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# THE INTERGENERATIONAL CORRELATION BETWEEN CHILDREN'S ADULT EARNINGS AND THEIR PARENTS' INCOME: RESULTS FROM THE MICHIGAN PANEL SURVEY OF INCOME DYNAMICS

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Intergenerational correlations between parental income and child earnings reflect the extent of intergenerational economic mobility and equality of opportunity. Previous estimates are about 0.2, but these estimates suffer from a number of problems, including the use of but one year of observations and of nonrandom samples. We present new estimates based on the Panel Study of Income Dynamics. These estimates suggest correlations over 0.5 with longer-run income and earning measures, as well as some gender and race differences and some impact of liquidity constraints. They also suggest that the intergenerational elasticity is greater as parental income increases, the opposite of the Becker-Tomes conjecture.

Economists and philosophers long have thought that the degree of intergenerational mobility, or its complement—the intergenerational correlation in earnings or income—is an important indicator of the healthiness and success of a society. One important reason for this belief is the judgement that equal opportunity is a desirable characteristic of a good society. Equal opportunity within this context means that children from different families have equal options regarding investments in their human resource and their expected incomes.[1]

Theories, a leading example of which is presented below, have been constructed to explain why parents' and children's income or earnings are correlated.[2] Yet surprisingly little is known about the magnitude of this correlation. For example Becker and Tomes (1986), after a thorough search, present evidence from a dozen, nonrandom samples for the period 1960 through 1982 drawn from five countries (U.S., England, Sweden, Switzerland, and Norway). They generally find low intergenerational correlations (a median R of 0.17) and small elasticities of children's earnings with respect to parents' inccome (a median of 0.17).[3] Thus,

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[1]We are more explicit about how equal opportunity might be defined more precisely in Section 1.

[2]For example see Becker (1967, 1981) and Meade (1976).

[3]One of the studies included is by us (Behrman and Taubman 1985) for two recent U.S. generations of whites. Our estimates in this study for the full sample are 0.20 for the correlation and 0.07 for the elasticity, though higher values for each are obtained if low-earnings or low-work experience children are excluded.

intergenerational mobility, at least as indicated by the complement of such correlations, appears to be considerable, and at the median only about a sixth of a given percentage change in parents' income appears to be reflected in children's earnings. Such results may be surprising given other studies that find childhood background to be very important in determining adult socioeconomic success (e.g. Behrman, Hrubec, Taubman and Wales, 1980; Olneck, 1977; Behrman and Taubman, 1989).

However, most of the estimates of intergenerational correlations can be criticized on several grounds: the samples are not random; the estimates are based on a single year's earnings for the children which need not be typical of lifetime earnings;[4] the estimates are based on a single year's income for the parents which again may not be typical of lifetime income and may be from the wrong lifecycle stage if liquidity constraints are important;[5] and most estimates do not control for the possible dependence of the elasticity of children's earnings with respect to parents' income on age, gender, and race.[6]

One purpose of this paper is to examine how important these possible problems are and to see how large the intergenerational associations are if we control for these problems. A second purpose of this study is to examine whether the elasticity of children's earnings with respect to parents' income declines as parent's income increases as Becker and Tomes (1986) have proposed (see section 1).

We use the Michigan Panel Survey of Income Dynamics (PSID).[7] The PSID is a random U.S. sample which has the unusual feature that it follows people who in 1968 lived with the surveyed head of household, but who subsequently joined another household. We have identified the offspring who split off and have created parent-child matches.

## 1. The Model

Economists have argued that one would expect parents' income and children's earnings to be positively correlated. The major reasons for expecting this correlation can be summarized within the framework of Figure 1 taken from

[4]Jenkins (1987), Solon (1987), and Solon, Corcoran, Gordon, and Laren (1987) all emphasize that the bias from using one year "snapshots" instead of life-cycle "movies" may be large. Solon, for example, suggests that for U.S. workers in the age range 25-32, the factor to be applied to the intergenerational correlation to correct for transitory earnings variations in a one-year sample probably is in the 1.4 to 1.8 range.

[5]Flavin (1981), Bernanke (1985), Hayashi (1985) and Zeldes (1989), for example, present aggregate and individual estimates for consumption that suggest that liquidity constraints are important for the U.S. If they are, parents' income at the time of marginal schooling decisions for the children may be critical rather than parents' income at some other time.

