extensions of the current literature were the marital labor force participation rates, relative hourly earnings between all females and males in the labor force, the relative number of hours supplied between males and females in the labor force, relative hourly earnings between wives and husbands, and the relative number of hours supplied between husbands and wives.

In order to construct a family earnings distribution, and to avoid the heroic assumptions that would have to be made to bridge the gap between a family earnings distribution and a family income distribution, the core population of all husband and wife families was chosen. The necessary data were taken from various published and unpublished sources of information gained from the Current Population Survey. The data were in three major groupings: (1) marital labor force participation pairings -- that is, all the possible combinations of husband and wife occupational pairings if they were employed as well as unemployed or not in the labor

force employment statuses; (2) hourly earnings and hours worked by sex and occupation; and (3) the marital labor force participation pairings as in (1). The time period considered was between 1962 and 1971.

Using Gini coefficients to determine whether or not the factors mentioned above had an equalizing or disequalizing impact on the distribution of family earnings, the following results were obtained. First, the increased labor force participation rates of married women as reflected in the increased marital labor force participation rates had a substantial disequalizing impact on the distribution of family earnings. This disequalizing impact was somewhat offset by the equalizing influences of the other four factors. The increase in the relative hourly earnings between all females and males had the greatest equalizing impact of the four. The net result was the fact that relative income dispersion increased between 1962 and 1971.

THE IMPACT OF MARRIED WOMEN AND RELATED FACTORS ON THE DISTRIBUTION OF FAMILY EARNINGS

By

Robin Lynn Bartlett

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Economics

1974

TO THE BARTLETT CLAN:

C.D.
MARCELLA
DAN
LINDA
BILL
SHARON
MIKE
BECKY
ROY
BERNIE
AND GRAM

ACKNOWLEDGMENTS

I wish to thank the following people:

Professor Robert Rasche, Chairman of the Committee, for crystalizing the initial ideas and for patiently reading the numerous drafts of each chapter;

Professor Collette Moser and The Center for Rural Manpower and Public Affairs for financial support;

Professor Maurice Weinrobe for his help and supervision;

Professor Daniel Hamermesh for willingness to speedily read and critique various drafts;

Professor William Haley for his assistance with various statistical problems;

Various friends who had their own special input;

Jacque Grossman who programmed a substantial portion of the work;

Linda Peppard who read countless numbers;

Jean Carlson who edited critical sections;

Jeanette Barbour and Betty Kronemeyer who typed the first and last drafts;

Pam Japinga who made the coffee breaks enjoyable and gave support before and during the writing of this thesis;

Those in my office -- Robert Leekley, Evelyn and Mark Fallek, and Jan Palmer.

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CHAPTER 1

THE DISTRIBUTION OF FAMILY EARNINGS: AN OVERVIEW

1.0 Introduction

The purpose of this study is to examine some of the factors that affect the distribution of family earnings; that is, whether certain factors make the distribution of family earnings more or less disperse. Particular attention is given to working wives and their contributions to aggregate family earnings and its distribution. This special attention is warranted and of interest for two reasons. First, the increased labor force participation of married women has many major economic and social ramifications, one of which is its impact upon the distribution of aggregate family earnings. Second, the work that has already been done in this area is inconclusive. Many studies pertaining to income size distribution and to the labor force participation of married women have made valuable suggestions as to which factors should be taken into consideration. After examining a few of these suggestions, an attempt will be made to integrate them into a model.

2.0 Some Suggestions From the Literature

From the macro perspective of income size distribution studies and the micro perspective of labor force participation studies, the consensus is that the increased labor force participation of married women is having and will continue to have an impact on the distribution of family earnings.

The direction and magnitude of this impact, however, depends upon the enhancing or retarding influences of related factors traditionally considered by each perspective. The following selections from the literature focus upon these related factors.

To Herman Miller, the most important factor relating to the increased labor force participation of married women is the proportion of families with working wives in the total population of all families. The total population of all families is divided into four groups: (1) Male head, married, husband present, and wife not in the paid labor force; (2) Male head, married, husband present, and wife in the paid labor force; (3) Male head, other; and (4) Female head. Miller looks at the respective Gini coefficients of the first two groups and infers that:

> "...the incomes are much more equally distributed among families where the wife works than where she is not working; the sizeable increase in the proportion of families with working wives has tended to decrease income inequality during the past decade." [13, Miller, p. 22]

Despite Miller's reference to the 1950's, he would probably make the same inference with respect to the 1960's since the proportion of families with a working wife has continued to increase. Miller is implicitly assuming that the shapes of the individual income distributions for these two groups of families are not changing as a result of the increased labor force participation of married women.

In a more recent study, Charles Metcalf, initially agreeing with Miller, shows that in fact the underlying distributions do change and that the impact of working wives cannot be readily surmized.

> "The increase in the proportion of families with a wife in the labor force has an impact on the aggregate distribution for two reasons. First, they are shaped differently, a change in their relative proportion will appear as a change in the aggregate distribution even if there is no change in the

> shapes of the two individual distributions. Second, the two groups appear to show different responses to cyclical movements in the economy." [4, Metcalf, p. 66]

The cyclical movements, moreover, of the two underlying distributions were found by Metcalf to vary inversely. He found a positive correlation between his measure of relative income equality and cyclical movements for the distribution of families with male head, married, husband present, and wife in the paid labor force. Counter-cyclical behavior was recorded for those families with Male head, married, husband present, and wife not in the paid labor force. The two studies point out the necessity of investigating the proportion of wives that work.

From a different perspective, the cyclical labor force behavior of husbands and/or their wives has been documented in several labor force participation studies. A few of the major ones are those done by Bowen and Finegan, Cain, and Mincer. Labor force entry, exit, and number of hours worked are explained using the traditional notions of income and substitution effects. The question as to why a wife works, however, is not as relevant to this study as how much she works and for what wage. In the unlikely situation that the "whys" for working between husband and wife are independent, George Stigler hypothesizes that "...the effect of their work [wives] would be to increase, and very substantially, the dispersion of family earnings." [1, Stigler in Budd, p. 104] Edward Budd is quick to point out that this is only true if a special case is made for this unlikely situation:

> "It does not follow, for example, that the distribution of family income in a world in which some wives as well as husbands work is necessarily more unequal than the family income distribution in a world in which only husbands work and wives stay at home, even if in the first world a wife's decision to work is independent of whether her husband does so. Only if

> there is a very close and direct relationship between the amount earned by a working wife and the corresponding size of her husband's earnings would the degree of income equality of family income be greater in the first case than in the second." [1, Budd, p. xxvii]

As an example, in a world where substitution and income effects do not enter into the decision of a wife to work, the increased labor force participation of married women would have a greater disequalizing effect if the relative earnings of wives were 90 percent of their husbands', than say 40 percent.

However, Budd's special case of Stigler's unlikely situation may be a crucial element of Jacob Mincer's more general situation. Lodged within Mincer's permanent and transitory income explanation of the labor force participation of married women, he notes:

> "For particular population groups observed, the more prevalent transitory components in the head's income, and the weaker the association between the wage rate of family members, the greater the equalizing effect of labor supply on family income distribution--and conversely." [5, Mincer, p. 97] (Emphasis added)

Or in other words, where transitory components in the head's income are less prevalent, a weaker association between the husband's wage and that of his wife would have less of a disequalizing impact upon the distribution of family income than a strong association. If transitory components are prevalent in the head's income the opposite would be true. The extent of transitory components in most head's income, and thus family income, dampens the disequalizing of family income resulting from the increased labor force participation of wives. Mincer's quote could also be interpreted as emphasizing the buffering influence of the relative wage between husband and wife upon the prevalence of transitory or permanent income components of the head's income. For the purposes of a family income distribution, the former is more adequate. It does mean that if there

is in fact a high correlation between the husband's and wife's wage, an increase in the number of working wives would make the distribution of family income more unequal, but deceptively so in degree.

The literature suggests that the increased labor force participation of wives could make the distribution of family income more or less equal depending upon the proportion of families whose wives work and the relative wage rate between husbands and wives. Taking the former related factor first, the increased labor force participation of wives could have varying impacts if a larger proportion of high income wives as compared to low income wives worked. Secondly, a wife is also part of the female labor force. Her occupational location and hourly wage rate is determined by those forces experienced by all females. The same is true for her husband. It stands to reason, therefore, that the relative wage rate between husbands and wives is related to the occupational distribution of all males and females and their relative wage rates. If females generally receive lower wages than males in most occupations, in addition to the likelihood of being in relatively lower paying occupations; then the relative wage between husband and wife is smaller, weakening their wage rate association. Using Mincer's argument, the impact of more working wives would be to decrease the inequality of family income.

3.0 The Model

While the previous studies dealt generally with all families, this study will concentrate upon all husband and wife families in the U.S. The scope is further narrowed since earnings, not total money income, will be discussed. This is done for two reasons. First, most families are husband and wife families, and earnings are their major source of

income. Second, establishing all husband and wife families and their earnings as a core population avoids the heroic assumptions that would have to be made in order to bridge the gap between a family earning distribution and a family income distribution.

This core population of all husband and wife families is divided into four groups:

1. Families in which the husband works and his wife stays at home;
2. Families in which both husband and wife work;
3. Families in which the husband stays at home and his wife works; and
4. Families in which neither the husband nor his wife works.

The data for 1971 indicate, contrary to popular belief, that the first of these four groups is not the predominant one. This is determined by regrouping the ten possible family earner patterns in Table 1 in the following manner. The largest single family earner pattern component of the first group is that where the husband is the sole provider (2.a.). 15,449 thousand families or 34 percent of all husband and wife families exhibited this pattern. When those families in which the husband worked along with some other relative or relatives other than his wife (3.b. + 4.b.) are added, the total number of all husband and wife families in group 1 is 20,094 thousand or 44 percent of the population. Combining the family earner patterns in which both husband and wife worked (3.a. + 4.a.) for group 2 gives 20,552 thousand or 45 percent of all husband and wife families. Group 2 then is slightly larger than group 1, making it the predominant family earner group. The remaining family earner patterns in Table 1 are partitioned into groups 3 and 4. The former (2.b. + 3.c. + 4.c.) accounts for only 3 percent of all husband and wife families, families where just

TABLE 1

Family Earner Patterns for All
Husband and Wife Families in 1971*

FAMILY EARNER PATTERN		
1. No Earners	3,443	
2. One Earner	16,784	
a. Head Only		15,449
b. Wife Only		997
c. Other Relative Only		338
3. Two Earners	18,714	
a. Head and Wife		15,381
b. Head and Other Relative		3,103
c. Head Not an Earner		230
4. Three Earners	6,812	
a. Head and Wife		5,171
b. Head an Earner, Wife Not an Earner		1,542
c. Head Not an Earner		99
5. Total Number of Families	45,753	

*[12, U.S. Department of Commerce, p. 80]

the wife worked. In 8 percent of all husband and wife families, however, neither the husband nor his wife worked (1. + 2.c.).

The four groupings are easily expressed in algebraic terms.

$$EFAM^t = E_h^t + E_w^t \tag{1.1}$$

where $EFAM^t$ represents the family's total annual earnings in year t; E_h^t represents the husband's earnings in year t; and E_w^t represents the wife's earnings in year t. In Equation (1.1), $E_h^t > 0$ and $E_w^t = 0$ for those families in which the husband works and his wife stays at home. $E_h^t > 0$ and $E_w^t > 0$ for those families in which both work. $E_h^t = 0$ and $E_w^t > 0$ for those families in which the husband stays at home and the wife works. Finally, $E_h^t = 0$ and $E_w^t = 0$ for those families in which neither works.

From these groupings aggregate family earnings and its distribution for any given year can be constructed provided the following pieces of information are available for Equation 1.1: (1) the number of marital labor force participation pairings -- that is, all the possible combinations of husband and wife occupational pairings if they are employed as well as unemployed or not in the labor force employment statuses; (2) hourly earnings and hours worked by sex and occupation; and (3) the marital labor force participation rates -- that is, the number of families who find themselves in a particular marital labor force participation pairing as in (1).

Assuming there are n possible occupations for either the husband and/or his wife to be employed, plus two additional categories for unemployed and not in the labor force, then there are $(n+2)^2$ possible marital labor force participation pairings. For any one marital pairing, the annual earnings of the husband and/or his wife are approximated by the annual earnings of a male or female in their respective occupations. Summing E_h^t and E_w^t in Equation (1.1), then gives the family's total annual earnings,

given a particular marital pairing. With $(n+2)^2$ possible marital pairings, there are $(n+2)^2$ possible discrete family earnings levels. Multiplying each family's annual earnings by the marital labor force participation rate for that marital pairing gives $(n+2)^2$ subtotals of aggregate family earnings. Summing these subtotals determines aggregate family earnings. Reranking the subtotals by family earnings levels from lowest to highest determines the distribution of aggregate family earnings. Algebraically,

$$AEFAM^t = \sum_{\overline{ij}}^{m} {}_{\overline{ij}}N^t({}_iE_h^t + {}_jE_w^t) \qquad (1.2)$$

where $AEFAM^t$ = aggregate family earnings,

$m = (n+2)^2$, the possible number of marital labor force participation pairings,

$\overline{ij}$ = a particular marital labor force participation pairing,

i = the husband's occupation,

j = the wife's occupation

N = the marital labor force participation rate, and

t = year.

The selected studies of Section 2.0 of this chapter on family income size distribution tended to emphasize the marital labor force participation rates, ${}_{\overline{ij}}N^t$; while those on labor force participation emphasized the relationship of the husband's earnings, ${}_iE_h^t$, to that of his wife, ${}_jE_w^t$.

Equation (1.2) can be slightly modified in order to deal with the questions of the relative earnings between husband and wife as suggested in the literature, the relative earnings between all males and females in each occupation, the occupational distribution of all males and females, and how these related factors affect the distribution of aggregate family earnings. The annual earnings of either the husband or his wife are the

products of his/her hourly earnings in his/her occupation and the number of hours worked annually. Substituting hourly earnings and hours worked first in Equation (1.1) and then into Equation (1.2) gives the following results:

$$AEFAM^t = \sum_{ij}^{m} {}_{ij}N^t ({}_iW_h^t \cdot {}_iH_h^t + {}_jW_w^t \cdot {}_jH_w^t), \tag{1.3}$$

where W represents hourly earnings and H represents the average number of hours worked annually. The annual earnings of husband and wife in a particular marital labor force participation pairing in relative terms is found by factoring out the husband's annual earnings.

$$AEFAM^t = \sum_{ij}^{m} {}_{ij}N^t \{ {}_iW_h^t \cdot {}_iH_h^t \left[1 + \left(\frac{{}_jW_w^t}{{}_iW_h^t}\right)\left(\frac{{}_jH_w^t}{{}_iH_h^t}\right)\right]\}. \tag{1.4}$$

The last two terms of Equation 1.4 give the relative earnings between a wife and her husband in a particular marital pairing. Multiplying the terms inside the brackets by $({}_iW_f^t/{}_iW_f^t)({}_iH_f^t/{}_iH_f^t)$ adds the influence of the relative wage between males and females in each occupation to the model.[1] Equation (1.4) then becomes:

$$AEFAM^t = \sum_{ij}^{m} {}_{ij}N^t \{ \left(\frac{{}_iW_h^t}{{}_iW_f^t}\right)\left(\frac{{}_iH_h^t}{{}_iH_f^t}\right)({}_iW_f^t \cdot {}_iH_f^t)\left[1 + \left(\frac{{}_jW_w^t}{{}_iW_h^t}\right)\left(\frac{{}_jH_w^t}{{}_iH_h^t}\right)\right]\}. \tag{1.5}$$

Equation (1.5) contains six factors which affect aggregate family earnings and its distribution: $({}_iW_h^t/{}_iW_f^t)$, the relative hoursly earnings between males and females in the husband's occupation; $({}_iH_h^t/{}_iH_f^t)$, the relative number of hours worked annually between males and females in the husband's occupation; $({}_iW_f^t \cdot {}_iH_f^t)$, a floor on any one occupation's earnings since it

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[1] Instead of putting the relative hourly earnings and hours worked in terms of the husband's occupation, the wife's annual earnings could have been factored out. This would have put the related factors in terms of the wife's occupation. The results are the same.

represents what a female could earn in the husband's occupation; $({}_{j}W_{w}^{t}/{}_{i}W_{h}^{t})$, the relative hourly earnings between wives and husbands in a particular marital pairing; $({}_{j}H_{w}^{t}/{}_{i}H_{h}^{t})$, the relative number of hours worked annually by wives and husbands in a particular marital pairing; and $\overline{\overline{{}_{ij}N}}^{t}$, the marital labor force participation rates. The first three of these factors are determined by the overall labor force, while the last three are specific to all husband and wife families. A change in any one of these factors will affect aggregate family earnings and its distribution. Whether changes will have an equalizing or disequalizing impact, however, cannot a priori be determined.

Gini coefficients are used to measure the relative equality or inequality of aggregate family earnings. The impact of various factors in Equations (1.2), (1.3) and (1.5) is determined by holding each factor constant while all else varies, resulting in an adjusted Gini coefficient. Given a knowledge of the general direction of change in each of these factors, the impact of any one factor is deduced by comparing the adjusted Gini coefficient with the actual Gini coefficient. If the former is greater than the latter, the related factor held constant had an equalizing impact on the distribution of aggregate family earnings. Using one of the related factors in Equation 1.5 as an example, if the relative hourly earnings between all males and females is found to be decreasing and that the adjusted Gini coefficient with this factor held constant is greater than the actual Gini coefficient, then it can be surmized that the decrease had an equalizing impact on the distribution of family earnings -- and conversely.

4.0 The Outline of This Study

Before aggregate family earnings and its distribution can be constructed, hourly earnings and annual hours worked for all males and females in the labor force by occupation are developed from Census data. This is done in a format very similar to Equation (1.1). Within this framework three basic questions relevant to Equation (1.5) can be answered: (1) What has been the overall direction of change in the relative hourly earnings between all males and females in the labor force; (2) What has been the overall direction of change in the relative number of hours worked between all males and females; and (3) What has been the overall direction of occupational shifts for all males and females. Chapter 3 is a summary of these findings.

Chapter 4 deals with three questions relating specifically to the population of all husband and wife families. Again following the format of Equation (1.1) the following questions relevant to Equation (1.5) can be answered: (1) What has been the overall direction of change in the relative hourly earnings between wives and husbands and how closely are the two associated; (2) What has been the overall direction of change in the relative number of hours worked between wives and husbands; and (3) What has been the overall direction of occupational shifts for wives as well as husbands. The findings with respect to these three questions immediately follow the development of the model.

Chapter 5 brings together the information and findings of Chapters 3 and 4 to construct aggregate family earnings and its distribution. An examination of the various impacts of the six related factors found in Equations (1.5) is preceded, however, by an examination of the Gini coefficients obtained using Equations (1.2) and (1.3). This is done for two

reasons. First, from Equation (1.2) the underlying distributions of all wives' earnings and all husbands' earnings can be compared. Second, using quintile analysis the contributions of wives as compared to that of their husbands in terms of hours worked and earnings received can also be examined. These extensions provide a more in depth understanding of the Gini coefficients that follow.

Finally, summaries of all the major findings are presented in Chapter 6. The conclusions that will be drawn from these findings will, no doubt, suggest some policy implications and additional avenues for future research.

CHAPTER 2

RELATIVE HOURLY EARNINGS AND HOURS WORKED BETWEEN ALL MALES AND FEMALES IN THE LABOR FORCE

1.0 Introduction

This Chapter provides an empirical foundation to examine three related questions. First, what are the recent trends in: (a) the ratio of aggregate female earnings to that of male earnings; (b) the relative hourly earnings between all females and males; and (c) the relative quantities of labor supplied by both sexes? Secondly, what proportion of the gap between aggregate female earnings and male earnings is attributable to the other trends -- changing relative hourly earnings between females and males and/or the relative quantities of labor supplied? Finally, in the event that changing relative hourly earnings and/or relative quantities of labor are contributing substantially to the earnings gap between females and males, what proportion of these changes are reflections of occupational shifts in the labor force?

2.0 Aggregate Earnings

Aggregate earnings in the economy (AE) is identically equal to the aggregate annual earnings of all males (EM) and the aggregate annual earnings of all females (EF). Furthermore, the aggregate annual earnings of either males or females is equal to the product of hourly earnings (W) and the average number of hours worked annually (H); algebraically,

$$AE^t \equiv W_m^t \cdot H_m^t + W_f^t \cdot H_f^t \qquad (2.1)$$

where males are represented by the subscript m; females by the subscript f; and the time period by the superscript t. Dividing both sides of Equation (2.1) by the aggregate earnings of all males gives:

$$AE^t/EM^t \equiv 1 + [(W_f^t \cdot H_f^t)/(W_m^t \cdot H_m^t)]. \tag{2.2}$$

Rearranging Equation (2.2) and solving for W_f^t/W_m^t:

$$W_f^t/W_m^t = [(AE^t/EM^t - 1)/(H_m^t/H_f^t)]. \tag{2.3}$$

Finally, substituting $AE^t \equiv EM^t + EF^t$ into Equation (2.3):

$$W_f^t/W^t = [(EF^t/EM^t)/(H_m^t/H_f^t)]. \tag{2.4}$$

Equation (2.4) thus contains all three of the desired trend ratios: (EF^t/EM^t), the ratio of aggregate female earnings to those of all males; (H_m^t/H_f^t), the relative number of average hours worked per year or the relative quantities of labor supplied by both sexes; and (W_f^t/W_m^t), relative hourly earnings between the sexes.

Annual estimates for the median EF^t and EM^t are readily available. Estimates for either H_m^t/H_f^t or W_f^t/W_m^t, however, are not easily accessible and must be constructed from disaggregate data. This is done by disaggregating the male and female labor forces along either occupational or industrial lines. One delineation serves only as a check upon the other.

Occupational disaggregation involves labeling workers according to their skill level or occupation. Eleven such categories are used to encompass the labor force: (1) Professional, technical, and kindred workers; (2) Managers, officials, and proprietors, except farm workers; (3) Clerical and kindred workers; (4) Sales workers; (5) Craftsmen, foremen, and kindred workers; (6) Operatives and kindred workers; (7) Private household workers; (8) Service workers, except private household workers; (9) Laborers,

except farm and mine; (10) Farmers and farm managers; and (11) Farm laborers and foremen. Industrial disaggregation divides all workers into various industries regardless of their occupation. All of the two-digit Standard Industrial Classifications (S.I.C.) can conveniently serve this purpose. The classifications are as follows: (1) Agriculture; (2) Mining; (3) Forestries and fisheries; (4) Construction; (5) Manufacturing; (6) Transportation, communication, and other public utilities; (7) Wholesale and retail trade; (8) Services and finance; and (9) Public administration.

Disaggregated hourly earnings by sex for these occupations and industries do not exist. Information on the average number of hours worked per year by sex, however, can be derived from the data that are available on the average number of hours worked per week and the average number of weeks worked per year by sex for both occupations and industries. The total number of hours worked per year by either sex in a particular disaggregated category is equal to the product of the average number of hours worked per week and the average number of weeks worked per year by an individual times the number of males or females employed in that category. Aggregating by sex over all occupations or industries gives the total number of hours supplied annually by all males, H_m^t; or the total number of hours supplied annually by all females, H_f^t. The ratio of H_m^t to H_f^t can be expressed as follows:

$$\frac{H_m^t}{H_f^t} = \frac{\sum_{i=1}^{n} ({}_iHPW_m^t \cdot {}_iWPY_m^t) \cdot {}_iQ_m^t}{\sum_{i=1}^{n} ({}_iHPW_f^t \cdot {}_iWPY_f^t) \cdot {}_iQ_f^t}, \qquad (2.5)$$

where H = the total number of hours supplied,

HPW = the average number of hours worked per worker per week,

WPY = the average number of weeks worked per worker per year,

Q = the total number of workers employed,

m = males,

f = females,

t = year,

i = the i^{th} disaggregate category,

n = 11, for occupational disaggregates, and

n = 9, for industrial disaggregates.

By substituting Equation (2.5) back into Equation (2.4), aggregate relative hourly earnings between all females and males in the labor force, W_f^t/W_m^t, is determined. With the appropriate data over some time period, all three trends in the first question can be examined.

