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"You Pay Your Share, We'll Pay Our Share"

The College Cost Burden and the Role of Race, Income, and College Assets

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"You Pay Your Share, We'll Pay Our Share": The College Cost Burden and the Role of Race, Income, and College Assets

Changes in financial aid policies may place too much of the burden of paying for college on students. In addition, incentives for accumulating college assets may exacerbate the college cost burden on minority and lower income students. Our study investigated the impacts of these policy changes on college cost burden using trivariate probit analysis with predicted probabilities. We find that recent changes in the financial aid system place a higher responsibility on African American, Latino/Hispanic, and moderate-income students to pay for college themselves. An implication is that greater opportunities for more and higher dollar grants and scholarships at 4-year colleges are needed for African Americans. Further, there is a need to create more grants and scholarships that target Latino/Hispanic students as well as moderate-income students at both 2-year and 4-year colleges. We also find that students are less likely to pay for college with student contributions when parents open a savings account, start a state-sponsored savings plan, or open a college investment fund . However, nonminority and higher-income families are more likely to have college assets than their counterparts. Therefore, we suggest an additional strategy to to reduce the college cost burden on students is to create policies that will encourage accumulation of college assets among minority and lower-income families.

Key words: assets, college savings, college finances, college costs, student debt, student loans

Attaining a college degree is commonly viewed as a key tool for augmenting worker productivity, wages, and living standards. Given this, students, their families and society have a stake in students attending and graduating from college. However, with cutbacks on funding for higher education, college costs are likely to continue rising in the coming years. Rising college costs negatively impact college enrollment decisions of low-income and minority students in particular (Freeman, 1997; Heller, 1997; Leslie & Brinkman, 1988; McPherson & Schapiro, 1998). For example, findings suggest that a $150 net cost increase (in 1993/94 dollars) results in a 1.6 percentage point reduction in enrollment among low-income students (McPherson & Schapiro, 1998). In addition to high college costs, there have been three major shifts in financial aid policy in the last several decades that may burden lower-income and minority students disproportionately.

Since the late 1970s, the federal government has attempted to address inequities caused by high college costs by adopting of policies that make college loans accessible to more students. It has largely done this through programs such as federal Parent PLUS Loans and Stafford subsidized and unsubsidized loan programs. For example, the Middle Income Student Assistance Act (1978) brought college loans to the middle class by removing the income limit for participation in federal aid programs (Hansen, 1983). The 1992 amendments to the Higher Education Act made

unsubsidized loans available, and the Omnibus Budget Reconciliation Act (1993) included provisions for the Federal Direct Loan Program. More recently, Congress raised the ceiling on the amount of individual federal Stafford loans students can borrow through the Ensuring Continued Access to Student Loans Act (2008). The Health Care and Education Reconciliation Act (2010) routed all federal loans through the Direct Loan program, making it easier for students and parents to borrow directly from the U.S. Department of Education. These policies mark a shift away from societal responsibility for financing college (largely through scholarship/grants) toward greater financial obligations for students and their families.

Another important shift in financial aid policy is from need-based aid toward merit-based aid (Woo & Choy, 2011). Need-based aid is determined solely on the assets and income (i.e., financial need) of the prospective student and his or her family. Factors such as test scores have no bearing on the aid decision. In the case of merit-based aid, of which scholarships are the most common form, a student with little financial need (i.e., higher assets and income) is just as entitled to aid as are students with high levels of financial need (i.e., lower assets and income). Test scores are often the key factor for determining eligibility. Woo and Choy (2011) find that the proportion of undergraduates receiving merit aid rose from 6% in 1995/96 to 14% in 2007/08. Further, research suggests that merit-based aid is awarded disproportionately to students from higher-income families (Woo & Choy, 2011) and that it has done little to improve college enrollment rates among low-income and minority students (Marin, 2002).

The last significant shift in financial aid is the shift from spending programs to tax subsides. With the exception of increases in the maximum Pell Grant and loan subsidies, most new federal resources have been provided through the tax code. Middle- and upper-income students benefit most from these changes because they have a higher marginal tax rate then lower-income families (Maag & Fitzpatrick, 2004). Examples of these programs are college investment funds such as the Coverdell Education Savings Accounts, State 529s, and Education Savings Bonds. These programs provide an incentive for families to begin saving for college costs prior to students enrolling in college. Money invested in these types of college savings vehicles grow tax-free and withdrawals made from them to pay for college are also tax-free. While there is some evidence that suggests assets such as net worth and savings accounts do have a positive relationship with both college enrollment and graduation (for a review of this research see Elliott, Destin, & Friedline, 2010), there is little information to date about whether tax based college asset vehicles increase enrollment in college or whether they make college affordable.

These policy trends along with rising college costs raise the question, "Are students as likely as or more likely than society to bear the responsibility of paying for college?" In this study we investigate the probability that students pay for college with student, family, and/or societal contributions (grants/scholarships). We also examine whether differences exist by race and income. Findings may have implications for whether some students are disproportionately burdened by the shift toward greater contributions by students and families. Finally, we focus on how different types of college

assets affect whether students are more likely to report paying for college with student, family, or societal contributions.

Review of Research

Student contributions

As discussed in the introduction, increasingly student loans are the primary way students contribute to college costs. Students must take money from future savings or job earnings to pay the balance of their loans. As such, loans represent a way students make financial contributions to their education. The College Board (2009) reports that in 1989/90, 27% of all undergraduates had taken out federal Stafford loans at some point during their enrollment in postsecondary education, while in 2007/08, this proportion was 46%. However, research suggests that student loans may not improve attendance and completion rates, at least after a certain point (Dynarski, 1994; Dynarski, 2003; Kim, 2007; Perna, 2008; Volkwein & Szelest, 1995; Volkwein, Szelest, Cabrera, & Napierski-Prancl, 1998). For example, among 3,251 first-year undergraduate students who borrowed to pay for college, Kim (2007) finds that every additional $1,000 increase from the mean loan amount for students from low-income households resulted in a 60% decrease in the probability of graduating from college. Moreover, according to Dynarski (1994), 10% of students at 4-year colleges and universities defaulted on their student loans and were more likely to default when they had low earnings after college or did not complete college. Given this, having more students pay for college through loans may not be in the best interest of students or society. At the very least, there may be limits to the utility of student loans.

Another way that students contribute to their education is by working. Just about 70% of dependent students at 4-year colleges work regardless of the type of college (public, private, or for-profit) they attend (Perna, Cooper, & Li, 2006). In the 2010/11 academic year, federal work study accounted for 1% of the amount of financial aid packages. The average student received about $6,500 from federal work study and grants combined (Baum & Payea, 2011). Research suggests that students who work in federal work study jobs have higher college completion rates than when they do not (DesJardins, Ahlburg, & McCall, 2002; Stampen & Cabrera, 1988). For instance, in a study of 20% of the University of Wisconsin's first-year students from 1979, those who participated in federal work study (either by itself or in combination with other grants, scholarships, and loans) had the lowest dropout rates compared to students who paid for college without federal work study (Stampen & Cabrera, 1988). College students may benefit from working in several ways, including acquiring career-related knowledge (Perna, Cooper, & Li, 2007). However, very few students work in the federal work study program, which limits its ability to be an effective tool for helping to pay for college for most students.

Family contributions

Expected family contributions and parent loans are other ways students pay for college costs. Parent PLUS Loans are a common source of family contributions, and their use has almost tripled in the last decade (Baum & Payea, 2011). In contrast to student loans that are deferred until students are no longer enrolled full time, parents often begin repayment on the loans immediately. Parent PLUS Loans also require credit checks to determine eligibility, making them less available to families with poor credit ratings. During the 2010/11 academic year, 35% of parents whose children attended public, 4-year colleges and universities paid for college costs in part through Parent PLUS Loans, accounting for 9% of all federal and non-federal loans borrowed (Baum & Payea, 2011). The average Parent PLUS Loan amounted to approximately $12,000 (Baum & Payea, 2011). Parents may also take educational loans from private, non-federal institutions, such as from local banks and credit unions. These types of contributions account for 7% of all federal and non-federal loans borrowed (Baum & Payea, 2011).