[6]There are two studies of which we are aware that include dependence of the elasticities on age, race or gender: Behrman and Taubman (1985) find gender differences in elasticities for young white U.S. respondents and Datcher (1982) finds race differences in elasticities for young U.S. males (with control for a number of additional family and community background characteristics). Solon (1987) criticizes a number of estimates [explicitly including Behrman and Taubman (1985), Atkinson (1981), and Sewell and Hauser (1975), but presumably implicitly also Datcher and others], because they are based on homogeneous samples (e.g. only whites or only males), and therefore understate actual intergenerational correlations.

[7]Solon, Corcoran, Gordon, and Laren (1987) have used a shorter segment (1975-82) of the same panel to estimate sibling correlations.

Becker's Woytinski Lecture (1967). The demand for human capital is downward sloping for any given (exogenously determined) level of endowments due to diminishing returns to such endowments, and shifts to the right as endowments increase. The supply-of-funds curve slopes upwards as the individual exhausts cheaper sources. The equilibrium for a given individual in Figure 1 is found where the relevant demand curve intersects the relevant supply curve. The larger the human capital investments, the higher the children's earnings.

Within this simple model, parents' income and children's earnings are positively correlated on the demand side because parents with above average genetic endowments and income tend to have children with above average genetic endowments and income. If $D_1$ is the average demand curve and one's parents are on the $D_2$ curve, then one's demand curve probably lies to the right of $D_1$, though there may be some tendency towards regression towards the mean. Becker and Tomes (1986) argue that the elasticity of a given child's earnings with respect to parents' income for these demand reasons is nonlinear and diminishing with regard to parents' income. They suggest that low-income parents transfer assets to their children largely as human resource investments since, for small human resource investments, the marginal rate of return in equilibrium on such investments tends to be above the marginal rate of return on investments in financial assets. However, wealthier parents tend to invest much more in their children. As a result, their children tend to obtain an educational level at which the marginal rate of return to education equals the rate of return to financial assets, with additional resources transfered to children taking the form of financial assets.[8]

The generations also have positive linkages through the supply-of-funds curve. The supply-of-funds curve shifts down as parental income and wealth rise because those with higher income and wealth can finance more investments from their own sources at cheaper rates (given transaction costs) and have greater access to capital markets. For any given demand curve, the lower the supply curve, the lower the equilibrium marginal rate of return; but the total equilibrium earnings, the area under the demand curve up to the equilibrium point, increases. This supply effect, incidently, *may* or *may not* offset partially the Becker–Tomes nonlinear impact of parental income on child earnings.[9] Even if it does so over a range, if parents transfer enough resources to their children, the expected marginal rate of return to human resource investments still will be driven down to the (lower) interest rate, so the Becker–Tomes logic will hold equally well as above if parents transfer enough resources to their children.

How does this approach relate to the notion of equality of opportunity? If equality of opportunity means, as economists[10] usually define it, that children

[8]In Behrman, Pollak and Taubman (1989b), we develop the implications of the Becker and Tomes' model. We demonstrate that for the two-child family there are five cases, depending on the magnitude of resources of at least one child is less than that which would be required to drive the expected rate of return down to the expected rate of return on financial assets. In the two high resource cases the expected rate of return on all human resource investments may be equal to that on financial assets.

[9]If the supply of funds curve shifts down, of course, whether equilibrium earnings increase or decrease depend on the demand elasticity in the relevant range (i.e. whether it is greater than or less than unitary). We expect that diminishing returns to endowments mean that at least the demand curve eventually becomes inelastic.

[10]For example, see Meade (1976).

with equal abilities have equal options, the critical question is whether children from all families face the same supply-of-funds curve; that is, is this curve independent of family background? If it is, all children with equal endowments have equal equilibrium human resource investments and expected earnings.[11] Therefore the parental income-child earnings correlations would be smaller that if the supply-of-funds curve shifts down with higher parental wealth.