The second question, however, necessitates minor modifications of the model represented by Equation (2.4). Taking the first difference of the natural log and rearranging:

$$\Delta Ln(EF^t/EM^t) = \Delta Ln(W_f^t/W_m^t) - \Delta Ln(H_m^t/H_f^t). \tag{2.6}$$

Equation (2.6) gives the percentage change in each one of the trend ratios: EF^t/EM^t, H_m^t/H_f^t, and W_f^t/W_m^t. By finding the variances of each term, it is possible to determine how much of the variance in $\Delta Ln(EF^t/EM^t)$ or the aggregate earnings gap between females and males is accounted for by the variances of the two terms on the right-hand side of Equation (2.6):

$$\begin{aligned} Var[\Delta Ln(EF^t/EM^t)] &= Var[\Delta Ln(W_f^t/W_m^t)] + Var[\Delta Ln(H_m^t/H_f^t)] \\ &- 2Cov[\Delta Ln(W_f^t/W_m^t), \Delta Ln(H_m^t/H_f^t)], \end{aligned} \tag{2.7}$$

then dividing each side of Equation (2.7) by the left-hand term,

$$\begin{aligned} 1 = &\frac{Var[\Delta Ln(W_f^t/W_m^t)]}{Var[\Delta Ln(EF^t/EM^t)]} + \frac{Var[\Delta Ln(H_m^t/H_f^t)]}{Var[\Delta Ln(EF^t/EM^t)]} \\ &\frac{-2Cov[\Delta Ln(W_f^t/W_m^t), \Delta Ln(H_m^t/H_f^t)]}{Var[\Delta Ln(EF^t/EM^t)]}. \end{aligned} \tag{2.8}$$

Equation (2.8) tells how much of the variance of the percentage change in the ratio of aggregate female earnings to male earnings can be explained by the variance of the percentage change in the relative hourly earnings between females and males, by the variance of the percentage change in the relative quantities of labor supplied by both sexes, and by the covariance between the relative hourly earnings and quantities of labor supplied. In short, the development of Equation (2.8) should indicate which forces -- relative hourly earnings, relative quantities of labor supplied, or the interaction of the two -- are having the greatest impact.

Finally, given that relative hourly earnings between females and males, or their respective quantities of labor supplied in the labor force, are substantially influencing aggregate earnings, indices are constructed to measure the direction and magnitude of these changes manifested in occupational shifts within the labor force. Occupational shifts are typically defined as movements from higher paying occupations to lower paying occupations. The indices constructed to measure these shifts are comparable to Paasche and Laspeyres indices. The average number of hours worked and hourly earnings obtained from Equation (2.4) are employed in constructing these indices rather than normal prices and quantities sold. The indices are supplemented by another group of Paasche and Laspeyres indices constructed with annual earnings and employment figures.

For instance, the Laspeyres index for male hourly earnings is constructed in the following manner. First, hourly earnings for the current periods are multiplied by the base number of hours worked in each industry or occupation and then summed. This estimate is in turn divided by the sum of hourly earnings for the base period times the base number of hours worked in each industry or occupation; algebraically,

$$LWINDEX_j^t = \frac{\sum_{i=1}^{n} {}_iW_j^t \cdot {}_iH_j^1}{\sum_{i=1}^{n} {}_iW_j^1 \cdot {}_iH_j^1} , \qquad (2.9)$$

where LWINDEX = the Laspeyres hourly earnings index,

W = the hourly earnings per worker,

H = the average number of hours worked per worker annually,

t = the year,

i = the i^{th} disaggregate category,

n = 11, for occupational disaggregates,

n = 9, for industrial disaggregates,

j = 1, for males,

j = 2, for females.

Similarly, an annual earnings Laspeyres index for males and females is developed using annual earnings and the actual number of workers employed:

$$LEINDEX_j^t = \frac{\sum_{i=1}^{n} {}_iE_j^t \cdot {}_iQ_j^1}{\sum_{i=1}^{n} {}_iE_j^1 \cdot {}_iQ_j^1} , \qquad (2.10)$$

where LEINDEX = the Laspeyres earnings index,

E = the annual earnings per worker,

Q = the number of workers employed,

t = the year,

i = the i^{th} disaggregate category,

n = 11, for occupational disaggregates,

n = 9, for industrial disaggregates,

j = 1, for males,

j = 2, for females.

As a result, there are eight Laspeyres indices: a male hourly earnings index for industries, a male hourly earnings index for occupations, a male annual earnings index for industries, a male annual earnings index for occupations, and a comparable set of indices for all females.

The Paasche indices for hourly earnings are constructed in a similar manner. First the current period hourly earnings are multiplied by the current number of hours worked in each industry or occupation and summed. This estimate is in turn divided by the sum of the base year hourly earnings times the number of hours currently worked in each occupation or industry; algebraically,

$$PWINDEX_j^t = \frac{\sum_{i=1}^{n} {}_iW_j^t \cdot {}_iH_j^t}{\sum_{i=1}^{n} {}_iW_j^1 \cdot {}_iH_j^t} , \qquad (2.11)$$

where PWINDEX = the Paasche hourly earnings index,

W = the hourly earnings per worker,

H = the average number of hours worked per worker annually,

t = the year,

i = the i^{th} disaggregate category,

n = 11, for occupational disaggregates,

n = 9, for industrial disaggregates,

j = 1, for males,

j = 2, for females.

As before, an annual earnings Paasche index for males and females is developed using annual earnings and the actual number of workers employed:

$$PEINDEX_j^t = \frac{\sum_{i=1}^{n} {}_iE_j^t \cdot {}_iQ_j^t}{\sum_{i=1}^{n} {}_iE_j^1 \cdot {}_iQ_j^t} , \qquad (2.12)$$

where PEINDEX = the Paasche earnings index,

E = the annual earnings per worker,

Q = the number of workers employed,

t = the year,

i = the i^{th} disaggregate category,

n = 11, for occupational disaggregates,

n = 9, for industrial disaggregates,

j = 1, for males,

j = 2, for females.

There are eight Paasche indices as there are with the Laspeyres indices, making a total of 16 indices for comparison. The indices can be compared to see whether the Laspeyres indices are greater than the Paasche indices. If the female Paasche indices are greater than the female Laspeyres indices then females are moving into relatively higher paying occupations or industries. If the female Paasche indices are smaller than the female Laspeyres indices, then females are moving into relatively lower paying occupations. The same analysis is true for the male indices.

The Paasche and Laspeyres indices show the direction of occupational or industrial shifts, while the weighted averages that follow show their impact. The first step in this process is to calculate the relative hourly earnings between females and males solely from disaggregate data. Hourly earnings are multiplied by the total number of hours worked per year in each industry or occupation by sex, summed, and then divided by the number of hours supplied by all males or females in the labor force. A ratio of the two is derived as follows:

$$\frac{W_f^t}{W_m^t} = \frac{\dfrac{\sum_{i=1}^{n} {}_iW_f^t \cdot {}_iH_f^t}{\sum_{i=1}^{n} {}_iH_f^t}}{\dfrac{\sum_{i=1}^{n} {}_iW_m^t \cdot {}_iH_m^t}{\sum_{i=1}^{n} {}_iH_m^t}} , \qquad (2.13)$$

where W_f^t/W_m^t = the relative hourly earnings between all females and males,

W = the hourly earnings per worker,

H = the average number of hours worked annually,

m = male,

f = female,

t = the year,

i = the i^{th} disaggregate category,

n = 11, for occupational disaggregates,

n = 9, for industrial disaggregates.

Once Equation (2.13) has been calculated using hourly earnings and hours worked for current periods, it is recalculated first using current hourly earnings and base year hours and then using base year hourly earnings and current hours. The difference in estimates of the relative hourly earnings between females and males using current period data and some combination of base year data shows the impact of occupational shifting. As an aside, the current year estimates of W_f^t/W_m^t obtained in the manner serve also as a check upon those found with Equation (2.4).

The same process is used in finding the annual earnings differential as opposed to the hourly earnings differential between females and males. Here, as with the Paasche and Laspeyres indices, annual earnings and the actual number of workers employed are substituted in Equation (2.13).

3.0 The Data-Sources, Comparability, and Alterations

3.1 The CPS

Although the data in this study were taken from a variety of published and unpublished sources, they are comparable. All of the data were directly or indirectly obtained from the Current Population Survey (CPS) of the Bureau of the Census and the Department of Labor. The CPS is conducted each month with approximately 50,000 households representing the entire population in the United States. The monthly statistics on employment, unemployment, and related subjects are analyzed and published in such publications as Employment and Earnings and the Monthly Report on the Labor Force. Once each year in March, information on annual income is also collected and published in several additional sources. The Bureau of Labor Statistics (BLS) publishes some of these findings in their Special Labor Force Reports, while the Census Bureau publishes the Current Population Reports. The CPS is the only comprehensive survey of this nature.

The income data obtained in household interviews of this type are subject to various types of reporting errors which tend to produce an underestimate of income. It is estimated that the income surveys conducted by the Census Bureau during the past years have obtained about 87 percent of the comparable total money income aggregates and about 95 percent of the comparable money wage or salary income aggregates included in the personal income series published by the Office of Business Economics ([12], U.S. Dept. of Commerce, No. 80, p. 10). One such response or reporting error stems from the fact that entries are based on memory; in particular, upon the memory of the wife since she is usually at home during the time of the interview. Often minor or irregular sources of income are forgotten or the concept of income is misunderstood by the respondent.

Sampling variability in these statistics, however, can virtually be ignored when major national aggregates are being considered. The chances are about 68 out of 100 that an estimate from the sample would differ from a complete census figure by less than the standard error. The chances are 95 out of 100 that the difference would be less than twice the standard error ([12], U.S. Dept. of Commerce, No. 80, p. 12). Reliability depends upon both the size of the percentage as well as upon the size of the total upon which the percentage is based.

Prior to 1967, the sample was spread over fewer areas with fewer interviews. Historical data have not been revised to take account of the differences because the differences themselves are relatively small. For most analytical purposes, the data may be regarded as reasonably comparable ([10], U.S. Dept. of Commerce, No. 22, p. 18).

3.2 Sources

The aggregate data necessary for Equation (2.4) are obtained in various annual issues of Income of Families and Persons in the United States [12]. Aggregate annual wage or salary income for all males and females is approximated by multiplying the median annual wage or salary income by the number of males and females who had this type of income. The definition of wage or salary income used by the CPS includes wages, salaries, commissionships, or pay in kind from a private employer or from a governmental unit. Excluded, however, are wages in kind such as the value of food and fuel produced and consumed on farms, the net rental value of owner-occupied homes, the property income received by mutual life insurance companies, and the value of the services of banks and other financial intermediaries rendered to persons without the assessment of specific charges.

Aggregate annual earnings for all males and females is approximated by multiplying nonfarm and farm self-employment income by the number of males and females who had these types of income and then adding them to aggregate annual wage or salary income. The data for industries exclude the nonfarm and farm self-employment income; therefore, the data set for occupations is different from that collected for industries. Given the importance of wage or salary income as a component of earnings, however, the two data sets not only serve as a check upon each other, but also the industrial data should prove insightful with respect to the occupational data.

In addition, this study uses the only measure available in employing medians rather than means for income data. The problem can be shown to be of minor importance in Table 2. If it can be shown that a relatively constant difference exists between the mean and median with respect to wage or salary income and earnings, then as long as the study confines itself to relative as opposed to absolute changes, medians are useful. Table 2 shows that this is indeed the case. Presented are both the median and mean wage or salary income for all industries and occupations as well as the comparable earnings data. Taking the ratio of mean to median and then wage or salary income to earnings income from 1967 to 1971, gives a constant relationship between the two. The final average of 1.0281 for males and 1.0139 for females reveals that the scalar difference is small. This fact enables the assumption to be made that the bias inherent in using medians rather than means is irrelevant for the purposes of this study.

The disaggregate median annual wage or salary income by sex and industry and median annual earnings by sex and occupation were also obtained from Income of Families and Persons in the United States [11], [12]. It is

TABLE 2

A Comparison of Median and Mean Incomes

Wage or Salary Income--All Industries and Occupations [7]

	Male		Female	
	Median	Mean	Median	Mean
1967	$5,974	$6,116	$2,295	$2,678
1968	6,376	6,523	2,468	2,869
1969	6,854	7,105	2,612	3,089
1970	7,108	7,469	2,801	3,341
1971	7,351	7,774	3,045	3,541

Earnings--All Industries and Occupations

	Male		Female	
	Median	Mean	Median	Mean
1967	$6,020	$6,337	$2,351	$2,779
1968	6,442	6,811	2,512	2,921
1969	6,899	7,340	2,564	3,091
1970	7,152	7,685	2,730	3,328
1971	7,388	8,023	2,986	3,524

Ratio of Mean to Median Incomes--All Industries and ccupations

	Wage or Salary Income		Earnings	
	Male	Female	Male	Female
1967	1.0237	1.1668	1.0559	1.1820
1968	1.0230	1.1624	1.0572	1.1628
1969	1.0366	1.1826	1.0639	1.2055
1970	1.0508	1.1928	1.0745	1.2190
1971	1.0575	1.1629	1.0860	1.1802

Ratio of Mean/Median Wage or Salary Income to
Mean/Median Earnings--All Industries and Occupations

	Male	Female
1967	1.0314	1.0130
1968	1.0334	1.0003
1969	1.0263	1.0193
1970	1.0225	1.0219
1971	1.0269	1.0148
AVG.	1.0281	1.0139

of interest at this point to note that the statistics that will be used for comparison in Chapter 3 from the U.S. Department of Labor/Workplace Standards Administration/Women's Bureau are based upon the same set of data.

The data used in calculating the relative number of hours supplied by males and females, H_m^t/H_f^t, were found in two separate sources. First, Employment and Earnings [16] provided the average number of hours worked per week per person by sex and occupation for the years 1967 through 1971. BLS provided the unpublished data for the years 1962 through 1966. BLS also provided the average number of hours worked per week per person by sex for all industries from 1962 to 1971 [12]. The estimates for the average number of hours worked per week per person may differ somewhat from other sources since the estimates are based on the actual number of hours worked during the survey week. For persons working more than one job, the figure relates to the number of hours worked at all jobs during the CPS survey week, and all the hours are credited to the longest job.

The second source of information is The Work Experience of the Population [19]. The average number of weeks worked per year per person by sex for industries or occupations is obtained from various Special Labor Force Reports. Published data cover the period of 1962 through 1970. BLS again furnished the unpublished data for 1971. The published form of the average number of weeks worked per year per person is disaggregated into two groups: full-time and part-time. Full-time workers are those who work 35 or more hours per week while those classified as part-time work less than 35 hours per week. Each one of these groups is further divided into three more groups: those who worked 50-52 weeks per year, those who worked 26-49 weeks per year, and those who worked 1-26 weeks per year. Thus this source not only provided the number of males and females employed in a particular

industry or occupation, but also their status with respect to the number of weeks worked per year per person.

3.3 Alterations

Slight alterations in all four series -- wage or salary income data and earnings data, hours worked per week per person data, weeks worked per year per person data, and the number of workers employed data -- are necessary. In order to obtain a complete and consistent data set, the first compromise involved the average number of hours worked per week per person. The unpublished industrial data received from BLS combined both Agriculture and Mining in the early years, 1962 through 1966. The constraints imposed upon the other three industrial data series were complicated further by the median annual wage or salary income estimates found in the Current Population Reports. This data series combined Agriculture with Forestries and Fisheries. Given the significance of Agriculture in terms of the number of people employed, all three industries were combined leaving only seven industrial categories. The extent of the disaggregating problem is easily shown. Over the 10-year period of 1962 through 1971, Forestries and Fisheries was incorporated in three different S.I.C.'s. On several occasions, Forestries and Fisheries is found in Service and Finance, with Agriculture, or by itself. As a result all four data series for industries -- median annual wage or salary income, hours worked per week per person, weeks worked per year per person, and the number of workers employed -- were adjusted by disaggregating and reaggregating using employment figures as weights to make Agriculture, Forestries and Fisheries, and Mining one classification.

Occupational data was less troublesome. Private Household workers were sometimes included in the Service occupation. After excluding them

from Service to form their own category, the earnings, hours, and employment occupational data sets were compatible.

After the above alterations were made, the average number of weeks worked per year per person was tabulated by sex and industry or occupation from the disaggregate data. The average number of weeks worked per year per person is found by taking a weighted average as follows:

$$ {}_iWPY_j^t = (1-{}_i\gamma_j^t)(51\cdot {}_iA1_j^t+38\cdot {}_iA2_j^t+13\cdot {}_iA3_j^t)+{}_i\gamma_j^t(51\cdot {}_iB1_j^t+38\cdot {}_iB2_j^t $$
$$ +13\cdot {}_iB3_j^t), \qquad (2.14) $$

where WPY = the average number of weeks worked per year per person,

γ = the percentage of part-time workers,

A1 = the percentage of full-time workers who worked 50-52 weeks per year,

A2 = the percentage of full-time workers who worked 27-49 weeks per year,

A3 = the percentage of full-time workers who worked 1-26 weeks per year,

B1 = the percentage of part-time workers who worked 50-52 weeks per year,

B2 = the percentage of part-time workers who worked 27-49 weeks per year,

B3 = the percentage of part-time workers who worked 1-26 weeks per year,

i = the i^{th} disaggregated category,

n = 11, for occupational disaggregates,

n = 7, for industrial disaggregates,

j = 1, for males,

j = 2, for females,

t = the year.

The midpoint of the number of weeks worked per year, i.e., 51 weeks for those full- and part-time workers who worked 50-52 weeks per year is chosen

as the appropriate weight. Equation (2.14) is exact for all seven of the industrial disaggregates but is modified for occupational disaggregates. The work experience weekly breakdown for part-time workers did not exist for the entire 10-year period. Thus it was assumed that all part-time workers fall within the 27-49 weeks worked per year category. This is not an unlikely assumption, since few workers are found in the extremes; algebraically,

$$ {}_{i}WPY_{j}^{t} = (1-{}_{i}\gamma_{j}^{t})(51\cdot{}_{i}A1_{j}^{t}+38\cdot{}_{i}A2_{j}^{t}+13\cdot{}_{i}A3_{j}^{t}) + {}_{i}\gamma_{j}^{t}\cdot 38. \qquad (2.15) $$

4.0 Summary

At the outset of this chapter, three interrelated questions were posed. This chapter not only proposed a method of analysis, but also the data to be used. The next chapter will present the findings and an analysis as to how they relate to each other. Of greater importance is the fact that these findings will in turn provide the foundation upon which to determine the possible impacts of working wives and related factors upon the distribution of family earnings for all husband and wife families. The relative hourly earnings, the relative number of hours supplied annually by both sexes to the economy, as well as their trends, will play an important role in achieving this objective.

CHAPTER 3

AGGREGATE TRENDS AND THE IMPORTANCE OF RELATIVE CHANGES IN THE LABOR FORCE

1.0 Introduction

The preceding chapter posed three related questions: (1) What are the recent trends in the ratio of aggregate female earnings to male earnings, the relative hourly earnings between females and males, and the relative number of hours supplied by males and females; (2) What proportion of the gap between aggregate female and male earnings is attributable to the trends mentioned in (1); and finally, (3) What proportion of these trends are reflections of occupational shifts within the labor force. This chapter will present and discuss in detail the empirical findings. For purposes of comparison and discussion, these findings will be supplemented with information contained in the Handbook of Women Workers [20]. In addition to the information contained in this Women's Bureau publication, their data were updated in order to make a direct comparison over the 1962 to 1971 period possible.

2.0 Aggregate Trends in Earnings, Hours, and Wages

2.1 Earnings and Wage or Salary Income

The ratio of aggregate female earnings to that of all males in the labor force increased noticeably over the period of 1962 to 1971. The annual estimates for EF^t/EM^t found for Equation (2.4) using occupational data rose from .20 in 1962 to .26 in 1971. Similarly, the ratio of aggregate

female wage or salary income to that of all males also rose from .20 in 1962 to .27 in 1971 as shown in Table 3. The estimates indicate that

TABLE 3

The Ratio of Aggregate Female Earnings to That of Males and the Ratio of Aggregate Wage or Salary Income of Females to That of Males, EF^t/EM^t, 1962 to 1971

Year	Earnings	Wage or Salary
1962	.20	.20
1963	.19	.21
1964	.20	.22
1965	.22	.24
1966	.20	.23
1967	.22	.25
1968	.23	.25
1969	.24	.25
1970	.25	.26
1971	.26	.27

aggregate earnings and wage or salary income of all females is growing at a proportionately faster rate than the aggregate earnings and wage or salary income of all males in the labor force. This suggests the following five possibilities:

1) The relative quantity of labor supplied by males to that supplied by females is decreasing, ceteris paribus;
2) The relative hourly earnings or wage rate between females and males is increasing, ceteris paribus;
3) The relative quantity of labor supplied by males to that supplied by females is decreasing, while the relative hourly earnings or wage rate between females and males is increasing but at either a proportionately faster or slower rate;
4) The relative quantity of labor supplied by males to that supplied by females is decreasing, while the relative hourly earnings or wage rate between females and males is decreasing, but at a proportionately slower rate; and

5) The relative quantity of labor supplied by males to that supplied by females is increasing, while the relative hourly earnings or wage rate between females and males is increasing at a proportionately faster rate.

Any other combination of increasing or decreasing relative factors would lead to a downward drift in EF^t/EM^t. An examination of the relative quantity of labor supplied by males to that supplied by females will eliminate some of these possibilities.

2.2 The Relative Quantity of Labor Supplied

Aggregating the number of hours worked per week, the number of weeks worked per year, and the number of male or female workers employed across occupational and industrial lines shows that the relative quantity of annual hours supplied by all males to that supplied by females is decreasing. These findings immediately eliminate possibilities (2) and (5). Table 4 presents the occupational and industrial estimates for H_m^t/H_f^t.

TABLE 4

The Relative Number of Annual Hours Supplied by All Males to That Supplied by All Females From Occupational and Industrial Categories, H_m^t/H_f^t, 1962 to 1971

Year	All Occupations	All Industries
1962	2.47	2.46
1963	2.47	2.42
1964	2.44	2.48
1965	2.42	2.41
1966	2.35	2.35
1967	2.30	2.27
1968	2.28	2.26
1969	2.23	2.22
1970	2.20	2.21
1971	2.19	2.17

Males in general supply at least twice as many hours as do females to the economy each year, but the proportion is continually decreasing. This

implies a disproportionate increase in the relative number of hours supplied by females. Indeed, the literature on labor force participation rates for women would imply such a trend. The discrepencies between the columns for all occupations and all industries is a result of the two different data sets. The exclusion of those workers with farm and nonfarm self-employment income from the industrial data provides an additional comparison. In general the industrial estimates of H_m^t/H_f^t are lower than those for occupations, suggesting that females are working proportionately more hours for wage or salary income than for self-employment income -- and conversely for males.

The literature, however, would also imply that the decreasing trend in the relative number of hours supplied by all males to that supplied by all females is a result of the increased labor force participation of females; and in particular, to married females. No doubt the increased relative employment of females to males has played a substantial part in increasing the number of hours supplied by all females, but changes in the relative number of hours worked per week, the relative number of weeks worked per year, and thus the relative number of hours worked per year between males and females may be of equal significance.

2.2.a The Quantity of Labor Supplied by Occupations

Over the 10-year period of 1962 through 1971 for all occupations, as summarized in Table 5, the average percentage change in the number of hours worked per week per person was negative for both sexes. The overall occupational average decrease for males was only .18 percent. On the other hand, the average percentage decrease in the number of hours worked per week per person for females was .50 percent. Table A in Appendix A indicates that females in general worked fewer hours per week per person than males. Table G exemplifies the point in relative terms. As a result the average decrease in the number of hours worked per week per person for

TABLE 5

Average Annual Percentage Changes in Selected Variables by Occupation, 1962 to 1971

Occupation / Variable	Average Number of Hours Worked Per Week Per Person	Average Number of Weeks Worked Per Year Per Person	Average Number of Hours Worked Per Year Per Person	The Number of Workers Employed Per Year	Average Total Number of Hours Worked Per Year	Hourly Earnings Per Person	Sex
Professional	-.37	-.18	-.55	3.25	2.69	6.11	Male
	-.35	-.27	-.09	4.55	4.46	6.14	Female
Managers	-.44	-.04	-.48	.23	-.27	7.31	Male
	-.77	.12	-.64	3.43	2.68	8.60	Female
Clerical	-.39	-.56	-.95	1.01	.04	5.55	Male
	-.48	-.25	-.72	4.12	3.36	4.72	Female
Sales	.39	1.08	1.48	1.43	2.84	4.01	Male
	-.84	-.06	-.89	1.36	.47	4.29	Female
Craftsmen	-.13	.08	-.05	2.65	2.60	4.91	Male
	-.55	-.37	-.99	6.27	4.71	5.06	Female
Operatives	-.12	-.11	-.23	.55	.35	4.66	Male
	-.09	.20	.11	1.74	1.88	4.79	Female
Private Households	1.26	--	--	1.87	--	--	Male
	-.34	.03	-.31	-4.96	-5.18	3.45	Female
Service	-.71	-.81	-1.52	4.15	2.58	3.92	Male
	-1.18	.02	-1.16	4.62	3.41	6.40	Female
Laborers	.12	.22	.33	1.74	2.01	3.08	Male
	-1.04	.46	-.55	18.74	16.56	9.82	Female
Farmers	.27	-.15	.12	-3.64	-3.51	6.54	Male
	.66	.51	1.14	5.06	6.51	6.13	Female
Farm Laborers	.05	.36	.39	-3.92	-3.52	6.66	Male
	.55	-.14	.43	-4.92	-4.53	2.29	Female
*All Across Time	-.18	-.03	-.22	1.39	1.16	5.17	Male
	-.50	-.01	-.52	2.82	2.27	5.15	Female

*This figure was derived by holding the year constant and then taking a weighted average for all occupations.

females is greater in absolute terms, but may not be greater in relative terms. Nonetheless, the overall average decreases are due to the negative average percentage change in the number of hours worked per week per person in six out of the 11 occupations for males, and nine out of the 11 occupational categories for females.

