The Occupational Mobility of Female Workers: An Empirical Analysis

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I. INTRODUCTION

In recent years new colloquial expressions such as "Yuppie" (Young Upwardly-Mobile Professionals) have been coined to identify those workers that succeed in optimizing their economic position through a progression of jobs along occupational hierarchies. The dynamics of the modern economy have caused a greater awareness of the flow of labor resources between alternative jobs and occupations. The importance of the occupational mobility process has therefore been widely discussed in the popular press and empirically analyzed in the academic literature.

Theoretically, mobility is an important determinant of worker success in orthodox neoclassical economic models (16;17) as well as in more radical segmented labor market (SLM) theories (6). Both frameworks of thought propose models in which workers accumulate human capital through a sequence of jobs that offer on-the-job-training (OJT) thereby increasing their productivity and earnings potential. Neoclassical economists implicitly assume insignificant barriers to mobility and therefore workers maximize the present value of earnings by making periodic employer and/or occupational moves. Relying heavily on institutional and sociological variables, SLM models stress the importance of intra-firm occupational hierarchies and internal labor markets. SLM economists further perceive that significant barriers (including race, sex, and limited formal education) may prevent certain groups of workers from gaining access to internal labor markets thereby limiting their potential upgrading through mobility.

Empirical analyses of occupational mobility have concentrated on testing the validity of the segmented labor market hypothesis (1;15) and on identifying the determinants of successful occupational upgrading (4;13). While this research has devoted a great deal of attention to looking at the effect of race on the outcome of an occupational change, very little time has been spent examining the impact of sex on the mobility process. This is surprising due to the abundance of literature dealing with the phenomena of female occupational segregation (2;20). Given the continuing questions of economic equality across sexual boundaries, and the evergrowing influence of female workers on the modern economy, the process of female occupational mobility takes on great importance.

This study will specifically address three central questions concerning the process of female occupational mobility; 1) What personal attributes and endowments contribute to successful mobility by female workers?, 2) Are internal or external movers more likely to experience significant gains through mobility?, and 3) Does the pattern of successful occupational mobility reflect equity across racial boundaries? The database and the regression model of occupational mobility utilized in the present investigation are discussed in Section II. The results and conclusions are then presented in Sections III and IV respectively.

II. DATA AND A MODEL OF OCCUPATIONAL MOBILITY

The Database

The database employed in the current study was created from the three supplemental mobility surveys conducted jointly with the Current Population Survey (CPS) during January of 1973, 1978, and 1981. The database reflects information concerning the personal characteristics and endowments (ie., race, age, sex, education, work experience, etc.) as well as structural variables (ie., industry of employment, geographic region, etc.) hypothesized to affect the mobility process for individuals who reported a change in their three-digit Census occupational code of employment during the previous year. Samples of both white and black early prime age (25 through 40 years of age) female workers were extracted for each of the yearly cross-sections represented by the data.

The samples of early prime age females were chosen to avoid the sample bias that would be encountered by including occupationally mobile young and old workers. The mobility patterns of young (less than 25 years of age) workers are dominated by individuals entering career paths after completion of formal education. On the other hand, the mobility patterns of older workers (above 40 years of age) may reflect movements into second careers or occupations as workers remove themselves from occupational hierarchies. Thus, the degree of change in occupational position would be biased in an upward direction for the young and in a downward direction for the old.

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Two alternative measures of occupational standing are used to calculate the economic effect of an occupational change. The CPS mobility files do not report actual changes in income, therefore, the first approach utilizes predicted earnings to order occupations. Predicted earnings are simply calculated as the mean income earned in 1969 by workers in each three-digit occupation (21). The second measure of occupational standing is the Duncan socio-economic status index (7). The Duncan index is an ordinal scale that assigns a prestige score (between 0 and 100) to occupational titles. Both the predicted income and the Duncan index measures of occupational standing have been widely used and accepted in the mobility literature (9;13). The degree of mobility success experienced by each female worker is calculated by determining the change in occupational standing (as measured by the change in predicted earnings and the change in socio-economic status) that occurs as a consequence of mobility.

