The determinants of annual earnings and job placement alternatives for female heads of families: An overview

Author: Lynn B. Ware

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Lynn B. Ware
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Introduction

The welfare explosion in the late 1960's continues to generate social, economic, and political aftershocks. The complex issues raised by this explosion have been discussed, debated, and analyzed by practitioners of virtually every discipline. Economists and other social scientists continue to uncover its root "causes" through statistical methods fraught with "necessary assumptions" and foreign to most of the populus. Typically these discoveries, while valuable, raise more new questions than provide answers to old ones. Meanwhile, federal and state officials have dealt with the welfare crisis in a variety of more down-to-earth ways. They have tightened up on eligibility criteria, introduced mandatory work requirements, and applied themselves to more vigilant administration. Success in reducing the size and cost of one welfare program, however, has often been offset by increases in another. New programmatic solutions continue to evolve. Many of the oldest and most fiscally-burdensome programs have been centralized in Washington. Others remain state-financed and continue to gnaw away at the patience and tax base of middle America. Nevertheless, the underlying base of poverty that feeds the demand for a minimum diet of American Life has not changed since the Second World War. The need and demand for comprehensive reform remains.

The newest effort to provide a uniform, family-oriented "safety net" for the poor has recently been offered by the Carter Administration. The proposal contains provisions for a guaranteed annual income at some 65

percent of the official poverty line, mandatory work requirements for those deemed able to work, and a back-up reserve of public service jobs intended to compensate for possible failures in the private labor market. The program also offers much applauded fiscal relief to state and local governments. The Carter Welfare Reform will begin Congressional scrutiny in October 1977.

This paper looks at one fundamental hingepin of this proposal: the ability of the private labor market to provide employment and income self-sufficiency to a major segment of the potential (and existing) welfare population, female heads of families. We examine two specific issues: (1) what factors associated with this population are likely to impinge on their "success" in the private jobs market; and (2) what kind of job referral or placement strategy could improve their economic position in this market.

Measures of Labor Market Success

Labor market success is measured in terms of two outputs of labor market activities: employment tenure (expected annual hours worked) and expected annual earnings. These are analyzed as jointly determined components of an annual earnings equation. Employment tenure is derived on the basis of four jointly determined probabilities, one each for labor force participation employment status,* weeks worked per year, and hours worked per week.** The

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*Employment status is a theoretically necessary component of the annual earnings equation. Empirically, however, female heads "in the labor force" sometime during the year also were "employed" sometime during the year. Hence, the probability of employment, conditioned on labor force participation, is equal to one for the sample population examined in this study.

**The statistical models for the probability and wage equations are based on three specific economic hypotheses which relate individual characteristics of female heads of families to labor market outcomes. These

last component of annual earnings, an hourly wage rate, completes the earnings equation.

Specification of an Annual Earnings Equation

Annual earnings can be decomposed into the product of two familiar factors: the number of hours worked each year and an hourly wage rate; that is,

$$\$Y = [\text{hours worked/year}] \times [\$\text{wage rate/hour}].$$

Hours worked each year, in turn, can be split into two product terms: the number of weeks worked each year and the number of hours worked in each of these weeks.

For year-round, full-time workers like most prime age white males, the main variation in annual earnings, $Y, is due almost entirely to variation in hourly wage rates. For a population like female heads of families, however, each of these components plays an important role in determining annual earnings.

**cont. hypotheses are:

(1) A "leisure/alternative income hypothesis," included in the neoclassical economic models of "choice."

(2) An employment opportunity hypothesis included in the many structural and institutional models of the labor market behavior of firms; and

(3) An aggregate employment conditions hypothesis included in certain macroeconomic models which are concerned with the effect of relatively high levels of national, state, or local unemployment on the supply of labor hours among low-skilled potentially "discouraged" workers.

Hypothesis (1) and (3) are the basis of the labor force participation rate equations, which are not conditioned on industry and occupation characteristics. Hypothesis (2) forms the core of the wage determination models. Each theoretical model plays a role in the probability models for weeks worked per year and hours worked per week.

Figure 1:
Theoretical Components of an Annual Earnings Function

Annual Earnings Component	Labor Market Activity ("Event")	Event Value	Conditioning Labor Market Activity	Event Label
Labor Force	In labor force sometime during (survey) year	1	Unconditional	LF
	Not in labor force sometime during year	0		
Employment	Employed sometime during year	1	Labor force participation	E|LF
	Not employed sometime during year	0		
Weeks Worked	Work year-round (50 to 52 weeks)	1	Employed during year	WEEKS50+|E
	Work part-year (1 to 49 weeks)	0		WEEKS49-|E
Hours Worked	Work full-time (35 or more hours per week)	1	Employed and work year-round	HOURS35+|WEEKS50+,E
	Work part-time (1 to 34 hours per week)	0		HOURS34-|WEEKS50+,E
	Work full-time (35 or more hours per week)	1	Employed and work part-year	HOURS35+|WEEKS49-,E
	Work part-time (1 to 34 hours per week)	0		HOURS34-|WEEKS49-,E

Figure 1, cont.

Estimating Equation	Predicting Equation for Event	Population Coverage
Prob(LF)	Prob(LF)	Age Cohorts: Under 25 years 25 to 34 years 35 to 44 years 45 to 54 years
	1 - Prob(LF)	
Prob(E |LF)	Prob(E |LF)	Occupation*
	1 - Prob(E |LF)	
Prob(WEEKS50+ |E)	Prob(WEEKS50+ |E)	Occupation*
	1 - Prob(WEEKS50+ |E)	
Prob(HOURS35+ |WEEKS50+,E)	Prob(HOURS35+ |WEEKS50+,E)	Occupation*
	1 - Prob(HOURS35+ |WEEKS50+,E)	
Prob(HOURS35+ |WEEKS49-,E)	Prob(HOURS35+ |WEEKS49-,E)	Occupation*
	1 - Prob(HOURS35+ |WEEKS49-,E)	

*Occupations of female heads are defined in terms of "occupation levels" and combined into occupation groups.

Figure 1 presents the four probability components of annual hours. The specific labor market activities we examine are given next to each component. Activities are defined in terms of two possible outcomes, or "events," which are mutually exclusive. These statistical dichotomies are then assigned "event values." These values are, in effect, the dependent variables in the probability estimating equations. If one of the labor market activities involved in determining annual hours results in a "successful" outcome, we give it an event value of "1"; if not, we assign an event value of "0". "In the labor force," "employed," "working year-round," and "working full-time" are the four "successful" events in the annual hours component of annual earnings analyzed in this study.*

The predicting equations presented in Figure 1 are combined with other information about the work schedules of female heads of families to produce an "expected value" of annual hours worked.** Separate wage rate estimates

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*A specific label has been attached to each of the possible outcomes; these are presented in the next column of Figure 1. The probability equations that relate the characteristics of female heads to the outcomes of each labor market activity are then listed and are given a specific name. The form of each probability equation is: Prob("successful event"), where a successful event is an event which has an event value of one. The predicting equations for successful events are the actual equations estimated. Predicting equations for unsuccessful events are the unit complement of the equations for success. Finally, the population coverage of each component part of annual hours is given in the last column of Figure 1.

**Specifically:

$$
\begin{aligned}
E(\text{Annual Hours}) = {} & [\text{Prob}(\text{WEEKS50+}|\text{E}) \times \overline{W}_{50+} \times \\
& \{\text{Prob}(\text{HOURS35+}|\text{WEEKS50+,E}) \times \overline{H}_{35+|\text{W50+}} + \\
& (1 - \text{Prob}(\text{HOURS35+}|\text{WEEKS50+,E})) \times \overline{H}_{34-|\text{W50+}}\}] \\
& + [1 - \text{Prob}(\text{WEEKS50+}|\text{E}) \times \overline{W}_{49-} \times \\
& \{\text{Prob}(\text{HOURS35+}|\text{WEEKS49-,E}) \times \overline{H}_{35+|\text{W49-}} + \\
& (1 - \text{Prob}(\text{HOURS35+}|\text{WEEKS49-,E})) \times \overline{H}_{34-|\text{W49-}}\}],
\end{aligned}
$$

are then used to weight expected annual hours; the product, with an estimate of labor force participation rate, yields an expected value of annual earnings.

The algebra of the component model of annual earnings is illustrated in Figure 2. This diagram connects the characteristics of female heads, the characteristics of her family and her geographic location, and the kinds of occupations and industries she is associated with to each component of the annual earnings function.*

**cont.

where, $\overline{W}_{50+}$ = average weeks in year-round work schedule (51).

$\overline{W}_{49-}$ = average weeks in part-year schedule, varying by occupation

$\overline{H}_{35+|W50+}$ = average hours in full-time work schedule, year-round workers, varying by occupation

