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Changing Roles of Parental Economic Resources in Children's Educational Attainment

We investigate whether the relationship between parents' economic resources and children's educational attainment has changed over time by comparing two cohorts from the Panel Study of Income Dynamics. We examine multiple measures of economic resources, including income, net worth, liquid assets, and homeownership. We employ probit regressions and Chow tests in multivariate analyses. Results show that the associations between parents' liquid assets and college attendance became significantly stronger among the later cohort, suggesting the increasing importance of liquid assets. Of particular interest is a change in the role of negative liquid assets (unsecured debt exceeding savings) in high school graduation: among the earlier cohort there was no difference in likelihood of graduation between students whose families had negative liquid assets and those from families with zero liquid assets, but among the later cohort students from families with negative liquid assets were more likely to graduate. Results demonstrate the importance of employing diverse measures of economic resources in studying educational mobility. We may need to consider saving incentives and expansion of credit market access among families with few economic resources to improve educational outcomes.

Key words: *education; assets (wealth); income; cohort; inequality*

Equal educational opportunity has been considered a fundamental indicator of a society's fairness. It is a deep-rooted belief in American culture that every child should have the equal opportunity to receive the best possible education. The existing literature, however, proves that family backgrounds, especially parents' economic resources, are strong predictors of educational attainment (Ellwood & Kane, 2000; Mare, 1981). Accordingly, it is a question of interest whether association between family backgrounds and children's educational attainment has strengthened or weakened over time. If the importance of family background has diminished, it indicates that society is moving in the direction of equal educational opportunity.

This study investigates whether the role of parents' economic resources has increased, decreased, or remained steady over time, by comparing two cohorts of children from the Panel Study Income Dynamics (PSID) data. Given that household wealth is not perfectly correlated with income (Wolff, 1990), it is important to examine the roles of parents' assets as well as income. Therefore, in comparison to existing studies, we use diverse measures of economic resources in addition to income, including three measures of parents' assets: net worth, liquid assets, and homeownership. In addition, this study investigates the roles of debt.

Background

Recent decades have seen dramatic socioeconomic changes. First, the financial cost of a college education has risen steadily, hitting low-income children particularly hard. College tuition and related costs have risen more rapidly than the inflation rate, while financial aid has shifted more toward non-need-based aid (Kane, 2004). These changes are expected to exacerbate the burden of low-

income children in financing college education. Second, the value of a college education has increased continuously since the late 1970s, as reflected in growing earnings gaps between workers with and without college degrees (Acemoglu, 2002). The increased value of education will heighten the impact of economic resources, if parents with low resources are unable to increase their investment in their children's college education. It is also possible that the increased value of education will motivate low-resource parents to invest more, shift their resources toward children's education, and become more willing and able to borrow money (Nam, 2004). Third, income and wealth inequalities have widened in the past few decades (Neckerman & Torche, 2007). Growing economic inequality may have contributed to growing educational gaps: higher levels of income inequality, as measured with the Gini coefficient, improved high-income children's educational outcomes, while lowering those of low-income children (Mayer, 2001). Finally, access to the consumer credit market has widened, especially among relatively low-income households. The percentage of households with credit card debt increased, while the gaps between desired and actual levels of borrowing declined since the 1980s (Bird, Hagstrom, & Wild 1999; Lyons 2003). Changes in the consumer credit market may have dual impacts on children's education. On the one hand, access to credit may help low-resource children to continue their education by smoothing consumption. On the other hand, it imposes financial constraints in the long term if parents become less willing or able to borrow for education on account of past consumer debts.

A small number of recent studies have empirically tested whether the relationship between parents' economic resources and educational attainment has changed over time. Most of these studies focus on income. Morgan and Kim (2006) and Ellwood and Kane (2000) conclude that the effect of parents' income on college enrollment has remained stable. Belley and Lochner (2007), however, show a substantial increase in the effect of parents' income on college attendance, but little change in regard to high school graduation. In summary, existing empirical studies have not reached consensus on whether the effects of parents' income on children's education has increased or not, calling for further research.