To this point we have focussed on the parental-income-child *earnings* link, which is what we investigate empirically in this paper. However, other intergenerational economic relations such as inter vivos gifts and bequests also affect children's income. The relevant question from the point of view of the interpretation of parental income-child earnings correlations as indicators of equal opportunity is whether such transfers alter child earnings. As suggested by Bowles (1972) and others because of the greater asset income of children who receive greater transfers, these children may choose to work fewer hours and/or to choose occupations with greater nonpecuniary and lesser pecuniary returns, which would reduce the parental income-child earnings correlation.[12] It seems generally to be believed that such offsetting tendencies are only partial, so that in fact a higher parental income-child earnings correlation does imply less equality of opportunity.

## 2. The Sample

This study is based on our special adaptation of the Michigan Panel Survey of Income Dynamics (PSID). The PSID is a longitudinal sample that began in 1968. We have annual observations through 1984. The panel has the unusual feature that as members of the original responding family set up or joined new households, the split-offs, including children who had lived with he head in 1968, became eligible respondents. By 1984 offspring as young as two in 1968 were 18 years old and might have set up separate households. Of course, the children had to be in the respondent's home in 1968 to be eligible to be a future sample member. Those above the age of 18 in 1968 still living with parents may be atypical; therefore, we eliminated those children from the sample.

Some characteristics of the sample for the children are given in Table 1. In 1984 the average age of the children was 26.1. The offspring averaged 12.4 years of education and had annual earnings in 1984 of $14,700. Approximately 51 percent of the sample's respondents are female. To evaluate how typical these numbers are, we note that in the 1980 *Census*, the mean education and earnings for 25 to 29 year olds were about 13 years and $11,500 respectively. The mean education and earnings from the Census are close to those in our sample. The difference between Census and our sample's mean earnings would be less with correction for inflation from 1980 through 1984.

By splitting the randomly-selected PSID into groups with and without children setting up separate households, we may be creating subsamples of

[11] Behrman, Pollak and Taubman (1989a) discuss further and explore empirically the implications of this dimension of differential equality of opportunity across recent generations in the U.S.

[12] If parents are interested solely in the monetary income of their children (*not* placing a value on their leisure), then in anticipation of these responses higher-income parents would invest less in the human resources of their children, ceteris paribus, than they would without such a reaction.

TABLE 1

SOME SOCIOECONOMIC CHARACTERISTICS OF THE OFFSPRING OF THE MICHIGAN PANEL OF INCOME DYNAMICS IN 1984

| | Mean | Standard Deviation |
|---|---|---|
| Female (%) | 50.5 | |
| Age (years) | 26.1 | 5.7 |
| Education (grades) | 12.4 | 2.1 |
| Earnings (thousands $)[a] | 14.7 | 14.5 |
| Married in 1984 (%) | 58.4 | |
| Never Married (%) | 19.3 | |

*Note*: If a question was not answered or if earnings were not available, the person is excluded for the particular variable. The sample sizes range from 2,053 to 3,271.

[a]For those with positive earnings the mean is 17.4 and the standard deviation is 14.1 thousand dollars.

atypical parents. We have examined the characteristics of the two groups of parents and find that they are similar in age, education and earnings with differences in the means of variables of 6 percent or less.

We have data on the individual's earnings, own income, spouse's earnings and income, and income of all members of the household. Both the parents' income and children's earnings data are expressed in 1981 dollars. We concentrate on the ln of parents' income and on the ln of children's earnings since the ln-ln relation most transparently yields the elasticity of interest. To test the Becker and Tomes' (1986) conjecture about this elasticity declining as parents' income increase, in alternative estimates we add a quadratic in ln parents' income. We also explore whether this elasticity is dependent on demographic factors (the children's age, race, and gender). We allow for race and gender differences partly to reflect possible discrimination in the labor market and in the provision of governmental services. We also distinguish between men and women because of women's greater tendency to work part-time and to have lesser earnings because of activities associated with childbearing.

Since the adult children in our sample are relatively young, their earnings may be subject to substantial variation because of initial job searches, sorting, and part-time work while completing schooling or training. These factors would seem to be particularly important for the younger children in the labor force. In Table 2 means and coefficients of variation for ln earnings for different-aged children and parents are given. The means increase monotonically with age for the 21-26 range, and then, generally stabilize. The coefficient of variation tends to be greatest among the children for the youngest children, particularly the 18-21 year olds. After 21, the coefficient of variation for the children tends to settle down (though there are exceptions, such as ages 27 and 33). Therefore, the inclusion of data from the 18-21 year-old children in the analysis below may increase the noise and reduce the apparent intergenerational association.[13] Thus,

[13]Disaggregation of the data by gender and race reveals that this pattern is similar for whites and blacks and for females and males.

