The Role of Parental Wealth and Income in Financing Children's College Attendance and Its Consequences
Online Appendix

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Appendix A Descriptive Statistics for Demographic Characteristics of Parents and their Children

TABLE A.1. Characteristics of Homeowning Parents and College-Age Children in PSID, 1997-2015[1]

Variable	Mean
Parent Characteristics when Child was Age 18:	
Parent married/cohabiting	0.70
Parent HH Headed by Male	0.82
Number of children under 16 in parent HH	0.87
Age of parent House Head	45.58
Parents Non-White	0.29
Parent's Education:	
High school or less	0.21
Some College	0.51
College graduate	0.28
Child Characteristics:	
Sex of child (male=1)	0.48
Year child turned 18[2]	2004.50

[1] Statistics weighted using PSID family weights.

[2] The range of years in which children turned age 18 is 1998–2015.

Appendix B   F-Tests for Weak Instruments in First-Stage Regressions for Control Function and IV Estimators

Below we provide statistics for F-tests of the joint significance of the instrumental variables in the first-stage regressions for the control function and IV estimators presented in Table 3. In the Table below, we indicate the tables to which the test statistics of the first-stage regressions correspond and the instrumental variables used in these regressions. We note that F-test statistics with values less than 10 for first-stage regressions are considered evidence of weak instruments (Stock and Staiger, 1997).

TABLE B.1. F-Tests of Joint Significance of Instruments in First Stage Regressions in Table 3[1]

Dependent Variable:	$Y_{imt_{18,j}}$	$H_{imt_{18,j}}$	$Y_{imt_{18,j}}$	$H_{imt_{18,j}}$
	Coll. Choice & Financing		*Amt. Transferred*	
F-test	63.95	17.98	25.11	7.28
P-Value	0.000	0.000	0.000	0.001
	Graduate from College[2]			
F-test	59.11	34.88		
P-Value	0.000	0.000		

[1] The instruments used in all of these regressions and for which the F-tests apply are: $\Delta HPI_{mt_{18_j}}$ and $\Delta W^P_{mt_{18_j}}$.

[2] These regressions are for children who attended college at age 18 ($N = 1,322$).

TABLE B.2. F-Tests of Joint Significance of Instruments in First Stage Regressions

Dependent Variable:	$Y_{nmt_{20}}$[1]	$Y_{nmt_{24}}$	$Y_{nmt_{28}}$
First Stage for Results in Panel A of Table 5:[2]			
Parents' Debt at t_{a_j}			
F-test	41.20	28.74	76.00
R^2	0.821	0.785	0.784
N	2,405	2,366	1,686
First Stage for Results in Panel B of Table 5:[3]			
Child's Debt at t_{a_j}			
F-test	258.7	153.0	200.5
R^2	0.861	0.852	0.836
N	1,119	1,171	736

[1] The n subscript in $Y_{nmt_{a_j}}$ is $n = i$ for parents and $n = j$ for child.

[2] The instruments used in the parents' debt regressions and for which the F-tests apply are: $\Delta W^P_{mt_{a_j}}, a = 20, 24, 28$, respectively.

[3] The instruments used in the child's debt regressions and for which the F-tests apply are: $\Delta W^C_{mt_{a_j}}, a = 20, 24, 28$, respectively.

Appendix C Estimates for the Effects of Parental Income and Wealth on the Costs and Quality of Colleges Attended

In this appendix, we examine whether parental wealth and income affect the costs and quality of the college attended for those children who chose to attend college. Below, we outline the data we use to measure college costs and quality, the estimation methodologies used and our findings.

Modeling Children's College & Quality

We obtain the annual tuition costs for a full-time student at that institution in the year they would have started college — which we denote by the variable $Tuition_{ij,18_j}$. We measure whether the institution was a 4-year college or university – denoted by the variable $4YrColl_{ij,18_j}$ – and whether it was a private institution – denoted by the dummy variable $Private_{ij,18_j}$. Finally, we examine an index of the quality of the college that a child attended by $Quality_{ij,18_j}$. The latter index is only available for children who attended a four-year college or university.

To measure the costs and the quality of the colleges children in our sample attended, we link responses from the main PSID interview or the TA study on the college attended to measures of college cost and quality available from the National Center for Education Statistics (NCES) Integrated Postsecondary Education Data System (IPEDS) database. We obtain the annual tuition costs for a full-time student at that institution in the year they would have started college. In doing so we use the state of residence of the parent at that time to determine whether children would have paid in-state or out-of-state tuition at any public institutions.[1]

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[1]We use in-state tuition if the parents resided in the same state as the institution in the year the child turned 18, and out-of-state tuition otherwise.