Looking at specific occupations, the largest average decrease in the number of hours worked per week per person for males was in Service workers, except Private Household workers with a .71 percent decrease. In contrast, one of the largest average increases for males occurred in Sales workers with .39 percent. Although Private Household workers also had an average increase of 1.26 percent, a much smaller proportion of the male labor force is situated in this occupation. The Sales workers' occupation is worthy of further note since females registered one of their larger average percentage decreases here. The .84 percent average decrease was sizeable, but Service workers, except Private Household workers and Managers, Officials, and Proprietors, except Farm Workers, also recorded average decreases of 1.18 and .77 percent respectively. The only average increases for females took place in Farmers and Farm Managers with .66 percent and in Farm Laborers and Foremen with .55 percent. Both are occupations employing a very small segment of the female labor force. It is safe to say then that the average decreases for females were approximately equal to and in most cases greater in absolute terms than those for males. The average decreases were more widespread than for males resulting in total in a sharper average percentage decrease.

Tables B and H in Appendix A provide the background data in analyzing the average percentage change in the number of weeks worked per year per person found in the second column of Table 5. The overall average percen-

tage change for males and females demonstrates the same behavior. While males showed a negligible average decrease of .03 percent in the number of weeks worked per year per person from 1962 to 1971, females showed a smaller average decrease of .01 percent. Males recorded an average decrease in the number weeks worked per year per person in six of the 11 occupations. Females, in contrast, recorded an average increase in six of the 11 occupations.

In Table 5 the greatest average decrease for males occurred again in Service workers, except Private Household workers with a .81 percent decrease. Clerical and Kindred workers also had a sizeable average decrease of .56 percent. The most significant average increase for males, however, was in Sales workers with 1.08 percent. In this same occupation, females had an average decrease of .06 percent. Other average decreases for females occurred in Clerical and Kindred workers with .25 percent, and in Craftsmen, Foremen, and Kindred workers with .37 percent. The largest average increases for females were in Laborers, except Farm and Mine with .46 percent and in Farmers and Farm Managers with .51 percent. The percentage of the female labor force in these last two occupations was a little over 3 percent in 1971.

Given the overall average decreases in both the number of hours worked per week and the number of weeks worked per year per person for males, it is not surprising that the average percentage change in the number of hours worked per year per person was slightly negative. Table C in Appendix A has the raw data for the estimates found in the third column of Table 5. Similarly, the average percentage change in the number of hours worked per year per person for females was negative resulting from average decreases in seven of the 11 occupations. As can be expected from the hours per week data, the average decrease for females is greater than that for males.

Finally, in column four of Table 5, the total number of males employed by all occupations over the decade increased significantly with an average increase of 1.39 percent. The average percentage increase, however, was enough to cause the average percentage change in the number of hours supplied by all males in the economy, H_m^t, to be positive -- 1.16 percent -- despite the average decrease in the number of hours worked per year per person. The increased number of females in the market allowed for an overall average increase of 2.82 percent, which in turn offset the average decrease in the number of hours worked per year, resulting in a substantial average increase in the number of hours supplied by all females in the economy, H_f^t, of 2.27 percent.

Although the increased labor force participation of females seems to be the overriding factor in determining the number of hours supplied by all females, a changing work pattern is also perceivable. A changing work pattern, hours worked annually, seems to dampen the hours of females more than males, although in Operatives and Kindred workers and in Farmers and Farm Managers, the changing work pattern accentuated the increased labor force participation of females. In Private Household workers, the decreasing working pattern in addition to the average annual decrease in the number of females employed exaggerated the average annual decrease in the number of hours supplied by all females.

In summary, the component parts of the number of hours supplied by all males or females reveal definite trends. Both sexes worked fewer hours per year per person with females working proportionately fewer. The average increase in the male labor force is not always sufficient to positively offset this trend while the average increase, at least for this time period, for females is.

2.2.b The Relative Quantity of Labor Supplied by Occupations

The significance of these changes are further explored by looking at the average percentage change in the relative number of hours worked per week per person between females and males, the relative number of weeks worked per year per person between females and males, the relative number of hours worked per year per person between females and males, etc. The underlying tables for all of the variables found in Table 6 are Tables G through K in Appendix A.

The overall average percentage change for all occupations with respect to the relative number of hours worked per week per person between females and males was negative. The average decrease of .14 percent over the 10-year period verifies the earlier hypothesis that the number of hours worked per week per person is decreasing faster for females than for males. In six of the 11 occupations, the average percentage change was negative. Positive average percentage changes were the greatest in the farm related occupations.

The overall average percentage changes in the relative number of weeks worked per year per person, however, was positive; resulting from positive average increases in seven of the 11 occupations. The most notable average increase was .86 percent in Service workers, except Private Household. In contrast, Sales workers showed an average decrease of 1.11 percent. Again the findings are consistent with the previous section. The effect is a slight average percentage increase in the relative number of hours worked per year per person of .02 percent. This means that on average the number of hours supplied to the market annually by females is decreasing but at a relatively slower rate than that of males.

In conjunction with the fact that the average percentage change in the relative number of females to males employed is positive, at an average

TABLE 6

Average Annual Percentage Changes in Selected Relative Variables By Occupation, 1962 to 1971

Occupation \ Relative Variable	The Relative Number of Hours Worked Per Week Per Person	The Relative Number of Weeks Worked Per Year Per Person	The Relative Number of Hours Worked Per Year Per Person	The Relative Number of Workers Employed Per Year	The Relative Number of Hours Supplied Per Year	The Relative Hourly Earnings
Professional	.02	.44	.47	1.30	1.76	.14
Managers	-.34	.19	-.14	3.18	3.04	1.21
Clerical	-.07	.29	.23	3.39	3.60	-.89
Sales	-1.17	-1.10	-2.24	.20	-2.15	.57
Craftsmen	-.44	-.21	-.69	2.68	1.48	.49
Operatives	.06	.37	.43	1.24	1.65	.05
Private Household	1.02	--	--	1.90	--	--
Service	-.43	.86	.41	1.16	1.58	2.69
Laborers	-.15	.43	.38	10.06	9.67	3.36
Farmers	.54	.68	1.20	6.52	8.09	9.81
Farm Laborers	.58	-.46	.15	-1.17	-.79	-3.03
*All Across Time	-.14	.19	.02	2.40	2.27	.71

*This figure was derived by holding the year constant for occupations and then taking a weighted average for all occupations.

annual increase of 2.40 percent, the relative number of hours supplied by all females and males had a 2.2 percent average increase and thus H_m^t/H_f^t decreased from 1962 to 1971. Keeping in mind the changing work patterns, the relative number of hours supplied by all males and females is decreasing slower than it would if the female working patterns were keeping pace with those of males. The changing work patterns are plausibly a direct result of the fact that the increased labor force participation rates of females are due chiefly to the increased labor force participation of married females. These females have more donfining responsibilities at home allowing for only part-time work, or full-time with little or no overtime. At the same time, the average percentage change in the relative number of weeks worked per year by females and males is positive. A tendency of more weeks worked per year on the part of females and fewer for males seems to be an adjustment for some as of yet unidentified change in life styles.

Several of the occupations definitely reflect such changes. The overall positive average increases in relative variables in Professional, Technical, and Kindred workers show that more females are willing to put in longer hours each week and more weeks of the year. A similar situation exists in Operatives and Kindred workers, Farmers and Farm Managers, Sales workers, and Craftsmen, Foremen, and Kindred workers which show an adjustment process with a decreasing work pattern in terms of hours across the occupations. Surprisingly enough, Clerical and Kindred workers have made very little adjustment.

The disaggregate data show that the average increase in the relative number of hours worked per year by all females and males is not just a phenomena solely related to the increased labor force participation of women, but is also a result of males working fewer hours per week, fewer

weeks per year, while relatively more females are working relatively fewer hours more weeks of the year. If this is indeed a trend, the industrial data should augment these findings.

2.2.c The Quantity of Labor Supplied by Industries

Table 7 presents a summary of the industrial data for 1962 to 1971. The actual data are found in Tables N through S in Appendix A. Column 1 of Table 7 shows that the average percentage change in the number of hours worked per year per person for both sexes was negative. The overall industrial average decrease for males was only .02 percent. Although females also had a negative average percentage change in the number of hours worked per week per person, it was not as great as the occupational data.

The average decrease for males in the number of hours worked per week per person was a result of average decreases in four of the seven industries. The largest average decreases occurred in Wholesale and Retail Trade and in Public Administration with .26 percent and .23 percent respectively. Manufacturing along with Transportation, Communication, and other Public Utilities both recorded positive average changes in the number of hours worked per week per person for males. In these two industries females had a negative average percentage change. In the two categories with positive average percentage changes for females, Agriculture, Forestries and Fisheries, and Mining had the largest with .49 percent. It can be seen from Table 7 that the average decrease incurred by females was again absolutely greater than that for males, confirming the occupational findings.

The average percentage changes in the number of weeks worked per year per person, however, were inconsistent with the occupational data. Rather than a decrease in the average number of weeks worked per year, both males and females recorded a significant average annual increase of .22 and .63

TABLE 7

Average Annual Percentage Changes in Selected Variables by Industry, 1962 to 1971

Occupation \ Variable	Average Number of Hours Worked Per Week Per Person	Average Number of Weeks Worked Per Year Per Person	Average Number of Hours Worked Per Year Per Person	The Number of Workers Employed Per Year	Average Total Number of Hours Worked Per year	The Wage Rate Per Person	Sex
Agriculture	-.05	1.46	1.39	-2.46	-1.29	4.78	Male
	.49	3.37	3.90	-3.84	-.66	6.77	Female
Construction	-.05	.48	.44	2.91	3.33	5.44	Male
	-.20	4.47	4.49	6.26	11.42	.17	Female
Manufacturing	.10	.19	.30	1.08	1.42	4.57	Male
	-.06	.14	.08	1.98	2.07	4.80	Female
Public Utilities	.02	-.13	-.12	2.12	1.97	5.94	Male
	-.58	.26	-.31	4.06	3.70	5.53	Female
Trade	-.26	-.37	-.62	2.70	2.16	5.77	Male
	-.86	.20	-.66	3.25	2.58	4.48	Female
Service	.05	.46	.52	3.38	3.89	5.43	Male
	.25	.95	1.22	3.55	4.78	6.14	Female
Public Administration	-.23	-.01	-.24	2.03	1.75	6.98	Male
	-.21	-.15	-.33	2.71	2.38	5.66	Female
*All Across Time	-.02	.22	.21	2.18	1.96	5.27	Male
	-.11	.63	.53	3.59	3.06	5.32	Female

*This figure was derived by holding the year constant for industries and then taking a weighted average for all industires.

percent respectively for those workers who received wage or salary income. The average percentage change was negative in only three of the seven industries for males and one of the seven for females.

Behavior is different for those with only wage or salary income as opposed to those with several sources of earnings again in that the average percentage change in the number of hours worked per year is positive for both sexes as found in column 3 of Table 7. The positive percentage changes in the number of weeks worked dominated the negative percentage changes in hours worked per week. Average decreases in the number of hours worked per year occurred in three of the seven categories for males as well as for females in the same three industries. The greatest average decrease for both males and females was in Wholesale and Retail Trade with a .62 percent decrease for the former and a .66 percent decrease for the latter. The largest average increases for females was in Agriculture, Forestries and Fisheries, and Mining as well as in Construction. While Construction also had one of the largest average increases for males of .44 percent, Services and Finance had an equal average increase of .52. Agriculture, Forestries and Fisheries with its 1.39 percent average increase for males was the largest. Females had sizeable gains in this category and in Construction.

All but one of the industrial categories had a positive average percentage change in the number of workers employed for both sexes. Column 4 of Table 7 shows that the largest average increase for males was in Service and Finance with 3.30 percent. Substantial average increases also were recorded in Construction, Wholesale and Retail Trade, and in Public Administration with 2.91, 2.70, and 2.02 percent respectively for males. Two different industries besides Construction -- Service and Finance and

Transportation, Communication, and other Public Utilities -- showed sizeable positive average increases for females of 6.26, 3.55, and 4.06 percent respectively. Agriculture, Forestries and Fisheries had the only average percentage decreases for both sexes.

As a result of these trends, the average percentage change in the number of hours worked per year by all females and males was positive -- 1.96 percent for males and 3.06 percent for females. Both estimates of the average increases are higher than the occupational data since a dampening effect was not felt through a decreasing work pattern. Females had an average increase substantially above that for males with respect to the number of hours supplied by them. In short, the number of hours supplied by all females is increasing at a faster rate than that supplied by males in the economy, thus H_m^t/H_f^t is decreasing.

2.2.d The Relative Quantity of Labor Supplied by Industry

Although the average percentage changes were different in absolute terms, the same pattern develops in relative terms for industries as in occupations. The estimates found in Table 8 are based on the raw data found in Tables T through V in Appendix A. As in the occupational data, the average percentage change in the relative number of hours worked per week per person between females and males was negative. This phenomenon was a result of a relative average percentage decrease for this variable in four out of the seven industries. Similarly, the average percentage change in the relative number of weeks worked per year per person was positive. Relative average percentage decreases occurred in Manufacturing and in Public Administration. The average percentage change in the relative number of hours worked per year per person was also positive. This time Transportation, Communication, and Other Public Utilities in addition to

TABLE 8

Average Annual Percentage Changes in Selected Relative Variables By Industry, 1962 to 1971

Relative Variable / Industry	The Relative Number of Hours Worked Per Week Per Person	The Relative Number of Weeks Worked Per Year Per Person	The Relative Number of Hours Worked Per Year Per Person	The Relative Number of Workers Employed Per Year	The Relative Number of Hours Supplied Per Year	The Relative Wage Rate Per Person
Agriculture	.55	1.67	2.23	-1.34	.63	3.91
Construction	-.25	3.51	3.52	2.59	6.82	-4.53
Manufacturing	-.15	-.02	-.18	.93	.74	.09
Public Utilities	-.58	.48	-.10	1.96	1.80	-.57
Trade	-.25	.57	.31	.58	.95	-.83
Service	.21	.50	.72	.25	.94	.77
Public Administration	.02	-.10	-.06	.76	.63	-1.32
*All Across Time	-.06	.52	.47	.76	1.25	-.17

Manufacturing and Public Administration recorded the relative average percentage decreases. The relative number of female and male workers employed was positive except in Agriculture, Forestries and Fisheries, and Mining. As a result the average percentage change in the number of hours supplied annually by all females and males was positive, thus H_m^t/H_f^t is also decreasing as in occupational data.

2.3 Hourly Earnings and Wage Rates

Since the overall average percentage change in the relative number of hours supplied by all females and males is definitely positive, possibilities (1), (3) and (4) still exist. By looking at the trends in the relative annual hourly earnings and wage rates, for occupations and industries respectively, the possibilities can be narrowed even further. This is done by solving Equation (2.4) for W_f^t/W_m^t. Theoretically, the substitution of the ratio of aggregate annual female earnings or wage or salary income to that of all males and the ratio of the aggregate number of hours supplied annually by males to that of females into Equation (2.4) should give us a good approximation of the relative hourly earnings for occupations and the relative wage rate for industries. Unfortunately, the data were not that accurate. The appropriate approximation of the ratio of aggregate annual female earnings to that of all males was found in the following manner.

First, by using the estimates of EF^t/EM^t found in Table 3 and those for H_m^t/H_f^t found in Table 5, W_f^t/W_m^t was calculated. Table 9 contains the results. Hourly earnings seem to exhibit a more noticable upward trend than the wage rate, although both behave eratically. Comparing these estimates of hourly remunerations to those calculated in Tables L and Y in Appendix A suggests that these estimates of W_f^t/W_m^t are too low. The reason is that in the calculation of H_m^t/H_f^t observations were dropped that had insufficient

TABLE 9

The Ratio of Hourly Annual Earnings or Wage Rates Between Females and Males, W_f^t/W_m^t, Using Aggregate Persons' Data, 1962 to 1971

Year	Hourly Earnings	Wage Rates
1962	.50	.55
1963	.52	.55
1964	.54	.59
1965	.57	.62
1966	.54	.58
1967	.57	.60
1968	.57	.61
1969	.56	.59
1970	.57	.61
1971	.59	.62

data, thus the aggregate number of males and females with earnings was six percent larger than the total in the disaggregate categories. The estimates of EF^t/EM^t were too small since a disproportionate percentage of the dropped data was in the male labor force. This would bias the estimates of Equation (2.4) downward. A new estimation of EF^t/EM^t was then calculated by multiplying annual earnings or wage or salary income by occupation and sex, or by industry and sex times a weighted average of the number of workers in that particular disaggregate. The new estimate for both EF^t/EM^t and W_f^t/W_m^t are found in Table 10. The estimates of W_f^t/W_m^t are now more in line with the underlying raw data and reveal little if any closing of the remunerations gap. An examination of particular occupations and industries shows the sources of the erratic behavior in W_f^t/W_m^t.

2.3.a Hourly Earnings Rates by Occupation

Over the 10-year period the average percentage change in the hourly earnings for males was positive with an overall occupational average increase of 5.17 percent. Females, despite their lower initial wage, had a 5.15 percent average annual increase. The largest average increase for males was in Managers, Officials, and Proprietors with a 7.31 percent

TABLE 10

The Ratio of Aggregate Female Earnings to That of Males and the Ratio of Aggregate Wage or Salary Income of Females to That of Males, EF^t/EM^t, Using Weighted Averages, 1962 to 1971

Year	Annual Earnings	Annual Wage or Salary Income
1962	.26	.30
1963	.27	.30
1964	.25	.31
1965	.29	.32
1966	.29	.32
1967	.30	.33
1968	.30	.34
1969	.30	.34
1970	.31	.34
1971	.31	.35

The Ratio of Annual Hourly Earnings or Wage Rates Between Females and Males, W_f^t/W_m^t, Using Weighted Averages, 1962 to 1971

Year	Hourly Earnings	Wage Rates
1962	.66	.75
1963	.66	.73
1964	.67	.76
1965	.70	.77
1966	.67	.76
1967	.68	.76
1968	.69	.77
1969	.66	.75
1970	.67	.75
1971	.68	.76

average increase. The next highest were recorded in Farmers and Farm Managers with a 6.53 percent average increase and Farm Labor with a 6.66 percent average increase. The other average annual increases for males ranged from 3 to 6 percent. Females had their largest percentage increase in Nonfarm Labor with a 9.82 percent increase as shown in column 6 of Table 4. This average increase is 6 percent greater than that of their male counterparts. A similar situation occurred in Service workers, except Private Household workers. The opposite phenomena was true in Farm Labor. In Clerical and Kindred workers where a substantial portion of the female labor force exists a smaller average increase of 4.72 percent was recorded as compared to that of males -- 5.55 percent.

2.3.b Relative Hourly Earnings By Occupation

In relative terms, the overall average annual percentage change was slightly positive -- .71 percent. The weighted averages showed a small gain by females in hourly earnings relative to males. The average annual percentage change in relative hourly earnings was negative in only two of the 11 occupations. The most noteworthy average percentage decrease was in Clerical and Kindred workers with a .89 percent decrease. The other average percentage decrease was in Farm Labor with a sezeable 3.03 percent decrease. In contrast, the largest positive average percentage change in relative hourly earnings was in Farmers and Farm Managers with a 9.81 percent increase. Other marked average percentage increases were in Nonfarm Labor with a .36 percent increase; Service workers, except Private Household, with 2.69 increase; and Managers, Officials, and Proprietors with a 1.21 percent increase. Only possibilities (1) and (3) are left: the relative quantity of labor supplied by males to that supplied by females is decreasing, while the relative hourly earnings between females and males is increasing, or remaining relatively constant.

2.3.c Wage Rates by Industry

Looking back at Table 7 shows that the overall average percentage change in the hourly wage rate was 5.27 for males and 5.32 for females. The average increases are comparable to those found using occupational data. The industrial estimates are slightly above the occupational ones despite the fact that relative hourly earnings are less than the relative hourly wage rates found in Table 10. The largest average percentage increase in the hourly wage rate for males was in Public Administration with a 6.98 percent annual increase. Sizeable average increases for males also were in Transportation, Communication, and Other Public Utilities with 5.94 percent and in Wholesale and Retail Trade with 5.77 percent. Although females experienced average percentage increases in each of these industries, the average increases were smaller with 5.66 percent, 5.53 percent, and 4.48 percent respectively. Females experienced greater average percentage increases than males in three of the seven industries. The increases were in Agriculture, Forestries and Fisheries, and Mining with the greatest difference of 2 percent; Manufacturing with a .25 percent difference; and Service workers, except Private Household workers with a .70 percent difference.

2.3.d Relative Wage Rates by Industry

The significance of the figures presented in Table 7 are seen by comparing them with those for the relative wage rates in Table 8. The overall average percentage change for all industries was negative -- a .17 percent annual decrease. This overall average decrease was a result of average decreases in four of the seven industries which contained at least 30 percent of the female labor force in 1971. Table 8 shows that Construction had the largest average decrease in the relative wage rate with a 4.53 percent annual decrease; Public Administration also had a sizeable decrease of

1.32 percent; Wholesale and Retail Trade registered a .83 percent average decrease; and Transportation, Communication, and Other Public Utilities had a .57 percent average decrease. Most of these decreases were offset in the aggregate by the .77 percent average increase that occurred in Service and Finance which employs 48 percent of the female labor force. The average increase in this occupation, however, was not enough to offset all of the relative losses.

In summary, the industrial data suggest possibilities (1) or (4): the relative quantity of labor supplied by males to that supplied by females is decreasing, while the relative hourly wage between females and males is decreasing or remaining relatively constant. These suggestions are not incompatible with those from the occupational data. The common possibility of (1) between the occupational data and the industrial data leads to the suggestion that the relative gains made by females with respect to self-employment income must positively offset the losses incurred by females working for someone else. This stands to reason, since one is less likely to cheat, or discriminate against, one's self.

At this point it would be helpful to see how the Women's Bureau interprets the earnings gap and whether or not their study confirms or contradicts these findings.

2.4 Women's Bureau Data and Their Updates

The information contained in the Handbook of Women Workers, 1969, pertains only to occupations but was obtained from the CPS as was the income data in this study. It was easy then to take the Women's Bureau's information and update it for comparison as well as to construct comparable figures for industries. The original Women's Bureau study covers the years 1956 to 1966. In reference to this period, they note a widening gap between

the median annual wage or salary income of females and males; to be specific, "a comparison of median wage or salary income of full-time year-round women and men workers reveals not only that the income of women are considerably less than those of men but also that the gap has widened in recent years [20, U.S. Dept. of Labor, p. 133]. In 1956, the median wage or salary income of full-time year-round women was 63 percent of men's and only 58 percent in 1966. Continuing the estimates to 1971 gives similar results. The gap between aggregate female and male earnings seems to have stabilized although it is still greater than it was in 1956. The estimates were obtained by taking a weighted average of the median wage or salary income. The overlapping years are identical. Table 11 presents the results.

TABLE 11

The Relative Aggregate Median Annual Wage or Salary Income of Full-Time Year-Round Females and Males, $WSFT_f^t/WSFT_m^t$, From 1962 to 1971

Year	$WSFT_f^t/WSFT_m^t$
1962	.58
1963	.58
1964	.58
1965	.58
1966	.58
1967	.59
1968	.58
1969	.58
1970	.60
1971	.60

Table 11 also indicates a sizeable gain in 1970 and 1971. Extended estimates of the relative annual wage or salary income between females and males for all workers and not just the small minority who work full-time year-round in Table 12 shows the same behavior, but with a wider gap. The stability in the gap between female annual wage or salary and that of males

TABLE 12

The Relative Aggregate Annual Median Wage or Salary Income of All Workers Between Females and Males (WS_f^t/WS_m^t) Across All Occupations from 1962 to 1971

Year	WS_f^t/WS_m^t
1962	.47
1963	.46
1964	.47
1965	.47
1966	.47
1967	.48
1968	.48
1969	.48
1970	.49
1971	.50

can be explained using the information of the previous section; that is, females are now working shorter weeks more weeks per year for a relatively lower wage. This is not necessarily inconsistent with the occupational data, since that data contained self-employment income. This strengthens the overall case for possibility (3).