Existing literature has rarely investigated the role of assets on changes in educational mobility. Parents' assets and debt, however, are likely to affect children's formal educational attainment. Liquid assets may reduce households' need to borrow for children's education and prevent children from dropping out of school by smoothing consumption at times of economic difficulty. Homeownership may facilitate borrowing by providing collateral to lenders. At the same time, homeownership in decent school districts is likely to improve educational outcomes. Access to the credit market and household debts may improve educational outcomes by providing economic means to get through economically difficult times. Debts, however, may be a sign of financial vulnerability because households with debts may have trouble getting additional credit for their children's education in the future (Gruber, 2001; Nam and Huang, In Press). Existing empirical studies show that parents' assets significantly increase children's educational attainment after controlling for parents' income and other family backgrounds (Conley, 2001; Nam and Huang, In Press; Zhan and Sherraden, 2003). Nam and Huang (In Press) show that children from negative liquid asset households (those whose debts exceed savings) are more likely to graduate high school but less likely to graduate college than their counterparts from zero liquid asset households.

Morgan and Kim (2006) is, to the best of our knowledge, the only study that uses parents' assets in studying changes in educational mobility. They find that the effects of parents' net worth and home equity have remained stable between the two cohorts. Invaluable as it is, Morgan and Kim's study is

not free from limitations. The study does not include liquid assets in its analysis, one of the major financial sources for children's education. In addition, the analysis suffers from data limitations. They used data from the Survey of Income and Program Participation, which is not an ideal data set for studying intergenerational mobility (Ratcliffe et al., 2008). In addition, their sample consists of young adults (17-21 years old), some of whom had become independent from their parents. Since the SIPP does not provide information about the economic resources and characteristics of parents of independent young adults, Morgan and Kim impute these variables. In addition, they use a monthly measure of family income, although previous studies of intergenerational mobility indicate that we should use at least three years of data on parents' income to account for income fluctuation (Nam, 2004; Solon, 1992).

This study contributes to the literature by including various measures of economic resources while investigating their changing roles in children's educational attainment. We examine parents' income, net worth, liquid assets, and homeownership to see whether the pattern of change differs by distinct types of economic resources. In addition, we create a categorical measure of liquid assets to test whether the effects of liquid assets are linear, paying special attention to household debts. By separating out households with negative liquid assets (unsecured debts exceeding financial assets), we are able to examine the effects of household debts on children's educational attainment.

Methods

Data and sample selection

This study uses data from the Panel Study of Income Dynamics (PSID). The PSID is a longitudinal survey of a nationally representative sample that has collected information from the same families since 1968. The PSID provides rich information on individual and household characteristics, including education, household income, and household composition (Hill, 1992). The PSID collected wealth data every five years between 1984 and 1999 and every two years thereafter. Other scholars have reported that the PSID provides reliable and valid data on household income and wealth in comparison with other survey studies (Hill, 1992; Ratcliffe et al., 2008). The PSID is considered an ideal dataset for studying intergenerational mobility, because it follows the children of the original sample families after they leave their parents' houses. As a result, the data were collected directly from the parents when children were young, and directly from the children after they formed their own households (Hill, 1992; Solon, 1992). This study also uses the Bureau of Labor Statistics' state unemployment rate data.

The sample in this study consists of two cohorts: one composed of children who were 15-17 years old in 1984 ('84 cohort) and the other consisting of those of the same ages in 1994 ('94 cohort). We include only whites and blacks in our sample, because the PSID does not have enough cases for other racial and ethnic groups due to its sampling design in 1968. We exclude 50 cases with missing values from our sample. The final sample consists of 798 individuals (390 from the '84 cohort and 408 from the '94 cohort).

Measures

The dependent variable is educational attainment at age 26, except for those who were 16 years old in 1994. For this group, we use educational outcomes observed at age 27 because the PSID did not

conduct a survey in 2004 when they turned 26. The youngest group in our sample (15 years old in 1994) became 26 year old in 2005 (the latest data available at the time of this study). We categorize educational outcomes into two dichotomous variables: high school graduation and college enrollment. The high school graduation variable assigns 1 to those who reported having 12 or more years of schooling (or a GED) and 0 to others. The college attendance variable is a value of 1 for at least one year of college and 0 for others. We do not analyze college graduation because the sample size for this analysis is too small (N=161) for the earlier cohort.