Research suggests that students' college attendance and graduation rates may be positively associated with family contributions (Bettinger, 2004; Charles, Roscigno, & Torres, 2007; Elliott, Destin, et al., 2011; Hanushek, Leung, & Yilmaz, 2004; Kim, 2007). Kim (2007), for example, finds that students who received financial contributions from their parents during their first year of college graduated at a rate 9% higher than students who did not receive contributions from their parents.

Societal contributions

In this study, societal contributions refer to grants and scholarships such as Pell Grants that do not require future repayment by students. Federal and private grants and scholarships used to pay for college comprise about 53% of students' total financial aid package during the 2010/11 academic year, with federal grants contributing to 27% of financial aid packages (Baum & Payea, 2011). Bettinger (2004) conducts a study examining the relationship between Pell Grants and college completion using student data gathered by the Ohio Board of Regents. He finds that students who received Pell Grants were less likely to drop out of college and that every $1,000 increase in the amount of Pell Grant awards was associated with a 10% decrease in the likelihood of attrition (Bettinger, 2004).

However, while grants can be very helpful, they make up only about half of all undergraduate student aid (Baum & Payea, 2011). Moreover, grants are increasingly offered based on merit as opposed to financial need (Heller, 2002). Unlike need-based aid which is determined based on the student's and their family's ability to pay, merit-based aid is based on the student's academic performance so that colleges can attract the students they most desire. Critics argue that this shift is likely to result in financial aid resources being funneled away from those most in need, reducing educational opportunities for low-income students (Heller, 2004). Taken together, these trends mean students and their parents—particularly those from lower income households—cannot rely solely on

grant aid and must rely more frequently on loans. As loans have become more accessible, the proportion of federal grants to federal loans that a particular student receives has plummeted. For example, the proportion of federal grants to federal loans in 1976 was about even (Archibald, 2002). However, by 1985 the ratio had shifted to 27% grants and 70% loans, and by 1998 to 17% grants and 82% loans (Archibald, 2002; also see Heller & Rogers, 2006 for more information on how this shift has taken place).

College assets

Families are increasingly incentivized, largely through the tax code, to start accumulating assets specifically for their children's educational costs prior to them reaching college age. Research on the relationship between assets and college outcomes suggests assets provide students with three things, each of which may improve college attendance and completion rates (Elliott, Destin, et al., 2011). First, assets help students develop educational expectations that include college (Elliott & Beverly, 2011a; Elliott, 2012a). Second, assets offer resources that can be used to get information about college costs and financial aid. Research suggests that students whose parents have greater assets may also have greater knowledge about financial aid, grants, and scholarships—or at least may know where to go or with whom to talk in order to get information about financial aid. Charles and colleagues (2007), for instance, find that students have greater knowledge about grants and loans when their parents are saving money for college. Third, assets may provide students with the financial resources needed to pay for college (Charles et al., 2007; Huang, Beverly, Clancy, Lassar, & Sherraden, 2011; O'Connor, Hammack, & Scott, 2010). Research consistently finds that assets are significantly related to college attendance and graduation (Elliott, Destin, et al., 2011), presumably because assets provide students with greater financial resources that can be leveraged to cover unmet need and to pay for college costs up front. While it is often assumed that the primary benefit of owning assets is their ability to help pay for college, there is little research that tests whether assets are predictive of how children pay for college. Simply put, it raises these questions: (1) Do college assets help reduce the college cost burden on students by increasing family contributions? and (2) Do current college asset policies make it more likely that higher-income and nonminority students are more likely to benefit by virtue of being more likely to have college assets in the first place?

In sum, little is known about factors that predict which types of contributions students are most likely to use to pay for college: (1) student contributions, (2) family contributions, or (3) societal contributions. The research on this topic is typically descriptive in nature. Learning more about factors that predict which contributions students use will help answer questions regarding whether or not, for example, "Are minority and lower-income students as likely as or more likely to pay for college with student contributions than white and higher-income students?" If they are, it suggests that minority and lower-income students might be overly burdened by policies that emphasize student contributions. It also may inform us as to where interventions should be targeted. For example, if low-income students are more likely to use student and societal contributions to pay for

college, maybe strategies need to be designed to increase parents' capacity to contribute. In the following section, we review some of the ways students pay for college by race and income.

Differences by race

Using data from the 1995-1996 National Postsecondary Student Aid Study (NPSAS) conducted by the U.S. Department of Education, King (1999) finds that students take out loans disproportionately by race. Fifty-four percent of African American students at 4-year colleges and universities rely on loans to pay for college compared with 36% of white students, 30% of Asian students, and 35% of Latino/Hispanic students (King, 1999). In part, students from racial/ethnic minority groups may rely more on loans because they might receive fewer family contributions to pay for college. Approximately 44% of white students and 37% of Asian students receive an expected family contribution of $12,500 or more; however, far fewer African American and Latino/Hispanic students receive an expected family contribution of the same amount—20% and 26%, respectively (King, 1999). Moreover, almost one-third of African American and Latino/Hispanic students do not expect any family contributions (King, 1999). If distributed as intended, grants and scholarships should make up for disproportionate contributions by parents. Among students at public 4-year colleges and universities, 39% of white, 44% of Asian, 62% of African American, and 56% of Latino/Hispanic students receive grants (King, 1999). These percentages are confirmed by reports using more recent data (Santiago & Cunningham, 2005). African American and Latino/Hispanic students are the most likely of all racial groups to receive grants in 2003/04 (Santiago & Cunningham, 2005).

Differences by income level

Students from low- and moderate-income households may rely on student contributions like work study and loans or societal contributions more often than family contributions when compared to their middle- and high-income counterparts (Berkner, Wei, He, Cominole, & Siegel, 2005; Choy & Berker, 2003; Choy & Bobbitt, 2000). According to data from full-time dependent students from the 1999-2000 NPSAS, 51% to 59% of students from low- and moderate-income households pay with loans compared with 27% to 49% from middle- and high-income households (Choy & Berker, 2003). Most students from low- and moderate-income households with loans have subsidized Federal Stafford (48% to 56%) and Perkins loans (10% to 17%), while fewer rely on Parent Plus Loans (2% to 7%; Choy & Berker, 2003). Compared to students from low- and moderate-income households, fewer students from middle- and high-income households pay with subsidized Federal Stafford (26% to 49%) and Perkins loans (<1% to 6%) and more students pay with Parent Plus Loans (5% to 10%; Choy & Berker, 2003). Seventy to 72% of students from low- and moderate-income households receive grants at public, 4-year colleges, and universities (Choy & Berker, 2003). Comparatively, approximately 28% of full-time students from high-income households at public, 4-year colleges, and universities pay with grants and scholarships (Choy & Berker, 2003; Presley & Clery, 2001).

Differences in college asset ownership

Research consistently suggests the current college asset-building policies and programs may be incentivizing higher-income and nonminority students and families more than lower-income and minority students to save for college. For example, in a study of United States households with children under 18 finds that only 37% of low-income parents save for their college-bound children, compared to 88% of high-income parents (Sallie Mae & Gallup, 2010). Even in regards to students who own savings in a local bank, research shows that higher-income and nonminority students may benefit more for current policies and programs. For example, Elliott (2012b) finds that while 83% of high-income 13 to 17 years old are banked, only 38% of low-income students are banked. Similar disparities exist in regards to having savings at a local bank designated specifically for future schooling like college (Elliott, 2012b). These findings suggest that there is a real possibility that college asset policies and programs make it more likely that higher-income and nonminority students benefit from a reduced college cost burden by virtue of being more likely to have parents who own college assets for them or to own them themselves. Asset researchers suggest that this inequality in access to college savings by socioeconomic status and race is largely a structural problem (e.g., Elliott, 2012b; Sherraden, 1991).