Two important characteristics of the database are uncovered by examining Table I (see Appendix) that reports the mean levels of initial occupational standing and change due to mobility for the selected samples of female workers. First, occupational upgrading dominates downward moves in the aggregate for each cross-section of white female workers while downgrading appears to have dominated the mobility process for black females in the 1977 sample. Secondly, if the mean level of occupational change is expressed as a percentage of the mean level of initial occupational standing, it is found that the returns to mobility are greater in the form of status upgrading relative to income upgrading for each of the white female samples. This suggests that white women may be experiencing relatively greater non-pecuniary rewards for their labor in lieu of income when mobile. The substitution of status for income, as a means of compensation for work, is given credence when one considers the well documented segregation of women into low paying white collar jobs that traditionally carry popular perception of prestige and job status (for example, nursing, teaching, etc.).

The Regression Model

Using this database to address the questions stated in Section I, a single equation second-order multiple linear regression equation may be written that accounts for the variables theoretically identified as important to the process of occupational upgrading and mobility:

$$OCC = \alpha + \beta_1(FORM) + \beta_2(INITOCC) + \beta_3(ED) + \beta_4(EXP) + \beta_5(EXP2) + \beta_6(MARSTAT)$$

$$+ \beta_7(CIND) + \beta_7(PIND) + \beta_8(REG) + \varepsilon$$

Where:

OCC = degree of change in occupational standing achieved through mobility

FORM = form of occupational change (1=inter-firm, 0=intra-firm)

INITOCC = initial level of occupational rank attainment

ED = vector of dummy variables reflecting the level of formal educational attainment

EXP = years of general labor market experience

EXP2 = years of general labor market experience squared

MARSTAT = marital status of occupationally mobile worker (1=married, 0=not currently married)

CIND = vector of dummy variables reflecting current industrial sector of employment (post-mobility)

PIND = vector of dummy variables reflecting previous industrial sector of employment (pre-mobility)

REG = vector of dummy variables reflecting initial geographic region of employment

ε= disturbance term due to unobservable random variables

Thus, the change in economic position due to an occupational change is viewed as dependent upon a variety of personal endowments and structural characteristics. The specification of this model draws heavily from the empirical literature concerning the occupational mobility of

male workers and can be estimated using an ordinary least squares technique under the classical assumptions. By estimating the model for each of the cross-sections represented in the database, the temporal stability of the mobility process may be examined.

A priori, it is expected that the FORM variable will reflect a higher return for internal (intra-firm) occupational movers. Economic reasoning suggests that a higher opportunity cost is involved in external (inter-firm) moves (eg., loss of seniority rights and acquired specific OJT). Further, it may be postulated that external movers may be seeking future advancement opportunities by changing employers and are willing to accept a lateral occupational move in anticipation of later promotion. Internal movers may be viewed as those progressing along the internal labor market hierarchies of jobs and occupations as predicted by segmented labor market theory.

The INITOCC coefficient is expected to indicate a negative correlation with the change in occupational position due to the "regression-toward-the-mean" effect. This simply means that the higher one starts on an occupational hierarchy, the less likely one is to advance still higher and the more likely that downgrading will occur due to an occupational change, holding all other variables constant. Alternatively, just the opposite situation would be expected for those holding positions near the bottom of the hierarchy of occupations. Intuitively, the INITOCC coefficient can be viewed as a measure of the flexibility by which upgrading and downgrading can occur along the lines of occupational progression (13;19).