TABLE 2

MEANS AND COEFFICIENTS OF VARIATION FOR LN CHILDREN'S EARNINGS AND LN PARENTS' INCOME BY AGE IN 1984

| Children | | | Parents | | |
|---|---|---|---|---|---|
| Age | Mean | Coefficient of Variation | Age | Mean | Coefficient of Variation |
| 18 | 9.50 (19,412) | 11.20 | 40 | 10.02 (30,835) | 10.56 |
| 19 | 9.45 (19,935) | 12.20 | 41 | 10.10 (32,472) | 7.61 |
| 20 | 9.34 (18,804) | 12.60 | 42 | 9.73 (30,781) | 20.45) |
| 21 | 9.19 (14,472) | 11.26 | 43 | 10.12 (30,147) | 6.48 |
| 22 | 9.31 (15,288) | 9.70 | 44 | 9.50 (22,565) | 15.44 |
| 23 | 9.26 (15,585) | 10.97 | 45 | 10.02 (29,276) | 8.10 |
| 24 | 9.28 (15,569) | 10.71 | 46 | 10.16 (36,417) | 9.04 |
| 25 | 9.30 (15,731) | 11.26 | 47 | 9.94 (32,336) | 14.95 |
| 26 | 9.43 (15,842) | 8.35 | 48 | 9.98 (29,992) | 8.85 |
| 27 | 9.09 (14,222) | 13.26 | 49 | 10.26 (40,067) | 8.82 |
| 28 | 9.49 (17,010) | 8.93 | 50 | 9.79 (28,549) | 19.48 |
| 29 | 9.49 (17,450) | 8.98 | 51 | 9.81 (26,076) | 9.02 |
| 30 | 9.47 (17,763) | 10.17 | 52 | 9.97 (34,785) | 13.89 |
| 31 | 9.50 (18,096) | 10.04 | 53 | 10.10 (31,543) | 8.00 |
| 32 | 9.53 (19,763) | 9.64 | 54 | 10.15 (34,305) | 8.40 |
| 33 | 9.40 (18,094) | 12.80 | 55 | 9.84 (29,313) | 13.06 |
| 34 | 9.65 (20,122) | 9.64 | 56 | 10.14 (39,724) | 8.88 |
| | | | 57 | 10.00 (32,405) | 9.11 |
| | | | 58 | 10.35 (47,158) | 9.27 |
| | | | 59 | 9.86 (28,834) | 9.89 |

*Note*: The means are given for ln earnings for the children and for ln income for the parents, but the means for the values themselves are given in parentheses.

there may be some tradeoff between using information on more years of children's earnings to reduce both transitory flucutations and period effects and including additional years at ages at which there is relatively greater variance in earnings as compared with those over 21 years of age. The coefficients of variation for parents' income varies considerably across ages.

## 3. RESULTS

In Table 3 alternative simple regressions of ln children's earnings on ln parents' income are given. Regression (1a) is the case in which each variable is measured for 1984 to reduce the relatively greater noise in earnings for the youngest children noted above. Regression (1a) yields a significant elasticity of children's earnings which respect to parental income of 0.27 and an intergenerational correlation ($R$) of 0.26 [$=(0.069)^{1/2}$]. Both of these results are similar to the medians of the estimates summarized in Becker and Tomes (1986). Even at the sample average age, when age-earnings profiles are leveling off and showing fairly constant coefficients of variation, such results suggest substantial intergenerational mobility and limited impact of parents' income on children's earnings.