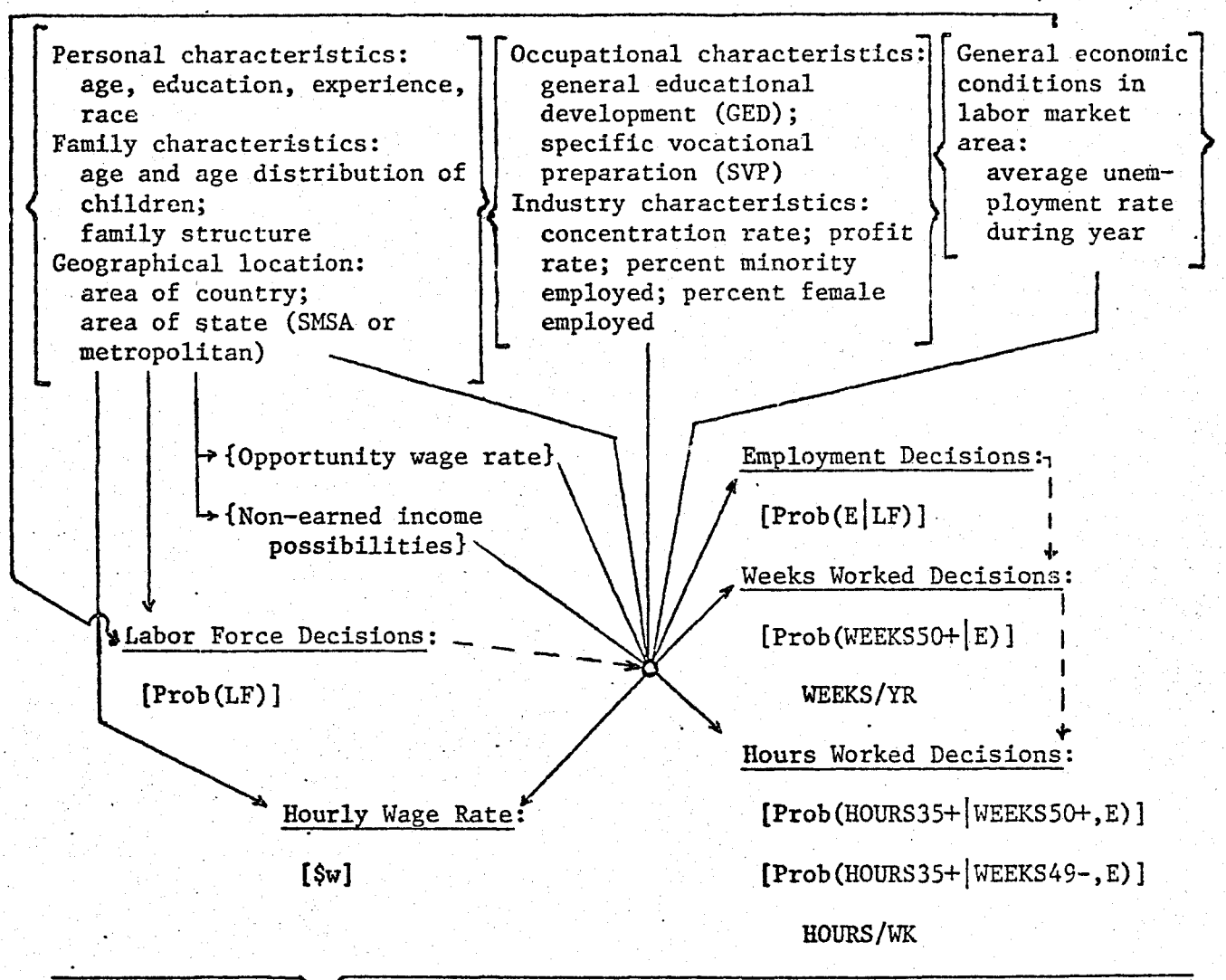
$\overline{H}_{34-|W50+}$ = average hours in part-time work schedule, year-round workers, varying by occupation

$\overline{H}_{35+|W49-}$ = average hours in full-time work schedule, part-year workers, varying by occupation

$\overline{H}_{34-|W49-}$ = average hours in part-time work schedule, part-year workers, varying by occupation

*In estimating the components of the model in Figure 2 we have tried to distinguish between those factors which are likely to affect "voluntary" decisions about labor market activities and "involuntary" decisions that arise as a consequence of decisions made by firms and industries. The former may be responsible for female heads of families wanting to work part-year or part-time, or possibly, not at all. The latter may be responsible for female heads only being able to work part-year or part-time. The size of the family headed by the female, the age distribution of children in her family, and her relationship to related families living in the same household (family structure) affect voluntary decisions about labor force participation, weeks worked per year, and hours worked per week. The many forms of market "imperfections" a female encounters in the labor market, including wage discrimination and the crowding of women into typically low-paying, high turnover occupations and industries, create "involuntary" decisions that affect labor market outcomes.

Figure 2:
Annual Earnings and its Relationship to Characteristics of Female Heads of Families



[Expected Annual Earnings:]

$$\$Y = Prob(LF) \times Prob(E|LF) \times WEEKS/YR \times HOURS/WK \times \$w$$

{ } = conditioning variable

[ ] = equation to be estimated

----- = conditioning labor market activity

In this study we examined annual earnings equations for five consecutive years, 1970 through 1974, based on data contained in the Current Population Surveys (CPS) for 1971 through 1975. Individual components of annual earnings were estimated for each year.

Expected Annual Earnings

Table 1 presents estimates of the expected level of annual earnings based on the joint annual earnings equation. Also shown are the three principal components of annual earnings: Prob(LF), Annual Hours (employment tenure), and Hourly Wage Rate.* Separate sections are given for each age group and are classified by age distribution of children.

In general, (1) labor force participation rates, (2) expected annual hours worked, (3) expected hourly wage rates, and, hence, (4) expected annual earnings, all increase with the age of female heads of families. From 1971 through 1974 annual hours worked decline around 50 to 100 hours between 40 year old female heads and 50 year old female heads. This decline then translates into a $100 to $400 decline in expected annual earnings, despite a small increase in hourly wage rates and, at times, an increase in labor force participation rates. This decline in annual earnings is consistent with a bow-shaped earnings profile which apparently has reached its apogy among female heads before the age of 54, principally because of fewer hours worked per year.

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*These estimates are taken at the midrange of the continuous explanatory variables which were statistically significant in the component equations of annual earnings. These are: educational attainment = 12; non-wage income = $2500; opportunity wage rate = $2.75; SVP = 3.5; market power factor = .31; percent minority employment = .38; profit rate = .08; and average unemployment rate = .05. Age is set at 20 years for female heads under the age of 25; 30 years for 25 to 34; 40 years for 35 to 44; and 50 years for 45 to 54. Experience = age - education - 5 years preschool.

Table 1:
Midrange Evaluations of Annual Earnings Equations*

	1970		1971		1972		1973		1974	
Age Distribution of Children:	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Under 25 Years										
Prob(LF)	.6386	.6386	.6028	.6028	.5914	.5914	.7401	.7401	.7198	.8252
Annual Hours	708	1227	642	918	384	689	521	713	594	820
$Wage Rate	$2.50	$2.50	$2.62	$2.62	$2.85	$2.85	$2.69	$2.69	$3.04	$3.04
$Earnings	$1128	$1955	$1016	$1451	$ 647	$1161	$1038	$1419	$1303	$2059
25 to 34 Years										
Prob(LF)	.5912	.7442	.7190	.8398	.6594	.8125	.7334	.8594	.6333	.7794
Annual Hours	708	1227	890	1183	777	1198	824	1052	849	1103
$Wage Rate	$2.74	$2.74	$2.85	$2.85	$3.00	$3.00	$3.07	$3.07	$3.39	$3.39
$Earnings	$1147	$2502	$1821	$2826	$1540	$2923	$1855	$2775	$1825	$2916
35 to 44 Years										
Prob(LF)	.8267	.8267	.5858	.7601	.7222	.8640	.5667	.7949	.5158	.7626
Annual Hours	708	1227	967	1257	998	1415	952	1181	928	1183
$Wage Rate	$2.90	$2.90	$2.99	$2.99	$3.12	$3.12	$3.31	$3.31	$3.64	$3.64
$Earnings	$1698	$2942	$1697	$2862	$2248	$3814	$1788	$3109	$1743	$3285
45 to 54 Years										
Prob(LF)	.7909	.7909	.7670	.7670	.7743	.7743	.4283	.7427	.7856	.7856
Annual Hours	708	1227	857	1150	938	1360	866	1095	808	1060
$Wage Rate	$2.98	$2.98	$3.07	$3.07	$3.19	$3.19	$3.42	$3.42	$3.79	$3.79
$Earnings	$1666	$2888	$2020	$2709	$2321	$3365	$1267	$2778	$2406	$3155

*In primary family households, in SMSAs in the Northeast Region, at area average unemployment rate = .05, with a high school level of education.

(1) = One or more own children under age 6; (2) = all own children over age 5

We also note a rather substantial difference between the expected values of labor force participation rates (10 to over 30 percentage points) and expected annual hours (200 to 500) when the age distribution of children was a statistically significant determinant of these two labor market activities. Further, within each age group we see a steady increase in the estimated hourly wage rate over the five year survey period, ranging from an increase of 50 cents per hour for female heads under 25 years of age to 80 cents per hour for female heads between the ages of 45 and 54. In any given survey year, hourly wage rate estimates rise with increases in labor market experience between younger and older female heads. The rate of increase does slow down, however, when we reach the 45 to 54 year group. Expected values of the other components of annual earnings exhibit no year-to-year pattern, regardless of age of female heads. With the exception of money wage rates the tangible results of labor market activities that generate annual earnings seem quite variable over time.*

A detailed analysis of the estimating equations that determine the annual earnings estimates in Table 1 suggest that there are many characteristics of female heads that will impinge on their employment tenure and annual earnings potential in the private jobs market. The results of this analysis are presented for personal and geographic characteristics, for family characteristics, and for occupation and industry characteristics. A perspective summary follows.

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*Some of this year-to-year variation is due to underlying changes in the characteristics of the population of female heads; another portion is due to variation in the sample coverage of the population by the Current Population Survey.

Personal and Geographic Characteristics

Educational attainment:* Years of schooling completed had its most significant impact on the labor force participation and hourly wage rate components of annual earnings. In the participation rate equations, female heads under the age of 25 who had completed any schooling beyond the eighth grade would have expected a participation rate some 15 to 23 percentage points higher than women who finished only a grade school level or less. This increase was typically greater among female heads in the Northeast, among female heads with some children under the age of six, and among female heads living with related families.

Among female heads between the ages of 25 and 34, completing a high school degree would typically increase their labor force participation rates by 15 to 25 percentage points; completing additional years would add another five to 16 points. As among younger female heads, the impact of education would be greater in the Northeast and among women with preschool age children.

Female heads over the age of 35 would also have higher expected labor force participation rates after the completion of additional years of schooling. Schooling beyond eighth grade, for example, would typically add some 20 percentage points to the participation rates of women between 35 and 44 and about 15 points to participation rates among women over 44.

One year increases in educational attainment were also associated with seven to 13 cent per hour increases in hourly wage rates over the period 1970 to 1974. The most striking changes, however, were associated with the completion of specific programs: completion of high school, for example, would typically add over 20 cents per hour, compared with hourly wage rates among high school dropouts. Completing years 13 through 15 would increase hourly wage rates by another 23 to 53 cents per hour; and the completion of college, another 51 cents to over $1.00.

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*There was a six point decline in the percent of all female heads in the five CPS samples who completed less than nine years of formal schooling during the survey period 1970 to 1974. The percent completing between nine and eleven years also declined slightly. The number of female heads completing high school or more was on the increase: between 83 and 86 percent of female heads had completed at most a high school degree and 14 to 17 percent had completed some kind of schooling beyond high school.