Both neoclassical and SLM models predict that formal education positively affects the success of occupational moves and that the process is subject to the law of diminishing marginal returns. Accordingly, greater levels of educational attainment are expected to enhance occupational achievement while the marginal returns to education are expected to decline at the upper levels of the spectrum. The categorical ED variables take the following form:

ED1 = 1 if 8 or less years completed, 0 otherwise
ED2 = 1 if 9 to 11 years completed, 0 otherwise
ED3 = 1 if 12 years completed, 0 otherwise
ED4 = 1 if 13 to 15 years completed, 0 otherwise
ED5 = 1 if 16 years completed, 0 otherwise
ED6 = 1 if 17 or more years completed, 0 otherwise

One categorical variable must be deleted from the vector of educational variables to avoid exact multicollinearity of the model and to assure that the equation can be estimated using a least squares technique. Standard econometric practice calls for the deletion of a variable that represents the observations with the greatest frequencies reported in the statistical population. In this case, ED3 (high school completed) will serve as the deleted reference variable.

The experience variables reflect the potential number of years of labor market experience available to the individual worker. As a general measure of acquired human capital, labor market experience is expected to positively influence occupational upgrading for younger workers, reach a peak, and then decline for older workers. Work experience for relatively young workers is a valuable human capital asset sought by potential employers, and therefore, is expected to significantly enhance the occupational upgrading potential of the young. Relatively older workers are more homogeneous with regard to years of general work experience and employers are less likely to retrain or offer on-the-job-training to older workers. Thus, general labor market experience is assumed to decline in importance for occupationally mobile workers as they advance in age.

Marital status is assumed to be of importance to the mobility process for female workers due to the relatively weak attachment to the labor force exhibited by females of child bearing age. As a result of this instability, females accumulate less human capital in the form of OJT and experience (11). Therefore, marriage and the corresponding lifestyle behavior patterns are expected to have a negative impact on the outcome of an occupational change for female workers.

The PIND, CIND, and REG vectors of categorical variables are entered into the model to control for the varying institutional and structural arrangements across industrial sectors and geographic regions. These variables are assumed to proxy differences in the organizational structure and institutional arrangements found in the different industries and regions of the nation that may enhance or suppress the returns to occupational change (5;14;18).

The CIND and PIND variables reflect five industrial categories of employment derived from aggregating across the industrial definitions of the census three-digit industrial classification system.

IND1 - represents agriculture, forestry, fisheries, and mining
IND2 - represents construction and manufacturing
IND3 - represents wholesale and retail trade
IND4 - represents finance, insurance, real estate, business, personal, and entertainment
IND5 - represents public utilities and public administration

Region of employment is defined according to the following census definitions:

REG1 - Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, West Virginia

REG2 - Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas

REG3 - District of Columbia, Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma, Texas

REG4 - Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Washington, Oregon, California, Alaska, Hawaii

The deleted reference variables are CIND3, PIND3, and REG3. Therefore, the OLS coefficients reported in the results for pre- and post-mobility industry of employment and geographic region reflect the structural effects on the outcome of an occupational change relative to the effects experienced by like workers reporting these characteristics.

III. EMPIRICAL RESULTS

The Regression Results

The estimated ordinary least squares regression coefficients for the model of occupational mobility outlined in the previous section are reported in Tables II and III (see Appendix) for white and black females respectively.

The coefficients of the ED variables reflect the impact of each alternative level of formal education relative to the influence of a high school education (the deleted reference variable, ED3) on the outcome of an occupational change. The expected positive relationship between years of formal schooling and occupational advancement is reflected in the estimates for both black and white groups. The attainment of advanced levels of education appears to significantly enhance the return to occupational mobility while low levels of education significantly reduce the opportunity for upgrading for all female workers. However, the regression results indicate that black female workers near either end of the educational spectrum experience substantially greater rewards (for advanced levels of education) and penalties (for low levels of education) relative to white female workers with like characteristics.

The coefficients of EXP and EXP2, the proxies for potential labor market experience, enter the white female equations with the expected signs and relative magnitudes. In no instance, however, do the coefficients reflect statistical significance at acceptable levels. Thus, experience does not appear to have the strong impact on the mobility process for white females that has been found for occupationally mobile males (13). On the other hand, experience does appear to be an important determinant of occupational upgrading for black females as indicated by the regression results.