The Women's Bureau made "A Comparison of wage or salary income of full-time year-round women workers in selected occupation groups with that of men [which showed] that women's relative income positions deteriorated in most occupations during the period of 1956 to 1966" [20, U.S. Dept. of Labor, p. 134] in the following five occupations:

(1) Professional, Technical, and Kindred workers,

(2) Managers, Officials, and Proprietors, except farm workers,

(3) Sales workers,

(4) Operatives and Kindred workers, and

(5) Service workers, except Private Household workers.

In only the first and the last occupations did the relative income position of females to that of males improve from 1956 to 1966. The update of these

categories in Table M of Appendix A, however, indicates that the relative income position of females improved very little if at all in Professional, Technical, and Kindred workers; definitely deteriorated from 1962 to 1971 in Managers, Officials, and Proprietors, except Farm; deteriorated also in Sales workers; improved slightly in Operatives and Kindred workers; and improved substantially in Service workers, except Private Household workers. All of the results correspond to the changes that took place as reflected in Table 6 for all workers, except in Managers, Officials, and Proprietors, except Farm workers. The difference here is that the occupational date in Table 6 contained in addition to the wage or salary income of workers their self-employment income from farm and nonfarm sources. The gains made with respect to the latter by females positively offsets the losses in the relative wage between females and males. Although there was a slight gain in the relative hourly earnings position of females in Sales workers, the gain was accompanied by a sizeable average percentage decrease in the relative number of hours supplied by women to that supplied by males. In addition to the Women's Bureau's five occupations the relative hourly earnings position of Clerical and Kindred workers also continued to worsen.

An updating for industries reveals a definite upward trend for full-time year-round workers, but not for all workers as shown in Table 13.

3.0 The Importance of Relative Quantities of Labor Supplied and Relative Remuneration Rates Between Females and Males

The evidence presented to now suggests that the most important variable in explaining the widening gap between aggregate annual female earnings and male earnings or wage or salary income is the relative quantity of labor supplied between them. Other possible causes of variation in this gap, however, were posed in the second question of Chapter 2. One can phrase

TABLE 13

The Relative Aggregate Median Annual Wage or Salary Income of Full-Time Year-Round Workers ($WSFT_f^t/WSFT_m^t$) and All Workers (WS_f^t/WS_m^t) For All Females and Males, Industrial Data, 1962 to 1971

Year	$WSFT_f^t/WSFT_m^t$	WS_f^t/WS_m^t
1962	.57	.46
1963	.57	.45
1964	.57	.46
1965	.57	.47
1966	.57	.46
1967	.58	.47
1968	.58	.47
1969	.58	.47
1970	.59	.47
1971	.60	.49

the question as follows: What proportion of the percentage change in the ratio of aggregate annual earnings or wage or salary income of females to that of males can be attributed to the percentage change in the relative number of hours supplied annually by all males and females (H_m^t/H_f^t) or to the percentage change in the relative hourly earnings or wage rates between females and males, (W_f^t/W_m^t).

Using Equation (2.8) of Chapter 2, the results in Table 14 were obtained. The calculations vary substantially between occupations and industries. In the industrial data the variance in the percentage change in W_f^t/W_m^t is 1.81 times the variance in the percentage change in EF^t/EM^t. The covariance of the percentage change between W_f^t/W_m^t and H_m^t/H_f^t is 1.71 times the variance in EF^t/EM^t, and positive. The inversion of H_m^t/H_f^t to H_f^t/H_m^t makes the covariance term negative. This makes the relative wage rate and hours comparison easier. Positive percentage changes in H_f^t/H_m^t are associated with negative percentage changes in W_f^t/W_m^t. In general, as the relative number of hours supplied by all females to that supplied by males increased, the relative wage rate between the two decreased.

TABLE 14

The Relative Importance of the Variance in the Percentage Change of H_m^t/H_f^t, W_f^t/W_m^t, and the Cov $(H_m^t/H_f^t, W_f^t/W_m^t)$ in Explaining the Variance of EF^t/EM^t, From 1962 to 1971

Solving Equation (2.8) using industrial disaggregates:

$\text{Var}[\Delta \text{Ln}(EF^t/EM^t)]$	=	.00030462	100.00 Percent
$\text{Var}[\Delta \text{Ln}(H_m^t/H_f^t)]$	=	.00027141	89.10 Percent
$\text{Var}[\Delta \text{Ln}(W_f^t/W_m^t)]$	=	.00055221	181.28 Percent
$\text{Cov}[\Delta \text{Ln}(H_m^t/H_f^t), \Delta \text{Ln}(W_f^t/W_m^t)]$	=	.00025983	- 170.59 Percent
			99.79 Percent

Solving Equation (2.8) using occupational disaggregates:

$\text{Var}[\Delta \text{Ln}(EF^t/EM^t)]$	=	.00058494	100.00 Percent
$\text{Var}[\Delta \text{Ln}(H_m^t/H_f^t)]$	=	.00008458	14.46 Percent
$\text{Var}[\Delta \text{Ln}(W_f^t/W_m^t)]$	=	.00073223	125.18 Percent
$\text{Cov}[\Delta \text{Ln}(H_m^t/H_f^t), \Delta \text{Ln}(W_f^t/W_m^t)]$	=	.00011595	- 39.65 Percent
			99.99 Percent

In the occupational data, the variance in the percentage change in W_f^t/W_m^t is 1.25 times the variance in EF^t/EM^t. The covariance term here is only a fourth as large as the variance of relative hourly earnings and positive. The variance in the percentage change in the relative number of hours supplied between males and females is only .14 percent as large as the variance in the percentage change in EF^t/EM^t. The positive covariance term is interpreted as before. In general as the relative number of hours supplied by females to that supplied by males increased; that is, H_m^t/H_f^t decreased, then the relative hourly earnings between females and males decreased. Thus, when viewed from both the occupational disaggregation, and the industrial disaggregation, relative earnings have been less volatile than relative wages because of the offsetting behavior of relative hours worked.

4.0 Occupational Shifts in the Labor Force

Occupational shifts imply a movement of workers among occupations. Workers may shift from relatively high paying occupations to relatively low paying occupations or vice versa. The indices discussed in Chapter 2 to capture this movement are presented in two separate sections. First, the Paasche and Laspeyres indices are presented to show the direction of the occupational shifts. Then the weighted averages are presented to show the impact of these shifts.

4.1 Shifts in Occupations

The values found for the Laspeyres and Paasche indices of Equations (2.9) through (2.12) are presented in Table 15. Using the indices three separate comparisons can be made: (1) male versus female; (2) Laspeyres versus Paasche; and finally (3) Occupational versus Industrial indices.

In most cases, the industrial female indices are noticeably larger than the male indices. This means that female hourly wages and annual earnings have increased at a faster rate than those of males. This does not necessarily mean, however, that female remunerations have increased relatively. A previous section of this chapter showed that with respect to wage or salary income females in general are incurring a slight relative loss. For occupational data, the female indices are not noticeably larger than the male indices and in some cases, especially after 1969, they are smaller. This seems to be the case with respect to both hourly earnings and annual earnings.

The comparison of the Laspeyres indices with Paasche indices shows that for males there was little if any occupational shifting, while for females substantial shifting occurred for wage or salary income. In 1965, females moved to relatively lower paying industries, since the Paasche

TABLE 15

Laspeyres and Paasche Indices of Hourly Remunerations, Annual Remunerations by Sex for Occupations and Industries From 1962 to 1971

Industrial Indices

	Laspeyres				Paasche			
	Wage Rate		Annual Wage or Salary Income		Wage Rate		Annual Wage or Salary Income	
Year	Male	Female	Male	Female	Male	Female	Male	Female
1962	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1963	1.05	1.01	1.04	1.02	1.05	1.01	1.04	1.02
1964	1.07	1.09	1.08	1.08	1.07	1.09	1.08	1.08
1965	1.11	1.46	1.14	1.15	1.11	1.38	1.14	1.15
1966	1.16	1.49	1.21	1.20	1.16	1.48	1.21	1.20
1967	1.21	1.49	1.27	1.28	1.21	1.54	1.27	1.27
1968	1.31	1.58	1.35	1.38	1.31	1.63	1.35	1.37
1969	1.44	1.70	1.47	1.46	1.44	1.77	1.46	1.46
1970	1.58	1.93	1.55	1.55	1.58	2.04	1.55	1.54
1971	1.62	1.94	1.60	1.68	1.62	2.06	1.60	1.68

Occupational Indices

	Laspeyres				Paasche			
	Wage Rate		Annual Wage or Salary Income		Wage Rate		Annual Wage or Salary Income	
Year	Male	Female	Male	Female	Male	Female	Male	Female
1962	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1963	1.04	1.04	1.07	1.03	1.04	1.04	1.05	1.04
1964	1.07	1.10	1.08	1.08	1.07	1.10	1.08	1.08
1965	1.09	1.16	1.12	1.15	1.09	1.15	1.17	1.15
1966	1.16	1.16	1.20	1.15	1.16	1.16	1.19	1.15
1967	1.22	1.24	1.25	1.22	1.22	1.23	1.25	1.22
1968	1.30	1.34	1.32	1.30	1.30	1.33	1.32	1.29
1969	1.42	1.38	1.42	1.34	1.42	1.39	1.42	1.34
1970	1.51	1.50	1.49	1.43	1.51	1.51	1.49	1.44
1971	1.60	1.58	1.56	1.51	1.59	1.59	1.55	1.52

index for hourly wages is lower than the Laspeyres. After 1966, the female Paasche hourly wage index is substantially above the Laspeyres, indicating that females moved into relatively higher paying industries. Both male and female annual wage or salary indices show very little deviation from each other. In the occupational data, there were very little change and where changes did occur the female Paasche indices were only slightly greater than the Laspeyres indices.

The occupational indices were in general less than the industrial indices. The male indices were very close. On the other hand, there was a substantial difference between female occupational indices and industrial indices. This may indicate the females as a whole are making greater gains with respect to wage or salary income than they are in self-employment income.

4.2 The Impact of Occupational Shifts

The occupational shifting of females did affect the relative hourly and annual remunerations between females and males as shown in Table 16. The estimates were derived using Equation (2.13). The results are presented separately for occupations and industries. The first three columns of each section contain annual earnings or wage or salary income. The last three columns are hourly remunerations. The first column in each set contains the current values. The second column has the estimates of the respective relatives with employment held constant. The third column was obtained by holding annual or hourly remunerations constant and letting the quantity of labor vary.

The occupational data for both annual earnings and hourly earnings show that the relative annual earnings and relative hourly earnings between females and males would have been consistently less if employment patterns

TABLE 16

A Weighted Average of Relative Annual and Hourly Remunerations Between Females and Males for All Occupations and Industries, From 1962 to 1971

	Annual Remunerations			Hourly Remunerations		
Year	Current	Employment Constant	Earnings Constant	Current	Hours Constant	Hourly Earnings Constant
1962	.43	.43	.43	.66	.66	.66
1963	.42	.42	.43	.67	.66	.66
1964	.43	.43	.43	.68	.67	.66
1965	.45	.44	.44	.70	.70	.67
1966	.43	.41	.44	.67	.65	.68
1967	.44	.42	.45	.68	.66	.68
1968	.44	.42	.45	.69	.67	.68
1969	.42	.40	.45	.66	.64	.68
1970	.44	.41	.45	.68	.65	.68
1971	.45	.41	.45	.68	.65	.69
Year	Current	Employment Constant	Wage or Salaries Constant	Current	Hours Constant	Wage Rate Constant
1962	.46	.46	.46	.75	.75	.75
1963	.45	.46	.46	.73	.72	.75
1964	.46	.47	.46	.76	.76	.75
1965	.47	.47	.46	.77	.77	.75
1966	.46	.46	.47	.76	.76	.74
1967	.47	.47	.47	.76	.76	.75
1968	.47	.47	.47	.77	.77	.75
1969	.47	.46	.47	.75	.75	.75
1970	.47	.47	.47	.75	.76	.74
1971	.49	.49	.46	.76	.76	.74

and the number of hours worked had remained as they were in 1962. Allowing employment and the number of hours worked to vary, however, while holding annual earnings and hourly earnings at their 1962 levels would have made the relative annual earnings generally larger and the relative hourly earnings about the same. This implies that the occupational shifting into higher paying occupations by females has increased their relative annual earnings. This increase, however, is not as great as it could have been if the increased supply of workers had not lowered the annual earnings in these occupations.

The impact of the structural shifts in the industrial data was slight. The relative annual wage or salary income was not affected in general by shifts in employment from lower paying to higher paying occupations. This tends to augment the findings in Section 3.0 of this chapter that the covariance term between hours worked and wages was an important factor in explaining the variance in the aggregate annual wage or salary gap between females and males. The positive covariance term indicated that substantial increases in the supply of females would be associated with a substantial decrease in their relative wage.

5.0 Summary and Conclusions

The relative number of hours supplied by males to that of females was found to be decreasing; partly as a result of changing work patterns, but mostly as a result of the increased labor force participation of females. The overall direction of change in the relative hourly earnings between females and males is positive, but the evidence is not strong. The reason for the doubt is the fact that the relative wage rate between females and males was found to be slightly negative. The wage or salary data used for the industrial disaggregates is a large percentage of annual

and hourly earnings used for occupational disaggregates. In this latter group, it was also found that the relative hourly earnings position of approximately 33 percent of the female labor force in 1971 deteriorated, Clerical and Kindred workers from 1962 to 1971 incurred an annual average percentage decrease of .89 percent in their relative hourly earnings. These losses, however, were offset by the average annual percentage increase in the relative hourly earnings of 2.69 percent for females in Service, except Private Household workers. In 1971 approximately 18 percent of the female labor force was situated in this occupation. The average annual percentage increase in the number of females employed in the former occupation was 3.39 percent and that of the latter was only 1.16 percent. This would tend to suggest that at some point in the future, if relative gains and losses continue as over the 1962-71 period, the average annual percentage change in the relative hourly earnings between females and males may become negative. For now, however, it is accepted as positive.

CHAPTER 4

AGGREGATE TRENDS AND THE IMPORTANCE OF RELATIVE HOURLY EARNINGS AND HOURS WORKED BETWEEN HUSBANDS AND WIVES IN THE ECONOMY

1.0 Introduction

This chapter provides an empirical foundation to examine three related questions. First, what are the recent trends in: (a) the ratio of aggregate wives' earnings to that of their husbands; (b) the relative hourly earnings between wives and husbands; and (c) the relative quantities of labor supplied between wives and husbands? Secondly, what proportion of the gap between the aggregate earnings of wives to that of their husbands' is attributable to the other trends -- changing relative hourly earnings between spouses and/or relative quantities of labor which they supplied. Finally, in the event that changing relative hourly earnings and/or relative quantities of labor supplied are contributing substantially to the earnings gap between husbands and wives, what proportion of these changes are reflections of occupation shifts in their work?

2.0 Aggregate Earnings of All Husband and Wife Families

Aggregate earnings of all husband and wife families (EFAM) are identically equal to the aggregate annual earnings of all husbands (EH) and the aggregate annual earnings of all wives (EW). Furthermore, the aggregate annual earnings of either all husbands or wives is equal to the product of hourly earnings (W) and the average number of hours worked per year (H) for all husbands and wives; algebraically,

$$EFAM^t \equiv W_h^t \cdot H_h^t + W_w^t \cdot H_w^t , \tag{4.1}$$

where husbands are represented by the subscript h; wives by the subscript w; and the time period by the superscript t. Dividing both sides of Equation (4.1) by the aggregate earnings of all husbands;

$$EFAM^t/EH^t \equiv 1 + [(W_w^t \cdot H_w^t)/(W_h^t \cdot H_h^t)], \tag{4.2}$$

rearranging and solving Equation (4.2) for W_w^t/W_h^t:

$$W_w^t/W_h^t \equiv [(EFAM^t/EH^t) - 1][H_h^t/H_w^t]. \tag{4.3}$$

Substituting $EFAM^t \equiv EF^t + EH^t$ into Equation (4.3):

$$W_w^t/W_h^t \equiv [(EW^t/EH^t)(H_h^t/H_w^t)]. \tag{4.4}$$

Equation (4.4) contains all three of the desired ratios (EW^t/EH^t), the ratio of aggregate wives' earnings to that of their husbands'; (H_h^t/H_w^t), the relative number of hours worked per year or the relative quantities of labor supplied by both husbands and wives; and (W_w^t/W_h^t), the overall relative hourly earnings between all wives and husbands.

Annual estimates for the median EW^t and the median EH^t are easily constructed from aggregate income data, but following the procedure in Chapter 3, a weighted average is used to correct for data insufficiencies. Estimates for either H_h^t/H_w^t and W_w^t/W_h^t, however, are not easily accessible since they have to be constructed from the disaggregated occupational data as in Chapter 2. Again disaggregate hourly earnings for husbands and wives do not exist as was true for all males and females. Information on the average number of hours worked per year by spouse is derived by using the average number of hours worked per year by males and females in a particular occupation. The total number of hours worked per year by all husbands and all wives is equal to the product of this occupational proxy for the average

number of hours worked per year by males or females and the number of husbands or wives in that occupation. Aggregating across all occupations by spouse gives the total number of hours supplied by husbands, H_h^t; and the total number of hours supplied by wives, H_w^t. The ratio of H_h^t to H_w^t is expressed as follows:

$$H_h^t/H_w^t = \frac{\sum_{i=1}^{n} {}_iHPY_h^t \cdot {}_iQ_h^t}{\sum_{i=1}^{n} {}_iHPY_w^t \cdot {}_iQ_w^t},$$

where H = the total number of hours supplied,

HPY = the average number of hours worked per year approximated from the occupational data,

Q = the total number of workers employed,

t = the year,

h = husbands,

w = wives,

i = the i^{th} occupation,

n = 11.

By substituting Equation (4.5) into Equation (4.4), the aggregate annual relative hourly earnings between wives and husbands, W_w^t/W_h^t, can be determined for all husband and wife families in the economy. With the appropriate data for 1962 through 1971, all three ratios in the first question of this chapter can be examined.

Minor modifications of Equation (4.4) are necessary in order to examine the second question: What proportion of the gap between aggregate wives' earnings and that of their husbands is attributable to the other trends -- changing relative hourly earnings or hours worked between husbands and wives. Taking the first difference of the natural log and rearranging:

$$\Delta \text{Ln}(EW^t/EH^t) = \Delta \text{Ln}(W_w^t/W_h^t) - \Delta \text{Ln}(H_h^t/H_w^t). \tag{4.6}$$

Equation (4.6) now gives the percentage change in each one of the ratios -- EW^t/EH^t, H_h^t/H_w^t, and W_w^t/W_h^t. By finding the variance in each term, it is possible to determine how much of the variance in the percentage change in the earnings gap between wives and husbands is explained by the variances of the percentage changes in the other two terms on the right-hand side of Equation (4.6).

$$\begin{aligned}\text{Var}[\Delta \text{Ln}(EW^t/EH^t)] &= \text{Var}[\Delta \text{Ln}(W_w^t/W_h^t)] + \text{Var}[\Delta \text{Ln}(H_h^t/H_w^t)] \\ &\quad - 2\text{Cov}[\Delta \text{Ln}(W_w^t/W_h^t), \Delta \text{Ln}(H_h^t/H_w^t)],\end{aligned} \tag{4.7}$$

then dividing each side of Equation (4.7) by the left-hand term;

$$\begin{aligned}1 = &\frac{\text{Var}[\Delta \text{Ln}(W_w^t/W_h^t)]}{\text{Var}[\Delta \text{Ln}(EW^t/EH^t)]} + \frac{\text{Var}[\Delta \text{Ln}(H_h^t/H_w^t)]}{\text{Var}[\Delta \text{Ln}(EW^t/EH^t)]} \\ &\frac{-2\text{Cov}[\Delta \text{Ln}(W_w^t/W_h^t), \Delta \text{Ln}(H_h^t/H_w^t)]}{\text{Var}[\Delta \text{Ln}(EW^t/EH^t)]}.\end{aligned} \tag{4.8}$$

Equation (4.8) indicates how much of the variance in the percentage change in the ratio of aggregate wives' earnings to that of their husbands is explained by the variance in the percentage change in the relative hourly earnings between wives and husbands, by the variance of the percentage change in the relative quantities of labor supplied by both spouses, and the covariance between their relative hourly earnings and quantities of labor supplied. The development of Equation (4.8) should indicate which forces -- relative hourly earnings, relative quantities of labor supplied, or their interaction -- are having the greatest impact upon the percentage change in EW^t/EH^t.

Finally, given that relative hourly earnings between wives and husbands and/or their respective quantities of labor supplied are influencing the earnings gap between wives and husbands; indices need to be constructed

as in Chapter 2 for all husbands and wives to measure the direction and impact of occupational shifts. Unlike the previous chapter, there are only two Laspeyres indices and two Paasche indices. The two Laspeyres indices are a husbands' hourly earnings index and a wives' hourly earnings index; similarly for the Paasche indices. If the Paasche indices are very close to the Laspeyres indices then very little occupational shifting is occurring. On the other hand, if the Paasche indices are greater than the Laspeyres indices, then husbands and/or wives are moving into higher paying occupations.

A weighted average of the wives' hourly earnings and that of their husbands shows the impact of any occupational shifting. Taking the ratio of the two weighted averages as follows:

$$\frac{W_w^t}{W_h^t} = \frac{\dfrac{\sum_{i=1}^{n} {}_iW_w^t \cdot {}_iH_w^t}{\sum_{i=1}^{n} {}_iH_w^t}}{\dfrac{\sum_{i=1}^{n} {}_iW_h^t \cdot H_h^t}{\sum_{i=1}^{n} {}_iH_h^t}}, \qquad (4.9)$$

where W_w^t/W_h^t = the relative wage between all wives and husbands,

W = the wage rate,

w = wives,

h = husbands,

t = the year,

i = the i^{th} occupation,

n = 11.

Equation (4.9) is calculated using current hours and hourly earnings, then it is recalculated first using current hourly earnings and base year

hours and then using base year hourly earnings and current hours. The difference in estimates of relative hourly earnings between wives and husbands using current hourly earnings and hours worked and some combination of base year hourly earnings or hours worked shows the impact of occupational shifting by husbands and wives upon W_w^t/W_h^t.

3.0 The Data - Sources and Alterations

3.1 Sources

The data necessary for the models presented came from two sources. First, hourly earnings and hours worked are taken from Chapter 3. As previously mentioned the number of hours worked per year by a wife is approximated by the average number of hours worked per year per female in her occupation. Correspondingly, the husband's hourly earnings and hours worked are approximated. Second, the marital labor force participation rates, $\underset{ij}{--}N^t$, are derived from the number of husbands and wives in a particular marital labor force participation pairing. This information was found in "Marital and Family Characteristics of Workers," another annual Special Labor Force Report published by the Department of Labor/Bureau of Labor Statistics [18]. The data, like those in Chapter 2, were originally obtained from the Current Population Survey. Two tables -- "Occupation Groups of Employed Married Women, Husband Present by Employment Status and Occupation Group of Husband, March 19 ," and "Employment Status of Married Women, Husband Present, By Employment Status and Occupation Group of Husband, March 19 " -- were combined to encompass the employment statuses of all husband and wife families in the U.S. from 1962 to 1971.

3.2 Alterations

Given the data above a husband and/or his wife may be employed, unemployed, or not in the labor force. If they are employed, each falls within

one of the 11 occupations. If either is unemployed or not in the labor force, he or she is lumped into one category: not in the paid labor force. Those husbands and/or wives in this category have zero earnings. Thus with 11 occupational categories and one for not in the paid labor force, there are 144 possible marital labor force participation pairings, each of which has a marital labor force participation rate.

4.0 Relative Hourly Earnings and Hours Worked Between All Husbands and Wives in the Economy

The ratio of aggregate wives' earnings to that of their husbands increased over the period of 1962 to 1971. The annual estimates for EW^t/EH^t rose from .17 in 1962 to .21 in 1971 as shown in Table 17. The average

TABLE 17

The Ratio of Aggregate Wives' Earnings to That of Their Husbands', EW^t/EH^t, For All Husband and Wife Families, From 1962 to 1971

Year	EW^t/EH^t
1962	.17
1963	.17
1964	.17
1965	.18
1966	.17
1967	.18
1968	.19
1969	.19
1970	.20
1971	.21

annual percentage increase in EW^t/EH^t was 2.47 percent. Comparing these estimates of EW^t/EH^t to EF^t/EM^t in Table 3 showed that working wives earned a smaller proportion of aggregate family earnings, than all females earn of aggregate earnings. Although the initial difference between the estimates of EW^t/EH^t and EF^t/EM^t in 1962 was approximately 3 percent, by 1971 the difference had widened to approximately 6 percent.