Educational attainment was also significant in some of the full-time hours worked probability equations, but change in hours worked per week associated with changes in education completed were marginal at best.

Experience: Years of labor market experience (proxied by age minus education completed minus 5 years preschool) were significant in the combined and occupation group two samples for weeks worked per year, and in the hourly wage rate equations.* Relative to other explanatory variables, changes in experience would not be associated with substantial changes in the number of weeks a female head would expect to work during a year, nor in the hourly wage rate. A ten year increase in experience, for instance, would add only a week to expected weeks worked per year and at most a few cents to hourly wage rates.

Opportunity Wage Rate: The wage rate a female head expects to receive in the labor market is hypothesized to affect her willingness to supply labor hours.** Opportunity wage rates were significant in the year-round weeks worked probability equations for the combined occupation sample in each survey year and for occupation groups two and three in most years. Variation in potential wage offers was one of the most powerful characteristics of female heads affecting weeks worked per year. A $1.00 to $2.75 increase in the wage offer, for example, would typically be associated with between four and seven additional weeks worked per year among female heads in the combined sample and four to nine additional weeks worked per year among female heads in occupation groups two and three, the middle skilled occupations. A further increase, from $2.75 to $4.00, would add another three to six weeks per year among women in the combined sample and six to ten weeks among women in the occupation specific samples. The impact of these changes would be larger among female heads with some young children in their family; that is, it would take a higher wage offer to induce female heads with some young children to work the same number of weeks per year as women whose children are all school age or older.

Non-wage Income Alternatives: Income received from other than labor market sources, such as welfare assistance or alimony and contributions from other family members, also affects the willingness of a female head to enter the marketplace, to work year-round, and to

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*Occupation samples are defined below, see: Specific Vocational Preparation.

**Opportunity wage rates were estimated for each female head, based on personal, family, and geographic characteristics. See Lynn B. Ware, The Determinants of Annual Earnings and Job Placement Alternatives for Female Heads of Families, Appendix A, Section V, SWRRI Publication No. 47, August 1977.

work full-time.* In the labor force participation rate equations the sensitivity of participation rates to increases in non-wage income declined dramatically with the age of female heads. Increases, for example, from $1000 to $2500 would be associated with eight to 16 percentage point declines in participation rates among female heads under 25 years of age, but only four to five percentage point declines among female heads over the age of 44. Participation rates would decrease another nine to 18 percentage points for a $2500 to $4000 increase in non-wage income among the under-25 age group, but by less than six percentage points for the over-44 group. The impact of variation in non-wage income was greatest in the Northeast, among women living with related families, and among female heads whose children were not all of school age.

The impact of these same dollar changes in non-wage income expected weeks worked per year were noticable, though small compared to changes in other variables: one to three weeks per year among the least skilled workers in occupation group one and two to five weeks per year among the more highly skilled. Its impact on hours worked per week was insignificant.

Age: As an independent, explanatory variable, the age of female heads was significant only in a few of the full-time hours worked probability equations, but variation in age produced only small changes in expected hours worked per week. The labor force participation rate equations are, of course, conditioned on age.**

Region of Country:*** Regional differences affect labor force participation rates and hourly wage rates. We found that female heads living in the Northeast, regardless of age, would have expected a participation rate some eight to 22 percentage points lower than

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*Non-wage income is the larger of the potential AFDC grant, or income from non-earned sources, such as alimony, child support, or net rental income. See Appendix A, Section V, The Determinants of Annual Earnings and Job Placement Alternatives for Female Heads of Families, op. cit.

**Over the survey period 1970 to 1974, there was a five percentage point increase in the percent of female heads under the age of 25 (9.8 to 13.3 percent), a four percentage point increase in the percent of female heads between the ages of 25 and 34 (19.7 to 23.0), and declines in the percent of female heads between the ages of 35 and 44 (20.4 to 19.8) and 45 to 54 (20.5 to 17.5). These four age groups, or cohorts, form the sample base for the age-specific labor force participation rate equations.

***About one-half of all female heads in the CPS sample resided in the Northeast and North Central regions; another third resided in the South. Over the five sample years there was a slight decline in the relative number of female heads in the Northeast region (26.1 to 24.1), a slight increase in

female heads living in other regions. The participation rates of female heads living with related families would be at the high end of this range, some 11 to 22 percentage points lower in the Northeast. Primary families in the Northeast would have participation rates some eight to 18 percentage points lower. Regional differences were also relatively larger among female heads with younger children. (Regional differentials in participation rates between the Northeast and South and other regions were also noted.)

Regional differences were also significant in the hourly wage rate equations. All other variables constant, a 35 to 38 cent lower wage rate would be expected among female heads living in the South compared to female heads in other regions of the country.

SMSA:* Whether or not a female head resided in a large economic area also affected her expected hourly wage rate, principally due to differences in the availability of jobs and transportation. The hourly wage differential would amount to 20 to 30 cents per hour higher in SMSA's relative to outlying areas.

Area Unemployment Rates: Aggregate economic conditions were proxied in the participation rate, weeks, and hours worked equations by an annual average unemployment rate in the labor market area of the female head. The effect of higher area unemployment was picked up in a few of the participation rate equations and a few of the weeks and hours worked equations. Empirically, its impact on this population would be minimal.

Family Characteristics

Age Distribution of Children:** Virtually all female heads under the age of 25 had at least one child under the age of 6.*** Women over

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***cont. the West (15.4 to 17.1 percent), and no change in the South (17 to 18 percent).

*There was very little difference in the SMSA (73 percent) and metropolitan (43 percent) sample frequencies over the survey period.

**Sixty to 64 percent of families headed by females included at least one own child (never married) under the age of 18. There was a noticable increase in the percent of female headed families which included children who were all under the age of six (20.7 to 25.7 percent). In contrast, there was a four percentage point decline (59.3 to 55.9) in the percent of families which included children who were all over the age of five (i.e., 6 to 17 years).

***One of the controlling variables in each estimating equation was that a female headed family must contain at least one child under 18 years of age and hence meet one eligibility criterion for AFDC assistance.

the age of 44 typically had all children who were all over the age of five. There was only scant evidence that age distribution of children within these families would affect individual participation rates: women with all young children would have a lower average participation rate compared to women with all older children. For female heads between the ages of 25 and 44, however, specific ages of children would be associated with sizeable differences in individual participation rates. Female heads between the ages of 25 and 34, for example, whose children were all over the age of five, would expect a labor force participation rate some 12 to 15 percentage points higher than a female head who had at least one child under age six in her family. The differential in participation rates increases to between 17 and 25 percentage points for female heads between the ages of 35 and 44. The effect of age distribution of children on labor force participation rates is larger among female heads living in the Northeast and among female heads living with related families.

Specific ages of children also play a substantial role in determining the number of weeks a female head can expect to work each year. This characteristic was significant in each survey year for the combined occupation sample equations and generally for each of the occupation-specific equations. Female heads with school age children would expect to work between three and six more weeks per year than would female heads with at least one preschool age child in the family.

Age distribution of children plays only a minor, and inconsistent, role in determining the number of hours a female head will likely work per week.

Family Structure: Whether or not a female head had established a primary (independent) household, or was living with related families, was a determinant of labor force participation rates only among younger female heads. It was not significant in the weeks worked or hours worked equations. The fact that a female heads was living in a primary household would be associated with an eight to 16 percentage point increase in her labor force participation rate compared to a female head with identical characteristics living with a related family. This characteristic was not significant among older female heads, primarily because nearly 90 percent of these women had established independent households.

Occupation and Industry Characteristics

Specific Vocational Preparation: Our principal index of occupational differences, Specific Vocational Preparation (SVP), measures training time needed to reach average proficiency on the job.*

We hypothesized that increases in training time should be associated with increases in job tenure and hourly wage rates. The impact of occupational differences in the weeks worked probability equations suggests that increases in training time between jobs in the middle skill levels (occupation group two) and the upper middle skill levels (occupation group three) would add some two to four weeks to annual weeks worked. Increases in training time between the least skilled occupations (group one) and the middle skill jobs produce at most a one week increment to weeks worked per year. Variation in SVP in the hours worked

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*Similarities in occupations are based on two measures of average occupational training requirements: GED (General Educational Development) which measures the degree of basic knowledge required to adequately perform a job, and SVP, which measures training time specific to a job. Based on these two measures, specific occupational titles were grouped into seventeen occupational levels, ranging from those with low GED and low SVP (occupation level one) to those with highest GED and SVP requirements (occupation level seventeen.) [See Lynn B. Ware, "Employment Probability Analysis Project: Selected Occupational Characteristics for 1970 Census Occupational Titles: Data, People, Things, GED, SVP, and Occupational Level," SWRRI Publication No. 40, December 1976.] Due to small sample sizes for many of these occupation levels we aggregated individual occupational levels into three occupation groups. Within each occupation group GED requirments are the same; SVP requirements increase with occupational levels within each group. The number of female heads in these three occupation groups are the sample bases, before exclusions for other data availability, for the probability equations for weeks worked and hours worked, and the hourly wage rate regressions. The sample sizes and GED/SVP boundaries are listed in the following table:

Number of Female Heads of Families by Occupation Groups

	Year				
	1970	1971	1972	1973	1974
Occupation Group One: GED=1.0-2.4 SVP=1.8-4.8 Occupation Levels= 1 to 3	340	295	332	342	382
Occupation Group Two: GED=2.5-3.4 SVP=2.0-8.0 Occupation Levels=4 to 9	1407	1370	1293	1341	1340
Occupation Group Three: GED=3.5-4.4 SVP=3.0-8.0 Occupation Levels=10 to 14	791	799	826	830	909
Combined Sample: Occupation Levels One to Fourteen	2538	2464	2451	2513	2631

probability equations have only a marginal impact on annual hours worked.

One point increases in the occupational index would be associated with between 16 and 23 cent per hour increases in expected hourly wage rates. Occupational shifts between lower skilled and middle skilled jobs would typically add about 20 cents per hour to the wage rate; shifts between the middle and upper middle skill jobs, however, would add between 45 and 51 cents per hour.

Market Power: The concentration of product demand among relatively few producers is hypothesized to affect both employment tenure and hourly wage rates.* Market power, or concentration rate, was significant in virtually all of the weeks worked probability equations, regardless of occupation, and in many of the hours worked per week probability equations. It was also significant in each of the combined sample equations for hourly wage rates.