The major independent variables are parents' income and assets during the childhood observation. The parents' income variable is created by averaging three years of family income (1982 to 1984 for the '84 cohort and 1992 to 1994 for the '94 cohort). Three years of data are used to account for income fluctuation over time (Solon, 1992). Household assets were measured in 1984 for the earlier cohort and in 1994 for the later cohort. This study employs three types of household assets: liquid assets, homeownership, and net worth. Liquid assets are created by subtracting the amount of unsecured debt (the sum of credit card charges, student loans, medical and legal bills, and loans from relatives) from a household's financial assets (the sum of the amount of money in saving and checking accounts, plus the total value of stocks, mutual funds, and investment trusts). We use a dichotomous measure of homeownership (1 for those owning a home and 0 for the others). The net worth variable is constructed by summing the amounts of liquid assets, home equity, other real estate equity, vehicle equity, business or farm assets, and other assets. All measures of family income and assets are inflation-adjusted to the 2006 dollar using the Consumer Price Index (CPI).

Following previous studies (Conley, 2001), we use the log of family income, net worth, and liquid assets in multivariate analyses to address their skewed distribution; we assign a value of one to cases with negative or zero values before we convert these variables into log form to prevent missing values. In addition to the continuous measure, we create a categorical measure of liquid assets: negative (less than zero), zero, modest (\$1-\$3,000), and high (larger than \$3,000).

In addition to economic resources, we create demographic and household characteristics, and environmental variables. Time-invariant variables [household head's race (The PSID does not collect race information on other household members), education, and age; child's gender, age, and stepchild indicator) are created based on the base-year information (1984 or 1994). The birth order to mother variable was collected in 1993. Family size and the number of children are constructed with three-year averages of childhood observations (1982-1984 or 1992-1994). The female-headed family variable assigns 1 for children who lived in this type of family at any time during the observation period and 0 otherwise. Two environmental variables are created: the southern origin variable (1 if an individual lived in a southern state in the base year, 1984 or 1994; 0 otherwise) and the state unemployment rate variable (three-year average during childhood observation).

Analytical Model

This study employs probit regressions because the education outcome variables are dichotomous. In multivariate analyses, we follow Mare's (1981) methodological suggestion to separate structural mobility from circulation mobility. That is, since overall educational attainment has increased over time (Kane, 2004; Mare, 1981), we should separate change in educational distribution (structural mobility) from changes in the association between family backgrounds and educational attainment (circulation mobility). We estimate the effects of family background on the probability of moving

into a given grade level, on the condition that an individual has completed the previous level. That is to say, we include only high school graduates in analyzing college attendance. Accordingly, differences in background effects between the two cohorts cannot result from a change in marginal distribution of either independent or dependent variables. In addition to separate probit regression for each cohort, we run Chow tests to see whether differences between the two cohorts are statistically significant (Greene, 2003).

Some families have multiple children in the sample. Since children from the same family are not independently observed (Greene, 2003), our multivariate analyses adjust for standard errors by clustering multiple children into the family unit. In both descriptive and multivariate analyses, we weigh the data with the last observed individual weight variable (individual weight at age 26 or 27) as recommended by Hill (1992). We run additional analyses to check the robustness of our findings: a model using an alternative measure of parents' education (higher level of parents' education for two-parent families instead of head's education), models using different types of housing assets (value of home and home equity), and analyses with logit regressions. Results from these analyses are not substantially different from those reported in this article [Results are available from the first author upon request].

Results

Descriptive statistics

Table 1 reports parents' economic resources and other characteristics of the sample. Statistics on parents' economic resources show similar results with those reported in existing studies. We compared our sample to households headed by 35-44 year-old and 45-54 year-old heads in the Census Bureau's report because 89% of our sample lived in households led by these age groups. Mean family incomes in our sample (\$ 64,145 for the '84 cohort and \$ 74,217 for the '94 cohort) lie between average incomes of households headed by 35-44 year-olds and 45-54 year-olds (\$61,713 and \$66,545 for 1984 and \$69,703 and \$79,367 for 1994, respectively) reported by the Census Bureau (<http://www.census.gov/hhes/www/income/histinc/h10ar.html>). The homeownership rates in our sample (76% and 73% respectively) are also comparable to the Census Bureau's information (<http://www.census.gov/hhes/www/housing/hvs/historic/histt15.html>) for the same age groups (68.92% and 76.46% in 1984; 65.51% and 75.15% in 1994).