This study is primarily exploratory in nature. We ask the following research questions: (1) Are students as likely as or more likely than society to bear the responsibility of paying for college? (2) Are minority and low-income students as likely as or more likely to be asked to carry the responsibility of paying for college than white and higher income students? (3) Do assets accumulated for college increase or reduce the likelihood that students report paying for college with student, parent, and/or societal contributions?

Methods

Dataset

This study used longitudinal data from the Educational Longitudinal Survey (ELS): 2002, a publically available dataset made available by the National Center for Education Statistics (NCES). The ELS: 2002 began in 2002 when students were in 10th grade. Follow-up waves took place in 2004 and 2006. Its purpose was to follow students as they progressed through high school and transitioned to postsecondary education or the labor market, making it an ideal dataset to test whether early experiences or resources predicted students' later outcomes. The ELS: 2002 aimed to present a holistic picture of student achievement by gathering information from multiple sources. Students, their parents, teachers, librarians, and principals provided information regarding students' average grades, math achievement, and educational expectations, school resources and curriculum, teacher experience, student and parent work/employment, and student post-high school enrollment in college. The dependent variables in this study came from the 2006 wave and independent variables came from the 2002 and 2004 waves.

Study sample

The final sample was restricted to students in the 10th grade cohort during the 2001/02 academic year, students who were both in the 2002/2006 ELS samples (i.e., follow-up questionnaire status), high school graduates, student who applied for financial aid, and students who attended a 2-year or 4-year college. In addition, American Indian and biracial students were eliminated from the analysis due to small sample sizes. Further, a few schools contained less than five students. These schools were removed from the analysis. After these restrictions were applied, the full sample included 7,366 students. Applying the panel weight resulted in a weighted sample of approximately 1,652,963 students. Two subsamples were drawn from the full sample. One is restricted to students who attended 2-year colleges (weighted n = 505,954; non-weighted n = 2,003) and the other is restricted to students who attended 4-year colleges (weighted n = 1,147,009; non-weighted n = 5,363).

Among the full weighted sample, there were slightly more females (56%) than males (44%). The majority of students were white (64%) with smaller percentages of students who were Asian (5%), Latino/Hispanic (17%), and African American (14%). Almost half of parents (45%) had a college degree or higher, 34% had some college, and 21% had a high school diploma or less. Students' mean GPA ranged between approximately 2.51 and 3.00 (between a C+ and B) on a scale of 4.00 ($\bar{x}$ = 4.52, SD = 1.285). Further, a majority of students (94%) and their parents (86%) expected the student to attain at least some college education. The majority of students (64%) reported that the availability of financial aid is very important when selecting a college compared to 36% who reported low college costs are very important. Other sample characteristics are reported in Table 1.

Student and parent/household variables

All control variables with the exception of dependent status, which was measured in 2006, were measured in the 2002 or the 2004 wave of the ELS. All three outcome variables were measured in 2006. Student gender and dependent status were dichotomous variables. Number of siblings was a continuous variable.

Student race/ethnicity. The variable representing race included seven categories. American Indian or Alaska Native and more than one race were dropped from the analysis due to small sample sizes. Hispanic and Latino were combined. There were four categories in the final analysis (white = 0; Asian = 1; Latino/Hispanic = 2; and African American = 3).

Table 1. Study variable by student, parent, and school characteristics among student attended college and applied for financial aid

Covariates	Full Percent	2-Year Percent	4-Year Percent
Student and Parent/Household Variables			
Dependent student	40	66	29
White	64	53	67
Asian	05	20	06
Latino/Hispanic	17	22	14
African American	14	15	13
Male	44	43	44
Student attended 2-year college	31	--	--
Student attended 4-year college	69	--	--
Head has high school diploma or less	21	31	16
Head has some college	34	40	31
Head has college degree or higher	45	29	53
Low-income ($0 to $20,000)	11	18	09
Moderate-income ($20,001 to $50,000)	37	45	33
Middle-income ($50,001 to $100,000)	39	31	42
High-income ($100,001 or higher)	14	06	17
School Variables			
Private school (by 10th grade)	09	13	11
Student expects to graduate college	94	87	97
Parent expects student to graduate college	86	74	93
Low college costs very important	36	47	31
Financial aid very important	64	72	60
Asset Variables			
Plan to remortgage home	09	07	10
Start a savings account	41	33	44
Have student put aside earnings	23	18	25
Start state-sponsored savings	07	06	07
College investment fund	18	10	22
Invest in real estate/stocks	29	19	33
Buy U.S. savings bonds	22	16	25
Continuous variables			
	$\bar{x}$ S.D.	$\bar{x}$ S.D.	$\bar{x}$ S.D.
Student and Parent/Household Variables			
Number of siblings	1.42 1.104	1.50 1.200	1.40 1.086
GPA	4.52 1.285	3.85 1.260	4.84 1.14
School Variables			
School climate	.318 .849	.367 .982	.288 .765
Number of guidance counselors	4.32 2.747	3.89 2.761	4.37 2.741
Free/reduced lunch	3.26 1.821	3.66 1.856	3.04 1.800

Source: Weighted data from the ELS: 2002/06. Data imputed using the Expectation Maximization (EM) algorithm.
Notes: S.D. = Standard Deviation. Full (weighted N = 1,652,963; non-weighted = 7,366); 2-year (weighted n = 505,954; non-weighted n = 2,003); 4-year (weighted n = 1,147,009; non-weighted n = 5,363).

Type of college. This variable was drawn from the highest level of education attempted variable in the ELS: 2006. For the purposes of this study, a dichotomous variable was created (1 = two-year college; 0 = four-year college).

Student GPA. Students' grade point average (GPA) was a categorical variable that averaged grades for all coursework in 9th through 12th grades. There were seven categories: (0 = 0.00-1.00; 1 = 1.01-1.50; 2 = 1.51-2.00; 3 = 2.01-2.50; 4 = 2.51-3.00; 5 = 3.01-3.50; and 6 = 3.51-4.00).

Student college expectations. Students were asked how far they expected to go in school. A dichotomous variable was created based on their responses (1 = expects to graduate from a 4-year college; 0 = does not expect to graduate from 4-year college).

College costs. Students were asked how important low costs (such as tuition, books, room and board) were for choosing a school, with response options including not important, somewhat important, or very important. The responses were dichotomized (1 = very important; 0 = not very important).

Financial aid. Students were asked how important the availability of financial aid was for choosing a school, with responses including not important, somewhat important, or very important. Responses were dichotomized (1 = very important; 0 = not very important).

Parent college expectations. Parents were asked how far they thought their child would go in school. A dichotomous variable was created based on their responses (1 = expect child to graduate from a 4-year college; 0 = do not expect child to graduate from 4-year college).

Parent education level. Parent education level was equivalent to mother's highest level of education or father's highest level of education, whichever was higher. Parents' level of education was composed of eight distinct levels. The eight levels were collapsed into three for the final analysis (0 = High school diploma or less; 1 = Some college; and 2 = 4-year college degree or higher).

Household income. In the ELS:2002, household income was composed of 13 distinct levels. For the purposes of this study, the levels of household income were combined into four levels (0 = Low-income [$0-$20,000]; 1 = Moderate-income [$20,001-$50,000]; 2 = Middle-income [$50,001-$100,000]; and 3 = High-income [$100,001 or higher].