In the year-round weeks worked equations the expected difference in weeks worked per year between otherwise identical female heads, one which worked in a highly undifferentiated, competitive industry and another who worked in a highly monopolized industry, would be between four and seven weeks. It is more important, however, that female heads work in highly concentrated industries, relative to the market average, than in average concentrated industries, relative to competitive ones.

Expected hourly wage rate differentials exhibit this same pattern: women employed in an average rather than low concentrated industry would expect 10 to 25 cent per hour higher wage rates; working in highly concentrated, rather and average concentrated, industries would add between 20 and 48 cents per hour.

Among the three industry measures consistently significant in the probability equations for weeks and hours worked, the concentration rate of industry had the most uniformly powerful impact on job tenure and, hence, annual earnings.

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*The market power factor, or concentration rate, is the ratio of sales by the largest firms in an industry (ranked by size of assets) to all sales in the industry. This ratio rises as an industry becomes dominated by a few firms which hold the predominant share of product demand. The higher the market power factor (approaching one), the more likely the industry is in a primary labor market and, as such, provides stable working conditions--in terms of expected job tenure and hourly wage rates.

Percent Minority Employment:* The social characteristics of co-workers had a minor impact on the number of hours a female could expect to work each week; it was never significant in the weeks worked per year probability equations. Its impact on hourly wage rates, however, was substantial. Female heads who worked in industries with virtually all white males would expect average hourly wage rates some 35 to 46 cents per hour higher than identical women working in an industry with an average proportion of women and nonwhite (i.e., minority) workers. The same hourly wage rate differential was also noted between industries which employ an average proportion of minority workers and industries which employ a relatively large number of women and nonwhites. The net impact on hourly wage rates could be as large as 75 to 90 cents per hour, depending on the kind of industry in which a female head finds employment.

Profitability:** Profit rates were significant in some of the occupation specific equations for year-round weeks worked and full-time hours worked. When significant, variation in profit rates tended to produce substantial changes in both weeks and hours worked. The overall impact of profitability on expected annual earnings, however, was small relative to the impact of industry concentration and percent minority employment.

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*Percent minority employment is used to proxy "crowding effects" on wage rates and the stability of employment in industries which are dominated by women and nonwhite workers relative to industries which employ mainly white males. It is hypothesized that as the degree of crowding increases wage rates will be depressed due to excess supply and hours worked per year will decline due to increased turnover, both voluntary and involuntary.

**The measure of profitability is an average of annual profit rates for industries over the five year period 1968 to 1972, the latest dates for which data were available. These averages proxy long-run profitability and measure economic variables like "ability to pay" used in wage negotiations. See Lynn B. Ware, "Employment Probability Analysis Project: Industry Characteristics Data for 1970 Census Industry Titles: 'Market Power Factor,' and Annual and Average Profit Rates," SWRRI Publication No. 41, January 1977.

Summary of Specific Findings

The foregoing, abbreviated summary of specific findings makes it rather clear that the relationships between individual characteristics of female heads and their successful labor market outcomes are complex phenomena. We have found year-to-year variation in the impact of many of these characteristics; we also note considerable variation in the impact of a given characteristic, depending on age or occupation. There are a few factors, however, which stand out in terms of their potential to make the labor market a viable alternative to public assistance, or minimally, to make this reliance a shorter term proposition relative to wage earning activities.

First, the impact of family structure, age distribution of children, and non-wage income alternatives on the willingness of female heads to enter into labor market activities all diminish with age. Older female heads are more likely to establish independent households, are more likely to have only school age children in their families, and are less likely to respond to the availability of non-wage alternatives as a substitute for labor market earnings. These factors, through their labor force participation rates, all tend to increase the likelihood that older female heads will enter the private jobs market and place a greater reliance on its outputs--employment and earnings.

This consistent findings points up, of course, the potential difficulties in successful job search and referrals among younger female heads. As a group they are more likely to reside with related families, are more likely to have one or more preschool age children, and are more likely to respond

to non-wage alternatives to labor market activities. As such, the labor market, and employment related activities in general, make up a smaller portion of their annual "time budget."

With the exception of the level of non-wage income, which may be wholly determined by federal and state legislatures, few of these factors are immediately amenable to national manpower or job referral strategies. Increasing the amount and perhaps quality of day care services could free up more time for the labor market; this additional time could be spent in wage earning activities; and this could in turn decrease their overall reliance on related families and responsiveness to non-wage income alternatives.

Younger female heads would, nevertheless, enter the marketplace with relative little general experience, relatively few job-related skills, and relatively lower educational attainment, expecially post-high school degrees of training credentials. The amount and quality of job skills and experience, but especially the kinds of occupations and industries where these young women will become employed, will remain major hindrances to employment tenure possibilities and relatively high wage rates. These problems are shared, we also find, by virtually every other age group.

Second, the presence of young children in the family also affects the potential number of hours worked per year among female heads of all ages. Our history supports the notion that child care is provided by parents, or at least by relatives. Whether day care services could replace this personal bond between mother and child for at least part of the day and assume an institutional role in the lives of female heads and their children

is yet to be determined. To date the principal role of day care seems to be related to "early education" of children and socialization, not to the labor market aspirations of female heads or the employment goals of manpower and welfare administrators. The extent to which the Carter Proposal's cash allowances for child care will increase the number of weeks female heads will work each year is empirical. It is probably fair to say that this one portion of the plan would have a salutory impact. Among many female heads, particularly the young, expected earnings will still fall short of the ratably-reduced national income floor.

Third, as a whole female heads are not a year-round, full-time aggregate of workers. Some of the reasons for this are related to the channeling of women into socially-sanctioned, lower skilled jobs and into relatively competitive, unconcentrated industries which are often highly impacted with other women and nonwhite workers. The findings of this study reaffirm the major roles that these kinds of institutional factors play in distributing annual hours and hourly wage rates, in this case, among female heads of families. Further, within the low-skilled, undifferentiated portion of the labor market that is most accessable to female heads, the disincentive effect of lower wage offers (opportunity wage rates) is a most powerful factor in further reducing the number of hours female heads are willing to bring to the marketplace each year. When combined with lower earned wage rates associated with fewer skills and unconcentrated, minority employment industries, the potential for increasing annual earnings much above the level of the public dole is also clearly diminished.

The importance of these institutional constraints within the labor market cannot be minimized. These factors are well beyond the control of individual women and have remained more or less immune to progressive legislation at the federal level. The provision of public service jobs at a national minimum wage rate will, of course, smooth over many of these institutional constraints. Once the legislated period of employment in these jobs has elapsed, however, these same women will return to the same private jobs market. This market remains the key to employment tenure and adequate long-run earnings. The job referral guidelines we now examine are rooted in this economic and social environment. They illustrate some alternatives in the private market, while pointing out again the handicaps shared by most female heads of families who enter, voluntarily or as a condition of public support.

A Guideline for Job Referral

The job referral guidelines we examine here have two related purposes: first, they enable both job seekers and placement officials to determine the kinds of alternatives available in the labor market and the tradeoffs that are implicit among them. Given job openings, job referrals based on these alternatives can be made so as to improve on the overall "success rates" of job search and placement efforts. Second, these guidelines indicate rather clearly the negative implications for clients and officials alike of job referrals in certain sectors of the labor market where employment tenure and expected annual earnings will not provide an unsupplemented source of family income.

Job placement guidelines are presented in the form of "Job Placement Tables." Each table specifies certain personal, family, and geographic characteristics of a particular female head, along with the wage rate she expects to find in the marketplace, the annual level of non-wage income she expects from public assistance or other non-earned income sources, given her family size and the like, and the prevailing area unemployment rate. Placement alternatives are given for this female head in the form of a table which gives an estimate of employment tenure (expected annual hours), expected hourly wage rate, and expected annual earnings for various occupation and industry alternatives. Annual earnings, of course, is the principal index of labor market success we examined in this study. We examine employment tenure, hourly wage rate, and annual earnings expectations for seven different occupations, using SVP as the occupation index, and thirteen different (aggregate) industry alternatives.

The hypothetical situation underlying the presentation of placement alternatives in table form is the following: a job placement official (welfare or Division of Employment Security) is faced with a client desiring to return to work or to find a better job. The official will ask certain questions about her personal and family characteristics, previous labor market experience, and her wage and non-wage income alternatives. Wage alternatives are stated in terms of an hourly wage rate and may refer to her current job, or, possibly, to an average wage rate during her last several jobs. Non-wage income alternatives may depend on her current welfare eligibility and grant, or other sources of income, such as alimony, child support, or support from members of related families. Together with data on the prevailing unemployment rate in her labor market area, this information could be fed into a computer terminal. The "output" is her own expected labor force participation rate, expected annual hours, expected wage rate, and expected annual earnings for alternative occupations and industries.*

Occupation and industry alternatives, we shall see, depend on specific labor markets. In some regions of the country some of the industry alternatives presented here may not exist. Since some of the occupation alternatives are tied to industries, they too may be unavailable choices. Further, even among industries located in her labor market area, there may be none with current job openings for any occupation. Hence, the preliminary examinations of job placement alternatives by job seekers and placement officials may have to be tempered with local labor market data on job availability. We look at specific examples of these adjustments later in this section.

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*Placement tables in this section are based on the 1974 estimating equations.

Table 2 is a single example of the kind of placement guideline that can be produced on the basis of the annual earnings function estimated in this study and on the foregoing scenario of information gathering. In this placement table we have a 30 year old female head of a primary family who lives in an SMSA in the Northeast. She has completed a high school degree and has thirteen years of general labor market experience. All her children are over the age of five. The prevailing unemployment rate in her labor market area is five percent. She would expect to receive $2500 during the year in non-earned income from non-family members or public assistance. And based on her labor market experience to date, she would expect a wage rate of $2.75 per hour.