Changes in wealth ownership demonstrate increasing economic inequality as documented in previous studies (Carney and Gale, 2001): gaps between bottom and top quartiles became wider among the later cohort for both net worth and liquid assets. Consistent with previous studies (Bird, Hagstrom, & Wild 1999; Lyons 2003), the percentage of households with negative liquid assets increased from 24% to 28%, while the proportion with positive liquid assets remained stable.

Table 1. Characteristics of sample by cohort

Variable	1984 cohort	1994 cohort
Family Income (\$)		
Mean (without top & bottom 5%) (SD) ***	64145.18 (33923.45)	74217.48 (33846.09)
Bottom Quartile	37839.42	47709.86
Median	57958.89	67784.46
Top Quartile	83392.19	97180.92
Net Worth (Continuous) (\$)		
Mean (without top & bottom 5%) (SD)	139860.9 (162073.8)	150052.2 (187890.6)
Bottom Quartile	29104.91	23125.51
Median	86055.45	78898.79
Top Quartile	188211.7	206769.2
% with negative net worth	5.49%	6.00%
% with positive net worth	91.48%	90.52%
Liquid Assets (\$) ^a		
Mean (without top & bottom 5%) (SD)*	15671.74 (33557.92)	20073.73 (36037.36)
Bottom Quartile	0.00	0.00
Median	970.16	3400.81
Top Quartile	15522.62	27750.61
% with negative liquid assets	24.00%	28.13%
% with positive liquid assets	59.09%	58.06%
Home Owner (%)	75.96	72.75
Black (%)	13.78	13.85
Female (%) **	40.09	46.99
Birth Order to Mother (mean) ***	2.62	1.93
Stepchild (%)	7.96	7.51
Child's Age (mean) ***	16.10	15.89
Parent's Age (mean)	43.93	43.55
Parent's Education (mean) ***	12.58	13.26
Family Size (mean) ***	4.58	4.22
Number of Children (mean) **	2.30	2.13
Female-Headed Household (%) **	17.62	24.58
Southern Origin (%)	32.62	33.01
State Unemployment Rate (mean) ***	9.17	6.78
Sample Size	390	408

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$ (Difference between the two cohorts)

^a. Liquid asset measure has 17 cases with missing values. Accordingly, sample sizes in analyses with liquid asset measures are slightly smaller than others.

Table 2 demonstrates improvement in educational attainment between the two cohorts. Between the '84 and 94 cohorts, the percentage of high school graduates increased from 85% to 92%, and the proportion of individuals who ever attended college grew from 47% to 56%. College attendance rates among those who succeeded in graduating high school rose from 56% to 61%. These findings justify the separation of circulation mobility from structural mobility.

Table 2. Educational Attainment by Cohort

	1984 cohort	1994 cohort
High School Graduation ^c	84.77	92.42 ^c
College Attendance ^b	47.28	56.28 ^b
College Attendance Among High School Graduates	55.77	60.89

^a Difference between the two cohorts is significant at the 0.1 level; ^b Difference is significant at the 0.05 level; ^c Difference is significant at the 0.01 level.

Multivariate analysis results: Continuous measures of economic resources

Table 3 summarizes the results of multivariate probit regression analyses using continuous measures of economic resources. The first four columns report findings on high school graduation and the second four on college attendance. Table 3 present results from two models: one with net worth and the other with liquid assets and home ownership.

Analysis results on high school graduation shows the importance of parents' assets. Parents' income did not have a significant association with the child's probability of finishing high school for either cohort, but parents' assets did. After controlling for parents' income and other family background characteristics: the amount of net worth significantly increased chances of high school graduation among the '84 cohort, while a higher level of liquid assets did the same among the later cohort. Homeownership, however, does not have significant association among either cohort. These results are consistent with Zhan and Sherraden (2003), which used a sample similar to the '94 cohort in this study (12-18 years old during the years 1992-1995).

Chow test results show that the associations between parents' economic resources and children's high school graduation do not differ between the two cohorts at the statistically significant level. These results suggest that the effects of parents' economic resources remained stable between the earlier and later cohorts.

In contrast to results on high school attendance, analysis results on college attendance indicate a positive relationship with income among the later cohort. The greater the parents' income, the more likely the child was to attend college. Both net worth and liquid assets have significant associations only among the later cohort while home ownership does so only among the earlier cohort.