School variables

School climate and number of guidance counselors were continuous variables. Private school indicated the type of school attended by the respondent in the base-year interview: (1) public, (2) Catholic school, or (3) other private. For the purposes of this study, a dichotomous variable was created (1 = private or other private; 0 = public). Free/reduced lunch was the percent of 10th graders

receiving free or reduced price lunch and was a categorical variable in the ELS: 2002 (1 = 0–5%; 2 = 6–10%; 3 = 11–20%; 4 = 21–30%; 5 = 31–50%; 51–75%; and 76–100%).

College assets variables

Variables of interest came from questions asking parents what they were doing to financially prepare for their child to attend college. These variables represented the types of assets available to students to pay for college costs. The following college assets were included: started a savings account; bought U.S. savings bonds; invested in stock/real estate; opened a college investment fund (i.e., mutual fund); planned to take out a home equity loan; and told student to put aside money for college. All variables were dichotomous (1 = yes; 0 = no).

Outcome variables

Student contributions. Student contributions were based on three questions that asked students whether or not they paid for college with (1) student loans, (2) savings or job earnings, and (3) federal work study grants. Responses to these questions were combined to create two categories (1 = paid with student contributions; 0 = did not pay with student contributions).

Family contributions. Family contributions were based on two questions that asked students whether or not they paid for college with (1) parent loans and (2) contributions from family. Responses to these questions were combined to create two categories (1 = paid with family contributions; 0 = did not pay with family contributions).

Societal contributions. Societal contributions were based on a question that asked students whether or not they paid for college with grants and scholarships. Responses to these questions were combined to create two categories (1 = paid with societal contributions; 0 = did not pay with societal contributions).

Table 2 provides information on the percent of students who used each of the proxies that made up the student, family, and societal contributions by race and income. Overall, students were more likely to report having paid for college with student and societal contributions than any of the other factors considered. Work study was the least commonly reported method for having paid for college. Not surprisingly, a higher percentage of students who attended a 4-year college reported using each of the different methods for having paid for college than students who attended a 2-year college.

Table 2. Percent of students by race and income who report paying for college using a proxy for student, parent, and societal constructs

Covariates	Student Contributions			Family Contributions		Societal Contributions
	Student Loans	Work Study	Savings/Job Earnings	Family Contributions	Parent Loans	Grants/Scholarships
Full (Full Sample)	63	18	46	56	27	73
White	63	17	49	60	28	71
Asian	51	22	40	62	19	78
Latino/Hispanic	60	16	46	47	25	75
African American	68	23	35	43	27	76
Low-income	62	26	40	14	14	87
Moderate-income	69	22	49	24	24	79
Middle-income	65	15	47	32	32	68
High-income	46	11	43	26	26	66
Full (2-Year College Sample)	28	06	44	38	09	61
White	32	04	46	42	10	59
Asian	16	09	45	36	10	63
Latino/Hispanic	20	06	45	38	08	57
African American	30	08	32	27	08	73
Low-income	28	03	39	50	08	53
Moderate-income	30	05	47	47	10	51
Middle-income	29	06	45	34	10	65
High-income	20	07	37	26	06	72
Full (4-Year College Sample)	63	18	46	56	27	73
White	63	17	49	60	28	71
Asian	51	22	40	62	19	78
Latino/Hispanic	59	16	46	47	25	75
African American	68	23	35	43	27	76
Low-income	62	26	40	34	14	87
Moderate-income	69	22	49	47	24	79
Middle-income	65	15	47	61	32	68
High-income	46	11	43	72	26	66

Source: Weighted data from the ELS: 2002/06.

Notes: Row percentages are reported. Data imputed using the Expectation Maximization (EM) algorithm. Full (weighted N = 1,652,963; non-weighted = 7,366); 2-year (weighted n = 505,954; non-weighted n = 2,003); 4-year (weighted n = 1,147,009; non-weighted n = 5,363).

Table 3. Percent of students by race and income who report paying for college with student, parent, and societal contributions

	Full			2-Year			4-Year		
Covariates	Student	Parent	Societal	Student	Parent	Societal	Student	Parent	Societal
Full Sample	72%	59%	69%	59%	42%	61%	78%	67%	73%
Race									
White	75	64	68	64	46	59	78	71	71
Asian	63	64	74	52	42	62	67	70	77
Latino/Hispanic	68	50	66	56	42	57	77	58	75
African American	69	47	74	52	29	73	80	57	75
Income Level									
Low-income ($0 to $20,000)	64	36	78	56	53	53	75	41	87
Moderate-income ($20,001 to $50,000)	74	50	73	64	52	50	83	58	79
Middle-income ($50,001 to $100,000)	76	68	63	60	39	65	79	74	68
High-income ($100,001 or higher)	64	78	64	50	30	72	65	81	66

Source: Weighted data from the ELS: 2002/06.

Notes: Row percentages are reported. Data imputed using the Expectation Maximization (EM) algorithm. Full (weighted N = 1,652,963; non-weighted = 7,366); 2-year (weighted n = 505,954; non-weighted n = 2,003); 4-year (weighted n = 1,147,009; non-weighted n = 5,363).

Table 3 provides information on the percentage of students who reported using student, family, and societal contributions. In the aggregate and in the case of the 4-year college sample, a higher percentage of students reported having paid for college with student contributions than societal contributions. In regards to the 2-year sample, white students were the only racial/ethnic group to have a higher percentage of students who reported using student contributions when compared to the percentage of students who reported using societal contributions. However, in the case of the 4-year college sample, only Asian students did not have a higher percentage of students who reported that they used student contributions to pay for college when compared to students who reported using societal contributions. Interestingly, a higher percentage of low-income students at 2-year colleges reported using student contributions to pay for college than they did societal contributions.

Analysis Plan

Missing data

The first step in the analysis was to account for missing data. Missing data were imputed using the Expectation Maximization (EM) algorithm (Dempster, Laird, & Rubin, 1977). The EM algorithm imputes missing values by maximum likelihood estimation using the observed data in an iterative estimation process (Little & Rubin, 1987).

Multivariate (Trivariate) probit model

In the second step in the analysis we conducted a multivariate probit model using the "mvprobit" program in STATA 11.0. Preliminary analyses of the three primary outcomes of interest (student contributions, family contributions, and societal contributions) revealed that there was a significant correlation between different pairs of outcomes. Therefore we concluded that analyses that ignored correlations across outcomes, such as simple univariate probits, might lead to bias (Cappellari & Jenkins, 2003). A trivariate probit model is a generalization of univariate probit model. It allowed us to estimate three dichotomous dependent variables simultaneously while explicitly modeling the correlation in disturbance terms using simulated maximum likelihood methods (Cappallari & Jenkins, 2003). The coefficient estimates from the trivariate probit model accounted for unobserved correlation among the outcomes. Because ELS:2002/06 randomly selected approximately 26 students within each school, we adjusted standard errors by clustering them into the same school unit. Further, both the descriptive and binary regression analyses were weighted using the ELS: 2002's second follow-up base year panel weight.

The following equations represent the trivariate probit estimates modeled in this study, where i equals the nth subject and m equals the nth variable. These equations were used to calculate joint results for three outcomes and account for correlations between the errors. In other words, equations calculate whether or not students use each type of contribution (e.g., student, family, and

societal contributions) at the same point in time while accounting for correlations between the errors of the three models.

(1) Student contributions$_{i\,m}$* = β_0'X$_{i\,0}$ + β_1'X$_{i\ \text{dependent student status}}$ + β_2'X$_{i\ \text{race}}$ + β_3'X$_{i\ \text{gender}}$ ... β_{23}'X$_{i\ \text{savings bonds}}$ + $\varepsilon_{i\,m}$; where m = 1(race), ... , M(savings bonds)

Student contributions$_{i\,m}$ = 1 if student contributions$_{i\,m}$* > 0 and 0 otherwise $\varepsilon_{i\,m}$, where m = race, ... , savings bonds are error terms that have multivariate normal distributions, each with a mean of zero and variance/covariance matrix V, with values of 1 on the diagonal and correlations $p_{j\,k} = p_{k\,j}$ as off-diagonal elements.