Considering just those families in which both the husband and wife worked a substantially different estimate of EW^t/EH^t occurred. Table 18 contains the estimates for this subpopulation of all husband and wife families. For this particular subpopulation, the annual estimates of

TABLE 18

The Ratio of Aggregate Wives' Earnings to That of Their Husbands', EW^t/EH^t, for Families in Which Both Husband and Wife Work, From 1962 to 1971

Year	EW^t/EH^t
1962	.45
1963	.44
1964	.45
1965	.47
1966	.43
1967	.44
1968	.45
1969	.43
1970	.44
1971	.44

EW^t/EH^t remained relatively constant from 1962 with .45 percent to .44 percent in 1971. Comparing these estimates of EW^t/EH^t to EF^t/EM^t in Table 3, it can be seen that working wives earn a larger proportion of aggregate family earnings, than all females earn of aggregate earnings. In contrast to the estimate of EW^t/EH^t for all husband and wife families, the gap between EW^t/EH^t for just those families in which both husbands and wives worked and EF^t/EH^t decreased over the period.

Aggregating the number of hours worked by all husbands and comparing it to the number of hours worked by all wives across the possible marital labor force participation pairings, showed that the relative quantity of hours supplied was decreasing. Table 19 shows that all husbands worked about four to five times the number of hours than did their wives. The

continual average annual percentage decrease of 2.06 percent indicates a disproportionate increase in the relative number of hours supplied by wives. Again, the literature on labor force participation rates of married women would anticipate these findings.

TABLE 19

The Relative Number of Hours Supplied by Husbands To That Supplied by Wives, H_h^t/H_w^t, for All Husband and Wife Families and For Those in Which Both Worked, From 1962 to 1971

Year	All Husband and Wife Families	Families in Which Both Worked
1962	5.38	1.97
1963	5.31	2.01
1964	5.24	2.02
1965	5.13	1.99
1966	5.14	2.05
1967	4.93	2.03
1968	4.77	2.06
1969	4.66	2.07
1970	4.57	2.10
1971	4.47	2.08

In contrast, Table 19 also shows that the relative number of hours supplied in the subpopulation of families in which both worked increased slightly. In addition this ratio, H_h^t/H_w^t, was slightly below that for the entire labor force, H_m^t/H_f^t, found in Table 4. This is probably because single men work fewer hours than married men.

Using the appropriate estimates for EW^t/EH^t in Tables 17 and 18 and those for H_h^t/H_w^t in Table 19, Equation (4.4) is solved for W_w^t/W_h^t. Table 20 presents the results for all husband and wife families and for those families in which both worked. The relative hourly earnings for all wives and husbands were consistently higher for families in which both worked than in all husband and wife families. The difference, however, was slight. The average annual percentage change in the latter group was only .41 percent.

TABLE 20

Relative Hourly Earnings Between Wives and Husbands, W_w^t/W_h^t, for All Husband and Wife Families and for Those in Which Both Worked, From 1962 to 1971

Year	All Husband and Wife Families	Families in Which Both Worked
1962	.89	.89
1963	.89	.89
1964	.90	.90
1965	.93	.93
1966	.89	.89
1967	.90	.90
1968	.92	.92
1969	.89	.89
1970	.91	.92
1971	.92	.93

The percentage changes in W_w^t/W_h^t for both groups followed the same pattern. This demonstrates that the association between the wife's hourly earnings and that of her husband's is not only a positive one as Mincer notes, but also a very consistent association.

The question to be posed now is how the percentage change in the ratio of aggregate wives' earnings to that of their husbands' (EW^t/EH^t) is associated with the percentage changes in the relative number of hours supplied annually by all husbands to that of their wives (H_h^t/H_w^t), or to the percentage changes in the relative hourly earnings between them (W_w^t/W_h^t). Using Equation (4.8), the following results in Table 21 were obtained. The factor

TABLE 21

The Relative Importance of the Variance in the Percentage Change of (H_h^t/H_w^t), (W_w^t/W_h^t), and the $\text{Cov}(H_h^t/H_w^t, W_w^t/W_h^t)$ in Explaining the Variance of EW^t/EH^t, From 1962 to 1971

$\text{Var}[\Delta \text{Ln}(EW^t/EH^t)]$	= .00117061,	100.00 Percent
$\text{Var}[\Delta \text{Ln}(H_h^t/H_w^t)]$	= .00015733,	13.44 Percent
$\text{Var}[\Delta \text{Ln}(W_w^t/W_h^t)]$	= .00070130,	59.91 Percent
$\text{Cov}[\Delta \text{Ln}(H_h^t/H_w^t), \text{Ln}(W_w^t/W_h^t)]$	= .00015975,	27.29 Percent

contributing the most variance in the percentage change in the ratio of aggregate wives' earnings to that of their husband was the variance in the percentage change in the relative hourly earnings between all wives and husbands. The variance in the percentage change in W_w^t/W_h^t is 60 percent as large as the variance in the percentage change of EW^t/EH^t. The second largest factor was the covariance in the percentage change between H_h^t/H_w^t and W_w^t/W_h^t which was 27 percent as large as the variance in the percentage change of EW^t/EH^t. As in the model for all males and females, the variance in the percentage change in H_h^t/H_w^t amounts to only 13 percent of the variance in the percentage change in EW^t/EH^t. All of these findings are very similar to those for the entire labor force.

Unlike the covariance term found for all males and females in the labor force, as previously presented in Table 14, the covariance term for all husband and wife families was negative. This is interpreted to mean that if the percentage change in H_h^t/H_w^t is positive, then the percentage change in W_w^t/W_h^t is negative. Inverting H_h^t/H_w^t to H_w^t/H_h^t makes the covariance term positive, which, in turn, means that if the percentage change in H_w^t/H_h^t is positive, then the percentage change in W_w^t/W_h^t is also positive. Thus if the relative number of hours supplied by wives to that supplied by their husbands increases, the relative wage between wives and husbands increases -- and vice versa. The difference in behavior for all husband and wife families and the entire labor force with respect to the covariance term could be the result of changes in supply and demand forces. For all wives, if the demand for the labor increased, a rise in their relative hourly earnings and hours worked is expected, and conversely. For all females, however, as the supply of their labor increases, a decrease in their relative hourly earnings is expected, and conversely. In short,

all wives may be moving along their supply curve while all females may be shifting their supply curve.

Whether or not there has been any appreciable movement over the period among occupations by husbands and/or their wives can be surmized from the Laspeyres and Paasche indices. The Paasche indices in Table 22 are slightly smaller than the Laspeyres indices indicating that husbands and wives are moving into relatively lower paying occupations. This may indeed be the

TABLE 22

Laspeyres and Paasche Hourly Earnings Indices for All Wives and All Husbands, From 1962 to 1971

	Laspeyres		Paasche	
Year	Husbands	Wives	Husbands	Wives
1962	1.00	1.00	1.00	1.00
1963	1.04	1.06	1.04	1.06
1964	1.07	1.11	1.07	1.11
1965	1.09	1.17	1.09	1.16
1966	1.16	1.19	1.15	1.18
1967	1.22	1.26	1.21	1.25
1968	1.30	1.38	1.29	1.38
1969	1.43	1.47	1.42	1.46
1970	1.53	1.61	1.52	1.60
1971	1.62	1.71	1.61	1.71

case, since one out of every three married women work in Clerical and Kindred workers, which was shown in Chapter 3 to be an occupation where females in general were incurring relative hourly earnings losses.

Table 23 contains the weighted averages to show the impact of the shifting. By wives staying in their 1962 employment patterns, and the hourly earnings varying, the relative hourly earnings between all wives and husbands would have been greater than found by using current hourly earnings and hours worked. On the other hand, if hourly earnings were held constant while employment varied, then the relative hourly earnings

between all wives and husbands would have been smaller than those in current terms.

TABLE 23

Weighted Averages of the Relative Hourly Earnings Between All Wives and Husbands, From 1962 to 1971

Year	Current Hourly Earnings and Hours Worked	Current Hourly Earnings and Base Hours Worked	Base Hourly Earnings and Current Hours Worked
1962	.89	.89	.89
1963	.89	.91	.87
1964	.90	.93	.87
1965	.93	.95	.87
1966	.89	.91	.86
1967	.90	.92	.87
1968	.92	.95	.86
1969	.89	.91	.87
1970	.92	.94	.87
1971	.92	.94	.87

This tends to indicate that if wives had not incurred the relative losses of all females in hourly earnings in Clerical and Kindred workers, the relative hourly earnings between them and their husbands would have been greater. At the same time, the larger proportion of working wives in Professional, Technical, and Kindred workers; in Managers, Officials, and Proprietors; and in Operatives and Kindred workers has kept relative hourly earnings between wives and husbands from falling even more. The third column of Table 23 indicates how low relative hourly earnings between wives and husbands would have gone if females as a whole had not made relative hourly earnings gains in the above mentioned occupations. As a matter of reference, Table 24 contains the occupational distribution of the female and male labor forces and that of all wives and husbands.

5.0 A Conditional Probability Distribution of Husbands and Wives

The stability of the consistent association between what a wife can earn on an hourly basis as compared to that of her husband depends on the

TABLE 24

The Occupational Distribution of All Females, All Working Wives, All Males and All Working Husbands In 1971 By Percentage of Totals in Each

Occupation	All Females	All Wives	All Males	All Husbands
Professional	13.78	15.87	12.95	14.37
Managers	4.02	5.23	12.01	17.65
Clerical	32.95	33.16	6.70	6.06
Sales	7.47	7.43	6.00	6.06
Craftsmen	1.18	1.20	20.21	21.55
Operatives	13.42	14.48	18.59	17.75
Private Household	5.16	3.41	.07	2.34
Service	18.07	16.80	8.78	4.42
Laborers	.87	.91	9.00	5.21
Farmers	.47	.17	3.10	3.56
Farm Laborers	2.61	1.27	2.58	.96

socioeconomic factors, somewhat divorced from the market. If $P_{\bar{i}j}$ represents the conditional probability that a wife is in the j^{th} occupation, given that her husband is in the i^{th} occupation, then a two-way analysis of variance model can be used to test which factors determine $P_{\bar{i}j}$. The model is as follows:

$$P_{\bar{i}jk} = \mu + \alpha_i + \beta_j + \gamma_{ij} + \varepsilon_{ijk}. \tag{4.10}$$

$P_{\bar{i}jk}$ is first a positive function of μ, the overall mean for all husband and wife families. This mean is the probability that any given husband and wife will find themselves in a particular marital labor force participation pairing, $\bar{i}\bar{j}$. To this probability is added the probability that any husband is in the i^{th} occupation, α_i. Correspondingly, β_j represents the probability that any wife may find herself in the j^{th} occupation. α_i is considered the fixed row effect, while β_j is the fixed column effect. To these terms, an interaction term, γ_{ij}, is added. γ_{ij} represents the probability that given the husband's occupation, the family will be in any of the remaining labor force participation pairings, $\bar{i}j$. Finally, ε_{ijk} is the error term. The conditions of Equation (4.10) are the following:

$$1) \quad \sum_{i=1}^{12} \alpha_i = 0,$$

$$2) \quad \sum_{j=1}^{12} \beta_j = 0,$$

and

$$3) \quad \sum_{i=1}^{12} \sum_{j=1}^{12} \gamma_{ij} = 0.$$

The above analysis of variance model involves only two assumptions. First, the column and row effects are nonadditive, the reason for the interaction term. Secondly, the ε_{ijk}'s are independent random variables, normally distributed with mean 0 and variance σ^2. They represent the extent to

which the data depart from the model because of random disturbances. The significance of the α_i's, β_j's, and γ_{ij}'s are tested with the F-statistic.

After combining the two BLS data sets to derive the marital labor force participation rates, the conditional probabilities were calculated and are summarized in Table 25. These probabilities show that husbands in farm related occupations have the highest probabilities of having a non-working wife. For husbands in Farmers and Farm Managers, moreover, the probability that their wives, if they worked, were also in farm related occupations was a combined total of 14.3 percent. At the other end of the rank ordering, husbands in Professional, Technical, and Kindred workers had a 15.1 percent chance that their wives, if they worked, were in the same occupation. Despite the occupations of most husbands, there was always a good chance that a working wife was in Clerical and Kindred workers. This suggests that wives tend to be in occupations related to those of their husbands. For example, if their husbands are employed in white collar occupations then there is a greater probability that wives, if employed, are in related white collar occupations than in blue collar occupations and vice versa.

The analysis of variance model represented by Equation (4.10) confirms these suspicions. The results were as follows:

Source of Variance	Sum of Squares	Degrees of Freedom	F-Statistic	Level of Significance
i	.000357	11	.1952311	.998
j	41.516239	11	22700.87	<.0005
ij	1.411839	121	70.18058	<.0005
ijk	.215471	1296		
Total	43.143906	1439		

TABLE 25

The Conditional Probability Distribution of
All Husband and Wife Families, 1962 to 1971

Occupation of Husband \ Occupation of Wife	Professional	Managers	Clerical	Sales	Craftsmen	Operatives	Private Household	Service	Laborers	Farmers	Farm Laborers	Not in the Paid Labor Force
Professional	15.1	1.3	12.4	2.1	.3	1.5	.3	2.3	.0	.1	.1	64.7
Managers	6.2	4.4	15.6	4.6	.4	2.6	.4	3.4	.1	.0	.1	62.3
Clerical	5.9	2.0	19.7	3.2	.6	5.6	1.0	5.6	.1	.0	.1	56.1
Sales	7.5	2.4	16.8	4.8	.4	2.7	.6	4.0	.1	.0	.0	60.5
Craftsmen	3.4	1.4	12.3	2.9	.6	7.8	1.3	6.2	.2	.1	.2	63.7
Operatives	2.4	1.1	10.3	2.5	5.7	11.4	2.0	7.2	.3	.0	.3	61.8
Private Household	4.8	1.7	16.1	3.5	.3	5.5	1.1	6.6	.3	.0	.1	59.8
Service	3.4	1.4	8.5	2.3	.5	8.5	4.5	15.6	.2	.0	.1	55.0
Laborers	1.7	.9	7.1	1.7	.3	8.7	5.6	9.2	.6	.2	.5	63.6
Farmers	3.9	1.1	3.8	1.4	.4	4.0	1.0	3.4	.1	1.0	13.3	66.7
Farm Laborers	1.9	.2	3.2	1.0	.1	4.2	5.6	5.1	.9	.4	3.9	72.9
Not in the Paid Labor Force	2.8	1.3	4.7	1.6	.3	4.4	2.3	4.6	.1	.1	.1	77.7

The α_i's were insignificant. The husband's occupation had no direct influence on the conditional probability that a wife was in the i^{th} occupation, given that of her husband. The β_j's, however, were significant. This is interpreted to mean that the distribution of working wives as found in Table 25 is not by chance. The interaction term, γ_{ij}, was also significant, meaning that the husband's occupation places his wife on the low or high end of the rank ordering of female occupations, the β_j's. As suggested, white collar husbands tend to have white collar wives and vice versa. W_w^t/W_h^t is highly correlated because males and females pick mates with similar socioeconomic backgrounds, and therefore their occupational opportunities are very similar.

6.0 Summary and Conclusions

In this chapter it was found that the relative number of hours supplied by all husbands to that supplied by all wives, H_h^t/H_w^t, was decreasing. This result is very similar to that found in Chapter 3 for all males and females. A different result, however, arises when just families in which both husband and wife worked are considered. The relative number of hours supplied between husbands and wives was gradually increasing. Thus H_w^t/H_h^t in Equation (1.5) is steadily decreasing. For this to occur despite the increased labor force participation of wives, the number of wives taking part-time jobs must be significant.

Relative hourly earnings between all wives and husbands was found to have increased slightly. In addition the estimates of between all wives and husbands were found to be very high -- that is, the wife's hourly earnings was approximately 90 percent of her husband's. The analysis of variance model showed that this relationship was relatively stable since

the occupational opportunities available to a wife were dependent upon those opportunities available to females in general and the socioeconomic characteristics of her husband.

CHAPTER 5

THE CONTRIBUTIONS OF MARRIED WOMEN TO AND THE EFFECT OF RELATED FACTORS ON THE DISTRIBUTION OF AGGREGATE FAMILY EARNINGS

1.0 Introduction

At the beginning of this study an identity as represented by Equation (1.5) was introduced to show the impact of the increased labor force participation of married women, the relative hourly earnings between all wives and husbands, the relative number of hours supplied by wives and husbands, the relative hourly earnings between all males and females, and finally, the relative number of hours supplied between all males and females on the distribution of family earnings. The purpose of this chapter is to integrate the findings of the previous chapters, to determine aggregate family earnings and its distribution, and to determine the impact of the above five factors on this distribution.

In brief, the evidence in Chapter 3 led to the following conclusions. First the relative number of hours supplied by all males to that supplied by all females is decreasing. Furthermore, it was found that the relative hourly earnings between all females and males was increasing slightly. The industrial wage or salary income data, however, suggests that this may be only a temporary phenomena, since relative wages between females and males in the labor force had a negative average annual percentage change. The proportion of earnings that is wage or salary income is the predominant factor in drawing this conclusion. Finally, the Paasche and

Laspeyres indices for males showed very little occupational shifting as defined as males either moving into relatively higher or lower paid occupations. The impact of the absolute increases indicated by the Paasche and Laspeyres indices can be assumed equally distributed, thus $(W_f^t \cdot H_f^t)$ scalarly increased across all occupations.

Chapter 4 considered the related factors that pertained to all husband and wife families. It was found that for those families in which both husband and wife worked, the relative hourly earnings between all wives and husbands had a positive average annual percentage change. In contrast to the entire labor force, the relative number of hours supplied by all husbands to that supplied by wives in those families in which both worked was found to have positive average annual percentage changes. The increased labor force participation of married women is an established fact and needs no further documentation. Finally, it was found using the conditional probability distribution that a wife's hourly earnings is highly correlated with that of her husband's and that this relationship is relatively stable over time.

Aggregate family earnings were calculated using Equations (1.2), (1.3), and (1.5). Gini coefficients were calculated for each year (see Appendix B). Then as outlined in Chapter 1, the increased labor force participation of married women and the other five related factors were separately held constant while all else varied to generate six adjusted Gini coefficients. Two other measures of income equality are used to help interpret the Gini coefficients. First, to illustrate the subtler changes that are taking place -- in particular, the extent to which high income females are working as compared to low income females -- the quintile distribution of hours worked and earnings received are explored. Second,

in order to see if these subtler changes are making families relatively better or worse off, absolute and relative measures of income equality are also employed. Finally, if the identity in Equation (1.5) proves to be adequate then the impact of various related factors and the increased labor force participation of married women on the distribution of family earning can be determined.

2.0 Aggregate Family Earnings and Its Distribution

Aggregate family earnings, $AEFAM^t$, as calculated in Equation (1.3), are presented in Table 26. Over the ten-year period they have continued to increase and have almost doubled while the number of husband and wife families has increased only 4 percent. The Gini coefficient of aggregate

TABLE 26

Aggregate Family Earnings, $AEFAM^t$, and Husband and Wife Families in Thousands, From 1962 to 1971

Year	$AEFAM^t$	Number of Husband and Wife Families
1962	196,366,954	40,309
1963	208,689,081	40,836
1964	220,424,357	41,142
1965	232,415,584	41,501
1966	253,377,545	41,954
1967	271,043,547	42,395
1968	297,684,416	43,057
1969	326,014,396	43,559
1970	347,297,306	44,029
1971	359,055,128	44,445

family earnings as calculated for each year are presented in Table 27. As a Gini coefficient approaches one, the earnings distribution is becoming more disperse. The Gini coefficients in Table 27 range from .31125 in 1968 to .34139 in 1971. Thus, over the ten-year period variation is relatively small and cyclical in character. The stability of these Gini

TABLE 27

Gini Coefficients for Aggregate Family Earnings, $AEFAM^t$, From 1962 to 1971

Year	Gini Coefficient
1962	.3249
1963	.3258
1964	.3225
1965	.3179
1966	.3120
1967	.3138
1968	.3113
1969	.3180
1970	.3211
1971	.3414

coefficients can be deceiving since identical Gini coefficients can be derived from two very different Lorenz Curves. The actual plotting of the underlying Lorenz Curves for selected years helps to detect subtler changes. Figure 2 contains such plots for 1962, 1966, and 1971.

The Lorenz Curves show that the lower income families gained in their share of aggregate family earnings between 1962 and 1966, but by 1971 had lost even more than the original gain. The percentage of aggregate family earnings received by the higher levels of family earnings continued to increase over the entire time period. Figure 2 also suggests that the family earnings level for about 10 percent of all families -- those between 70 and 80 percent of all families -- has a special significance. The Lorenz Curve pivots in this region. The families that fall before the focal point have incurred relative losses, while those after this point seem to have made relative gains over the period.

Dividing the Lorenz Curves into quintiles shows where and how these gains and losses were incurred. Thus, the horizontal axis of the Lorenz Curve is partitioned into five equal sections or quintiles. Each section contains 20 percent of all husband and wife families. Similarly the vertical axis is partitioned such that each quintile of husband and wife families received their respective amounts of aggregate family earnings. The underlying disaggregate data used to calculate $AEFAM^t$ also gave the number of hours supplied by each quintile as found in Table 28.

From 1962 to 1971 the percentage of aggregate family earnings received by Quintiles IV and V increased by about 1 percent each. Quintiles I and III each lost about .5 percent of aggregate family earnings, while Quintile II lost 1 percent. The gain of the top two quintiles was definitely at the expense of the bottom three quintiles.

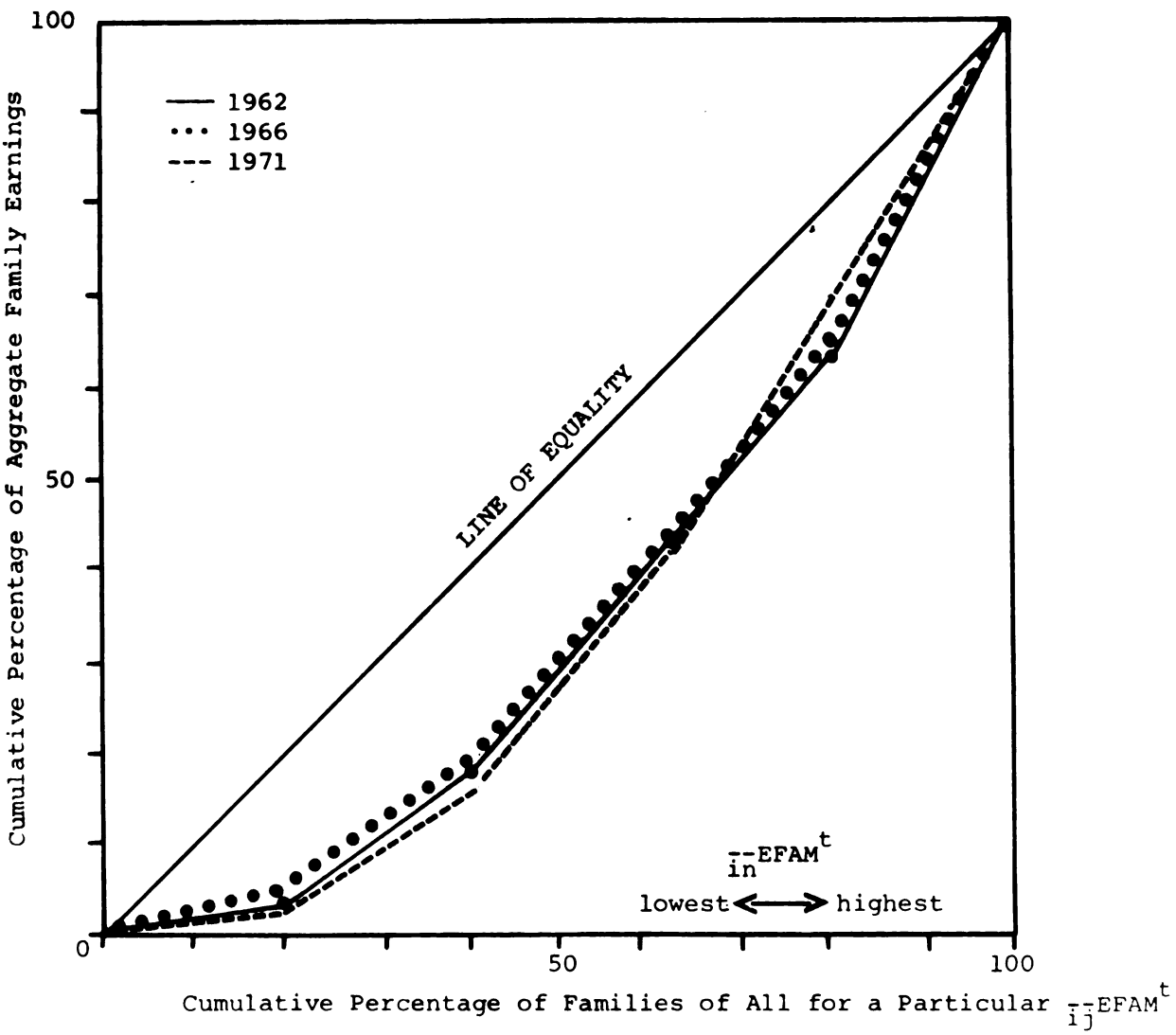

FIGURE 2

The Lorenz Curves of Aggregate Family Earnings in Selected Years

TABLE 28

Aggregate Family Earnings and Hours Worked by Quintile, In 1962 and 1971

Quintile	Boundaries	% of $AEFAM^t$	% of $AEFAM^t$ Earned by Wives	% of $AEFAM^t$ Earned by Husbands	% Earned in Each Quintile by Wives	% of Total Hours Worked	% of Total Hours Worked by Wives	% of Total Hours Worked by Husbands	% Hours Worked in Each Quintile by Wives
				1962		1962			
I	0-1992	2.00	.31	1.69	15.66	5.18	.46	4.72	8.87
II	1993-4546	14.95	2.07	12.84	13.84	16.57	2.48	14.09	14.98
III	4547-5645	21.54	.75	21.06	3.49	19.76	.98	18.78	4.94
IV	5646-7036	26.70	1.55	25.15	5.81	26.27	2.02	24.25	7.71
V	7037-10751	34.81	9.51	25.07	27.35	32.22	9.73	22.49	30.20
	Total	100.00	14.19	85.81		100.00	15.67	84.33	
				1971		1971			
I	0-3311	1.55	.35	1.20	22.33	2.37	.44	1.93	18.70
II	3312-7672	13.98	2.85	11.23	20.39	17.51	3.30	14.21	18.83
III	7673-10043	21.02	1.35	19.66	6.45	20.64	1.58	19.06	7.64
IV	10044-11770	27.90	2.56	25.34	9.17	25.86	3.04	22.82	11.77
V	11771-17923	35.55	10.01	25.45	28.15	33.23	9.92	23.31	29.86
	Total	100.00	17.12	82.78		99.61	18.28	81.33	

The percentage of aggregate family earnings received by working wives in each quintile increased from 1962 to 1971. There was almost a doubling of the percentage of aggregate family earnings received by wives in Quintile II. The increases reflect almost a 25 percent increase in the percentage of earnings received by all wives. In particular, in 1962 wives earned 14.20 percent of aggregate family earnings. By 1971, they were earning 17.12 percent of aggregate family earnings. In contrast, the percentage of aggregate family earnings received by husbands decreased from 85.81 percent in 1962 to 82.78 percent in 1971. The percentage of earnings received by husbands in each quintile decreased in the first three quintiles. The percentage of aggregate family earnings received by husbands in the top two quintiles increased.