It is not clear that data from 1984 should be used for the parents' income if one is to be restricted to data for a year (but not necessarily the same year)

for each of the two variables. After all, in 1984 the children averaged 26 years of age; plausibly some measure of parental income when the children were younger better captures the story outlined in section 1, if liquidity constraints preclude easy transfer of resources across years. Therefore, we have estimated relations in which the ln children's earnings in 1984 are regressed on ln parents' (real) income calculated separately when the children were ages 14 through 22. Regression (2) in Table 3, which is the alternative which maximizes the intergenerational correlation, uses parents' incomes for the year in which the child was 15 years old. This regression has a slope coefficient of 0.60 and a $R$ of 0.36; both are greater than in regression (1a).[14]

TABLE 3

PARENTS' INCOME AND CHILD'S EARNINGS, VARIOUS YEARS

| | ln Parents Income | (ln Parents' Income)$^2$ | Intercept | $R^2$/No. of Obs. |
|---|---|---|---|---|
| 1. Children's Earnings 1984, Parents' Income 1984[a]: | | | | |
| a. | 0.27 | | 6.78 | 0.069 |
| | (9.8) | | (24.6) | 1,290 |
| b. | −0.46 | 0.039 | 10.12 | 0.083 |
| | (2.7) | (4.3) | (12.4) | 1,290 |
| 2. Children's Earnings 1984, Parents' Income When Child 15: | 0.60 | | 3.17 | 0.131 |
| | (4.6) | | (2.4) | 144 |
| 3. Children's Earnings 1984, Parents' Income 1975: | 0.37 | | 5.74 | 0.081 |
| | (10.7) | | (16.4) | 1,290 |
| 4. Children's Earnings 1975–84, Parents' Income 1975–84[b]: | | | | |
| a. | 0.80 | | 1.25 | 0.287 |
| | (24.4) | | (3.7) | 1,481 |
| b. | −0.51 | 0.065 | 7.79 | 0.289 |
| | (0.729) | (1.9) | (2.2) | 1,481 |

*Note*: Absolute $t$ values are given in parentheses.
[a]$F$ test for 1b vs. 1a is 8.20, accept null.
[b]$F$ test for 4b vs. 4a is 1.45, accept null.

In regression (2) incomes are measured in different years for different families and come from different parts of the business cycle. Therefore, we also have estimated regressions with different lags for parents' income. Regression (3) gives the alternative with parents' income for 1975, a year when the children had an average age of approximately 16, about the age of decisions regarding continuation of education beyond secondary school. The estimates in regression (3)

[14]For this exploration the same sample of 1,481 children-parent pairs was used for every regression to assure comparability, at the cost of losing a number of observations. The pattern of $R$'s has several local peaks: 0.06 for age 14, 0.13 for age 15, 0.08 for age 16, 0.09 for age 17, 0.09 for age 18, 0.06 for age 19, 0.06 for age 20, 0.08 for age 21, and 0.09 for age 22. Alvin and Thornton (1984) study the comparative role of family background, measured when the child was less than five and as a teenager, on high school performance and years of education completed by age 18. Using a sample of children born in Detroit in 1961, they find smaller impacts of variables measured at widely different times.

imply larger intergenerational associations than in regression (1A), but less than in (2): the elasticity of children's earnings with respect to parents' income is 0.37 and $R$ is 6.28. Thus, the impact on the intergenerational correlation from controlling for the business cycle as in relation (3) seems to be less than that from controlling for possible liquidity constraints as in relation (2).

What happens to the intergenerational association if we use more years of observations for parents' income and child earnings to average out transitory fluctuations for both generations? Both variables are subject to fluctuations over time due to the business cycle and individual-specific, transitory factors. Solon (1987) claims that the estimates of intergenerational correlations for this age range of the children should increase by 40 to 80 percent with the switch from one year to permanent observations given available estimates of the relative size of the transitory income component. However, including earlier years for children results in more years at the beginning of the children's adult work experience during which variations in their earnings are relatively large. The impact of averaging both variables over 1975–84 in regression (4a) is striking. The elasticity of children's earnings with respect to parents' income is 0.80, significantly higher than the previous estimates. The $R$ of 0.54 also is higher than in the other regressions discussed to this point, and the increase in comparison with regression (1a) is even greater than Solon (1987) predicts. Both measures of association are much higher than than the values for the medians of the distributions of estimates based on a single year of data in Becker and Tomes (1986). Thus, more permanent earnings and incomes measures increase the estimated intergenerational association substantially.