(2) Family contributions$_{i\,m}$* = β_0'X$_{i\,0}$ + β_1'X$_{i\ \text{dependent student status}}$ + β_2'X$_{i\ \text{race}}$ + β_3'X$_{i\ \text{gender}}$ ... β_{23}'X$_{i\ \text{savings bonds}}$ + $\varepsilon_{i\,m}$; where m = race, ... , savings bonds

Family contributions$_{i\,m}$ = 1 if family contributions$_{i\,m}$* > 0 and 0 otherwise

(3) Societal contributions$_{i\,m}$* = β_0'X$_{i\,0}$ + β_1'X$_{i\ \text{dependent student status}}$ + β_2'X$_{i\ \text{race}}$ + β_3'X$_{i\ \text{gender}}$ ... β_{23}'X$_{i\ \text{savings bonds}}$ + $\varepsilon_{i\,m}$; where m = race, ... , savings bonds

Societal contributions$_{i\,m}$ = 1 if societal contributions$_{i\,m}$* > 0 and 0 otherwise

In the case of trivariate probit models in which there are three error terms (M = 3) each distributed as multivariate normal, there are eight joint probabilities corresponding to eight possible combinations of affirmative (student contributions$_{i\,m}$ = 1) and negative (student contributions$_{i\,m}$ = 0) outcomes. The joint probabilities are expressed in equation (4), using the example where all outcomes are affirmative (i.e., student contributions$_{i\,m}$ = 1; family contributions$_{i\,m}$ = 1; and societal contributions$_{i\,m}$ = 1):

(4) Pr (Student contributions[y_1] = 1, Family contributions[y_2] = 1, Societal contributions[y_3] = 1)

= Pr($\varepsilon_1 \leq \beta_1$'X$_{i\ \text{dependent student status}}$, $\varepsilon_2 \leq \beta_2$'X$_{i\ \text{race}}$, $\varepsilon_3 \leq \beta_3$'X$_{i\ \text{gender}}$ ... $\varepsilon_{23} \leq \beta_{23}$'X$_{i\ \text{savings bonds}}$)

= Pr($\varepsilon_{23} \leq \beta_{23}$'X$_{i\ \text{savings bonds}}$ | $\varepsilon_{22} < \beta_{22}$'X$_{i\ \text{real estate/stocks}}$, $\varepsilon_{21} < \beta_{21}$'X$_{i\ \text{college investment fund}}$, ... , $\varepsilon_1 < \beta_1$'X$_{i\ \text{dependent student status}}$) x Pr ($\varepsilon_{22} < \beta_{22}$'X$_{i\ \text{real estate/stocks}}$ | $\varepsilon_{21} < \beta_{21}$'X$_{i\ \text{college investment fund}}$, ... , $\varepsilon_1 < \beta_1$'X$_{i\ \text{dependent student status}}$) x Pr($\varepsilon_1 < \beta_1$'X$_{i\ \text{dependent student status}}$)

The Cholesky decomposition of the variance/covariance matrix for the errors is expressed as follows:

$E(\varepsilon\varepsilon') = V = C\epsilon\epsilon'C$, where

$\varepsilon_1 = C_{1\,1}\epsilon_1$

$\varepsilon_2 = C_{2\,1}\epsilon_1 + C_{2\,2}\epsilon_2$

$\varepsilon_3 = C_{3\,1}\epsilon_1 + C_{3\,3}\epsilon_3$; and so forth until

$\varepsilon_{23} = C_{23\,1}\epsilon_1 + C_{23\,23}\epsilon_{23}$

The trivariate normal probabilities of the three affirmative outcomes (i.e., student contributions$_{i\,m}$ = 1; family contributions$_{i\,m}$ = 1; societal contributions$_{i\,m}$ = 1) can then be expressed as:

(5) $\Pr(\varepsilon_1 \leq \beta_1'X_{i\ \text{dependent student status}}, \varepsilon_2 \leq \beta_2'X_{i\ \text{race}}, \varepsilon_3 \leq \beta_3'X_{i\ \text{gender}} \ldots \varepsilon_{23} \leq \beta_{23}'X_{i\ \text{savings bonds}})$
$= \Pr[\epsilon_{23} \leq (\beta_{23}'X_{i\ \text{savings bonds}} - C_{23\,23}\epsilon_{23} - C_{23\,1}\epsilon_1) / C_{23} \mid \epsilon_{22} \leq (\beta_{22}'X_{i\ \text{real estate/stocks}} - C_{22\,22}\epsilon_{22} - C_{22\,1}\epsilon_1) / C_{22} \mid \ldots, \epsilon_1 \leq \beta_1'X_{i\ \text{dependent student status}} / C_{1\,1}]$
$\text{x } \Pr[\epsilon_{22} \leq (\beta_{22}'X_{i\ \text{real estate/stocks}} - C_{22\,22}\epsilon_{22} - C_{22\,1}\epsilon_1) / C_{22} \ldots, \epsilon_2 \leq (\beta_2'X_{i\ \text{race}} - C_{2\,1}\epsilon_1 / C_{2\,1}) / C_{2\,2} \mid \epsilon_1 \leq \beta_1'X_{i\ \text{dependent student status}} / C_{1\,1} \text{ x } \Pr[\epsilon_1 \leq \beta_1'X_{i\ \text{dependent student status}} / C_{1\,1}]$

The standard normal variates, ϵ, that appear in equation (5) are uncorrelated with each other.

Marginal effects are typically calculated in probit models; however, they are difficult to compute in trivariate probit models. Given this, predicted probabilities of a positive response for each of the three outcomes based on the weighted trivariate probit model were calculated instead. The "mvppred" program in STATA Version 11.0 was used to calculate the predicted probabilities (Cappallari & Jenkins, 2003). We present the weighted mean of the predicted probabilities for each race/ethnic subgroup of our sample (e.g., the mean predicted probability of using students' contributions for whites, Asians, Latinos/Hispanics, and African Americans) and for each income subgroup of our sample (e.g., low-income, moderate-income, middle-income, and high-income). We also calculate what we refer to as students' college cost burden from predicted probabilities. The college cost burden is the difference between the predicted probability students report using societal contributions to pay for college from the predicted probability he/she uses student contributions.

Trivariate Probit Results

To reduce space and to make comparisons of results across the three outcomes and the three samples, signs of significant predictors of student, family, and societal contributions for the full, 2-year, and 4-year samples are presented in Table 4. Tables 5 and 6 provide more detailed information on each sample to include trivariate probit estimates, adjusted standard errors, confidence intervals, and estimated correlation coefficients for all three outcomes.

Full sample

The trivariate probit regression results for the full sample are presented in Table 5. Estimated correlation coefficients are listed at the bottom of Table 5. The only significant and positive correlation is between student contributions and family contributions; the correlation coefficient for these two outcomes is .147 (95% CI: .095, .198). This suggests that these equations share the same unobservables in the error terms. The correlations between student and societal contributions and family and societal contributions are both significant and negative (-.085 [95% CI: -.139, -.031] and -.122 [95% CI: -.172, -.072], respectively). This indicates that the expected unconditional relationship

between family contributions and societal contributions, for example, is not fully removed through the inclusion of the explanatory variables.

2-year college sample

The trivariate probit regression results for the 2-year college sample are presented in Table 6. Estimated correlation coefficients listed at the bottom of Table 6 are in the same direction and all are significant similar to the full model. However, the strength of relationship in each case is stronger in the 2-year college sample than it was in the full sample.