For college quality we use three separate measures. First, we measure whether the institution grants 4-year degrees. Second, we use whether a child attended a private university, where we restrict our attention to students who attend a 4-year university. Finally, we use the college quality index used in Black and Smith (2004), Black, Smith and Daniel (2005), Black and Smith (2006), Dillon and Smith (2017), and Dillon and Smith (2020).[2] The index is based on the following measures of colleges' selectivity and resources: college's mean SAT or ACT scores; percent of applications rejected; average salary of faculty involved in instruction; and the undergraduate faculty-student ratio.[3] The index is the first principal component of these four indicators of college quality measured in 2008.[4]

In Table C.1, we display mean values for the measures of college attributes described above for those attending college. One can see that all of the measures of college completion and the indicators of the quality of colleges attended are greater for children attending college with parental financial support compared to those attending without it. This is especially true for the composite college quality index ($Quality_{ij,18_j}$), which increases from 0.07 for college attended by children who did not receive financial help from their parents to 0.49 for those that did.

We examine how parental income and parental housing wealth affect college quality for those who attended college. Recall that $Attend_{ij}$ is an indicator variable for whether child j attended college and let $Attend4Yr_{ij}$ be an indicator variable equal to 1 for those children who attended attended a 4-year college and zero otherwise. We estimate the parameters of the following

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[3]These dimensions of quality for colleges in the U.S. are obtained from the Integrated Post-Secondary Education Data System (IPEDS) and college rankings by *U.S. News & World Report.*
[4]The particular version of college quality index we use takes on values from −9 to +9 and is constructed to have a mean of 0 across all of 4-year colleges and universities in the U.S.

regression for regression quality: following form:

$$CollOut_{qij,18_j} = \lambda_{q0}^O + \lambda_{q1}^O H_{imt18_j} + \lambda_{q2}^O Y_{imt18_j} + \boldsymbol{\lambda}_{q3}^O \boldsymbol{X}_{ij18_j} + \lambda_{q4}^O M_{2mt18_j} + \phi_{qt18_j}^O + \delta_{qm}^O + \varepsilon_{ij,18_j}^q, \quad (\text{C.1})$$

where $CollOut_q = Grad,\ Tuition,\ 4YrColl$ are outcomes for those who attend college (i.e., $Attend_{ij} = 1$), $CollOut_q = Private$ and $Quality$ are outcomes for those who attended a 4-year college (i.e., $Attend4Yr_{ij} = 1$), and where $\phi_{qt18_j}^O$ and δ_{qm}^O are year and the parents' county fixed effects, respectively. The vector, $\boldsymbol{X}_{ij18_j} \in \boldsymbol{Z}_{2imt18_j}$, used in (C.1) is the same as the one used in equations (2) and (7), except that it also includes a dummy variable for whether the child has become a head or wife in a PSID household by age 24. This extra variable controls for the source of data from which college information is obtained (PSID main interview versus Transition to Adulthood).[5]

As with the parental transfers equation in (7) and the specification for whether children attending college graduated in (8), we need to account for potential selection-bias in the estimation of college graduation and measures of college quality, given that these outcomes are only measured for those children who attend college ($Attend_{ij} = 1$) or, the case of quality measures for those who attend 4-year colleges ($Attend4Yr_{ij} = 1$). We use the same two-stage selection-correction estimation strategy described in Section 3. Furthermore, to account for the potential endogeneity of H_{imt18_j} and Y_{imt18_j} in (C.1), we again employ an IV estimator for (C.1), using the same exclusion restrictions as instruments, i.e., $\boldsymbol{Z}_{1imt18_j} = (\Delta HPI_{mt18_j}, \Delta W_{mt18_j}^P)$. The same justification presented in Section 3.2 is applicable to the validity in the estimation of the

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[5]As noted in Section 2.2, if adult children have become a head or wife of a PSID household by age 24, their data can be drawn from the PSID main interview and is, in principle, available for all of the years, t_{24_j}, that we analyze. In contrast, if adult child j does not become a head of wife of a PSID household by 2013 – the year of the last wave of the PSID used in our analyses – we use data about the characteristics of the college child j attended from the PSID Transition to Adulthood sample. But this latter sample is only available for more recent (calendar) years. Thus, including this extra dummy variable in (C.1) allows us to account potential differences across these two different sources of data used to determine the dependent variables, $Tuition_{ij,18_j}$, $4YrColl_{ij,18_j}$, $Private_{ij,18_j}$ and $Quality_{ij,18_j}$.

graduate and quality outcome regressions in (C.1).