The hypothesized relationship between experience and occupational change is indicated for black females in the 1972 and 1977 equations that reflect significant and positive EXP coefficients of a large magnitude that "swamp" the negative and small EXP2 coefficients. However, this functional relationship is not found for the 1980 cross-section of black females. In fact, for 1980 the coefficient of EXP carries a negative sign and an absolute value that "swamps" the smaller and positive EXP2 coefficient. Thus, for this cross-section, a recessionary year, the results indicate that the functional relationship between occupational upgrading and years of experience is "U-shaped." This suggests that nominal amounts of labor market experience are negatively related to occupational advancement and a relatively large number of years spent in labor force activities appear to be needed before experience positively enhances the occupational upgrading process for this sample.

Looking at the results concerning marriage, it is found that for both racial groups of early prime age female workers, MARSTAT, when significant, has a negative impact on occupational advancement. It would appear, in line with the a priori expectation, that unmarried women have an advantage over married women with like characteristics when occupationally mobile.

Turning to the results concerning the influence of the structural variables, FORM enters the regression equations with negative coefficients in both the white and black female models but only attains significance in the case of white cohorts in the 1977 cross-section. This finding indicates that internally mobile white female workers received greater returns to occupational change than externally mobile workers with like characteristics. However, the penalty for inter-firm mobility by both white and black females appears to be weak given the abundance of statistically insignificant FORM coefficients.

The expected pattern of negative and significant INITOCC coefficients is encountered in

the results for mobile females of both races. The values of the INITOCC coefficients do not display wide variations between the black and white models or between cross-sections. Thus, a stable regression-toward-the-mean effect is suggested implying that substantial differences in the ability of workers to move along occupational hierarchies is not in evidence.

The results concerning the influence of industrial structure and geographic region are somewhat disappointing with many relatively small and insignificant coefficients being reported. The most significant results indicate substantial income and status returns for white women who acquire occupations in manufacturing (CIND2) or public service (CIND5) areas of employment. The coefficients for the remaining structural variables do not demonstrate consistently significant impacts on occupational change for early prime age mobile females. The influence of personal and human capital variables appear to be more important than the industrial and regional characteristics involved in the mobility process. Such findings are consistent with the conclusions of previous research on male mobility (9;12;13).

Test of Temporal Stability

The F-test developed by Chow (3) to test for significantly different relationships between dependent and independent variables across separate cross-sectional samples was performed using the results of the mobility regression model. The test was used to check for statistically significant variations in the determination of occupational upgrading between the three years considered in this investigation. The F-statistics computed from the utilization of the Chow procedure are reproduced in Table IV (see Appendix).

Examination of Table IV reveals that the F-statistics for black females do not acquire levels of statistical significance and therefore the null hypothesis that the separate cross-section regressions are identical cannot be rejected. This finding suggests a strong degree of stability over time between occupational change and the independent variables under consideration for black female workers.

The F-statistics in Table IV reflect, however, that significant differences do exist between the 1977 and 1980 cross-sections in the white female regressions. These two years reflect contrasting levels of aggregate macroeconomic activity. Looking at the annual growth in real GNP, 1977 represents a year just past a cycle peak while 1980 represents the bottom of the trough when real GNP fell by two-tenths of a percent. Cyclical swings such as this may be expected to result in uneven contractions and expansions across the various sectors of the economy and thereby impact on the occupational mobility process. The results indicate that the outcome of an occupational move by white female workers may have been influenced by differences in the economic environment between 1977 and 1980.

One of the major differences in the significant independent variables of the 1977 and 1980 white female regressions is the dramatic increase in the return to advanced levels of education. The marginal return through mobility for a college education and beyond is estimated to nearly double, relative to like cohorts with only a high school education, based on the coefficients of the ED5 and ED6 variables. The substantial relative advantage for internal mobility also disappears between the 1977 and 1980 white female regressions. These observations suggest that white females with advanced levels of education can improve their occupational position without substantial penalties for inter-firm moves during a recessionary period.

It is important to note that while white female workers with above average levels of human capital receive substantial returns for their investments even during recessionary periods, those cohorts with less than average investments in human capital receive significantly greater penalties through mobility during downturns in the economy. This is seen by comparing the ED1 and ED2 coefficients across the 1977 and 1980 regressions.