4-Year college sample

The trivariate probit regression results for the 4-year college sample are presented in Table 7. The only significant positive correlation is between student contributions and family contributions; the correlation coefficient for these two outcomes is .110 (95% CI: .046, .185). Unlike in the full sample and the 2-year sample, the correlation between student and societal contributions is not significant in the 4-year sample. The correlation between family and societal contributions is significant and negative -.077 [95% CI: -.139, -.015].

It is difficult to determine the magnitude of differences by race and income, key variables of interest in this study, by interpreting the coefficient estimates. Thus, we calculate marginal predicted probabilities for race and income. In addition we calculate students' college cost burden.

Table 4. Signs for statistically significant predictors of student, family, and societal contributions for the full, 2-year, and 4-year samples

Predictors	Student Contributions			Family Contributions			Societal Contributions		
	Full	2-Year	4-Year	Full	2-Year	4-Year	Full	2-Year	4-Year
Dependent student	-	-	-	-		-	-	-	-
Asian	-	-	-	+		+			
Latino/Hispanic	-	-							
African American	-	-			-		+	+	+
Male	+	+					-		
Student – 2-year college	-			-	-		+		
Number of siblings				-		-			
Head – some college				+				-	
Head – 4-year college degree or higher				+	+	+			
Moderate-income ($20,001 to $50,000)	+		+	+		+	-		-
Middle-income ($50,001 to $100,000)	+	+	+	+	+	+	-	-	-
High-income ($100,001 or higher)				+	+	+	-		-
GPA	-		-	+		+	+	+	+
Private school (by 10th grade)	-	-	-						
School climate									
Number of guidance counselors							-	-	-
Free/reduced lunch	-	-		-		-	+	+	
Student expects to graduate college			-	+	+	+	+	+	
Parent expects student to graduate college	+	+					-	-	
Low college costs very important				-		-	-		-
Financial aid very important	+		+	-	-	-	+		+
Plan to remortgage home	+	+	+						
Start a savings account	-	-	-			+			
Have student put aside earnings	+	+	+	+	+				+
Start state-sponsored savings	-	-	-	-	-	-			
College investment fund	-	-	-	+		+			
Invest in real estate/stocks	-		-						
Buy U.S. savings bonds		+		+	+				

Source: Weighted data from the ELS: 2002/06.

Notes: See Tables 5 – 7 for trivariate probit estimates and correlation coefficients. Full (weighted N = 1,652,963; non-weighted = 7,366); 2-year (weighted n = 505,954; non-weighted n = 2,003); 4-year (weighted n = 1,147,009; non-weighted n = 5,363).

Table 5. Trivariate probit estimates: probability of paying for college with student, parent, and societal contributions for students who attended either a 2-year or 4-year college and applied for financial aid

Covariates	Student Contributions				Family Contributions				Societal Contributions			
	β	SE	95% C.I.		β	SE	95% C.I.		β	SE	95% C.I.	
Dependent student	-.228****	.044	-.313	-.143	-.115***	.044	-.201	-.028	-.186****	.044	.192	.480
White (reference)	0				0				0			
Asian	-.314****	.066	-.443	-.185	.189***	.062	.067	.310	.090	.064	-.128	.020
Latino/Hispanic	-.117*	.062	-.238	.004	.016	.057	-.095	.128	.024	.061	-.358	-.151
African American	-.163**	.070	-.300	-.025	-.064	.063	-.188	.060	.336****	.074	-.003	.065
Male	.133**	.040	.055	.211	-.022	.036	-.093	.048	-.054	.038	-.194	.046
Student – 2-year college	-.521***	.050	-.619	-.424	-.359****	.049	-.456	.262	-.254****	.053	-.172	.088
Number of siblings	.019	.018	-.016	.054	-.065****	.016	-.097	.033	.031*	.017	-.318	-.019
Head – high school or less (reference)	0				0				0			
Head – some college	.051	.055	-.057	.159	.091*	.052	-.011	.194	-.074	.061	-.660	-.341
Head – 4-year college degree or higher	-.041	.059	-.156	.075	.211****	.056	.100	.322	-.042	.066	-.697	-.301
Low-income ($0 to $20,000) (reference)	0				0				0			
Moderate-income ($20,001 to $50,000)	.229****	.065	.101	.356	.207***	.065	.079	.335	-.169**	.076	.187	.262
Middle-income ($50,001 to $100,000)	.228***	.073	.085	.372	.451****	.072	.310	.592	-.501****	.081	-.056	.182
High-income ($100,001 or higher)	-.109	.088	-.282	.063	.521****	.087	.351	.691	-.499****	.101	-.078	.035
GPA	-.045*	.019	-.082	-.008	.048***	.018	.012	.083	.224****	.019	-.036	-.006
Private school (by 10th grade)	-.296****	.062	-.418	-.175	.008	.058	-.106	.123	.063	.061	.011	.066
School climate	-.020	.025	-.068	.028	-.008	.023	-.053	.037	-.022	.029	.016	.351
Number of guidance counselors	-.009	.009	-.027	.009	.002	.008	-.013	.018	-.021***	.008	-.242	.021
Free/reduced lunch	-.038**	.015	-.067	-.008	-.028**	.013	-.053	-.003	.039***	.014	-.184	-.005
Student expects to graduate college	-.070	.081	-.230	.089	.246***	.083	.082	.410	.184**	.085	.268	.448
Parent expects student to graduate college	.139**	.062	.018	.260	-.044	.060	-.162	.074	-.111*	.067	-.233	.055
Low college costs very important	.010	.048	-.084	.103	-.079*	.044	-.165	.007	-.094**	.046	-.132	.064
Financial aid very important	.181****	.044	.093	.268	-.266****	.045	-.354	-.178	.358****	.046	-.042	.159
Plan to remortgage home	.241***	.073	.098	.384	.091	.071	.048	.230	-.089	.073	-.043	.271
Start a savings account	-.158***	.054	-.263	-.053	.035	.050	-.063	.132	-.034	.050	-.079	.147
Have student put aside earnings	.221****	.057	.109	.332	.112**	.051	.011	.213	.058	.051	-.147	.053
Start state-sponsored savings	-.309****	.077	-.459	-.159	-.244**	.076	-.393	-.095	.114	.080	-.149	.053
College investment fund	-.157***	.058	-.270	-.043	.144**	.061	.024	.264	.034	.057	-.638	-.009
Invest in real estate/stocks	-.148***	.053	-.253	-.044	.045	.050	-.054	.144	-.047	.051	.192	.480
Buy U.S. savings bonds	.089	.054	-.017	.194	.125**	.052	.024	.227	-.048	.052	-.128	.020
Constant	.990****	.152	.692	1.288	-.153	.154	-.454	.148	-.324*	.160	-.358	-.151

Correlation coefficients				
rho21 (Student – Parent)	.147****	.026	.095	.198
rho31 (Student – Societal)	-.085****	.028	-.139	-.031
rho32 (Parent – Societal)	-.122****	.026	-.172	-.072

Draws = 100 Log pseudolikelihood = -2825320.9 Wald $\chi 2$ = 1935.54*** Weighted N = 1,652,963 Unweighted N = 7, 366

Source: Weighted data from the ELS: 2002/06.

Notes: Estimates adjusted for clustering within schools. Data imputed using the Expectation Maximization (EM) algorithm. *p<.10; ** p < .05; *** p < .01; **** p < .001.