The first measure of labor market activity in the placement table is her expected labor force participation rate, .78. This estimate is based on her age-specific participation rate equation using information about her personal, family, and geographic characteristics. Unless she is currently in the labor force, each of the annual earnings estimates in this table must be weighted by this participation rate estimate. As is, these estimates are conditioned on female heads who are in the labor force.*

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*This points up an important statistical, or sampling, feature of these placement guidelines. Namely, each table should be interpreted in terms of the expected outcomes of a large number of job referrals among female heads with the characteristics given at the top of the table. On average, among many female heads identical to the woman shown in Table 2, we would expect that about 78 percent will be in the labor force sometime during the year. Another 22 percent, on average, will not. There is, therefore, only a 78 percent chance that these earnings estimates will actually pan out. Similarly, individual estimates of expected annual hours, hourly wage rates, and annual earnings should be interpreted as overall averages among many identical female heads. Some women with these characteristics will find these individual estimates lower than actual; others will find them higher. With this caveat in mind we continue to refer to a placement guideline for "a" female head of family.

Table 2: PLACEMENT TABLE FOR FEMALE HEADS OF FAMILY

IPTION OF FEMALE HEAD
AGE: 30
REGION OF COUNTRY: NORTHEAST
RESIDENCE: IN AN SMSA
FAMILY STRUCTURE: PRIMARY HOUSEHOLD
EDUCATIONAL ATTAINMENT: 12 YEARS
ABOR MARKET EXPERIENCE: 13 YEARS
AGE DISTRIBUTION OF CHILDREN: ALL OVER AGE 5
AREA UNEMPLOYMENT RATE: 5 PERCENT
EXPECTED NON-WAGE INCOME: $2500
EXPECTED WAGE OFFER: $2.75
LABOR FORCE PARTICIPATION RATE: 0.78

EXPECTED ANNUAL HOURS(H), WAGE RATE(W), AND UNWEIGHTED ANNUAL EARNI (E)

		INDUSTRY													
SVP/OCC		AGRIC	CONST	DUR	NONDUR	TRANS	COMM	UTIL	W.T.	R.T.	F&IERE	B&R SV	PER SV	E&R SV	PUBLIC
1	H	784	730	938	919	892	1130	1052	782	812	907	738	701	705	1258
	W	$2.85	$2.84	$3.04	$2.91	$2.98	$3.21	$3.27	$2.80	$2.72	$2.80	$2.68	$2.41	$2.47	$3.46
		233	$2076	$2848	$2670	$2656	$3632	$3438	$2193	$2208	$2536	$1977	$1687	$1741	$43
		70	814	1025	1006	979	1215	1137	868	900	995	824	789	793	1338
		3.05	$3.05	$3.24	$3.11	$3.18	$3.42	$3.47	$3.01	$2.92	$3.00	$2.88	$2.61	$2.67	$3.67
	E	$2655	$2481	$3321	$3130	$3114	$4151	$3949	$2612	$2630	$2987	$2376	$2060	$2118	$4906
3	H	957	901	1112	1094	1066	1297	1221	956	989	1084	912	880	883	1415
		3.26	$3.25	$3.44	$3.31	$3.39	$3.62	$3.68	$3.21	$3.13	$3.21	$3.09	$2.81	$2.88	$3.87
	E	$3117	$2929	$3829	$3626	$3609	$4698	$4490	$3072	$3093	$3474	$2817	$2476	$2539	$5477
4	H	1045	989	1197	1181	1153	1377	1303	1045	1078	1172	1002	972	974	1488
	W	$3.46	$3.46	$3.65	$3.52	$3.59	$3.83	$3.88	$3.42	$3.33	$3.41	$3.29	$3.02	$3.08	$4.07
		18	$3416	$4368	$4155	$4138	$5266	$5057	$3569	$3592	$3994	$3298	$2933	$3001	$6063
	H	1133	1077	1281	1265	1238	1452	1382	1133	1167	1257	1091	1064	1066	1557
	W	$3.66	$3.66	$3.85	$3.72	$3.79	$4.03	$4.09	$3.62	$3.54	$3.61	$3.50	$3.22	$3.28	$4.28
	E	$4152	$3940	$4934	$4711	$4695	$5851	$5645	$4101	$4124	$4543	$3815	$3429	$3501	$6659
6	H	1219	1164	1361	1347	1320	1523	1457	1219	1253	1340	1179	1156	1156	1623
		$3.87	$3.86	$4.06	$3.93	$4.00	$4.23	$4.29	$3.82	$3.74	$3.82	$3.70	$3.43	$3.49	$4.48
	E	$4717	$4496	$5522	$5290	$5277	$6448	$6249	$4663	$4684	$5114	$4364	$3959	$4034	$7261
7		1303	1249	1438	1425	1399	1589	1527	1303	1336	1418	1265	1244	1245	1678
	W	$4.07	$4.07	$4.26	$4.13	$4.20	$4.44	$4.49	$4.03	$3.94	$4.02	$3.91	$3.63	$3.69	$4.69
		5306	$5081	$6126	$5886	$5878	$7053	$6864	$5250	$5268	$5704	$4941	$4518	$4596	$7

Estimates of the level of annual hours (H), hourly wage rates (W), and annual earnings (E) in Table 2 also depend on many of the characteristics of this female head. Since these characteristics are fixed for a given table, variation in H, W, and E depend solely on variation in the occupation index for specific job traning, SVP, and three measures of each industry alternative: market power factor (sales concentration in the product market), percent minority employment (females and nonwhites), and long-run profitability. Variation in placement alternatives between different female heads depend on different personal, family, and other characteristics. We briefly examine these later in this section.

Table 3 presents a representative catalog of different occupations based on SVP.* Training time needed to reach average proficiency in each occupation is also listed. These requirements increase from a short demonstration period among laborers in SVP 1 to between two and four years training time required among nurses and various managers and administrators in SVP 7.**

Industry characteristics entering the annual earnings equations in a placement table are given in Table 4. We examine thirteen private sectors

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*These occupations are ordered as in Table 7, Section II, The Determinants of Annual Earnings and Job Placement Alternatives for Female Heads of Families, op. cit., which gives the most frequent occupations among female heads during the five year survey period 1970 to 1974.

**Occupations with SVP above 7 (training time above 4 years), which include mainly professional and technical workers, are excluded. There were few female heads in these occupations and none were represented in the estimating equations for hours worked or hourly wage rates. SVP classes 2 through 6 are divided into two sections to indicate that a second occupational index, general educational development (GED), has increased for a given amount of specific training requirements.

Table 3:
Occupation Catalog for Job Placement Tables

SVP	Training Time	Occupational Titles
1	Short demonstration only	Laborers
2	Beyond demonstration up to and incl. 30 days	Packers and wrappers, excl. meat and produce Chambermaids and maids, excl. private household Food counter and fountain workers Dishwashers Laundresses, private household Cashiers Child care workers
3	30 days to 3 months	Assemblers Cleaning service workers Food service workers Textile operatives Laundry and dry cleaning operatives Maids and servants, private household Waiters Telephone operators Clothing ironers and pressers Stock handlers
4	3 months to 6 months	Sales clerks, retail trade Nursing aides, orderlies, and attendants Sewers and stitchers Other clerical workers Typists Farm laborers Machine operatives Checkers, examiners, and inspectors, manufacturing Postal clerks Teachers aides
5	6 months to one year	Receptionists Key punch operators Stenographers Meat cutters and butchers Bookkeepers Practical nurses Health service aides Housekeepers Bank tellers Payroll and timekeeping clerks

Continued

Table 3, cont.
Occupation Catalog for Job Placement Tables

SVP	Training Time	Occupational Titles
6	1 to 2 years	Dressmakers and seamstresses, excl. factory Secretaries Cooks, excl. private household Hairdressers and cosmetologists Restaurant, cafeteria, and bar managers
7	2 to 4 years	Registered nurses Farm owners and tenants Self-employed managers and administrators Foremen Clerical supervisors

Table 4:
Industry Averages for Market Power, Percent Minority Employment, and Profit Rate

Industry	Market Power Factor Concentration Rate	Percent Minority Employment	5-Year Profit Rate
Agriculture, Forestry, and Fisheries	.1293	.2419	.0261
Construction	.0216	.1547	.0442
Durable Goods Mfg.	.4029	.2915	.0739
Nondurable Goods Mfg.	.3833	.4030	.0809
Transportation	.3206	.2785	.0401
Communications	.7591	.4222	.0643
Utilities	.5997	.2286	.0308
Wholesale Trade	.1348	.2910	.0582
Retail Trade	.2116	.4416	.0574
Finance, Insurance, and Real Estate	.3789	.5082	.0127
Business and Repair Services	.0733	.3605	.0372
Personal Services	.0782	.6382	.0440
Entertainment and Recreation Services	.0669	.5664	.0416
Public (Civil Service)	1.0*	.3825	0.0*

*Assumed a monopoly, with a profit rate of zero.

of the economy and an industry alternative not included in the estimating equations, the public, or civil service, sector. These federal, state, and local employers have, by definition, a concentration rate of one (a perfect monopoly on the production of public goods and services), and a long-run profit rate of zero. Percent minority workers in public employment is based on actual data.

The impact of interindustry differences in concentration rates, percent minority employment, and profitability, along with occupation training differences can be seen in Table 2.* The range of expected annual earnings for this 30 year old female head is considerable: from $1687 in the personal services industries to $7053 in the communications industries--a 318 percent difference. The $1687 earnings estimate assumes an SVP 1 occupation, of which there are very few typically held by women. Among these SVP 1 workers, however, expected annual earnings could be over twice as large, as in the communications industries where earnings would be $3632 on average. In contrast, among SVP 7 workers expected annual earnings could be over 50 percent lower than the $7053 maximum in communications, as in the personal services industries where earnings would be $4518 on average.

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*In the previous section we reported that industry characteristics were particularly important in determining the number of hours worked per year and the expected hourly wage rate. The statistical relationship between the concentration rate of industry and expected annual hours and hourly wage rate is positive: the higher the market power of an industry the higher, on average, are employment tenure and wages in that industry. Percent minority employment in an industry, on the other hand, has a powerful negative relationship to the hourly wage rate and a relatively smaller negative relationship to hours worked per year. Variation in the level of these opposing industry characteristics create most of the employment tenure and annual earnings tradeoffs embedded in a given placement table. Differences in occupation characteristics are responsible for the remainder. Variation in industry profitability empirically plays a much smaller role in establishing differences in annual hours and expected annual earnings.

These estimates for a particular female head of family illustrate two common features of all placement tables generated in this fashion:

(1) variation in expected annual earnings among workers in the lowest skilled occupations will be greater than variation in annual earnings among higher skilled workers. As a consequence, placement errors, or the inability to place job seekers in relatively higher earnings industries because of a lack of job openings, will bear far more heavily on lower skilled workers. In Table 2 this error could be as large as a 200 percent difference in expected annual earnings among the least skilled compared to only a 50 percent difference among the more highly skilled.