The quintile distribution of the number of hours worked by all husband and wife families is much more equal than the distribution of their earnings. From 1962 to 1971, the percentage of aggregate hours supplied by working wives and husbands decreased substantially in Quintile I. This percentage increased in Quintiles II and III, decreased in Quintile IV, and increased in Quintile V. The percentage of aggregate hours worked by wives in each quintile increased except in Quintile I. In total, wives increased the total number of hours they supplied by 25 percent, from 15.67 percent in 1962 to 18.28 percent in 1971. Husbands, on the other hand, showed a decrease in the total number of hours supplied by them from 84.32 percent in 1961 to 81.33 percent in 1971. This was a result of percentage decreases in the total number of hours supplied by husbands, particularly in Quintile I, and in Quintile II. This percentage increased in the other three.

These estimates of hours worked are not necessarily inconsistent with those found in Table 19. Included in the quintile analysis are those families in which wives worked and the husband did not, those families in which the husband worked and the wife did not, and those families where neither worked. Otherwise, aggregate family earnings would be incomplete.

The contribution of working wives is better illustrated, however, by looking at what percentage of the earnings received or hours worked by a particular quintile came from wives. In 1962, working wives contributed 15.66 percent of Quintile I's earnings while supplying 8.87 percent of the hours worked in that quintile. In Quintile II, they again earned a sizeable portion of the earnings received by that quintile, 13.84 percent, and supplied a greater percentage of the hours worked, 14.98 percent. The percentage of earnings received and hours worked by wives in Quintiles III and IV were about half as much as the first two quintiles. The largest proportion earned and hours worked by married women was in Quintile V. Wives earned close to a third of family earnings in this quintile, 30.20 percent, and supplied 27.35 percent of the hours worked. In 1962 wives in Quintile V supplied 21 times the number of aggregate hours worked by married women in Quintile I.

In 1971, the percentage of earnings received and hours supplied by married women increased in every quintile, except for Quintile V. In this quintile a negligible decrease occurred in the percentage of hours worked by wives. The sizeable increase in these percentages in the bottom two quintiles is worthy of note, yet high income females are still supplying relatively more hours. Wives in Quintile V supply 23 times the number of aggregate hours worked by wives in Quintile I, a slight increase over 1962's estimates.

The impact of the increases in hours worked and earnings received by the wives of the top two quintiles can be illustrated using absolute and relative income dispersion measures. First, absolute income dispersion is measured by taking the mean annual earnings of Quintile V and subtracting those of Quintile I. The difference is absolute income dispersion. In 1962 Absolute income dispersion was $7,898, while in 1971 it was $13,294. Absolute income dispersion increased by $5,294. But this piece of information is worthless without a measure of whether or not Quintile I is now relatively worse off than before. This is measured by the relative income dispersion, found by taking the mean annual earnings of Quintile V and dividing it by that of Quintile I. In 1962, the relative income dispersion for all husband and wife families was 8.93; that is, Quintile V had an average family earnings level 8.93 times that of Quintile I. The relative income dispersion for 1971 was 8.97. Thus while absolute income dispersion has almost doubled, the relative income dispersion has only slightly increased. Proportionately more hours are supplied by high income wives than by low income wives, making the distribution of family earnings more disperse. The occupational distributions of married women for 1962 and 1971 are shown in Table 29. The percentages at the bottom of the table do not add up to 100 percent because many working wives are miscellaneously scattered throughout the various occupations. At most, 6 percent of the wives in any one quintile have not been accounted. Table 29 indicates that if a husband had a working wife, the chances of their family earnings level being within the boundaries of Quintile V were very good. The percentage of working wives has increased in every quintile from 1962 to 1971. In Quintile I most wives do not work. But those who do work must have full time jobs since they earned between 15 to 22 percent of aggregate family earnings going to

TABLE 29

The Percentage of Wives in Particular Occupations Within Each Quintile in 1962 and 1971

Quintile / Occupation	I		II		III		IV		V	
	1962	1971	1962	1971	1962	1971	1962	1971	1962	1971
Professional			2	3		1	1		18	25
Managers			1	1					6	8
Clerical			5	10	2	2	1	14	38	37
Sales	1	2		1	2	6	4		4	4
Craftsmen								7	1	
Operatives			6	8	1	2	8		8	9
Private Household	3	1	2	2	2	1	1	6		
Service	4	5	4	5	4	9	6		3	4
Laborers										
Farmers										
Farm Laborers			3	1						
Not in the Paid Labor Force	90	89	71	63	86	75	77	69	18	8
Total	98	97	94	94	97	96	98	96	96	95

that quintile. Although approximately 30 percent of the wives in Quintile II worked, their contributions were only 14 to 20 percent of the aggregate family earnings going to that quintile. Between 1962 and 1971 the percentage of wives who worked in Clerical and Kindred workers in this Quintile doubled. Quintile III had a tripling of the number of wives who worked in Sales workers and a doubling of the number in Service, except Private Household workers. Yet the contributions of these wives were noticeably lower than those of the first two quintiles. In Quintile IV the percentage of wives who worked increased over that of Quintile III. The percentage of wives who worked in Clerical and Kindred workers went from 1 percent in 1962 to 14 percent in 1971, the largest occupation shift. The labor force participation of wives in Quintile V was substantial. In those families in which the wife worked family earnings were greatly affected. Twenty-five percent of the wives in Quintile V were in Professional, Technical, and Kindred workers, while over 37 percent were in Clerical and Kindred workers in 1971. In short, Table 29 gives some idea of which wives are working and where.

In summary, although the Gini coefficients seem relatively stable, the percentage of aggregate family earnings going to each quintile has noticeably changed. The top two quintiles have gained at the expense of the lower three quintiles. The percentage of aggregate hours supplied by the top two quintiles has increased by .6 percent. The percentage of aggregate hours supplied by husbands has decreased .6 percent. The deficit was made up by working wives and extended by their increasing the percentage of aggregate hours which they supplied by 1.2 percent. In contrast, the percentage of aggregate hours supplied by the bottom three quintiles decreased 1 percent. Husbands supplied 2.4 percent

fewer hours and wives supplied 1.4 percent more of aggregate hours. As a result relative income dispersion increased slightly.

3.0 The Impact of Related Factors on the Distribution of Family Earnings

Having discussed the actual distribution of aggregate family earnings and the contributions made by working wives in terms of earnings and hours worked, this section further explores first the underlying distribution of all husbands' and all wives' earnings, the adjusted Gini coefficients derived by holding constant the components of Equations (1.2) and (1.3), and finally, the adjusted Gini coefficients derived by holding the related factors of Equation (1.5) constant.

3.1 Adjusted Gini Coefficients for Components of Aggregate Family Earnings

The actual Gini coefficients for aggregate family earnings as well as those for all husbands' and wives' earnings are compared in Table 30. The

TABLE 30

The Actual Gini Coefficients for Aggregate Family Earnings, $AEFAM^t$; For All Husbands' Earnings, EH^t; and For All Wives' Earnings, EW^t; From 1962 to 1971

Year	$AEFAM^t$	EH^t	EW^t
1962	.3249	.3036	.3722
1963	.3258	.3056	.3635
1964	.3225	.3029	.3635
1965	.3179	.2916	.3341
1966	.3120	.2890	.3260
1967	.3138	.2961	.3125
1968	.3113	.2978	.3049
1969	.3180	.3023	.3181
1970	.3211	.3046	.3377
1971	.3414	.3277	.3584

Gini coefficients derived from Equation (1.2) show that the distribution of all husbands' earnings are much more equally distributed than aggregate family earnings. In contrast, the distribution of all wives' earnings

are much more disperse than aggregate family earnings. The addition of wives' earnings to that of their husbands is such that the distribution of family earnings is more disperse. These are results that were anticipated from the quintile analysis and from the occupational distribution of wives.

Using Equation (1.3) to partition the annual earnings of husbands into hourly earnings and hours worked, the earnings of wives into hourly earnings and hours worked, the components of the two underlying distributions of aggregate family earnings are examined. First, the marital labor force participation rates are held constant while all else varies. The adjusted Gini coefficient for this factor held constant is substantially lower than that of the actual distribution of family earnings as shown in Table 31. The adjusted Gini coefficients holding the marital labor force

TABLE 31

The Gini Coefficient for Aggregate Family Earnings, $AEFAM^t$, the Adjusted Gini Coefficients for Constant Marital Labor Force Participation Rates, $\bar{\bar{N}}^t_{ij}$; for Constant Hours Worked Per Year, $\bar{H}$; and for Constant Hourly Earnings, $\bar{W}$; From 1962 to 1971

Year	$AEFAM^t$	$\bar{\bar{N}}^t_{ij}$	$\bar{H}$	$\bar{W}$
1962	.3249	.3249	.3249	.3249
1963	.3258	.2893	.3286	.3215
1964	.3225	.2793	.3266	.3161
1965	.3179	.2656	.3220	.3157
1966	.3120	.3041	.3220	.3050
1967	.3138	.3094	.3285	.3025
1968	.3113	.3022	.3260	.3004
1969	.3180	.2824	.3234	.3045
1970	.3211	.2450	.3243	.3082
1971	.3414	.2389	.3475	.3235

participation rates constant exhibit relatively little cyclical behavior and continue to decrease. This implies that more married women working has had a substantial disequalizing impact on the distribution of family earnings.

The adjusted Gini coefficients holding the hours worked by both husbands and wives constant is consistently greater than the actual Gini coefficients in Table 31. In Chapter 4, it was found that the relative number of hours worked between husbands and wives was increasing. Thus, H_w^t/H_h^t is decreasing and has had an equalizing impact on the distribution of family earnings. It was also found in Chapter 4 that the relative hourly earnings between husbands and wives was increasing slightly. Holding this factor constant gave lower adjusted Gini coefficients, meaning the changes that have occurred between the hourly earnings of all wives and husbands had a disequalizing impact on the distribution of aggregate family earnings.

The impact of the hours worked per year by wives and their hourly earnings can be seen by holding each one of them separately constant. In Table 32, the adjusted Gini coefficient, holding the hourly earnings of wives constant, is smaller than the actual Gini coefficients. This implies

TABLE 32

The Gini Coefficient for Aggregate Family Earnings, $AEFAM^t$; the Adjusted Gini Coefficients for Constant Hourly Earnings of Wives, $\bar{W}_w^t$; and for Constant Hours Worked Per Year by Wives, $\bar{H}_w^t$; From 1962 to 1971

Year	$AEFAM^t$	$\bar{W}_w^t$	$\bar{H}_w^t$
1962	.3249	.3249	.3249
1963	.3258	.3244	.3265
1964	.3225	.3195	.3235
1965	.3179	.3133	.3185
1966	.3120	.3082	.3134
1967	.3138	.3114	.3163
1968	.3113	.3080	.3170
1969	.3180	.3138	.3202
1970	.3211	.3147	.3215
1971	.3414	.3380	.3431

that the hourly wage earned by wives has had a disequalizing impact on family earnings. This may be the result of one in every three wives being

in Clerical and Kindred workers, an occupation of relatively low pay which helps to make the distribution of wives' earnings more disperse. Holding the hours worked per year constant for all wives resulted in adjusted Gini coefficients that were larger than the actual Gini coefficients in Table 32, The implication of which is that hours worked per year had an equalizing impact.

3.2 Adjusted Gini Coefficients for Related Factors

In order to capture the impacts of the increased relative hourly earnings between all females and males in the labor force, the decreased relative number of hours worked between all males and females, the slight increase in relative hourly earnings between wives and husbands, and the slight increase in the relative number of hours worked by husbands and wives, adjusted Gini coefficients were derived holding each related factor in Equation (1.5) constant. The actual Gini coefficients for aggregate family earnings are larger than those presented in Table 27 because the algorithm used for computation deleted more observations than that used in Equation (1.3). Table 33 has the new actual as well as adjusted Gini

TABLE 33

The Gini Coefficient for Aggregate Family Earnings, $AEFAM^t$; the Adjusted Gini Coefficients Holding ${}_iW_h^t/{}_iW_f^t$, ${}_iH_h^t/{}_iH_f^t$, ${}_jW_w^t/{}_jW_h^t$, and ${}_jH_w^t/{}_jH_h^t$ Constant, From 1962 to 1971

Year	$AEFAM^t$	${}_iW_h^t/{}_iW_f^t$	${}_iH_h^t/{}_iH_f^t$	${}_jW_w^t/{}_jW_h^t$	${}_jH_w^t/{}_iH_h^t$
1962	.3881	.3881	.3881	.3881	.3881
1963	.3848	.3856	.3851	.3842	.3862
1964	.3797	.3792	.3846	.3783	.3817
1965	.3561	.3933	.3532	.3535	.3577
1966	.3270	.3812	.3458	.3269	.3303
1967	.3316	.3759	.3346	.3331	.3339
1968	.3300	.3735	.3207	.3303	.3352
1969	.3346	.3783	.3350	.3368	.3381
1970	.3384	.3777	.3592	.3400	.3408
1971	.3633	.4004	.3852	.3652	.3660

coefficients. In Chapter 3, the relative hourly earnings between all females and males was found to be slightly increasing over time. Holding ${}_iW_h^t/{}_iW_f^t$ constant resulted in adjusted Gini coefficients that were larger than the actual Gini coefficients. Thus the increase in the relative hourly earnings between all females and males in the labor force has an equalizing effect on the distribution of family earnings.

Holding the relative number of hours constant while all else varied resulted in higher adjusted Gini coefficients than the actuals, indicating an equalizing effect. The equalizing effect of the decrease in ${}_iH_h^t/{}_iH_f^t$ is not as great as the decrease in ${}_iW_h^t/{}_iW_f^t$, since the adjusted Gini coefficients of the latter are greater than those of the former.

In Chapter 4, the relative hourly earnings between wives and husbands was found to be increasing slightly. Holding ${}_jW_w^t/{}_iW_h^t$ constant resulted in smaller adjusted Gini coefficients from 1962 to 1966 and larger adjusted Gini coefficients after 1966 than were the actuals. The reason may be that the greatest percentage increases in the relative hourly earnings between wives and husbands mainly occurred before 1965, with the largest percentage decreases after 1965, as shown in Table 20. Thus increases in the relative hourly earnings between wives and husbands has a disequalizing impact on the distribution of family earnings -- and conversely.

Finally, in Chapter 4 the relative number of hours worked by husbands and wives was found to be increasing slightly. Holding this factor constant resulted in adjusted Gini coefficients that were larger than the actual Gini coefficients. Therefore the increase in the relative number of hours worked between husbands and wives had an equalizing impact on the distribution of family earnings.

In order of importance, the increased relative hourly earnings between all females and males, W_f^t/W_m^y, had the greatest equalizing impact on the

distribution of family earnings of any of the related factors. The decreased relative number of hours supplied by all males to that supplied by all females, H_m^t/H_f^t, had a lesser equalizing impact. Of equal magnitude in equalizing the distribution of family earnings was the decrease in the relative number of hours supplied between wives who worked and whose husbands also worked. The increase in the relative hourly earnings between wives and husbands had a disequalizing impact before 1965. The relative decreases in hourly earnings between 1966 and later years had an equalizing impact on the distribution of family earnings.

All of these influences, however, were overshadowed by the increased marital labor force participation rates of married females. As shown in Table 28, working wives increased the number of hours supplied to the top two quintiles more than to the bottom three quintiles, although the proportion of hours supplied by working wives in the lower quintile has increased markedly. As a result, and despite the equalizing influences of the other related factors, the effect of the increased labor force participation of married women has been to make the distribution of family earnings more unequal.

CHAPTER 6

A SUMMARY OF FINDINGS AND CONCLUSIONS WITH SUGGESTIONS FOR POLICY AND FUTURE RESEARCH

1.0 A Summary of Findings and Conclusions

The purpose of this study was to determine how factors related to the increased labor force participation of married women and the increase itself affected the distribution of aggregate family earnings. The related factors considered were suggestions and extensions of the existing literature. They were: (1) the relative hourly earnings between all females and males, W_f^t/W_m^t; (2) the relative number of hours supplied between all males and females, H_m^t/H_f^t; (3) the marital labor force participation rates, $\underset{ij}{--}N^t$; (4) the relative hourly earnings between wives and husbands, ${}_jW_w^t/{}_iW_h^t$; and (5) the relative number of hours supplied between wives and husbands, ${}_jH_w^t/{}_iH_h^t$.

The necessary information to develop a distribution of aggregate family earnings was obtained from disaggregated occupational data. In the process several other pieces of information were analyzed. First, the ratio of aggregate female earnings to male earnings rose from .26 in 1962 to .31 in 1971. During this period the relative number of hours supplied between all males and females in the labor force, H_m^t/H_f^t, decreased from 2.47 in 1962 to 2.19 in 1971 at an average annual rate of 2.27 percent. Most of the decrease in the relative number of hours supplied was a direct result of the 2.40 average annual percentage change

in the relative number of females to males employed in the labor force. A dampened effect, however, was achieved by more females working fewer hours per week more weeks per year as compared to males.

Second, the increase in the ratio of aggregate female earnings to that of males was partially the result of relative hourly earnings between females and males, W_f^t/W_m^t, increasing slightly at an average annual rate of .71 percent. W_f^t/W_m^t was lowest in 1966 with an estimate of .66 and highest in 1965 with an estimate of .70. In general the relative hourly earnings between females and males changed very little. Underneath this stability, however, females in Farmers and Farm Managers increased their relative hourly earnings position to males at an average annual rate of 9.81 percent. Females in Laborers, except Farm and Mine workers, also made sizeable gains in relative hourly earnings with a 3.36 percent average annual percentage change. In Service workers, except Private Household workers, where over 18 percent of the female labor force was located in 1971, there was a 2.69 percentage annual increase in their relative hourly earnings to males. In contrast, 33 percent of the female labor force incurred relative losses in their hourly earnings as compared to males in Clerical and Kindred workers. This occupation had an average annual percentage decrease of .89 percent. The relative gains of the female labor force with respect to the male labor force in hourly earnings, in the aggregate, outweighed the losses. This pattern may not be permanent, since the average percentage change in the number of hours supplied by females to that of males is 3.04 percent annually in Clerical and Kindred workers, and only 1.58 percent annually in Service, except Private Household workers.

The industrial data lends further caution to the conclusion that the average annual percentage change in the relative hourly earnings

between females and males will remain positive. Relative hourly wage rates between all females and males decreased at an average annual rate of .17 percent. Given the large proportion of earnings that is wage or salary income, the increased hourly earnings between females and males may not be a continuing phenomenon.

Third, updating the Women's Bureau study on the relative annual earnings gap between females and males in the labor force also revealed a stalmated situation. Using median annual wage or salary income for full-time, year-round workers, the annual earnings gap between females and males went from 58 percent in 1962 to 60 percent in 1971. The gap was closed by at most a 2 percent increase over the 10-year period. In 1956, the Women's Bureau notes that female workers earned 63 percent of what males earned. The gap has closed very little in 15 years. A similar situation was found in computing the annual earnings gap between all females and males for all workers although the percentage was much lower.

Thus the annual earnings gap between females and males has decreased slightly because the relative gains in hourly earnings from non-farm and farm self-employment income has offset the relative losses in wage or salary income. This is partially the result of females moving into relatively higher paying occupations such as Managers, Officials and Proprietors and Farmers and Farm Managers at an average annual rate of 3.04 and 8.09 percent respectively. In addition, more females are working fewer hours more weeks per year as compared to males whose occupational structure has changed little.

Fifth, the information gained with respect to the population of all husband and wife families was of equal interest. The ratio of aggregate wives earnings to that of their husbands rose from .17 in 1962 to .21 in

1971. The reasons were: (1) the relative number of hours supplied annually by husbands to that supplied by wives, ${}_iH_h^t/{}_jH_w^t$, decreased from 5.38 in 1962 to 4.47 in 1971; and (2) the relative hourly earnings between wives and husbands, ${}_jW_w^t/{}_iW_h^t$, increased eratically from .89 in 1962 to .92 in 1971 at an average annual rate of .41 percent.

The subpopulation of all husband and wife families in which both worked showed very different results. The ratio of aggregate wives earnings to that of their husbands ranged from .43 to .47 over the period with an average annual percentage change of .44 percent. The relative number of hours supplied between husbands and wives in this group increased from 1.97 in 1962 to 2.08 in 1971, while relative hourly earnings between spouses increased like that for all husband and wife families. For H_h^t/H_w^t to increase while more and more wives are becoming employed, the number of wives taking part-time jobs has to be markedly increasing. For the ratio of aggregate hours supplied by all husbands and wives to fall either more wives are working while their husbands stay at home or more families have neither employed. In 1971 11 percent of all husband and wife families fell within these two categories.

The high correlation in hourly earnings between wives and husbands was found to be stable over time using an analysis of variance model. The two most important factors in determining the conditional probability that a wife was in a particular occupation given that of her husband was in a given occupation were female occupational opportunities and an interaction term between the wife's occupation and that of her husband. It was found that husbands in higher ranking occupations tended to have wives in related occupations -- and similarly for husbands in lower ranking occupations -- despite the fact that one out of every three wives was in Clerical and Kindred workers.

Finally, using these findings as background and as essential elements in constructing aggregate family earnings and its distribution, the following results evolved. It was found that the actual Gini coefficients between 1962 and 1971 were relatively constant while displaying cyclical movements. The Gini coefficients ranged from .3113 to .3414 over the period. Absolute income dispersion increased by $5,294 increasing relative income dispersion from 8.93 in 1962 to 8.97 in 1971. Wives in the top quintiles in 1962 and 1971 supplied approximately 30 percent of the aggregate hours in that quintile. The slight gains made by all females in the labor force, however, increased the percentage of aggregate earnings which they received for that quintile from 27 percent in 1962 to 28 percent in 1971. Wives who worked in the bottom quintiles substantially increased the number of hours which they supplied as well as the earnings which they received.

The impact of the increased labor force participation of married women was found to make the distribution of family earnings more unequal. The impact was strong enough to offset the equalizing impacts of the four related factors. The increased relative hourly earnings between females and males in the entire labor force had the strongest equalizing impact. Second in equalizing importance were the decreased relative number of hours supplied between all males and females and the decreased relative number of hours supplied between husbands and wives. Although the increased relative hourly earnings between wives and husbands did not consistently have an equalizing impact on the distribution of aggregate family earnings, in general it did.