Table 6. Trivariate probit estimates: probability of paying for college with student, parent, and societal contributions for students who attended a 2-year college and applied for financial aid

Covariates	Student Contributions				Family Contributions				Societal Contributions			
	β	SE	95% C.I.		β	SE	95% C.I.		β	SE	95% C.I.	
Dependent student	-.190***	.070	-.327	-.052	.040	.078	-.112	.192	-.173**	.077	-.324	-.023
Asian	-.318***	.122	-.558	-.078	.184	.133	-.078	.445	.154	.144	-.127	.436
Latino/Hispanic	-.188*	.098	-.380	.004	.051	.102	-.149	.251	-.111	.102	-.311	.089
African American	-.354***	.114	-.578	-.130	-.218**	.107	-.429	-.008	.469****	.117	.239	.699
Male	.262****	.072	.122	.403	.043	.066	-.087	.173	-.101	.069	-.236	.034
Number of siblings	-.008	.028	-.062	.047	-.069**	.031	-.129	-.009	.044	.030	-.014	.102
Head – some college	-.060	.077	-.210	.090	.131	.082	-.030	.293	-.158*	.091	-.336	.020
Head – 4-year college degree or higher	-.047	.095	-.232	.139	.238**	.095	.053	.423	-.113	.101	-.310	.084
Moderate-income ($20,001 to $50,000)	.118	.100	-.078	.313	.087	.105	-.120	.294	-.042	.112	-.262	.179
Middle-income ($50,001 to $100,000)	.252**	.111	.033	.470	.328***	.118	.097	.559	-.357***	.116	-.586	-.129
High-income ($100,001 or higher)	.132	.166	-.195	.458	.418**	.177	.071	.765	-.153	.199	-.542	.237
GPA	-.005	.028	-.060	.049	.020	.030	-.039	.079	.177****	.030	.118	.237
Private school (by 10th grade)	-.386***	.138	-.658	-.115	.045	.149	-.247	.337	.204	.134	-.058	.467
School climate	-.020	.037	-.092	.053	.003	.035	-.065	.071	-.031	.045	-.119	.056
Number of guidance counselors	.000	.015	-.029	.029	-.004	.014	-.031	.024	-.032**	.015	-.061	-.004
Free/reduced lunch	-.073***	.026	-.123	-.023	-.002	.022	-.045	.041	.087****	.025	.039	.135
Student expects to graduate college	.059	.100	-.137	.256	.251**	.109	.038	.464	.235**	.104	.030	.439
Parent expects student to graduate college	.149*	.083	-.014	.313	-.115	.083	-.278	.049	-.173**	.088	-.344	-.001
Low college costs very important	.073	.081	-.085	.232	-.049	.069	-.185	.086	-.023	.078	-.176	.129
Financial aid very important	.051	.085	-.114	.217	-.258***	.084	-.422	-.093	.299****	.080	.141	.456
Plan to remortgage home	.284**	.141	.008	.559	.164	.134	-.098	.425	-.042	.141	-.319	.236
Start a savings account	-.235**	.102	-.435	-.035	-.133	.089	-.308	.041	-.005	.090	-.182	.172
Have student put aside earnings	.177*	.104	-.027	.382	.202**	.102	.002	.402	-.135	.099	-.329	.059
Start state-sponsored savings	-.290*	.157	-.598	.018	-.292*	.155	-.596	.012	.050	.156	-.255	.356
College investment fund	-.206*	.118	-.436	.025	.057	.127	-.192	.306	-.023	.130	-.278	.231
Invest in real estate/stocks	-.082	.101	-.279	.116	-.082	.095	-.268	.105	.010	.108	-.201	.222
Buy U.S. savings bonds	.198*	.106	-.010	.407	.286***	.104	.081	.490	.026	.105	-.181	.232
Constant	.454**	.209	.044	.865	-.441*	.243	-.916	.035	-.585**	.226	-1.029	-.142

Correlation coefficients				
rho21 (Student – Parent)	.235****	.041	.153	.314
rho31 (Student – Societal)	-.316****	.040	-.393	-.235
rho32 (Parent – Societal)	-.201****	.042	-.283	-.116

Draws = 100 Log pseudolikelihood = -944651.44 Wald $\chi 2$ = 446.85*** Weighted n = 505,954 Unweighted n = 2,003

Source: Weighted data from the ELS: 2002/06.

Notes: Estimates adjusted for clustering within schools. Data imputed using the Expectation Maximization (EM) algorithm. *p<.10; ** p < .05; *** p < .01; **** p < .001.

Table 7. Trivariate probit estimates: probability of paying for college with student, parent, and societal contributions for students who attended a 4-year college and applied for financial aid

Covariates	Student Contributions				Family Contributions				Societal Contributions			
	β	SE	95% C.I.		β	SE	95% C.I.		β	SE	95% C.I.	
Dependent student	-.293****	.056	-.402	-.184	-.179****	.051	-.279	-.079	-.178***	.054	-.284	-.073
Asian	-.309****	.078	-.461	-.156	.188***	.071	.049	.327	.051	.076	-.097	.199
Latino/Hispanic	-.074	.079	-.229	.081	-.030	.071	-.169	.110	.106	.080	-.051	.263
African American	-.037	.090	-.214	.140	.020	.083	-.144	.183	.249***	.090	.072	.425
Male	.063	.047	-.029	.155	-.054	.044	-.140	.032	-.022	.046	-.111	.068
Number of siblings	.037	.023	-.009	.082	-.065***	.020	-.104	-.026	.025	.022	-.018	.067
Head – some college	.119	.077	-.032	.271	.072	.068	-.062	.206	-.008	.086	-.177	.162
Head – 4-year college degree or higher	-.009	.074	-.154	.136	.174**	.069	.037	.310	.005	.084	-.161	.171
Moderate-income ($20,001 to $50,000)	.285***	.097	.094	.475	.303****	.079	.149	.457	-.274***	.098	-.467	-.081
Middle-income ($50,001 to $100,000)	.195*	.102	-.004	.394	.558****	.088	.385	.730	-.635****	.106	-.844	-.427
High-income ($100,001 or higher)	-.130	.117	-.359	.099	.607****	.103	.405	.808	-.675****	.123	-.917	-.433
GPA	-.064**	.025	-.113	-.016	.056**	.024	.008	.104	.251****	.024	.204	.299
Private school (by 10th grade)	-.267****	.067	-.398	-.136	-.011	.064	-.137	.115	.020	.066	-.109	.149
School climate	-.025	.032	-.089	.038	-.022	.031	-.083	.038	.007	.034	-.059	.073
Number of guidance counselors	-.013	.011	-.034	.008	.004	.011	-.017	.025	-.016*	.009	-.034	.002
Free/reduced lunch	-.022	.018	-.056	.013	-.038**	.016	-.069	-.006	.017	.015	-.013	.047
Student expects to graduate college	-.447***	.145	-.731	-.162	.271**	.131	.014	.528	.090	.142	-.189	.369
Parent expects student to graduate college	.144	.098	-.047	.335	.027	.091	-.151	.204	.008	.096	-.180	.196
Low college costs very important	-.039	.060	-.157	.078	-.097*	.054	-.203	.009	-.125**	.059	-.240	-.009
Financial aid very important	.240****	.051	.140	.339	-.262****	.053	-.366	-.157	.383****	.055	.276	.490
Plan to remortgage home	.231***	.083	.067	.394	.061	.085	-.106	.228	-.097	.083	-.261	.066
Start a savings account	-.129*	.066	-.259	.001	.103*	.061	-.018	.223	-.043	.063	-.167	.081
Have student put aside earnings	.267****	.068	.133	.400	.085	.063	-.038	.208	.134**	.060	.016	.253
Start state-sponsored savings	-.330****	.087	-.501	-.159	-.232**	.092	-.412	-.052	.146	.093	-.035	.328
College investment fund	-.134*	.066	-.263	-.004	.168**	.070	.030	.305	.047	.063	-.076	.170
Invest in real estate/stocks	-.175***	.063	-.298	-.052	.079	.061	-.040	.198	-.074	.060	-.191	.042
Buy U.S. savings bonds	.042	.063	-.082	.167	0.067	.063	-.057	.190	-.086	.062	-.207	.036
Constant	1.360****	.217	.935	1.784	-0.300	.214	-.721	.120	-.363*	.220	-.794	.069
Correlation coefficients												
rho21 (Student – Parent)	.110****	.033	.046	.185								
rho31 (Student – Societal)	.045	.034	-.022	.112								
rho32 (Parent – Societal)	-.077**	.032	-.139	-.015								
Draws = 100 Log pseudolikelihood = -1847640 Wald $\chi 2$ = 1091.42**** Weighted n = 1,147,009 Unweighted n = 5,363												

Source: Weighted data from the ELS: 2002/06.