Now we examine the nonlinear relation between the ln of children's earnings and the ln of parents' income proposed by Becker and Tomes (1986) by including the square of the ln of parents' income in alternative regressions, one for 1984 (regression 1b) and one for the averages over 1975–84 (regression 4*b*).[15] In both cases there is evidence of some nonlinearity: an $F$ test rejects imposing the constraint that the coefficient of the quadratic term is restricted to zero and the $R$ increases. However, the sign pattern of the estimates suggests *greater* elasticities for higher parents' income, contradicting the Becker and Tomes' conjecture. As we note above in section 1, if the demand curve is sufficiently elastistic and shifts out enough with parental income, such a result is possible within the framework of Figure 1. This effect may be an absolute income effect, so that as the U.S. economy grows, it will become a more rigid society, a disturbing outcome to us. Alternatively it may be a relative income effect in the sense that the elasticities are higher in a cross-section for higher parental incomes, so that there are not implications of increasing rigidity over time. We are not able to identify the importance of the absolute versus the relative income interpretations with our data.

To this point we have ignored the children's gender and the family's race. We have limited our consideration of the age of the children to the question at which single child age does parental income have the greatest association.

[15]This exploration must be qualified since with cross-sectional data we are not exploring what happens for children of *given* ability as parental wealth increases. Nevertheless we think that it is suggestive.

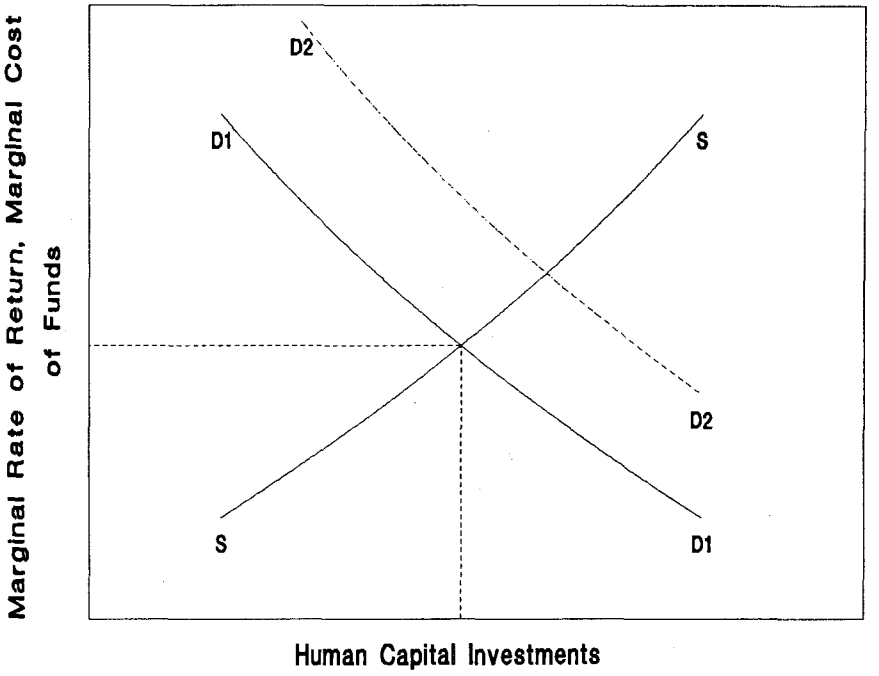


Figure 1. Becker's Woytinski Lecture (1967) Demand and Supply Curves for Investing in an Individual's Human Capital

However, all three of these characteristics may affect the elasticity of children's earnings with respect to parents' income and the intergenerational correlation.

The regressions in Table 4 allow the elasticity of children's earnings with respect to parents' income to depend upon the child's gender, the family's race, and a quadratic in the child's age.[16] The dependence of the parental income elasticity on such characteristics rarely has been explored, though some other studies have included such characteristics as additive controls.[17] In our case, having the elasticity depend on such characteristics is more consistent statistically with the variation in ln children's earnings than having them enter in an additive fashion; moreover, an $F$ test for the 1984 data does not reject imposing zero restrictions on the additive controls if dependence of the elasticity on such characteristics is allowed.[18]

The regression for 1984 in the first row of Table 4 suggests a much stronger intergenerational correlation, an $R$ of 0.37, than the first two estimates in Table 3 and a larger correlation than those in most studies summarized in Becker and

[16]If interactions among age, race and gender are allowed in addition, the multicollinearity is so high that it is difficult to sort out effects. Therefore, we do not present estimates with such interactions.

[17]See footnote 5.