Only the amount of liquid assets shows a significant change between the two cohorts among the four types of parental economic resources. Although other economic resource variables show differences in coefficients between the two cohorts, Chow tests show that inter-cohort differences are not statistically significant for parents' income, net worth, and homeownership. To the contrary, the association between liquid assets and college attendance was strengthened at a statistically significant level, suggesting that the role of parents' liquid assets increased between the two cohorts.

Table 3. Probit Regressions: Parents' Economic Resources and Educational Achievement

	High School Graduation				College Attendance			
	Model 1: Net Worth		Model 2: Liquid Assets and Home		Model 1: Net Worth		Model 2: Liquid Assets and Home	
	'84 cohort	'94 cohort	'84 cohort	'94 cohort	'84 cohort	'94 cohort	'84 cohort	'94 cohort
Income	0.02 (0.09)	-0.13 (0.20)	0.00 (0.09)	-0.23 (0.23)	0.22 (0.18)	0.42** (0.18)	0.28 (0.19)	0.35* (0.18)
Net Worth	0.06** (0.03)	0.04 (0.04)			0.05 (0.04)	0.05* (0.03)		
Liquid Assets			0.03 (0.03)	0.06** (0.03)			-0.00 (0.02)	0.05** ^a (0.02)
Home			0.19 (0.23)	0.09 (0.33)			0.47* (0.24)	0.30 (0.23)
Black	1.13*** (0.29)	-0.14 ^c (0.37)	1.20*** (0.29)	-0.19 ^c (0.36)	0.56** (0.29)	0.10 (0.27)	0.55* (0.29)	0.12 (0.27)
Female	0.508** (0.200)	0.42* (0.22)	0.53** (0.20)	0.46* (0.24)	0.17 (0.19)	0.13 (0.17)	0.13 (0.20)	0.12 (0.17)
Birth Order	-0.00 (0.07)	-0.09 (0.10)	-0.01 (0.07)	-0.12 (0.10)	0.03 (0.07)	-0.05 (0.11)	0.04 (0.07)	-0.02 (0.11)
Stepchild	-0.17 (0.29)	-0.74* (0.42)	-0.11 (0.32)	-0.67 (0.44)	0.03 (0.30)	-0.59 (0.38)	-0.03 (0.32)	-0.59 (0.37)
Age 16	-0.07 (0.26)	0.39 (0.31)	-0.10 (0.26)	0.42 (0.31)	-0.12 (0.26)	-0.08 (0.20)	-0.02 (0.26)	-0.05 (0.20)
Age 17	0.23 (0.26)	-0.16 (0.27)	0.23 (0.27)	-0.16 (0.29)	0.07 (0.24)	0.32 (0.22)	0.18 (0.25)	0.30 (0.23)
Parent's Age	-0.01 (0.02)	0.01 (0.02)	-0.01 (0.02)	0.01 (0.02)	-0.01 (0.02)	0.03* (0.02)	-0.01 (0.02)	0.03 (0.02)
Parent's Education	0.11*** (0.04)	0.23*** (0.07)	0.11** (0.04)	0.20*** (0.07)	0.25*** (0.04)	0.18*** (0.04)	0.24*** (0.04)	0.18*** (0.05)
Family Size	-0.14 (0.15)	0.01 (0.26)	-0.14 (0.16)	0.11 (0.27)	-0.17 (0.16)	-0.24 (0.22)	-0.20 (0.16)	-0.23 (0.23)
# of Children	-0.05 (0.17)	-0.06 (0.30)	-0.09 (0.19)	-0.08 (0.30)	0.11 (0.17)	0.41* (0.24)	0.13 (0.18)	0.45* (0.25)
Female-Headed Household	-0.51 (0.33)	-0.41 (0.34)	-0.58* (0.32)	-0.35 (0.35)	-0.20 (0.33)	-0.53* (0.31)	-0.16 (0.34)	-0.55* (0.32)
Southern Origin	-0.07 (0.22)	0.30 (0.31)	-0.07 (0.23)	0.29 (0.31)	-0.06 (0.20)	-0.13 (0.19)	-0.09 (0.21)	-0.04 (0.20)
Unemployment Rate	-0.08 (0.05)	0.07 (0.09)	-0.10 (0.06)	0.10 ^a (0.09)	0.03 (0.05)	-0.02 (0.07)	0.03 (0.05)	0.01 (0.07)
N	390	408	379	402	324	370	314	367
Pseudo R ²	0.17	0.21	0.17	0.21	0.22	0.27	0.23	0.28

* p < 0.1 ** p < 0.05 *** p < 0.01

^a Difference between the two cohorts is significant at the 0.1 level; ^b Difference is significant at the 0.05 level; ^c Difference is significant at the 0.01 level.