2.0 Policy Implications

The policy implications to be drawn from the above conclusions are straight-forward. First and foremost is the enforcement of Equal Pay for Equal Work legislation; particularly in Clerical and Kindred workers. If the small yet positive average percentage changes in the relative hourly earnings had the strongest equalizing impact on the distribution of family earnings, then equalizing the hourly earning inequities between females and males would aid in equalizing this distribution. Second, day care centers or something comparable should be established freeing those wives in lower income families to work if they so choose. The increase in relative gains in family earnings at the lower extremes of the distribution as opposed to the upper extremes would decrease relative income dispersion. Such a plan would also continue to decrease the relative number of hours supplied between husbands and wives, a factor which had an equalizing impact on the distribution of family earnings also. Finally, since the increase in the relative hourly earnings between wives and husbands had an equalizing impact on the distribution, more job opportunities as proposed by Affirmative Action Programs should be encouraged.

3.0 Further Research

Originally, the population of all husband and wife families was decided upon as the core population in order to avoid the heroic assumptions that would have to be made in order to bridge the gap between a family earnings distribution and a family income distribution. The extension to bridge this gap can go in two directions. First, income other than earnings can be incorporated into the distribution. Such income would include Social Security payments, rents, dividends, interest, pensions, fringe

benefits and welfare payments. Second, those families included in the population could be extended beyond just husband and wife families. An extension in both directions -- all income and all families would bridge the gap between this study and an income distribution that really measure how well off households are. Even without such a complete income distribution, a study of an after tax family earnings distribution would undoubtedly be fruitful.

APPENDICES

APPENDIX A

APPENDIX A

Occupations	Industries
1. Professional	1. Agriculture
2. Managers	2. Construction
3. Clerical	3. Manufacturing
4. Sales	4. Public Utilities
5. Craftsmen	5. Trade
6. Operatives	6. Service
7. Private Household	7. Public Administration
8. Service	
9. Laborers	
10. Farmers	
11. Farm Laborers	

Index of Occupations and Industries

Occupations

1. Professional, Technical, and Kindred Workers
2. Managers, Officials, and Proprietors, except Farm Workers
3. Clerical and Kindred Workers
4. Sales Workers
5. Craftsmen, Foremen, and Kindred Workers
6. Operatives and Kindred Workers
7. Private Household Workers
8. Service Workers, except Private Household Workers
9. Laborers, except Farm and Mine
10. Farmers and Farm Managers
11. Farm Laborers and Foremen

Industries

1. Agriculture, Forestries and Fisheries, and Mining
2. Construction
3. Manufacturing
4. Transportation, Communication, and other Public Utilities
5. Wholesale and Retail Trade
6. Service and Finance
7. Public Administration

TABLE A

THE AVERAGE NUMBER OF HOURS AT WORK PER WEEK PER PERSON BY OCCUPATION AND SEX

Year \ Occupation	Profes-sional	Managers	Clerical	Sales	Craftsmen	Operatives	Private Household	Services	Laborers	Farmers	Farm Laborers
					MALES						
1962	44.30	50.00	40.50	40.50	41.70	42.10	26.40	41.50	35.00	52.70	42.20
1963	44.30	49.90	40.40	40.80	41.90	42.40	24.30	41.60	35.10	52.70	41.80
1964	43.30	49.50	40.00	40.40	41.80	42.20	22.90	40.90	34.90	52.30	42.00
1965	44.10	50.20	40.50	41.20	42.50	42.80	23.70	41.00	35.50	53.30	42.50
1966	44.20	49.70	40.20	40.90	42.90	42.90	21.70	40.50	35.50	53.20	41.20
1967	43.80	49.30	39.70	42.80	42.10	42.00	24.60	39.80	35.30	53.70	43.20
1968	44.00	49.00	39.70	43.00	42.30	41.80	32.10	39.80	35.90	53.70	41.70
1969	43.70	49.30	39.30	42.60	42.10	41.80	22.10	38.70	35.30	53.00	42.20
1971	42.90	48.10	39.10	42.00	41.30	41.60	27.40	38.70	35.30	54.00	42.00
					FEMALES						
1962	36.80	45.20	36.40	32.20	38.00	36.70	24.70	36.30	33.20	31.00	32.70
1963	37.20	44.20	36.20	32.20	37.30	36.70	24.60	35.40	32.20	29.60	32.90
1964	36.30	43.90	35.80	32.50	37.90	36.40	24.00	35.00	32.20	31.60	33.00
1965	36.60	44.40	36.10	32.50	37.20	37.20	24.10	35.00	34.60	33.10	33.30
1966	37.00	45.00	36.10	31.80	37.70	37.50	23.40	35.00	35.70	31.70	34.10
1967	36.40	43.60	35.60	31.30	37.80	36.50	25.30	33.80	33.70	32.50	33.80
1968	36.20	43.00	35.20	30.00	38.10	36.80	25.20	33.60	37.20	32.40	34.50
1969	36.20	42.50	35.40	30.10	36.80	37.00	24.70	32.80	36.90	34.70	34.70
1970	36.20	41.50	35.00	29.40	37.10	36.50	23.30	32.40	32.70	33.70	35.30
1971	35.70	42.20	34.90	29.80	36.10	36.40	23.90	32.50	33.00	32.60	43.30

TABLE B

THE AVERAGE NUMBER OF WEEKS WORKED PER YEAR PER PERSON BY OCCUPATION AND SEX, FROM 1962 TO 1971

Year \ Occupation	Professional	Managers	Clerical	Sales	Craftsmen	Operatives	Private Household	Service	Laborers	Farmers	Farm Laborers
					MALES						
1962	44.22	46.60	41.35	35.23	42.29	40.21	---	35.57	29.85	40.91	27.46
1963	43.77	46.99	40.51	34.95	43.18	41.14	---	35.10	30.60	40.09	27.76
1964	44.47	47.08	40.18	35.66	43.79	41.21	---	35.03	30.66	41.19	27.76
1965	43.99	47.21	40.12	36.11	44.05	40.86	---	34.94	30.92	41.21	27.58
1966	44.05	47.45	40.05	38.24	44.27	41.32	---	34.84	31.55	41.90	29.20
1967	43.75	47.09	39.98	39.21	44.65	41.43	---	34.48	31.71	41.79	29.10
1968	43.93	47.33	39.76	38.70	44.14	41.23	---	34.15	31.02	41.40	28.57
1969	44.06	47.13	38.92	38.24	43.89	40.52	---	33.78	30.46	39.32	28.37
1970	43.83	46.52	38.68	38.76	43.05	39.84	---	33.60	30.63	39.84	28.27
1971	43.52	46.51	39.28	38.83	42.80	39.82	---	33.08	30.46	40.13	28.41
					FEMALES						
1962	33.30	37.66	33.97	28.80	36.39	33.22	29.60	28.81	27.75	29.44	29.12
1963	32.65	38.02	33.83	28.27	36.50	33.50	29.69	28.89	27.50	29.80	28.86
1964	33.25	38.94	33.77	28.46	34.35	33.81	29.57	28.89	28.14	30.12	28.84
1965	33.08	38.18	33.83	28.76	35.89	34.52	30.09	28.79	29.15	30.49	28.36
1966	33.07	39.38	33.50	28.56	33.10	33.76	29.25	28.67	31.19	30.39	28.40
1967	33.84	38.10	33.74	28.80	35.77	34.38	29.29	28.82	29.44	30.57	27.73
1968	33.38	38.34	33.20	28.46	36.17	34.37	29.11	28.88	30.43	30.96	28.76
1969	33.73	38.46	33.06	28.48	36.61	33.54	29.37	28.72	28.71	29.72	28.68
1970	34.25	38.17	32.97	28.72	33.01	33.19	30.06	28.61	29.77	29.76	30.21
1971	33.97	38.18	33.20	28.61	35.12	33.97	29.57	28.85	29.18	30.69	29.07

TABLE C

THE AVERAGE NUMBER OF HOURS WORKED PER YEAR PER PERSON BY OCCUPATION AND SEX, FROM 1962 TO 1971

Year \ Occupation	Profes-sional	Managers	Clerical	Sales	Craftsmen	Operatives	Private Household	Service	Laborers	Farmers	Farm Laborers
					MALES						
1962	1958.99	2330.03	1674.85	1426.93	1763.53	1692.91	---	1476.01	1044.72	2156.16	1158.99
1963	1939.09	2344.75	1636.42	1425.92	1809.04	1744.55	---	1459.99	1074.03	2112.97	1171.69
1964	1925.46	2330.24	1607.15	1440.61	1830.54	1739.19	---	1432.83	1070.16	2154.38	1166.04
1965	1939.80	2369.70	1624.89	1487.72	1871.92	1748.68	---	1432.74	1097.60	2196.77	1172.01
1966	1946.86	2358.35	1610.00	1563.97	1899.33	1772.55	---	1411.16	1119.97	2228.89	1202.99
1967	1916.19	2321.39	1587.19	1678.03	1879.71	1740.13	---	1372.20	1119.22	2244.10	1257.13
1968	1932.88	2319.10	1578.66	1663.94	1867.06	1723.61	---	1359.20	1113.56	2223.06	1191.21
1969	1925.50	2323.37	1529.70	1628.86	1847.75	1793.84	---	1307.11	1075.29	2083.84	1197.32
1970	1919.94	2260.69	1520.30	1624.25	1795.31	1645.31	---	1280.20	1053.77	2087.59	1193.01
1971	1867.03	2237.29	1536.03	1630.82	1767.45	1656.45	---	1280.17	1075.27	2166.97	1193.02
					FEMALES						
1962	1225.29	1702.28	1236.67	927.48	1382.67	1219.18	731.00	1045.80	921.32	912.72	952.35
1963	1214.50	1680.49	1224.70	910.21	1361.49	1229.46	730.32	1022.82	885.65	882.16	952.68
1964	1206.87	1709.66	1208.83	924.86	1301.78	1230.69	709.74	1011.03	906.21	951.72	951.69
1965	1210.69	1695.25	1221.39	934.82	1335.01	1284.05	725.19	1007.57	1008.42	1009.21	944.27
1966	1223.52	1772.30	1209.53	908.08	1247.85	1265.91	684.38	1003.58	1097.85	963.42	968.33
1967	1231.88	1661.02	1201.22	901.47	1352.27	1254.84	741.16	741.16	977.42	993.66	937.17
1968	1208.19	1648.83	1168.55	853.66	1377.97	1264.85	733.55	970.21	1132.07	1003.23	992.16
1969	1221.13	1634.68	1170.33	857.31	1347.07	1240.92	725.41	942.01	1059.46	1031.12	995.14
1970	1239.96	1584.08	1153.81	844.46	1224.59	1211.33	700.36	926.82	973.52	1002.88	1066.57
1971	1212.77	1611.25	1158.81	852.55	1267.77	1236.33	706.65	937.52	962.90	1000.48	997.00

TABLE D

THE NUMBER OF WORKERS EMPLOYED BY OCCUPATION AND SEX, FROM 1962 TO 1971, IN THOUSANDS

Year \ Occupation	Professional	Managers	Clerical	Sales	Craftsmen	Operatives	Private Household	Service	Laborers	Farmers	Farm Laborers
					MALES						
1962	5425	6728	3468	3042	9045	9964	70	3700	4463	2443	2291
1963	5725	6656	3512	3020	9196	10219	65	3774	4411	2229	2232
1964	5822	6611	3585	3138	9353	10340	61	3738	4741	2272	2317
1965	5896	6398	3722	3193	9482	10756	84	3920	4664	2218	2086
1966	6466	6392	3791	2861	9984	10678	53	3915	4149	1950	1469
1967	6814	6665	3808	2823	10094	10556	68	3854	4149	1945	1616
1968	7024	6759	3780	2868	10529	10774	65	3871	4314	1860	1468
1969	7219	7118	3980	2998	10685	10779	67	3760	4513	1837	1434
1970	7191	7488	3638	3102	10455	10161	38	4789	4866	1777	1414
1971	7253	6729	3754	3360	11323	10414	42	4918	5042	1734	1444
					FEMALES						
1962	3607	1197	8906	2593	319	4546	3381	4703	173	161	1832
1963	3688	1257	9476	2635	293	4584	3283	4936	151	132	1753
1964	3899	1221	9763	2626	315	4747	3278	5085	151	163	1892
1965	4117	1250	9927	2696	264	5058	3347	5352	121	149	1486
1966	4571	1305	10615	2705	366	5392	2634	5598	158	138	1076
1967	4611	1374	11579	2739	363	5502	2426	5785	209	106	1093
1968	4845	1424	12104	2696	382	5466	2365	6246	206	108	1076
1969	5200	1446	12420	2854	389	5848	2231	6470	194	151	884
1970	5217	1684	12617	2912	463	5299	2120	6893	364	165	970
1971	5378	1567	12857	2915	459	5237	2013	7048	338	184	1018

TABLE E

THE TOTAL NUMBER OF HOURS WORKED ANNUALLY BY SEX AND OCCUPATION, FROM 1962 TO 1971, IN THOUSANDS

Year \ Occupation	Profes-sional	Managers	Clerical	Sales	Craftsmen	Operatives	Private Household	Service	Laborers	Farmers	Farm Laborers
					MALES						
1962	10627510	15676455	5808364	4340731	15951094	16868172	---	5461220	4662598	5267498	2655241
1963	11101313	15606655	5747113	4306270	16635933	17827532	---	5509998	4737566	4709817	2615205
1964	11210056	15405221	5761621	4520630	17121078	17983202	---	5355936	5073606	4894759	2701723
1965	11437040	15161358	6047848	4750289	17749526	18808749	---	5616322	5119211	4872331	2444821
1966	12588407	15074546	6103521	4474526	18962943	18927332	---	5524677	4646734	4346344	1767189
1967	13056925	15472075	6044021	4737064	18973815	18368849	---	5288450	4643633	4364783	2031518
1968	13576518	15674811	5967190	4772180	19658257	18570190	---	5261479	4803919	4134884	1748692
1969	13900166	16537737	6088199	4883332	19743184	18257933	---	4914747	4852780	3828005	1817962
1970	13806316	16928012	5530836	5038431	18769930	16718011	---	6130893	5127655	3709644	1686920
1971	13541556	15054699	5766273	5479559	20012806	17250281	---	6295863	5421505	3757528	1722718
					FEMALES						
1962	4419628	2037626	11013799	2404949	441072	5542400	2471520	4918390	159388	146947	1744704
1963	4470963	2112373	11605250	2398407	398917	5635859	2397648	5048645	133732	116445	1670048
1964	4705583	2087500	11801787	2428677	410060	5842072	2326533	5141070	142274	150371	1800594
1965	4984404	2119056	12124733	2520270	352442	6494711	2427214	5392522	122019	150371	1403185
1966	5592716	2312847	12839166	2456366	456713	6825810	1802662	5618057	173459	132952	1041919
1967	5680208	2282237	13908932	2469120	490872	6904119	1798051	5636092	204280	105327	1024321
1968	5853667	2347929	14144080	2301478	526383	6913661	1734834	6059923	233207	108348	1067569
1969	6349860	2363749	14535473	2446766	524010	7256894	1618381	6094780	205534	155698	879706
1970	6468846	2267586	14894911	2459053	566985	6418817	1484771	6388569	354359	165475	10034571
1971	6522273	2524823	14894911	2485178	581908	6474659	1422481	6607634	325460	184089	10014942

TABLE F

THE HOURLY EARNINGS RATE BY OCCUPATION AND SEX, FROM 1962 TO 1971

Year \ Occupation	Profes-sional	Managers	Clerical	Sales	Craftsmen	Operatives	Private Household	Service	Laborers	Farmers	Farm Laborers
					MALES						
1962	3.59	2.80	3.09	3.36	3.20	2.69	---	2.19	2.10	.92	.42
1963	3.80	2.98	3.21	3.60	3.22	2.76	---	2.25	2.18	.87	.47
1964	4.03	3.08	3.40	3.61	3.30	2.84	---	2.34	2.17	.96	.45
1965	3.95	3.18	3.39	3.73	3.35	2.89	---	2.40	2.20	1.20	.63
1966	4.28	3.54	3.52	3.70	3.52	3.04	---	2.41	2.30	1.37	.64
1967	4.66	3.79	3.78	3.59	3.70	3.17	---	2.66	2.34	1.19	.66
1968	4.90	4.02	4.10	3.90	3.97	3.43	---	2.69	2.38	1.20	.72
1969	5.46	4.43	4.45	4.19	4.30	3.69	---	2.82	2.31	1.44	.69
1970	5.70	4.75	4.77	4.50	4.65	3.90	---	3.22	2.63	1.46	.65
1971	6.02	5.26	4.99	4.74	4.86	4.03	---	3.06	2.71	1.53	.64
					FEMALES						
1962	3.03	1.57	2.36	1.13	1.98	1.81	.54	1.04	---	---	.31
1963	3.06	1.75	2.48	1.09	2.12	1.88	.56	1.14	---	---	.31
1964	3.36	1.74	2.59	1.23	2.18	1.94	.59	1.18	---	---	.31
1965	3.63	1.92	2.69	1.44	2.37	1.93	.82	1.12	1.89	---	.36
1966	3.47	2.04	2.67	1.44	2.51	1.97	.64	1.31	1.00	.70	.34
1967	3.70	2.34	2.78	1.50	2.34	2.17	.61	1.47	1.60	1.50	.39
1968	3.96	2.53	2.99	1.64	2.56	2.42	.64	1.57	1.74	1.09	.34
1969	4.29	2.92	3.08	1.45	2.97	2.46	.56	1.59	1.66	1.33	.34
1970	4.73	3.03	3.38	1.62	2.76	2.65	.57	1.67	2.16	1.09	.35
1971	5.07	3.27	3.53	1.62	3.07	2.72	.58	1.80	2.26	.99	.37

TABLE G

THE AVERAGE NUMBER OF HOURS WORKED PER WEEK PER FEMALE RELATIVE TO THAT PER MALE OCCUPATION, FROM 1962 TO 1971

Year \ Occupation	Profes-sional	Managers	Clerical	Sales	Craftsmen	Operatives	Private Household	Service	Laborers	Farmers	Farm Laborers
1962	.83	.90	.90	.80	.91	.87	0.94	.87	.94	.59	.77
1963	.84	.89	.90	.79	.89	.87	1.01	.85	.92	.56	.79
1964	.84	.88	.90	.80	.91	.86	1.05	.86	.92	.78	.78
1965	.83	.88	.89	.79	.88	.87	1.02	.85	.97	.62	.78
1966	.84	.91	.90	.78	.88	.87	1.08	.86	.99	.60	.83
1967	.83	.88	.90	.73	.90	.87	1.03	.85	.94	.61	.78
1968	.82	.88	.89	.70	.90	.88	0.79	.84	1.04	.60	.83
1969	.83	.86	.90	.71	.87	.89	1.12	.85	1.05	.65	.82
1970	.83	.85	.89	.70	.89	.88	0.93	.85	.95	.64	.84
1971	.83	.88	.89	.71	.87	.88	0.87	.84	.93	.60	.82

TABLE H

THE AVERAGE NUMBER OF WEEKS WORKED PER YEAR PER FEMALE
RELATIVE TO THAT PER MALE BY OCCUPATION, FROM 1962 TO 1971

Year \ Occupation	Professional	Managers	Clerical	Sales	Craftsmen	Operatives	Private Household	Service	Laborers	Farmers	Farm Laborers
1962	.76	.81	.82	.82	.86	.83	---	.81	.93	.72	1.00
1963	.75	.81	.84	.81	.85	.81	---	.82	.90	.74	1.03
1964	.75	.83	.84	.80	.87	.82	---	.82	.92	.73	1.04
1965	.75	.81	.84	.80	.81	.84	---	.87	.94	.74	1.03
1966	.75	.83	.84	.75	.75	.82	---	.82	.99	.73	.97
1967	.77	.81	.84	.73	.80	.83	---	.84	.93	.73	.95
1968	.76	.81	.83	.74	.82	.83	---	.85	.98	.75	1.01
1969	.77	.82	.85	.74	.83	.83	---	.85	.94	.76	1.01
1970	.78	.82	.85	.74	.77	.83	---	.85	.97	.75	1.07
1971	.78	.82	.85	.74	.82	.85	---	.87	.96	.76	1.02

TABLE I

THE AVERAGE NUMBER OF HOURS WORKED PER YEAR PER FEMALE
RELATIVE TO THAT PER MALE BY OCCUPATION, FROM 1962 TO 1971

Year \ Occupation	Professional	Managers	Clerical	Sales	Craftsmen	Operatives	Private Household	Service	Laborers	Farmers	Farm Laborers
1962	.63	.73	.74	.65	.78	.72	---	.71	.88	.42	.82
1963	.63	.72	.75	.64	.75	.70	---	.70	.82	.42	.81
1964	.63	.73	.75	.64	.71	.71	---	.71	.85	.44	.82
1965	.62	.72	.75	.63	.71	.73	---	.70	.92	.46	.81
1966	.63	.75	.75	.58	.66	.71	---	.71	.98	.43	.80
1967	.64	.72	.76	.54	.72	.72	---	.71	.87	.44	.75
1968	.63	.71	.74	.51	.74	.73	---	.71	1.02	.54	.83
1969	.63	.70	.77	.53	.73	.73	---	.72	.99	.49	.83
1970	.65	.70	.76	.52	.78	.74	---	.72	.92	.48	.89
1971	.65	.72	.75	.52	.72	.75	---	.73	.90	.46	.84

TABLE J

THE NUMBER OF FEMALE RELATIVE TO MALE WORKERS EMPLOYED BY OCCUPATION, FROM 1962 TO 1971

Year \ Occupation	Profes-sional	Managers	Clerical	Sales	Craftsmen	Operatives	Private Household	Service	Laborers	Farmers	Farm Laborers
1962	.66	.18	2.57	.85	.04	.46	48.30	1.27	.04	.07	.80
1963	.64	.19	2.70	.87	.03	.45	50.51	1.39	.03	.06	.79
1964	.67	.18	2.72	.84	.03	.46	53.74	1.36	.03	.07	.82
1965	.70	.20	2.67	.84	.03	.47	39.85	1.37	.03	.07	.71
1966	.71	.20	2.80	.95	.04	.51	49.79	1.43	.04	.07	.73
1967	.68	.21	3.04	.97	.04	.52	35.68	1.50	.05	.05	.68
1968	.69	.21	3.20	.94	.04	.51	36.38	1.61	.05	.06	.73
1969	.72	.20	3.12	.95	.04	.54	33.30	1.72	.04	.08	.62
1970	.73	.22	3.47	.94	.04	.52	55.79	1.44	.07	.09	.69
1971	.74	.23	3.42	.87	.04	.50	47.93	1.43	.07	.11	.71

TABLE K

THE TOTAL NUMBER OF HOURS WORKED ANNUALLY BY ALL FEMALES
RELATIVE TO THAT OF ALL MALES BY OCCUPATION, FROM 1962 TO 1971

Year \ Occupation	Professional	Managers	Clerical	Sales	Craftsmen	Operatives	Private Household	Service	Laborers	Farmers	Farm Laborers
1962	.42	.13	1.90	.55	.03	.33	---	.90	.03	.03	.66
1963	.40	.14	2.02	.56	.02	.32	---	.92	.03	.02	.64
1964	.42	.14	2.05	.54	.02	.32	---	.96	.03	.03	.67
1965	.44	.14	2.00	.53	.02	.35	---	.96	.02	.03	.57
1966	.44	.15	2.10	.55	.02	.36	---	1.02	.04	.03	.59
1967	.44	.15	2.30	.52	.03	.38	---	1.07	.04	.02	.50
1968	.43	.15	2.37	.48	.03	.37	---	1.15	.05	.03	.61
1969	.46	.14	2.39	.50	.03	.40	---	1.24	.04	.04	.51
1970	.47	.16	2.63	.49	.03	.38	---	1.04	.07	.04	.61
1971	.48	.17	2.58	.45	.03	.38	---	1.05	.06	.05	.59

TABLE L

THE HOURLY EARNINGS RATE PER FEMALE RELATIVE TO THAT PER MALE BY OCCUPATION, FROM 1962 TO 1971

Year \ Occupation	Professional	Managers	Clerical	Sales	Craftsmen	Operatives	Private Household	Service	Laborers	Farmers	Farm Laborers
1962	.84	.56	.76	.34	.61	.67	---	.48	---	---	.74
1963	.81	.59	.77	.30	.66	.68	---	.51	---	---	.65
1964	.83	.56	.76	.34	.66	.68	---	.51	---	---	.68
1965	.92	.60	.79	.39	.71	.67	---	.47	.86	---	.57
1966	.81	.58	.76	.39	.71	.65	---	.54	.43	.51	.53
1967	.79	.62	.74	.42	.63	.68	---	.55	.68	1.26	.59
1968	.81	.63	.73	.42	.65	.70	---	.58	.73	.91	.48
1969	.79	.66	.69	.35	.69	.67	---	.56	.72	.92	.50
1970	.83	.64	.71	.36	.59	.68	---	.52	.82	.75	.54
1971	.84	.62	.71	.34	.63	.67	---	.59	.83	.65	.57