[18]The value of $F$ is 0.45, with critical values of 3.70 and of 2.60 at the 1 percent and 5 percent levels. If the average of the years 1975-84 are used for both variables, an $F$ test rejects imposition of these restrictions ($F = 8.30$). Nevertheless, the formulation with these characteristics only affecting the elasticities is more consistent with sample variance in the ln of children's earnings than is the formulation with only additive characteristics.

TABLE 4

REGRESSIONS OF LN CHILDREN'S EARNINGS ON LN PARENTS' INCOME WITH MULTIPLICATIVE CONTROLS FOR AGE, AGE$^2$, GENDER, AND RACE FOR AVERAGES OVER ONE TO TEN YEARS

| Time Period Children's Earnings and Parents' Income | Ln Parents' | Ln Parents' Income Multiplied by | | | | | |
|---|---|---|---|---|---|---|---|
| Averaged Over | Income | Age | Age$^2$ | Gender[a] | Race[b] | Intercept | $R^2$/No. of Obs. |
| 1984 | 0.011 | 0.012 | −0.00012 | −0.007 | −0.043 | 7.37 | 0.139 |
| | (0.136) | (2.3) | (1.6) | (1.4) | (7.8) | (25.8) | 1,290 |
| 1983–84 | 0.16 | 0.010 | −0.00010 | −0.010 | −0.041 | 6.18 | 0.159 |
| | (2.0) | (2.0) | (1.2) | (1.9) | (7.1) | (18.2) | 1,364 |
| 1982–84 | 0.17 | 0.012 | −0.00013 | −0.012 | −0.041 | 5.86 | 0.188 |
| | (2.3) | (2.6) | (1.7) | (2.5) | (7.5) | (17.5) | 1,393 |
| 1981–84 | 0.25 | 0.009 | −0.00009 | −0.012 | −0.038 | 5.42 | 0.213 |
| | (3.8) | (2.3) | (1.3) | (2.6) | (7.2) | (16.5) | 1,413 |
| 1980–84 | 0.26 | 0.010 | −0.00009 | −0.013 | −0.039 | 5.21 | 0.230 |
| | (4.4) | (2.7) | (1.4) | (2.9) | (7.5) | (15.7) | 1,426 |
| 1979–84 | 0.29 | 0.011 | −0.00011 | −0.014 | −0.040 | 4.82 | 0.256 |
| | (5.2) | (3.2) | (1.9) | (3.1) | (7.8) | (14.3) | 1,440 |
| 1978–84 | 0.40 | 0.008 | −0.00009 | −0.015 | −0.044 | 4.16 | 0.282 |
| | (7.2) | (2.6) | (1.4) | (3.3) | (8.6) | (11.8) | 1,458 |
| 1977–84 | 0.51 | 0.007 | −0.00007 | −0.015 | −0.040 | 3.30 | 0.302 |
| | (9.2) | (2.2) | (1.2) | (3.4) | (7.7) | (9.1) | 1,467 |
| 1976–84 | 0.57 | 0.007 | −0.00006 | −0.017 | −0.038 | 2.75 | 0.324 |
| | (10.6) | (2.1) | (1.1) | (3.8) | (7.4) | (7.48) | 1,471 |
| 1975–84 | 0.60 | 0.007 | −0.00006 | −0.012 | −0.037 | 2.42 | 0.338 |
| | (11.3) | (2.1) | (1.1) | (2.9) | (7.4) | (6.53) | 1,481 |

*Note*: Beneath the point estimates are absolute values of the $t$ statistics.
[a]Dichotomous variable with value of one if child is female, zero if male.
[b]Dictomous variable with value of one if white, zero otherwise.

Tomes (1986) (though not larger than the correlation in the third regression in Table 3). The estimates for the quadratic in age imply a maximum elasticity of 0.31 when the children are 50[19] as compared with a value of 0.21, for example, when the children are 21. The estimate for gender implies no significant difference. The estimate for race implies a smaller elasticity for whites than for nonwhites (by −0.043), perhaps because nonwhites are more constrained by their own familial resources in a variant of the Becker and Tomes' (1986) argument. Thus, these results suggest that controlling for children's age and race makes a significant difference in estimating the intergenerational elasticity, though the same is not the case for gender.