Empirical Results

In Panels A and B of Table C.2 we present the estimates of the effects of parental net housing equity $(H_{imt_{18_j}})$ and income $(Y_{imt_{18_j}})$ on various indicators of the quality of the college attended for those children who attended college. OLS estimates are presented in in columns (1) and (3) and IV estimates in columns (2) and (4) for these outcomes outcomes. Looking at the effects of parental home equity on the various attributes and types of colleges attended, we find the effects to be very small. For example, a $10,000 increase in parental net equity would result in the child going to a college that is only slightly more expensive, ranging from $109 based on OLS estimates to $99 based on the IV estimates. (Recall from Table C.1 that the average annual tuition of college attended is $9,682.) Similarly, a $10,000 increase in parents' home equity would increase the probability of attending a private college by 0.3 percentage points (based on OLS) and would reduce it by 0.46 percentage points (based on the IV estimates). Furthermore, none of the effects of parental home equity are precisely estimated. With respect to the effects of parental income on the tuition, types and quality of the college attended, none of the other estimated effects of parental are precisely estimated, with the exception of the OLS estimated effects on the quality of college children attended. Furthermore, increases in parental income seem to have relatively negligible effects whether their children go to a more expensive school, one that is private or one that is of higher quality.

The lack of precision in the estimates of the effects of parental home equity and income may be due, in part, to the smaller sample sizes used to estimate the effects found in Table C.2 compared the likelihood of graduation in Panel D of Table 3. The samples used to estimate the effects presented in Panels A and B of Table C.2 are almost half of those used to estimate

the effects for college graduation in Panel D of Table 3. (The F-tests for the first-stage of the IV regressions displayed in Table C.3 are all slightly above conventional critical values.) While the smaller sample sizes contributed to the imprecision of our estimates, these findings do not indicate that parents use their income (or housing wealth) to send their child to a more expensive college, a private one, or a more highly ranked one.

TABLE C.1. Measures of the Costs and Quality of Colleges Children Attend by Whether or not Parents Helped to Finance Child's College Education[1]

Variable	Full Sample	Attended College	$EduFin1$ (Coll, but No Transfer)	$EduFin2$ (Coll & Transfer)
Annual Tuition ($Tuition$)[2]		$9,608	$7,776	$10,924
Attended 4-Year College ($4YrColl$)[2]		0.82	0.76	0.87
Attended Private College ($Private$)[3]		0.33	0.31	0.35
College Quality Index ($Quality$)[3]		0.33	0.07	0.49

[1] Statistics weighted using PSID family weights. Tuition amounts are in 2013$.
[2] Conditional on those students who attended college at age 18.
[3] Conditional on those who attended a 4-year college at age 18.

TABLE C.2. Effects of Parents' Home Equity and Family Income on Probability of Child Graduating from College and on Quality of College their Children Attended[1]

Variable	Selection-OLS[2] (1)	Selection-IV[3] (2)	Selection-OLS[2] (3)	Selection-IV[3] (4)
Panel A.	*Annual Tuition Costs*[2]		*Attended 4-Year College*[2]	
$H_{imt_{18_j}}$	108.00***	99.40	0.0004	−0.0023
	(52.69)	(180.63)	(0.0020)	(0.0068)
$Y_{imt_{18_j}}$	7.58	−92.63	0.0018	−0.0042
	(63.96)	(167.09)	(0.0027)	(0.0071)
R^2	0.383	0.379	0.368	0.286
N	795		793	
Panel B.	*Attended Private College*[3]		*College Quality Index*[3]	
$H_{imt_{18_j}}$	0.0030	−0.0046	0.0278**	−0.0180
	(0.0031)	(0.0107)	(0.0125)	(0.0299)
$Y_{imt_{18_j}}$	−0.0012	0.0018	0.0128	0.0333
	(0.0110)	(0.0110)	(0.0113)	(0.0356)
R^2	0.301	0.289	0.436	0.316
N	653		643	

[1] *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

[2] Regressions use only observations for children who attended college at age 18 (i.e., $EduFin1 + EduFin2 = 1$) and are corrected for this selection. The variables $H_{imt_{18_j}}$ and $Y_{imt_{18_j}}$ are treated as exogenous. Standard errors are obtained by bootstrap.

[3] Regressions use only observations for children who attended a 4-year college at 18 and are corrected for this selection. The variables $H_{imt_{18_j}}$ and $Y_{imt_{18_j}}$ are treated as endogenous and are instrumented with $\Delta HPI_{mt_{18_j}}$ and $\Delta W^P_{mt_{18_j}}$. Standard errors are obtained by bootstrap.

TABLE C.3. F-Tests of Joint Significance of Instruments in First Stage Regressions in Table C.2[1]

	Annual Tuition Costs[2]		Attended 4-Year College[2]	
F-test	43.30	11.68	42.98	11.87
P-Value	0.000	0.000	0.000	0.000
	Attended Private College[3]		College Quality Index[3]	
F-test	26.58	12.26	26.36	11.90
P-Value	0.000	0.000	0.000	0.000

[1] The instruments used in all of these regressions and for which the F-tests apply are: $\Delta HPI_{mt_{18_j}}$ and $\Delta W^P_{mt_{18_j}}$.

[2] These regressions are for children who attended college at age 18 ($N = 1,322$).

[3] These regressions are for children who attended a 4-year college at age 18 ($N = 795$).

References

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