The ability to upgrade skills or to place female heads in higher skilled occupations is critical: the higher the skill level that can be assigned to a given job seeker, the smaller the annual earnings penalty for relatively poorer job placements, regardless of the reason.

(2) the rank order of expected annual earnings across industry alternatives is the same regardless of occupation selection. That is, "best" to "worst" industry choices based on annual earnings potential are not affected by the skill level of a female head.* Based, therefore, on this universal

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*Table 2 suggests that the public sector should be a first choice. It is, provided we are willing to ignore the arbitrary assignment of a concentration rate of 1.0 and a profit rate of 0.0. It may be a best choice, nevertheless, for rather different reasons.

ordering of placement alternatives, the following order of placement selection would be optimal:

(1) communications
(2) utilities
(3) durable goods manufacturing
(4) nondurable goods manufacturing
(5) transportation
(6) finance, insurance, and real estate
(7) agriculture, forestry, and fisheries
(8) retail trade
(9) wholesale trade
(10) construction
(11) business and repair services
(12) entertainment and recreation services
(13) personal services

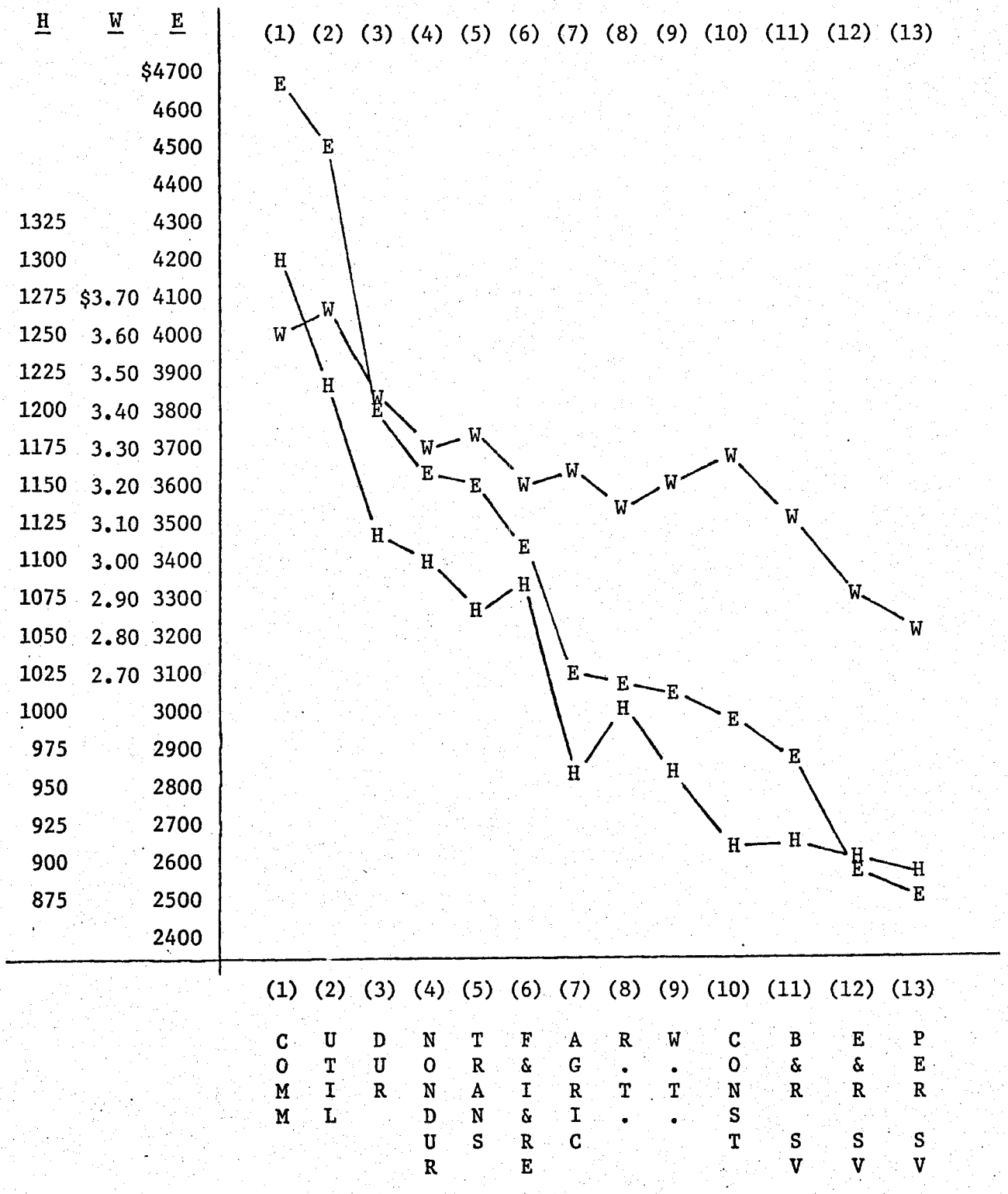
It is important to note the way in which industry characteristics dominate this placement order. For example, the top six industry alternatives have the top six concentration rates; the bottom four alternatives are the least concentrated. The last two choices also employ the greatest proporion of minority workers among all industries.

Annual hours and hourly wage rates do not share the same rank order as their product, expected annual earnings. They underscore, however,

the underlying tradeoffs between concentration rates and percent minority employment that generate this basic placement ordering. Figure 3 illustrates these tradeoffs. We have plotted expected annual earnings (E), expected annual hours (H), and expected hourly wage rates (W) on three different vertical scales for the female head in Table 2, assuming she would work in an SVP 3 occupation. Annual earnings would range from its maximum $4698 in communications to its minimum $2476 in personal services, a 90 percent differential due solely to interindustry differences in concentration rate, percent minority employment, and profitability. For each of these annual earnings estimates we then fill in the associated estimates for annual hours and hourly wage rates.

We find that annual hours dominates the downward pattern imposed on the annual earnings estimates in this figure, though there are one-time increases in annual hours in finance, insurance, and real estate and retail trade industries due to increases in concentration rate (see Table 4). Wage rates show a much more varied pattern within this annual earnings ordering, pointing up its sensitivity to interindustry differences in concentration rate but especially percent minority employment. Each increase in the expected hourly wage rate, in fact, can be associated with an industry whose percent minority employment is below the overall average in the thirteen industries. The only exception to this pattern is in the durable goods manufacturing industries whose relatively lower concentration rates compared with utilities could not outweigh the positive impact on hourly wage rates of relatively

Figure 3:
Component Analysis of Annual Earnings Estimates for Placement Tables



Source: Table 2.

Note: Scale is arbitrary; relative changes matter.

few minority workers.

The implications of this underlying pattern to annual hours worked, hourly wage rates, and expected annual earnings on efficient, successful job placements is rather clear:

Industry choices made by clients and job placement officials toward the bottom of the rank order of placement alternatives are more likely to be associated with undifferentiated, competitive industries, shorter employment tenure due to increased turnover in these industries, and depressed hourly wage rates due to the crowding of women and nonwhite workers into these labor market sectors. It may not matter that these kinds of choices are made voluntarily or result from mandatory placements in markets with few jobs available in the top-ranked industry alternatives.

It is also clear that the likelihood of having to supplement annual earnings increases among placement alternatives at the bottom of the placement ordering. This supplementation may come from unemployment compensation benefits for women who are able to work the required based periods of employment. For many other women, public assistance may be the only recourse. These implications worsen, of course, among female heads with the fewest job-related skills and experience.

The shape of the expected earnings profile in Figure 3 suggests that there are several plateaus of earnings levels, separated by relatively larger earnings gaps between certain industries. One such gap is between durable goods industries and utilities. A second is between finance, insurance, and real estate and agriculture, forestry and fisheries. A third is between business and repair services and entertainment and recreation services. These earnings gaps can be used to create "placement sectors"--groups of industry alternatives which provide, on average, the same level of expected annual earnings.

The four placement sectors suggested by Figure 3 are:

Sector One: communications and utilties

Sector Two: durable goods, nondurable goods, transportation, and finance, insurance, and real estate.

Sector Three: agriculture, forestry, and fisheries, retail trade, wholesale trade, construction, and business and repair services

Sector Four: entertainment and recreation services, personal services.

Expected annual earnings in sector one range from $4698 to $4490, some $660 more on average than the top earnings industry in sector two, durable goods. Earnings in sector two vary from $3829 to $3474. The five industries in sector three have earnings between $3117 and $2817. The two industries in sector four have earnings less than $2400 per year.

The annual hour and hourly wage rate composition of annual earnings in these sectors varies considerably and has an important implication for alternative placement strategies. In Table 5, for example, we show expected annual hours (H), hourly wage rates (W), and annual earnings

Table 5:
Component Changes in Placement Alternatives Between Placement Sectors

	Sector 1	Sector 2	Sector 3	Sector 4
(H)	1297	1112	957	883
(W)	$3.62	$3.44	$3.26	$2.88
(E)	$4698	$3829	$3117	$2539
%Δ(H)		16.63%	14.31%	8.38%
%Δ(W)		5.23	1.53	13.19
%Δ(E)		22.69	16.32	22.76
Int.*		.83	.48	1.19

Sector 1: communications and utilities

Sector 2: durable goods manufacturing, nondurable goods manufacturing, transportation, and finance insurance, and real estate

Sector 3: agriculture, forestry, and fisheries, retail trade, wholesale trade, construction, and business and repair services

Sector 4: entertainment and recreation services, and personal services

Source: Table 2.

*Decomposition of a product, H x W = E, into percent changes involves percent changes that can be attributed to each factor and a percent change that is associated with their interaction, Int.

for the highest earnings industry in each placement sector. Annual hours, wage rates, and earnings decline from sector one to sector four. We note, however, that nearly seven-tenths of the 23 percent increase in expected annual earnings between sector two industries and sector one industries can be attributed to longer job tenure. Wage rate differences make up the remainder. Nearly all of the 16 percent increase in expected annual earnings between sector three and sector two industries is due to increased job tenure. Wage rate differences are relatively unimportant. In contrast, the principal actor in the 23 percent increase in annual earnings between the bottom two placement sectors is the 13 percent increase in hourly wage rates. Here, interindustry differences in the social characteristics of co-workers dominate the expected annual earnings profile. Differences in interindustry concentration are less important as they affect potential job tenure.