IV. CONCLUSIONS

Several important conclusions can be drawn from the results of the present study. First, the descriptive statistics of the sample of occupationally mobile female workers suggest that such workers are receiving greater status returns relative to pecuniary returns for occupational change. If individual preferences between income and status are assumed to be equal, this may reflect a substitution of prestige for income compensation on the part of employers or society. Secondly, the regression results indicate that personal characteristics and endowments play a larger role relative to structural influences in the outcome of an occupational change for both black and white female workers. In particular, investments in formal human capital are found to have the strongest impact with regard to positively affecting occupational upgrading for both both races while general labor market experience is found to be of greater importance to mobile black females than to white.

Based on the regression results concerning the INITOCC variable, it is concluded that no significant difference exists with regard to the ability of black and white female workers to move along the occupational hierarchy. However, the results indicate a slight advantage for female workers that make their moves within an internal labor market. Further, no consistently significant differences are found between industrial sectors and geographic regions of employment for mobile females of either race.

With regard to the question of racial equity in the process of occupational mobility, the

results indicate that black female workers with low levels of human capital investment are at a relative disadvantage compared to their white cohorts. At the same time, however, black females with advanced levels of education and labor market experience experience significantly greater returns to mobility than their white peers. Such a finding is consistent with the evergrowing empirical research on the labor market success of black female workers (8;10). It would appear that to increase the occupational attainment of minority female workers, steps must be taken to increase their attainment of investments in human capital.

While the results of this paper demonstrate that females may succeed in enhancing their economic position through mobility given the proper endowments of human capital, further research is needed to determine if mobility alone is sufficient to bring about occupational equity across sexual boundaries.

APPENDIX

TABLE I

SAMPLE MEAN LEVELS OF INITIAL OCCUPATIONAL STANDING AND CHANGE DUE TO MOBILITY

	1972				1977				1980			
Race	Level	ΔY	Level	ΔD	Level	ΔY	Level	ΔD	Level	ΔY	Level	ΔD
White	5.13	.07	42.95	1.75	4.99	.22	42.21	2.70	5.16	.17	43.46	1.64
Black	4.52	.40	36.10	1.77	4.99	-.03	29.81	-1.40	5.07	.03	42.01	-.71

Y - predicted income
D - Duncan socioeconomic index

TABLE II

ESTIMATED REGRESSION COEFFICIENTS FOR
EARLY PRIME WHITE FEMALES

Variable	1972		1977		1980	
	Income	Duncan	Income	Duncan	Income	Duncan
INTERCEPT	4218.57***	45.24***	5064.16***	42.23***	3706.50***	27.73***
FORM	-189.34	-2.02	-1032.31***	-7.45***	-196.81	-.21
INITOCC	-.84***	-.81***	-.87***	-.82***	-.83***	-.80***
ED1	-770.14*	-14.85***	-366.46	-5.89	-434.89	-11.19**
ED2	-489.30**	-11.29***	-292.22	-5.99**	-478.40***	-8.13***
ED3	—	—	—	—	—	—
ED4	123.02	2.10	-127.08	-.24	488.96***	5.88**
ED5	914.24***	7.56**	683.50***	8.74***	1120.26***	12.76**
ED6	1918.77***	10.76**	761.74***	9.57***	1481.16***	12.45**
EXP	36.52	-.77	16.25	-.18	10.08	.27
EXP^2	-1.07	-.03	-.47	.01	-.71	-.01
MARSTAT	-234.06	-1.74	-190.09	-2.52*	148.04	1.73
CIND1	348.88	-1.90	392.24**	-3.15	873.11***	3.04*
CIND2	834.53***	11.86***	1037.52***	11.42***	1114.64***	11.81***
CIND3	—	—	—	—	—	—
CIND4	-24.79	2.11	155.11	3.84	383.93**	5.77**
CIND5	483.80**	8.12***	629.96***	8.70***	963.04***	10.36**
PIND1	269.37	.31	-127.74	.18	-95.85	-.95
PIND2	-470.50	-4.61	74.43	.53	24.23	-.24
PIND3	—	—	—	—	—	—
PIND4	149.74	1.22	168.50	.20	125.52	1.97
PIND5	2.11	-.52	100.37	-1.70	-68.57	-.78
RHG1	186.65	-2.39	79.29	-.82	60.09	.13
RHG2	-452.39***	-7.46***	67.43	-.63	-181.47	-2.38
RHG3	—	—	—	—	—	—
RHG4	-308.55	-4.68	107.32	-.56	329.98***	-5.25**
R^2	.47	.46	.42	.42	.42	.44
F	15.39	15.08	23.51	23.63	34.53	38.23
N	389	389	695	695	1029	1029

