The regressions estimated differed from the supply equation. The supply function may be written:

$$L=\alpha_0(X+W)^{\alpha_1}W^{\alpha_2}U^{\alpha_3}=\alpha_0X^{\alpha_1}W^{\alpha_2}U^{\alpha_3}+\alpha_0W^{\alpha_1+\alpha_2}U^{\alpha_3}$$

where L is either the labor force participation rate or its transformed value. The equation estimated was:

$$L=\alpha_0X^{\alpha_1}W^{\alpha_2}U^{\alpha_3}.$$

The partial derivative of the participation rate with respect to other family income, $\partial L/\partial X$, is the same for both equations. The partial derivatives for the other two variables differ between the two equations.[22] Although the estimates of the coefficients with respect to wages and unemployment are biased, the income coefficient is an unbiased measure of the income effect.

The results of the regression analysis are summarized in table 5. The three economic variables explain between 94 and 97 percent of the between-cell variation in the labor force participation rates. The regression coefficient associated with family income other than the wage and salary income of the retiree has the expected sign in all of the regressions and is an unbiased estimate of the effect of income upon the different measures of labor force supply.

The assumption of homogeneity of the retirees in each of the cells was relaxed by introducing two sets of dummy variables—one set for all but one of the four age groups and one set for all but one of the six level-of-school groups.[23] This allowed us to determine whether, independent of the three economic variables of the "naive" model, there was variation in the labor force behavior of retirees that could be attributed purely to their age and level of school completed.[24] The results of this analysis are also summarized in table 5. The first set of coefficients apply to a regression equation in which only those age-level-of-school-completed dummies that contribute significantly to the explanatory power of the regression are included. The second set refers to regressions in which all 10 of the dummies are included. The addition of dummy variables that significantly reduce the unexplained variation in the dependent variable (equations 5–8) have little affect on the coefficients of the "economic" variables in equations 6–8 although the coefficients in equation 5 are reduced. However, when all of the dummies are used, the coefficients of the "economic" variables become less important.[25]

[22] The difference between the partial derivatives with respect to wage and salaries is $(\alpha_1+\alpha_2)\alpha_0W^{\alpha_1+\alpha_2-1}U^{\alpha_3}$ and between the partial derivatives with respect to unemployment is $\alpha_3\alpha_0W^{\alpha_1+\alpha_2}U^{\alpha_3-1}$.

[23] Dummies for the lowest age and level of school completed cells were omitted as independent variables in the analysis. Their exclusion from the analysis prevents the variance-co-variance matrix from becoming singular and, therefore, impossible to invert to obtain estimates of regression coefficients.

[24] The equally important question of whether there were significant interactions between the estimated coefficients of the "economic" variables and the dummy variables is not addressed in this paper, although we do explore differences in income elasticities estimated from these coefficients.

[25] Only three of the 12 coefficients remain statistically significant. Eight of the coefficients are smaller. High multicollinearity between the "economic" and the dummy variables produces substantial increases in the standard errors of many of the coefficients of the "economic" variables.