These comparisons suggest that if the only jobs available in a given labor market are in the bottom sectors of the placement order, obtaining the highest wage rate possible is especially critical in determining annual earnings. Differences in expected annual hours--job tenure possibilities--then become increasing important as one is able to obtain placements in the best earnings industries in placement sectors one and two. Job tenure in the low-ranked industry alternatives is not in question: it is tenuous at best for all but the highest skilled workers and will on average provide only a series of part-year jobs. The phenomenon of

"cycling" from the labor market to welfare is clearly illustrated by these kinds of industry choices. If these are all the marketplace can provide at a given time, we should not be surprised to find future job placements resulting in the same kind of marketplace-to-welfare pattern.

Job placement tables for 20, 40, and 50 year old female heads are presented in Tables 6, 7, and 8, respectively. All characteristics except age (and hence experience) are identical to those in the placement table for the 30 year old female head of family. These tables permit a brief look at the impact of age on placement outcomes, other characteristics held constant. The major findings can be summarized as follows:

Expected annual hours, hourly wage rate, and annual earnings in each occupation/industry alternative increase from 20 to 30 and from 30 to 40 years of age, and then decline among 50 year old female heads. Assuming each woman held an SVP 3 occupation, the range of potential annual earnings would vary between a low of $1548 for a 20 year old female head in personal services to a high of $5319 for a 40 year old female head in communications. Comparing their best industry alternative, the communications industries, we find that expected earnings would increase about 42 percent between 20 and 30 years of age, another 13 percent between 30 and 40 years of age, and then decline around five percent between the ages of 40 and 50. The differentials in expected annual earnings in less desirable industry alternatives are, of course, even higher. And the expected earnings differentials widen even further among less skilled workers.

Table 6: PLACEMENT TABLE FOR FEMALE HEADS OF FAMILY

IPTION OF FEMALE HEAD.
AGE: 20
REGION OF COUNTRY: NORTHEAST
RESIDENCE: IN AN SMSA
FAMILY STRUCTURE: PRIMARY HOUSEHOLD
EDUCATIONAL ATTAINMENT: 12 YEARS
ABOR MARKET EXPERIENCE: 3 YEARS
AGE DISTRIBUTION OF CHILDREN: ALL OVER AGE 5
AREA UNEMPLOYMENT RATE: 5 PERCENT
EXPECTED NON-WAGE INCOME: $2500
EXPECTED WAGE OFFER: $2.75
LABOR FORCE PARTICIPATION RATE: 0.83

EXPECTED ANNUAL HOURS(H), WAGE RATE(W), AND UNWEIGHTED ANNUAL EARNINGS(E)

		INDUSTRY													
SVP/OCC		AGRIC	CONST	DUR	NONDUR	TRANS	COMM	UTIL	W.T.	R.T.	F&I&RE	B&R SV	PER SV	E&R SV	PUBLIC
1	H	543	501	670	654	631	842	769	542	567	645	508	483	485	967
	W	$2.50	$2.49	$2.69	$2.56	$2.63	$2.86	$2.92	$2.46	$2.37	$2.45	$2.33	$2.06	$2.12	$3.11
		1359	$1250	$1801	$1674	$1659	$2413	$2246	$1332	$1345	$1580	$1185	$ 993	$1028	$301
		614	568	747	731	706	925	848	613	640	722	577	553	555	1050
	W	$2.70	$2.70	$2.89	$2.76	$2.83	$3.07	$3.13	$2.66	$2.57	$2.65	$2.54	$2.26	$2.32	$3.32
	E	$1660	$1533	$2159	$2019	$2000	$2837	$2651	$1630	$1649	$1916	$1465	$1250	$1289	$3484
3	H	688	640	826	811	784	1008	930	688	718	803	651	628	629	1134
		2.91	$2.90	$3.10	$2.97	$3.04	$3.27	$3.33	$2.86	$2.78	$2.86	$2.74	$2.47	$2.53	$3.52
	E	$2002	$1858	$2558	$2406	$2382	$3300	$3097	$1971	$1995	$2293	$1785	$1548	$1591	$3992
4	H	767	716	909	894	866	1092	1014	767	799	886	730	708	709	1216
	W	$3.11	$3.11	$3.30	$3.17	$3.24	$3.48	$3.53	$3.07	$2.98	$3.06	$2.94	$2.67	$2.73	$3.73
		87	$2225	$2998	$2833	$2806	$3798	$3582	$2353	$2382	$2712	$2148	$1889	$1936	$453
		848	796	993	978	949	1176	1098	849	882	971	811	791	791	1297
	W	$3.32	$3.31	$3.50	$3.37	$3.45	$3.68	$3.74	$3.27	$3.19	$3.27	$3.15	$2.87	$2.94	$3.93
	E	$2814	$2635	$3478	$3300	$3271	$4329	$4102	$2777	$2811	$3170	$2554	$2273	$2323	$5097
6	H	932	878	1077	1063	1034	1258	1181	933	967	1057	895	877	877	1375
	W	$3.52	$3.52	$3.71	$3.58	$3.65	$3.89	$3.94	$3.48	$3.39	$3.47	$3.35	$3.08	$3.14	$4.13
	E	$3282	$3087	$3994	$3805	$3773	$4888	$4655	$3243	$3281	$3665	$3001	$2699	$2753	$5684
7	H	1017	962	1161	1148	1119	1338	1263	1018	1053	1142	981	965	964	1449
	W	$3.72	$3.72	$3.91	$3.78	$3.85	$4.09	$4.15	$3.68	$3.60	$3.67	$3.56	$3.28	$3.34	$4.34
		789	$3579	$4543	$4343	$4311	$5471	$5235	$3747	$3787	$4195	$3488	$3166	$3223	$6288

Table 7: PLACEMENT TABLE FOR FEMALE HEADS OF FAMILY

IPTION OF FEMALE HEAD
AGE: 40
REGION OF COUNTRY: NORTHEAST
RESIDENCE: IN AN SMSA
FAMILY STRUCTURE: PRIMARY HOUSEHOLD
EDUCATIONAL ATTAINMENT: 12 YEARS
LABOR MARKET EXPERIENCE: 23 YEARS
AGE DISTRIBUTION OF CHILDREN: ALL OVER AGE 5
AREA UNEMPLOYMENT RATE: 5 PERCENT
XPECTED NON-WAGE INCOME: $2500
EXPECTED WAGE OFFER: $2.75
LABOR FORCE PARTICIPATION RATE: 0.76

EXPECTED ANNUAL HOURS(H), WAGE RATE(W), AND UNWEIGHTED ANNUAL EARNINGS(E)

SVP/OCC		INDUSTRY													
		AGRIC	CONST	DUR	NONDUR	TRANS	COMM	UTIL	W.T.	R.T.	F&IRE	B&R SV	PER SV	E&R SV	PUBLIC
1	H	859	803	1019	998	971	1212	1134	857	888	985	810	771	775	133
	W	$3.10	$3.09	$3.28	$3.16	$3.23	$3.46	$3.52	$3.05	$2.97	$3.05	$2.93	$2.65	$2.72	$3.71
		662	$2484	$3346	$3149	$3133	$4195	$3988	$2617	$2635	$3001	$2373	$2045	$2106	$4962
		8	891	1106	1087	1060	1295	1218	946	978	1075	900	862	866	1415
	W	3.30	$3.30	$3.49	$3.36	$3.43	$3.67	$3.72	$3.26	$3.17	$3.25	$3.13	$2.86	$2.92	$3.91
	E	$3129	$2936	$3859	$3651	$3634	$4746	$4535	$3082	$3102	$3494	$2819	$2464	$2530	$5537
3	H	1037	980	1193	1175	1147	1375	1301	1036	1069	1164	990	955	959	1488
		$3.51	$3.50	$3.69	$3.56	$3.63	$3.87	$3.93	$3.46	$3.38	$3.45	$3.34	$3.06	$3.12	$4.12
	E	$3636	$3429	$4404	$4186	$4169	$5319	$5107	$3585	$3607	$4021	$3305	$2926	$2996	$6127
4	H	1126	1069	1277	1260	1233	1450	1380	1125	1158	1251	1081	1049	1052	155
	W	$3.71	$3.70	$3.90	$3.77	$3.84	$4.07	$4.13	$3.66	$3.58	$3.66	$3.54	$3.27	$3.33	$4.32
		176	$3959	$4976	$4748	$4732	$5909	$5700	$4123	$4146	$4575	$3828	$3427	$3502	$6727
		1213	1157	1358	1343	1316	1522	1455	1213	1245	1334	1170	1142	1144	1620
	W	$3.91	$3.91	$4.10	$3.97	$4.04	$4.28	$4.33	$3.87	$3.78	$3.86	$3.75	$3.47	$3.53	$4.53
	E	$4747	$4522	$5570	$5333	$5320	$6511	$6309	$4692	$4712	$5153	$4384	$3963	$4042	$7333
6	H	1298	1243	1435	1421	1396	1588	1526	1297	1330	1414	1258	1232	1234	1678
		$4.12	$4.11	$4.30	$4.18	$4.25	$4.48	$4.54	$4.07	$3.99	$4.07	$3.95	$3.67	$3.74	$4.73
	E	$5343	$5113	$6179	$5935	$5927	$7119	$6928	$5285	$5302	$5749	$4967	$4529	$4611	$7940
7	H	1379	1327	1508	1495	1471	1650	1592	1379	1410	1489	1341	1319	1320	173
	W	$4.32	$4.32	$4.51	$4.38	$4.45	$4.69	$4.74	$4.28	$4.19	$4.27	$4.15	$3.88	$3.94	$4.93
		58	$5726	$6801	$6550	$6547	$7731	$7553	$5897	$5910	$6358	$5572	$5118	$5203	$8546

Table 8: PLACEMENT TABLE FOR FEMALE HEADS OF FAMILY

IPTION OF FEMALE HEAD
AGE: 50
REGION OF COUNTRY: NORTHEAST
RESIDENCE: IN AN SMSA
FAMILY STRUCTURE: PRIMARY HOUSEHOLD
EDUCATIONAL ATTAINMENT: 12 YEARS
LABOR MARKET EXPERIENCE: 33 YEARS
AGE DISTRIBUTION OF CHILDREN: ALL OVER AGE 5
AREA UNEMPLOYMENT RATE: 5 PERCENT
EXPECTED NON-WAGE INCOME: $2500
EXPECTED WAGE OFFER: $2.75
LABOR FORCE PARTICIPATION RATE: 0.79