* significant at the .10 level; ** significant at the .05 level; *** significant at the .01 level

TABLE III

ESTIMATED REGRESSION COEFFICIENTS FOR
EARLY PRIME BLACK FEMALES

	1972		1977		1980	
Variable	Income	Duncan	Income	Duncan	Income	Duncan
INTERCEPT	-1764.26	-8.84	1009.89	-2.93	5222.21***	37.30***
FORM	-822.09	-6.34	-795.94	-3.88	105.80	2.12
INITOCC	-.58***	-.66***	-.86***	-.85***	-.97***	-.82**
ED1	-1209.34*	-13.26	-403.18	-6.90	-1508.91*	-17.11*
ED2	-746.34	-11.35*	129.13	-5.91	-576.38	-6.69
ED3	—	—	—	—	—	—
ED4	64.88	4.22	1033.47**	17.63***	320.72	4.55
ED5	3074.31***	42.56	3652.62***	34.60***	1202.54***	11.27**
ED6	4908.56***	64.03	3606.06***	48.87***	2325.86***	27.92***
EXP	713.64***	2.62**	400.26**	4.12*	-373.90***	-3.70**
EXP^2	-25.55***	-.23**	-9.73	-.10	14.58***	.13**
MARSTAT	182.23	.18	-717.29**	-10.18**	503.60	-7.20**
CIND1	724.25	-8.95	-340.42	-9.83	884.01	2.04
CIND2	1944.07**	-.63	-2.96	-6.09	1013.18*	10.65
CIND3	—	—	—	—	—	—
CIND4	266.58	-15.57	-1369.16**	14.53	-257.69	-5.10
CIND5	1235.76*	-5.24	-578.93	-8.72	540.82	.77
PIND1	-91.99	4.02	1327.59**	18.23*	11.39	-.22
PIND2	-741.75	8.80	586.24	18.76*	488.23	2.45
PIND3	—	—	—	—	—	—
PIND4	918.80	1.78	1353.19*	16.50	603.95	12.76**
PIND5	351.63	1.72	5.32	-4.50	241.48	5.54
REG1	801.27	1.61	1221.72**	17.31**	730.50	7.81
REG2	-264.10	-6.02	-254.64	-2.73	474.04	2.82
REG3	—	—	—	—	—	—
REG4	-434.31	5.60	126.84	2.91	653.10*	3.89
R^2	.64	.69	.70	.63	.50	.52
F	2.90	3.55	6.11	4.53	4.83	5.23
N	56	56	78	78	125	125

* significant at the .10 level; ** significant at the .05 level; *** significant at the .01 level

TABLE IV

F-STATISTICS FOR CHOW TEST BETWEEN
CROSS-SECTION REGRESSIONS

Race	1972-1977 Income	1972-1977 Duncan	Pooled Years 1977-1980 Income	Pooled Years 1977-1980 Duncan	1972-1980 Income	1972-1980 Duncan
White	1.202 (22,1040)	.625	2.468*** (22,1679)	1.624***	1.048 (22,1374)	.775
Black	1.472 (22,90)	1.165	1.348 (11,158)	1.562	1.041 (22,137)	1.003

( ) Degrees of freedom
*** Significant at the .01 level

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