TABLE M

THE MEDIAN ANNUAL WAGE OR SALARY INCOME PER FEMALE RELATIVE TO THAT PER MALE BY OCCUPATION, WOMEN'S BUREAU UPDATE, FROM 1962 TO 1971

Year \ Occupation	Professional	Managers	Clerical	Sales	Craftsmen	Operatives	Private Household	Service	Laborers	Farmers	Farm Laborers
1962	.60	.51	.67	.30	.55	.53	---	.41	---	---	---
1963	.58	.45	.62	.27	.51	.52	---	.38	---	---	---
1964	.59	.49	.62	.31	.50	.53	---	.39	---	---	---
1965	.61	.45	.61	.32	.52	.53	---	.41	---	---	---
1966	.59	.48	.60	.30	.50	.51	---	.44	.81	---	.32
1967	.59	.50	.60	.28	.52	.54	---	.45	.64	---	.34
1968	.59	.49	.57	.29	.53	.56	---	.45	.71	---	.32
1969	.59	.50	.58	.25	.53	.55	---	.45	.60	---	.42
1970	.61	.50	.59	.25	.47	.55	---	.45	.67	---	.53
1971	.63	.50	.58	.26	.51	.55	---	.48	.70	---	.39

TABLE N

THE AVERAGE NUMBER OF HOURS AT WORK PER WEEK
PER PERSON BY INDUSTRY AND SEX, FROM 1962 TO 1971

Year \ Industry	Agriculture	Construction	Manufacturing	Public Utilities	Trade	Service	Public Administration
			MALES				
1962	47.70	39.20	41.60	42.30	43.00	41.00	42.70
1963	47.60	39.20	42.00	42.30	37.60	41.10	42.70
1964	47.30	38.90	41.70	42.10	42.30	40.50	42.40
1965	48.20	39.90	42.60	43.00	42.50	40.90	42.90
1966	47.80	40.00	43.00	43.10	42.10	40.90	42.70
1967	48.20	39.80	42.80	42.90	42.50	41.50	42.50
1968	47.80	39.50	42.70	43.00	41.90	40.80	42.20
1969	47.70	39.70	42.70	42.80	41.50	41.10	42.00
1970	47.00	38.70	41.60	42.10	40.90	40.50	41.50
1971	47.30	39.00	42.00	42.40	41.10	41.10	41.90
			FEMALES				
1962	32.90	35.30	37.60	38.00	34.30	33.70	36.70
1963	32.80	34.70	37.60	37.80	34.20	33.60	37.00
1964	33.00	34.90	37.20	37.30	33.90	33.10	36.40
1965	33.30	33.40	37.90	37.50	34.00	33.50	36.90
1966	33.60	34.20	38.30	37.60	33.90	33.50	36.60
1967	33.80	35.30	37.90	36.90	33.30	33.90	36.70
1968	34.30	34.70	37.70	37.20	32.80	33.40	36.10
1969	34.70	34.50	37.80	36.80	32.50	33.60	36.10
1970	34.90	33.20	36.90	35.80	31.70	33.00	35.60
1971	34.40	34.10	37.40	36.10	31.80	34.30	36.10

TABLE O

THE AVERAGE NUMBER OF WEEKS WORKED PER YEAR
PER PERSON BY INDUSTRY AND SEX, FROM 1962 TO 1971

Year \ Industry	Agriculture	Construction	Manufacturing	Public Utilities	Trade	Service	Public Administration
			MALES				
1962	26.15	34.31	42.91	43.54	35.07	34.37	45.10
1963	25.27	35.60	43.17	43.53	34.74	34.43	45.75
1964	26.08	36.49	43.76	44.08	34.54	34.40	45.58
1965	26.21	37.20	44.01	44.22	34.20	34.78	45.85
1966	30.97	38.18	44.66	44.64	34.77	36.57	45.17
1967	30.49	38.70	44.80	44.58	35.00	36.79	45.83
1968	29.64	38.11	44.62	44.77	34.72	36.21	45.46
1969	28.56	37.68	44.20	43.86	34.01	36.81	44.32
1970	28.68	37.11	43.53	43.62	33.98	35.81	44.81
1971	29.45	36.19	43.72	43.12	33.88	35.96	45.18
			FEMALES				
1962	13.65	26.21	35.26	35.40	25.00	26.85	34.73
1963	12.33	25.47	35.99	35.89	24.70	26.61	35.81
1964	12.81	22.98	36.27	36.40	24.48	26.77	34.57
1965	14.45	19.75	36.39	37.09	24.98	26.97	33.74
1966	18.54	24.42	36.42	36.93	25.31	28.16	32.31
1967	15.85	30.64	36.87	35.67	26.47	28.81	34.15
1968	14.43	31.86	36.48	35.35	25.54	28.61	34.73
1969	16.65	31.66	35.47	35.34	24.87	28.76	34.99
1970	16.33	32.56	35.35	35.05	24.56	28.80	31.87
1971	17.29	34.66	35.90	36.38	25.31	29.20	33.87

TABLE P

THE AVERAGE NUMBER OF HOURS WORKED PER YEAR PER PERSON BY INDUSTRY AND SEX, FROM 1962 TO 1971

Year \ Industry	Agriculture	Construction	Manufacturing	Public Utilities	Trade	Services	Public Administration
			MALES				
1962	1247.25	1345.15	1785.15	1841.83	1508.00	1409.32	1925.94
1963	1202.83	1395.50	1813.19	1841.41	1306.21	1415.26	1953.37
1964	1233.48	1419.33	1825.00	1855.90	1461.16	1393.39	1932.48
1965	1263.26	1484.22	1874.98	1901.54	1453.51	1422.67	1966.86
1966	1480.21	1527.09	1920.59	1924.07	1463.97	1495.52	1928.72
1967	1469.80	1540.29	1917.60	1912.47	1487.31	1526.95	1947.84
1968	1416.93	1505.30	1905.30	1924.95	1454.68	1477.77	1918.46
1969	1362.53	1495.84	1887.50	1877.27	1411.29	1512.94	1861.54
1970	1348.03	1436.26	1810.69	1836.41	1389.70	1450.30	1859.55
1971	1392.88	1411.23	1836.36	1828.30	1392.58	1477.78	1892.96
			FEMALES				
1962	488.97	925.26	1325.84	1345.31	857.49	904.78	1274.67
1963	404.33	883.85	1353.10	1356.59	844.73	894.25	1325.09
1964	422.65	801.99	1349.13	1357.61	829.87	886.05	1258.37
1965	481.24	659.66	1379.13	1390.76	849.29	903.46	1245.07
1966	622.85	835.24	1394.73	1388.39	852.05	943.43	1182.61
1967	535.87	1081.73	1397.43	1316.09	881.45	976.54	1253.43
1968	495.10	1105.38	1375.32	1315.17	837.56	955.71	1253.70
1969	577.73	1092.20	1340.80	1300.68	808.27	966.23	1263.30
1970	569.90	1081.03	1305.34	1254.85	778.48	950.45	1134.57
1971	594.94	1181.98	1342.74	1313.49	804.81	1001.65	1222.56

TABLE Q

THE NUMBER OF WORKERS EMPLOYED BY INDUSTRY
AND SEX, FROM 1962 TO 1971, IN THOUSANDS

Year \ Industry	Agriculture	Construction	Manufacturing	Public Utilities	Trade	Services	Public Administration
			MALES				
1962	2716	4011	13855	3817	7365	7701	2737
1963	2606	4018	14395	4037	7212	7778	2798
1964	2577	4272	14563	3972	7631	8108	2741
1965	2528	4337	15142	3876	7807	8304	2674
1966	2146	4293	15613	3940	8089	8344	2935
1967	2221	4268	15619	4184	8022	8903	2943
1968	2660	4432	16004	4082	8055	8969	3301
1969	2053	4690	16387	4119	8302	9244	3332
1970	2051	4689	15634	4346	8854	9889	3162
1971	2134	5102	15232	4547	9240	10275	3204
			FEMALES				
1962	838	224	5678	894	6097	12686	1181
1963	803	198	5681	879	6146	13373	1245
1964	821	229	5801	871	6381	13764	1295
1965	781	219	6155	980	6486	14475	1350
1966	635	245	6635	2053	6938	14798	1453
1967	589	252	6913	1143	7284	14972	1566
1968	605	243	6815	1230	7264	16024	1687
1969	523	259	7253	1283	7511	16585	1690
1970	541	281	6906	1294	7928	17054	6906
1971	565	339	6721	1263	8082	17396	1499

TABLE R

THE TOTAL NUMBER OF HOURS WORKED ANNUALLY BY INDUSTRY AND SEX, FROM 1962 TO 1971, IN THOUSANDS

Year \ Industry	Agriculture	Construction	Manufacturing	Public Utilities	Trade	Service	Public Administration
			MALES				
1962	3387518	5395376	24733308	7030275	11106448	10853158	5271303
1963	3134569	5607112	26100851	7433760	9420420	11007929	5465529
1964	3178665	6063398	26577459	7371645	11150107	11297582	5296922
1965	3193511	6437048	28390906	7370375	11347557	11813820	5259393
1966	3176527	6555813	29986130	7580842	11842026	11478578	5660801
1967	3264422	6573966	29951057	8001775	11931211	13594186	5732499
1969	2797267	7015484	30930434	7732474	11716505	13982616	6202640
1970	2764816	6734629	28308300	7981056	12304430	14341980	5879886
1971	2972398	7200074	27971468	8313283	12867406	15184201	6065036
			FEMALES				
1962	376235	207258	7528140	1202708	5228102	1147862	1505391
1963	324673	175003	7686956	1192442	5191703	11958766	1649742
1964	346993	183656	7626284	1182482	5295385	12195590	1629590
1965	375849	144465	8488541	1362949	5508512	13077640	1680642
1966	395512	204634	9254054	1461976	5911535	13960820	1718327
1967	315625	272596	966040	1504289	6420459	14620739	1962874
1968	299537	268608	9372815	1617659	6084034	15314290	2114993
1969	302151	282879	9724811	1668768	6070901	16024902	2134982
1970	308317	303770	9007774	1623778	6171762	16208915	1836873
1971	336140	400692	9024526	1658937	6504471	17424767	1832622

TABLE S

THE HOURLY WAGE RATE BY INDUSTRY
AND SEX, FROM 1962 TO 1971

Year \ Industry	Agriculture	Construction	Manufacturing	Public Utilities	Trade	Services	Public Administration
			MALES				
1962	2.05	3.57	3.21	3.11	2.87	3.15	3.02
1963	2.05	3.60	3.25	3.26	3.41	3.26	3.19
1964	2.09	3.69	3.32	3.38	3.10	3.61	3.31
1965	2.34	3.75	3.40	3.48	3.26	3.73	3.42
1966	2.39	3.99	3.49	3.60	3.47	3.74	3.65
1967	2.37	4.11	3.63	3.81	3.66	3.90	3.81
1968	2.65	4.52	3.90	4.00	3.90	4.41	4.11
1969	2.94	5.07	4.27	4.49	4.29	4.62	4.61
1970	3.30	5.54	4.59	4.87	4.66	5.07	5.19
1971	3.11	5.67	4.74	5.19	4.70	5.04	5.43
			FEMALES				
1962	---	---	2.31	2.69	2.26	2.29	3.18
1963	---	---	2.27	2.72	2.33	2.36	3.17
1964	---	---	2.39	3.01	2.51	2.56	3.45
1965	2.11	4.71	2.35	2.88	2.65	2.66	3.56
1966	1.61	4.74	2.42	2.98	2.64	2.74	3.86
1967	2.23	3.62	2.60	3.37	2.66	2.84	3.80
1968	2.71	3.34	2.82	3.40	2.98	3.16	4.13
1969	2.36	3.85	3.12	3.82	3.08	3.35	4.37
1970	3.73	4.34	3.40	4.22	3.36	3.58	5.13
1971	3.35	4.41	3.42	4.22	3.34	3.87	5.07

TABLE T

THE AVERAGE NUMBER OF HOURS WORKED PER WEEK
PER FEMALE RELATIVE TO THAT PER MALE BY INDUSTRY, FROM 1962 TO 1971

Year \ Industry	Agriculture	Construction	Manufacturing	Public Utilities	Trade	Service	Public Administration
1962	.69	.90	.90	.90	.80	.82	.86
1963	.69	.89	.90	.89	.91	.82	.87
1964	.70	.90	.89	.89	.80	.82	.86
1965	.69	.84	.89	.87	.80	.82	.86
1966	.70	.86	.89	.87	.81	.82	.86
1967	.70	.89	.89	.86	.78	.82	.86
1968	.72	.88	.88	.87	.78	.82	.86
1969	.73	.87	.89	.86	.78	.82	.86
1970	.74	.86	.89	.85	.78	.81	.86
1971	.73	.87	.89	.85	.77	.83	.86

TABLE U

THE AVERAGE NUMBER OF WEEKS WORKED PER YEAR PER FEMALE
RELATIVE TO THAT PER MALE BY INDUSTRY, FROM 1962 TO 1971

Year \ Industry	Agriculture	Construction	Manufacturing	Public Utilities	Trade	Service	Public Administration
1962	.52	.76	.82	.81	.71	.78	.77
1963	.49	.72	.83	.82	.71	.77	.78
1964	.49	.63	.83	.83	.71	.78	.76
1965	.55	.53	.83	.84	.73	.78	.74
1966	.60	.64	.82	.83	.72	.77	.72
1967	.52	.79	.82	.80	.76	.78	.75
1968	.49	.84	.82	.79	.74	.79	.76
1969	.58	.84	.80	.81	.73	.78	.79
1970	.57	.88	.81	.80	.72	.80	.71
1971	.59	.96	.82	.84	.75	.81	.75

TABLE V

THE AVERAGE NUMBER OF HOURS WORKED PER YEAR PER FEMALE RELATIVE TO THAT PER MALE BY INDUSTRY, FROM 1962 TO 1971

Year \ Industry	Agriculture	Construction	Manufacturing	Public Utilities	Trade	Service	Public Administration
1962	.36	.69	.74	.73	.57	.64	.66
1963	.34	.63	.75	.74	.65	.63	.68
1964	.34	.57	.74	.73	.57	.64	.65
1965	.38	.44	.74	.73	.58	.64	.63
1966	.42	.55	.73	.72	.58	.63	.61
1967	.36	.70	.73	.69	.59	.64	.64
1968	.35	.73	.72	.68	.58	.65	.65
1969	.42	.73	.71	.69	.57	.64	.68
1970	.42	.75	.72	.68	.56	.66	.61
1971	.43	.84	.73	.72	.58	.68	.65

TABLE W

THE NUMBER OF FEMALE RELATIVE TO MALE WORKERS EMPLOYED BY INDUSTRY, FROM 1962 TO 1971

Year \ Industry	Agriculture	Construction	Manufacturing	Public Utilities	Trade	Service	Public Administration
1962	.31	.06	.41	.23	.83	1.65	.43
1963	.31	.05	.39	.22	.85	1.72	.45
1964	.32	.05	.40	.22	.84	1.70	.47
1965	.31	.05	.41	.25	.83	1.74	.50
1966	.30	.06	.43	.27	.86	1.77	.50
1967	.27	.06	.44	.27	.91	1.68	.53
1968	.29	.05	.43	.30	.90	1.79	.51
1969	.25	.06	.44	.31	.90	1.79	.51
1970	.26	.06	.44	.30	.90	1.72	.51
1971	.26	.07	.44	.28	.87	1.69	.47

TABLE X

THE TOTAL NUMBER OF HOURS WORKED ANNUALLY BY ALL FEMALES RELATIVE TO THAT OF ALL MALES BY INDUSTRY, FROM 1962 TO 1971

Year \ Industry	Agriculture	Construction	Manufacturing	Public Utilities	Trade	Service	Public Administration
1962	.11	.04	.30	.17	.47	1.06	.29
1963	.10	.03	.29	.16	.55	1.09	.30
1964	.11	.03	.29	.16	.47	1.08	.31
1965	.12	.02	.30	.18	.49	1.11	.32
1966	.12	.03	.31	.19	.50	1.12	.30
1967	.10	.04	.32	.19	.54	1.08	.34
1968	.10	.04	.31	.21	.52	1.16	.33
1969	.11	.04	.31	.22	.52	1.15	.34
1970	.11	.05	.32	.20	.50	1.13	.31
1971	.11	.06	.32	.20	.51	1.15	.30

TABLE Y

THE HOURLY WAGE RATE PER FEMALE RELATIVE TO THAT PER MALE BY INDUSTRY, FROM 1962 TO 1971

Year \ Industry	Agriculture	Construction	Manufacturing	Public Utilities	Trade	Service	Public Administration
1962	---	---	.72	.86	.79	.73	1.06
1963	---	---	.70	.84	.69	.72	.99
1964	---	---	.72	.89	.81	.71	1.04
1965	.90	1.25	.69	.83	.81	.71	1.04
1966	.67	1.19	.69	.83	.76	.73	1.06
1967	.94	.88	.72	.88	.73	.73	1.00
1968	1.02	.74	.72	.85	.76	.72	1.00
1969	.80	.76	.73	.85	.72	.73	.95
1970	1.13	.78	.74	.87	.72	.71	.99
1971	1.08	.78	.72	.81	.71	.77	.93

TABLE Z

THE MEDIAN ANNUAL WAGE OR SALARY INCOME PER FEMALE RELATIVE TO THAT PER MALE BY INDUSTRY, WOMEN'S BUREAU UPDATE, FROM 1962 TO 1971

Industry / Year	Agriculture	Construction	Manufacturing	Public Utilities	Trade	Service	Public Administration
1962	---	---	.54	.63	.45	.47	.70
1963	---	---	.52	.62	.44	.46	.67
1964	---	---	.53	.65	.46	.45	.68
1965	.34	.56	.51	.61	.48	.45	.66
1966	.28	.65	.50	.60	.44	.46	.65
1967	.34	.62	.52	.61	.43	.47	.64
1968	.36	.54	.52	.58	.44	.46	.66
1969	.34	.56	.52	.59	.41	.46	.64
1970	.48	.59	.53	.59	.40	.46	.60
1971	.41	.65	.53	.58	.41	.52	.60

APPENDIX B

APPENDIX B

The Gini coefficient is a measure of concentration that is derived from a Lorenz Curve. A Lorenz Curve is obtained by plotting the cumulative percent of some aggregate units -- in this case, all husband and wife families by their annual family earnings level -- on the horizontal against the cumulative percent of aggregate family earnings accounted for by these units on the vertical axis. An hypothetical Lorenz Curve is illustrated in Figure 1. If all families had equal earnings, the Lorenz Curve would be represented by the diagonal -- the line of equality -- in Figure 1. Lorenz Curves drawn from actual data, however, will fall below

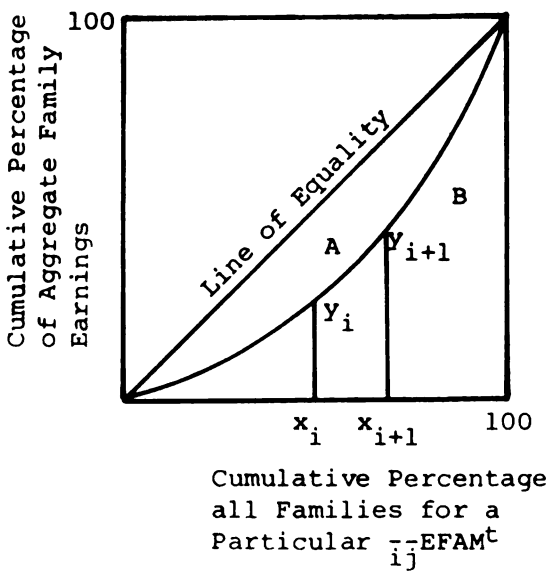

FIGURE 1

A Hypothetical Lorenz Curve for Aggregate Family Earnings

the line of equality. The greater the inequality in the distribution of aggregate family earnings, the greater the area between the line of equality and the actual Lorenz Curve. This area is represented by A in Figure 1. If B is the total area under the line of equality, then the Gini coefficient is defined as the proportion of B found in A; that is, the Gini coefficient = A/B [13, Miller, pp. 220-221]. Algebraically,

$$\text{Gini coefficient} = 1 - \sum_{\underline{\underline{ij}}=1}^{m} (x_{\underline{\underline{ij+1}}} - x_{\underline{\underline{ij}}})(y_{\underline{\underline{ij}}} + y_{\underline{\underline{ij+1}}}),$$

where m is the total number of marital labor force participation pairings, $x_{\underline{\underline{ij}}}$ represents a particular $_{\underline{\underline{ij}}}EFAM^{t}$ or family earnings level, and $y_{\underline{\underline{ij}}}$ represents the percentage of aggregate family earnings.

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"Occupation--Median Wage or Salary Income in 19__ and 1939 of Persons in the Experienced Civilian Labor Force, By Work Experience and Sex."

1969	No. 75	Table 63
1970	No. 80	Table 60
1971	No. 85	Table 60

"Industry and Race--Median Wage or Salary Income in 19__ and 1939 of Wage or Salary Workers 14 Years Old and Over, By Work Experience and Sex."

1969	No. 75	Table 62
1970	No. 80	Table 59
1971	No. 85	Table 59

"Type of Income in 19__: Families and Unrelated Individuals By Wage or Salary Income, Non-Farm Self-Employment Income, Farm Self-Employment Income, and Income Other Than Earnings, for the United States."

1962	No. 41	Table 13
1963	No. 43	Table 15
1964	No. 47	Table 15
1965	No. 51	Table 15
1966	No. 53	Table 15
1967	No. 59	Table 21
1968	No. 66	Table 32
1969	No. 75	Table 38
1970	No. 80	Table 42
1971	No. 85	Table 42

"Type of Income in 19__: Persons 14 years Old and Over By Wage or Salary Income, Non-Farm Self-Employment Income, Farm Self-Employment Income, and Income Other Than Earnings, for the United States."

1962	No. 41	Table 28
1963	No. 43	Table 32
1964	No. 47	Table 32
1965	No. 51	Table 32
1966	No. 53	Table 32
1967	No. 60	Table 16
1968	No. 66	Table 54
1969	No. 75	Table 61
1970	No. 80	Table 63
1971	No. 85	Table 63

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"Persons at Work in Non-Farm Occupations by Full-Time and Part-Time Status and Sex."

1966	Volume 13	No. 10	Table A-24
1967	Volume 14	No. 3	Table A-24
1968	Volume 14	No. 10	Table A-24
1969	Volume 15	No. 10	Table A-26
1970	Volume 16	No. 10	Table A-26
1971	Volume 17	No. 10	Table A-26

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"Occupation Group of Employed Married Women, Husband Present, By Employment Status and Occupation Group of Husband, March, 19__."

1962	No. 26	Table S
1963	No. 40	Table S
1964	No. 50	Table R
1965	No. 64	Table Q
1966	No. 80	Table Q
1967	No. 94	Table Q
1968	No. 120	Table Q
1969	No. 120	Table Q
1970	No. 130	Table Q
1971	No. 144	Table Q

"Employment Status of Married Women, Husband Present, By Employment Status and Occupation Group of Husband, March, 19__."

1962	No. 26	Table R
1963	No. 40	Table R
1964	No. 50	Table Q
1965	No. 64	Table P
1966	No. 80	Table P

[18] (continued)

1967	No. 94	Table P
1968	No. 120	Table P
1969	No. 120	Table P
1970	No. 130	Table P
1971	No. 140	Table P

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"Industry: Persons With Work Experience in 19__, By Class of Worker of Longest Job and Sex."

1962	No. 38	Table A-2
1963	No. 48	Table A-2
1964	No. 62	Table A-2
1965	No. 76	Table A-2
1966	No. 91	Table A-2
1967	No. 107	Table A-2
1968	No. 115	Table A-2
1969	No. 127	Table A-2
1970	No. 141	Table A-2
1971*	No. ---	Table A-2

"Industry of Workers With Part-Time Jobs: Persons With Work Experience in 19__, By Class of Workers of Longest Job and Sex."

1962	No. 38	Table A-3
1963	No. 48	Table A-3
1964	No. 62	Table A-3
1965	No. 76	Table A-3
1966	No. 91	Table A-3

"Wage of Salary Workers and Color: Persons with Work Experience, By Industry of Longest Job in 1967 and Sex."

1967	No. 107	Table A-3

"Industry of Wage or Salary Workers by Color: Percent Distribution by Work Experience on Longest Job in 19__."

1968	No. 115	Table A-3
1969	No. 127	Table A-3
1970	No. 141	Table A-3
1971*	No. ---	Table A-3

"Occupation: Persons With Work Experience in 19__, By Longest Job and Sex."

1962	No. 38	Table A-4
1963	No. 48	Table A-4
1964	No. 62	Table A-5

[19] (continued)

1965	No. 76	Table A-5
1966	No. 91	Table A-5
1967	No. 107	Table A-4
1968	No. 115	Table A-4
1969	No. 127	Table A-4
1970	No. 141	Table A-4
1971*	No. ---	Table A-4

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