EXPECTED ANNUAL HOURS(H), WAGE RATE(W), AND UNWEIGHTED ANNUAL EARNINGS(E)

		INDUSTRY													
SVP/OCC		AGRIC	CONST	DUR	NONDUR	TRANS	COMM	UTIL	W.T.	R.T.	F&IERE	B&R SV	PER SV	E&R SV	PUBLIC
		745	693	896	877	850	1086	1008	743	772	865	700	666	669	1215
	W	$3.25	$3.24	$3.43	$3.30	$3.38	$3.61	$3.67	$3.20	$3.12	$3.19	$3.08	$2.80	$2.87	$3.86
	E	$2418	$2244	$3075	$2896	$2870	$3923	$3695	$2379	$2407	$2764	$2155	$1866	$1918	$4689
2	H	829	774	982	963	936	1171	1093	827	859	953	784	751	754	1296
	W	$3.45	$3.44	$3.64	$3.51	$3.58	$3.81	$3.87	$3.41	$3.32	$3.40	$3.28	$3.01	$3.07	$4.06
	E	$2859	$2668	$3571	$3380	$3350	$4469	$4231	$2818	$2851	$3238	$2573	$2259	$2316	$5268
3	H	915	859	1068	1051	1023	1255	1177	914	947	1041	871	840	843	1375
	W	$3.65	$3.65	$3.84	$3.71	$3.78	$4.02	$4.08	$3.61	$3.52	$3.60	$3.49	$3.21	$3.27	$4.27
		$3343	$3135	$4103	$3900	$3869	$5043	$4799	$3300	$3337	$3750	$3036	$2698	$2758	$5868
	H	1002	946	1154	1138	1109	1336	1260	1002	1035	1129	959	931	933	1450
	W	$3.86	$3.85	$4.05	$3.92	$3.99	$4.22	$4.28	$3.81	$3.73	$3.81	$3.69	$3.42	$3.48	$4.47
	E	$3867	$3645	$4669	$4455	$4423	$5640	$5394	$3821	$3861	$4297	$3540	$3180	$3244	$6484
5	H	1090	1033	1238	1223	1195	1413	1341	1090	1124	1215	1048	1023	1024	1521
	W	$4.06	$4.06	$4.25	$4.12	$4.19	$4.43	$4.48	$4.02	$3.93	$4.01	$3.89	$3.62	$3.68	$4.68
	E	$4427	$4193	$5263	$5039	$5008	$6255	$6011	$4379	$4420	$4873	$4083	$3702	$3770	$7111
6	H	1176	1121	1320	1306	1278	1486	1418	1177	1211	1299	1137	1114	1114	1587
	W	$4.27	$4.26	$4.45	$4.32	$4.40	$4.63	$4.69	$4.22	$4.14	$4.22	$4.10	$3.82	$3.89	$4.88
	E	$5019	$4776	$5880	$5648	$5619	$6883	$6646	$4968	$5008	$5474	$4659	$4259	$4331	$7743
	H	1261	1207	1399	1386	1359	1555	1491	1261	1295	1379	1223	1203	1203	1648
	W	$4.47	$4.47	$4.66	$4.53	$4.60	$4.84	$4.89	$4.43	$4.34	$4.42	$4.30	$4.03	$4.09	$5.08
	E	$5637	$5388	$6515	$6275	$6250	$7518	$7291	$5583	$5621	$6095	$5264	$4847	$4922	$8377

As noted earlier, neither the age nor any other characteristic of these female heads will affect the basic ordering of industry alternatives. The lack of labor market experience among young female heads, however, is especially damaging to their potential for relatively long job tenure. Only female heads in SVP jobs characterized by at least three months worth of specific training have an expected job tenure of more than one-half year. Even among the most skilled, expected hours worked seldom amount to more than 1200 per year. Among 40 year old female heads most industry alternatives would provide an average of at least 1000 hours per year, given at least a month of specific job training.

Using Placement Tables

Job placements in practice depend on the availability of jobs in a given labor market. A specific example of how placement decisions by clients and officials must be tempered with data on job openings illustrates this proposition. Job openings data are taken from the Massachusetts Job Bank and are shown in Table 9. This table gives the number of jobs per hundred job openings in the thirteen private sector industries listed in the placement table. Five different SMSAs are given, along with state-wide totals, to further emphasize the impact of job availability in specific labor market areas.

Placement Table 2 suggests that the best industry alternative in terms of expected annual earnings for a 30 year old female head is in the communications industries, regardless of her occupational skill level. Assuming that job openings will always match up with the skill levels of a given client, referrals to communications is a first choice. After consulting the job bank, however, we find that there were no current openings. The second choice, utilities, has openings in two SMSAs. A female head living in Boston, rather than Lawrence or Taunton, would also find this second best alternative unavailable--unless she is willing to commute. In practice, then, jobs in placement sector one are not available at this time.

The third best industry alternative for this female head--durable goods manufacturing industries--is available in each SMSA. In fact, 33 percent of the 545 jobs open in Boston were in durable goods. A long run placement strategy would require that this job applicant be sent to industries in this sector. Every other female head, regardless of age,

Table 9:
Index of Job Availability in Area Labor Markets: Number of Jobs per One Hundred Job Openings*

Industry	SMSA Boston	Springfield	Worcester	Lawrence	Taunton	Statewide
Agriculture, Forestry and Fisheries	0	67	0	0	0	11
Construction	1	0	3	1	0	1
Durable Goods Mfg.	33	7	40	20	52	34
Nondurable Goods Mfg.	5	7	7	14	6	7
Transportation	1	0	0	0	0	0
Communications	0	0	0	0	0	0
Utilities	0	0	0	2	1	1
Wholesale Trade	4	4	1	0	0	2
Retail Trade	3	1	2	8	2	2
Finance, Insurance, and Real Estate	6	8	6	10	5	6
Business and Repair Services	8	1	3	7	25	8
Personal Services	39	5	38	39	8	28
Entertainment and Recreation Services	0	0	0	0	0	0
Public (Civil Service)	na	na	na	na	na	na
Base: Total Jobs in Job Bank	545	297	588	117	315	1862

*An Analysis of Unfilled Job Openings, Massachusetts Job Banks, June 30, 1976

should also be sent to durable goods industries until all job openings are filled. Thereafter, openings in less desirable alternatives (in terms of expected annual earnings) in nondurable goods, in transportation, and in trade and service industries, should be filled in order.

Whether or not a particular female head actually possesses the right kinds of job skills for a given job opening is a major constraint on successful placement efforts. If openings in durable and nondurable goods manufacturing industries, for example, are limited to skilled machinists, many female heads cannot even apply. For many other women, there may be no job openings in their typical occupation. While in general it is better in terms of expected job tenure and expected annual earnings to place female heads in higher skilled occupations, if available, it is possible that lesser skilled job openings might provide better long-run placements if the female head is willing to apply to industries where she has little or no experience, or where the occupation itself may be less desirable.

Consider, for example, the placement alternatives facing a female head of family who has had recent experience as a nurses aide (SVP 4) and previous experience as a telephone operator (SVP 3). A desire to work in her "chosen profession" as a nurses aide limits her job opportunities almost exclusively to the personal services sector, which has job openings in each SMSA job bank. Expected annual earnings for a 30 year old female head in this occupation and industry would be a little over $2900. As a telephone operator, however, she could possibly find work in durable

goods, nondurable goods, transportation, finance, insurance, and real estate, or retail trade and still expect a higher long run annual earnings, due to an increase in expected job tenure and hourly wage rates associated with these more highly concentrated industries. In this example, the potential difference in annual earnings could be as much as 23 percent. As such, stepping down the occupation ladder might actually pay off. In contrast, a choice between a nurses aide in personal services and a telephone operator in personal or other service sectors is dominated by occupation skills, not industry differences. The nurses aide job is a better annual earnings alternative.

There are more extreme examples illustrated in the placement table for the 30 year old female head. Consider, for instance, job placements in communications industries which have job openings. An SVP 3 job as a telephone operator in this highly concentrated industry would provide, on average, a higher expected annual earnings than would SVP 5 jobs as bookkeepers, tellers, or payroll clerks in any of the trade and service sectors, and about the same expected annual earnings as a registered nurse in the highly unconcentrated personal services sectors.

These placement tables do not explicitly include "discount factors" for the quality or prestige values of different occupational choices, though these kinds of factors are implicitly measured by other variables in the estimating equations. We should expect, though, that some women may not choose to accept lower-skilled jobs even in better <u>overall</u> industrial settings despite a long-run, higher earnings potential. The placement table will, however, enable job seekers and placement officials to examine

these tradeoffs within the marketplace for female workers.

There is one final piece of analysis which may put the relationship between placement alternatives and welfare dependency in a sufficiently broad perspective. The 1974 sample of female heads in the Current Population Survey included about 1400 women for which all required information were available on personal, family, financial, and occupation and industry characteristics. Placement tables were generated for each of these women. We then asked this question: what percent of all female heads actually worked in the best job placement alternatives in terms of expected annual earnings, as suggested by their specific placement tables? And among these women, what percent received welfare assistance during the year?

An analysis of these placement tables revealed that about 41 percent of all female heads in this sample worked in industries in the top half of their placement ordering. Among these women 18 percent received welfare support during the year. Even among the 15 percent of all female heads who worked in their top three placement alternatives, 14 percent received public assistance. Hence, even among the best jobs in the private sector of our economy, welfare support appears to be an important part of annual income for a significant number of female heads.

Only among the two to three percent of all female heads who actually worked in the top two placement alternatives was there a noticable drop in welfare support, 8 percent out of the top two placements and 3 percent out of the top placement. It is important to note that among those female heads who did not work in the top of their placement ordering,

which include the majority of female heads, around 20 percent received public assistance during the year. Hence, placement strategies in a market with job openings can apparently contribute to longer job tenure, higher annual earnings, and a concomitant decline in welfare support. Jobs remain the key. Unless they are available, in the better sectors of the economy, work-and-welfare will likely continue as joint products of our existing market system.