We ran additional analyses to test whether increased college costs explain the changed role of liquid assets [Results are available from the first author upon request]. For these analyses, we used average tuition of state universities and community colleges in the state of residence as a measure of college cost, using data from the National Center for Education Statistics (http://nces.ed.gov/programs/digest/d05/tables/dt05_312.asp). Additional analyses produced substantially identical results to those reported in the article. These results imply that changes in the tuitions of state universities and community colleges were not a driving factor behind increased effects of parents' liquid assets. Due to limitations in data, this study could not examine whether an increase in college premium in the labor market, growing economic inequality, or expanded access to the credit market has contributed to the enhanced role of liquid assets in college attendance.

Results on race are of particular interest. Among the '84 cohort, blacks were significantly more likely to graduate high school and to attend college than whites, when other demographic characteristics and family backgrounds are controlled for. However, among the '94 cohort, blacks were not significantly different from their white counterparts in their chances of high school graduation and college attendance. Chow tests show that an inter-cohort change in race effects is statistically significant at the 0.01 level for high school graduation. Belley and Lochner (2007) produce similar results, showing that the positive effects of being black on educational attainment have disappeared in recent years.

Multivariate analysis results: Categorical measure of liquid assets

Table 4 reports results based on a categorical measure of liquid assets consisting of four levels: negative, zero (reference group), moderate (\$1-\$3,000), and high (larger than \$3,000). These analyses test whether the relationship between parents' liquid assets and children's education is linear, with special attention to negative liquid assets. Table 4 does not report results on other independent variables because they are not substantively different from those in Table 3.

Of the results on high school graduation, negative liquid assets are of particular interest. Its coefficient is not statistically significant among the '84 cohort but is significantly positive among the '94 cohort. That is to say, children from negative-asset households had the same chance of graduating high school as those from zero-asset households among the earlier cohort; among the later cohort, children from negative-asset households are significantly more likely to graduate. A difference in the coefficients between the cohorts is significant at the 0.05 level, implying that the relationship between negative liquid assets and high school graduation changed significantly.

Table 4 also summarizes the results on college attendance. Consistent with findings in Table 3, none of the liquid asset categories are significantly different among the '84 cohort. A high level of liquid assets has a significantly positive coefficient among the '94 cohort, indicating children from high-liquid asset families are more likely to attend college. A Chow test indicates that an inter-cohort difference in high liquid asset is not significant at the 0.1 level but significant at the 0.2 level (p-value of 0.117). The negative liquid asset variable has a positive coefficient for both cohorts, but it is not statistically significant.

Table 4. Probit Regressions: Categorical Liquid Assets and Educational Achievement

	<u>High School Graduation</u>		<u>College Enrollment</u>	
	'84 cohort	'94 cohort	'84 cohort	'94 cohort
Negative Liquid Assets	-0.19 (0.28)	0.77** ^b (0.38)	0.40 (0.30)	0.46 (0.30)
Modest Liquid Assets	0.23 (0.33)	0.16 (0.40)	-0.19 (0.34)	0.44 (0.38)
High Liquid Assets	0.08 (0.31)	1.45*** ^c (0.39)	0.24 (0.31)	0.95***
Sample Size	379	402	314	367
<i>Pseudo R</i> ²	0.17	0.26	0.24	0.29

* $p < 0.1$ ** $p < 0.05$ *** $p < 0.01$

^a Difference between the two cohorts is significant at the 0.1 level; ^b Difference is significant at the 0.05 level; ^c Difference is significant at the 0.01 level.

Note. In addition to variables listed in the table, each model include the following variables: gender, race, birth order to mother dummy variables, stepchild indicator, head's age, head's education, household size, number of children in the household, living in female-headed household, state unemployment rate, and southern origin

Conclusion

This study, by comparing two cohorts from PSID data, examines whether relationships between parents' economic resources and children's educational attainment have changed over time. We pay special attention to parental assets: liquid assets are often important financial resources for children's education, illiquid assets are likely to facilitate borrowing by providing collateral to lenders, and homeownership may provide better educational environments. We also investigate the roles of debts by separating out households with negative liquid assets from others.