What happens to the estimated intergenerational correlation as we increase the number of years that we average? The results of adding in earlier years are given in the subsequent rows of Table 4. The intergenerational correlation, $R$, increases substantially in this case by including additional years up to and

[19]We do not place great weight on this estimate of the maximum age since the quadratic effect is an imprecise estimate and since our sample includes only young adults and, thus, is not well-suited to precisely estimate the life-cycle association for older adults.

including the tenth additional year ($R$ increases from 0.37 for 1984 to 0.58 for 1975–84). The estimated impact of age, gender, and race on the intergenerational elasticities also changes as we add years. The addition of a number of years to 1984 yields age and race coefficient estimates that appear somewhat less important, but gender effects that appear to be substantially more important (and significant) than in the first row for 1984 alone. We do not have an explanation for the changing relative importance of age, gender and race as the number of years is increased. However, judging by the intergenerational $R$'s and the coefficient estimates of ln parents' income without interactions, the estimates based on more years are of most interest. For the estimates based on 1975–84 in the last row of Table 4, the race impact (−0.037 for whites) is slightly less than for 1984 alone (though not significantly less). The gender effect (−0.012 for females) is almost twice that estimated based on 1984 alone, and significantly nonzero for 1975–84, though it is smaller (and significantly so) than the race effect. The quadratic age effects are smaller and less precisely estimated with data for 1975–84 period than for 1984 alone and imply a maximum elasticity at age 58 or 0.80 as compared with 0.72 at age 21.[20]

## 4. Conclusion

We have used the Michigan Panel Study of Income Dynamics to create a linked parent-child file with panel features for both generations. We use this data set to undertake intergenerational earnings/income analysis beyond the usual single year cross-sectional studies. The panel feature allows better representation of life-cycle developments, possible liquidity constraint effects and reduction in measurement error, transitory income, and period effects.

Our estimates suggest higher intergenerational associations than in single cross-sections of the type used in all previous studies in three respects:

*First*, if only one year of data is used for children's and parents' income, there is a gain to using a year for the offspring's earnings in which the children are old enough to be on a relatively stable segment of their life cycle earnings paths and an earlier year for the parents' income when important educational decisions were being made for the offspring since liquidity constraints apparently are important.

*Second*, the use of averages over several years may result in higher associations than use of a single year of data because of limiting measurement errors, transitory fluctuations, and period-specific effects. For this data set there seems to be increasing correlations in using up to 10 years in such averaging. The magnitude of this increase is substantial, and larger than that from controlling for parental liquidity constraints.

*Third*, control for individual and family demographic characteristics increases the intergenerational correlation substantially. The elasticity of children's earnings with respect to parents' income is significantly higher for sons than for daughters and for nonwhites than for whites, with the latter effect larger than for former. This elasticity also increases during the children's initial years of the work cycle,

[20]See note 18.

presumably in part because the earnings data for the initial years are noisy for reasons mentioned above.

In our preferred estimates, which incorporate both a decade of data and control for demographic features, we find an intergenerational correlation of 0.58—a relatively high value as compared to most previous estimates that are summarized in Becker and Tomes (1986). The elasticity of children's earnings with respect to parents' income is about 0.80 for white sons at age 58, which is high in comparison with the median from previous estimates. Therefore, intergenerational earnings/income mobility appears to be substantially less between these two recent U.S. generations than implied by most of the estimates summarized by Becker and Tomes. Thus, some of the apparent paradox between the important role of childhood family background claimed in some studies (see the introduction) and low estimates of intergenerational correlations is due to inadequacies in previous estimates of the latter.

Finally, Becker and Tomes (1986) conjectured that the intergenerational elasticities are nonlinear in parents' income for given children with lower slope coefficients for wealthier parents because of relatively rare intergenerational transfer of financial or physical assets for poorer versus richer parents. We find some limited support for this conjecture in the slightly lower elasticity for whites than for nonwhites in the estimates in Table 4 (under the assumption that the former are wealthier). However, we find no support for it in straightforward estimates in which we add the square of the ln of parents' income. True, in such estimates we find some nonlinearity in the elasticity, but this elasticity increases for wealthier parents rather than falling as the Becker and Tomes conjecture would have it. This, mobility may decrease as the U.S. grows wealthier if this reflects primarily an absolute, rather than a relative, income phenomenon.

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