This study finds that parental assets and debts play an important role in children's educational attainment, independent of family income. Consistent with previous studies (Conley, 2001; Nam and Huang, In Press; Zhan and Sherraden, 2003), net worth, liquid assets, and homeownership have positive effects on children's formal education, including high school graduation. Children from households whose debts are larger than savings are more likely to graduate from high school than those from households with zero liquid assets among the '94 cohort, suggesting household debt plays a positive role at least in the short term.

Considering that high school education is free to most children (as long as they attend public school), it is somewhat puzzling that parents' assets have a significant association with high school graduation. Expectations of higher education may explain these relationships. Previous studies show that asset ownership promotes parents' expectations of higher education, which is likely to facilitate children's chances of high school graduation (Zhan & Sherraden, 2003). It is also plausible that parents' assets and ability to borrow may have smoothed consumption during times of economic difficulty, and prevented their children from working long hours to earn money. Intensive employment during adolescence significantly increases one's risk of high school dropout (Warren & Lee, 2003). Finally, the association between parental assets and high school graduation may simply reflect the fact that parents tend to save more to finance college education if their children are likely

to attend college (and therefore to graduate from high school). That is to say, higher chances of high school graduation may have caused higher levels of saving, not the other way around. These explanations, however, have not been empirically tested and call for future investigation.

This study finds that the roles of liquid assets and debt have changed between the two cohorts. The effects of the amount of liquid assets on college attendance significantly increased as shown in Table 3. The analyses with a categorical measure of liquid assets show that the positive effects of a high level of liquid assets (more than \$3,000) on high school graduation significantly rose between the two cohorts.

Of particular interest are changes in the role of negative liquid assets in high school graduation. Among the '84 cohort, the probability of graduating high school did not differ between children from households with negative liquid assets and those from households with zero liquid assets. Among the '94 cohort, however, the probability of graduation was higher for children from households with negative liquid assets. These shifts in the role of negative liquid assets may reflect expanded accessibility to the consumer credit market among the later cohort. Along with findings in previous research (Bird, Hagstrom, & Wild 1999; Lyons 2003), our data show that the proportion of negative liquid asset households increased between the two cohorts, particularly among those at lower income levels: while the overall percentage of households with negative liquid assets increased by four percentage points between the cohorts as shown in Table 2, the proportion rose from 25% to 34% among those at the second quartile (25th to 50th percentile) of income distribution. Changes are less dramatic among other income groups. These results suggest that an increased access to the credit market and ease of borrowing among lower-income households may have encouraged households to smooth consumption with unsecured debt, which may have prevented children from dropping out of high school during times of economic strain. This explanation is, however, hypothetical, and should be tested in future empirical studies.

Findings on race are also of interest. When parents' socioeconomic status were equivalent, blacks were more likely to graduate high school and to attend college than their white counterparts among the earlier cohort. This is not true among the later cohort. Inter-cohort differences in race are statistically significant on high school graduation, suggesting that blacks' advantage over whites in educational attainment disappeared in recent years. These findings call for further research and policy intervention on racial disparities in education.

Our study has the following limitations. We are unable to test whether the effects of parental economic resources found in this study may be caused by unobserved parental characteristics. For instance, parents with a strong future orientation often save more and encourage children to obtain higher levels of education than others. The PSID does not collect information on parents' attitudes, which prevents us from further investigating this issue. Second, data limitations prohibit us from examining what caused the shifts found in this study. Accordingly, we cannot explain why the roles of parents' liquid assets and race changed between the cohorts. Third, we cannot examine the long-term effects of parents' economic resources on children's educational outcomes because we are unable to study college graduation due to small sample size.

This article indicates the need for including assets and debts, as well as income, when studying the impact of parents' economic resources on children's educational attainment. We also show that it is important to examine educational mobility with diverse measures of parents' assets. As illustrated in

this study, parents' net worth, liquid assets, and homeownership have distinct associations with children's formal education. It is also noted that the relationship between liquid assets and education is not linear and that children from negative liquid asset households tend to have better educational outcomes than those from zero liquid asset households among the recent cohort, probably because of their greater access to the credit market.

Our findings suggest that issues related to savings and credit market accessibility should be considered when developing public policies. Considering increased associations between liquid assets and household debt and children's educational outcomes, we may consider saving incentives and expanded access to the credit market as new ways to promote education among low-resource children.

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