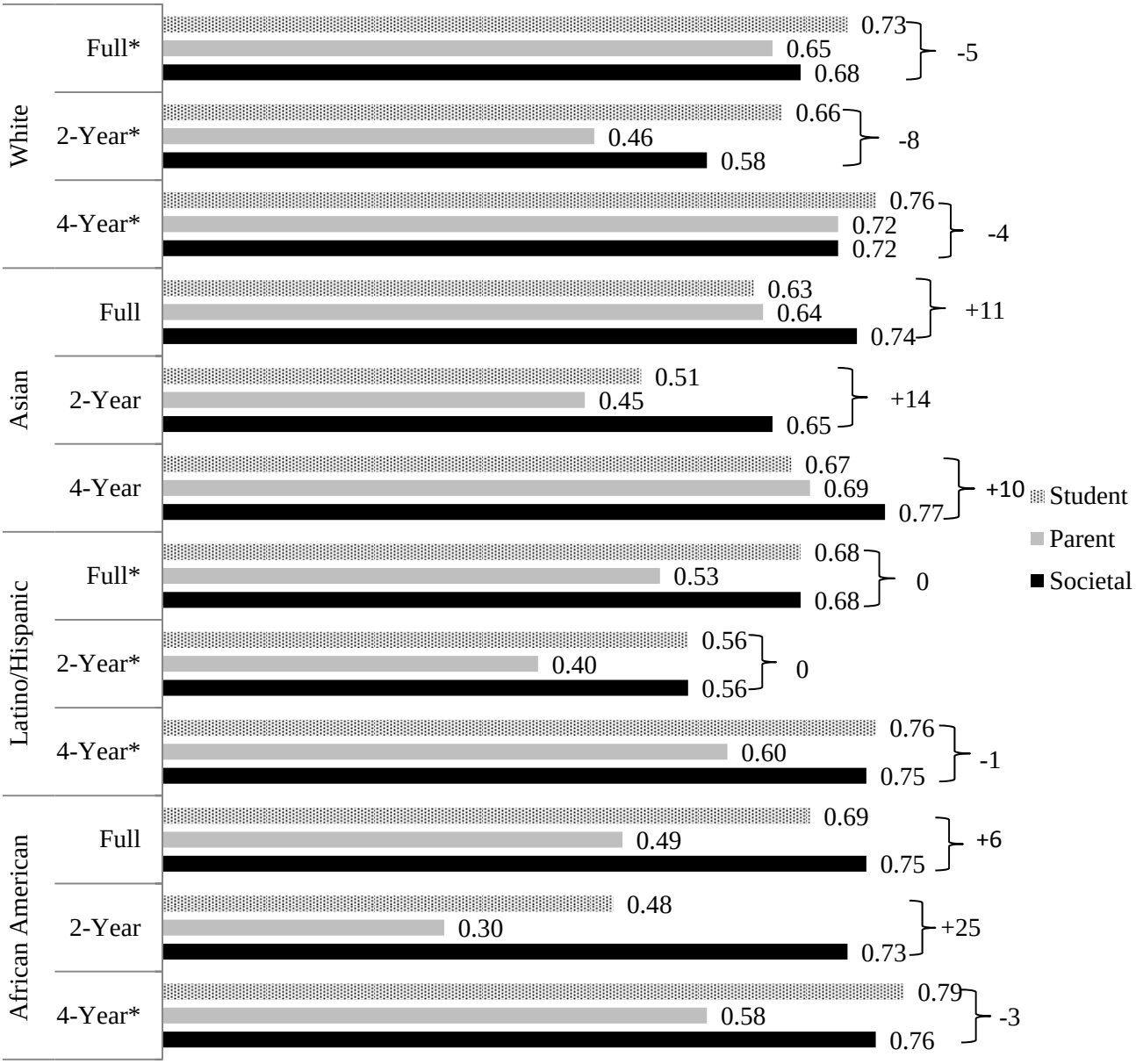
Notes: Estimates adjusted for clustering within schools. Data imputed using the Expectation Maximization (EM) algorithm. *p<.10; ** p < .05; *** p < .01; **** p < .001.

Predicted probabilities and students' college cost burden by race

Within groups. Figure 1 presents predicted probabilities and the college cost burden for racial/ethnic groups for all three outcomes. White students who attend a 2-year college by 2006 have a lower probability of reporting paying for college with family contributions than white students who attend a 4-year college. Further, in the full, 2-year, and 4-year samples white students have a lower probability of reporting paying for college with societal contributions than they do student contributions. The college cost burden for white students who attend a 2-year college is -8, and for a 4-year college it is -4. Asian students have a higher probability of reporting that they pay for college with societal contributions than student contributions in all three samples. Moreover, they have a college cost burden of +14 with respect to 2-year college attendance and +10 with respect to 4-year college attendance. Among Latino/Hispanic students, the probability of reporting that they pay for college with student contributions is equal or higher than the probability that they report paying for college with societal contributions. This is reflected in the college cost burden of zero for 2-year colleges and -1 for 4-year colleges. African American students have a higher probability of reporting that they pay for college with student contributions than societal contributions in the 4-year sample but the opposite is true in the 2-year sample. The college cost burden is incentive laden +25 at 2-year colleges for African American students. In contrast, it provides a disincentive at 4-year colleges (college cost burden = -3).

Comparing groups. Among minority groups, Asian students have the highest probability of reporting paying for college with family contributions regardless of whether they attend 2-year colleges or 4-year colleges. Using the college cost burden, findings also indicate that Asian students have the greatest incentive to attend college overall when compared to all other racial/ethnic groups. Their college cost burden at 2-year colleges is +14 and a +10 at 4-year colleges. Latino/Hispanic students do not seem to be given much incentive by society to attend either 2-year colleges or 4-year colleges. They are the only minority group for which the college cost burden is zero or negative for both 2-year and 4-year college attendance. This is also true of white students. Further, Latino/Hispanic students have the lowest probability of reporting having paid for college with societal funds at a 2-year college when compared to all other racial/ethnic groups. African Americans have one of the greatest disincentives to attend 4-year colleges of any racial/ethnic group using the college cost burden. First we find that they have the second-highest college cost burden at 4-year colleges (white students -4; African American -3). Second, findings indicate that they by far have the greatest incentive to attend 2-year colleges of any racial/ethnic group using the college cost burden. The college cost burden for African Americans at 2-year colleges is a whopping +25. Moreover, African Americans have the lowest probability of reporting paying for college with family contributions whether attending a 2-year college or a 4-year college of any racial/ethnic group.

Figure 1. Predicted probabilities for student, parent, and societal contributions and the financial aid gap by race and type of college among students who have attended college and applied for financial aid



Source: Weighted data from the ELS: 2002/06.
Notes: Estimates adjusted for clustering within schools. Data imputed using the Expectation Maximization (EM) algorithm. Full = students who attended either a 2-year or 4-year college. Full (weighted N = 1,652,963; non-weighted N = 7,366); 2-year (weighted n = 505,954; non-weighted n = 2,003); 4-year (N = 1,147,009; non-weighted = 5,363). Full (N = 1,652,963; non-weighted = 7,366); 2-year (N = 505,954; non-weighted = 2,003); 4-year (weighted n = 1,147,009; non-weighted n = 5,363).* = student contributions are equal to or greater than societal contributions. Open brackets indicate the financial aid gap (societal contributions minus student contributions).

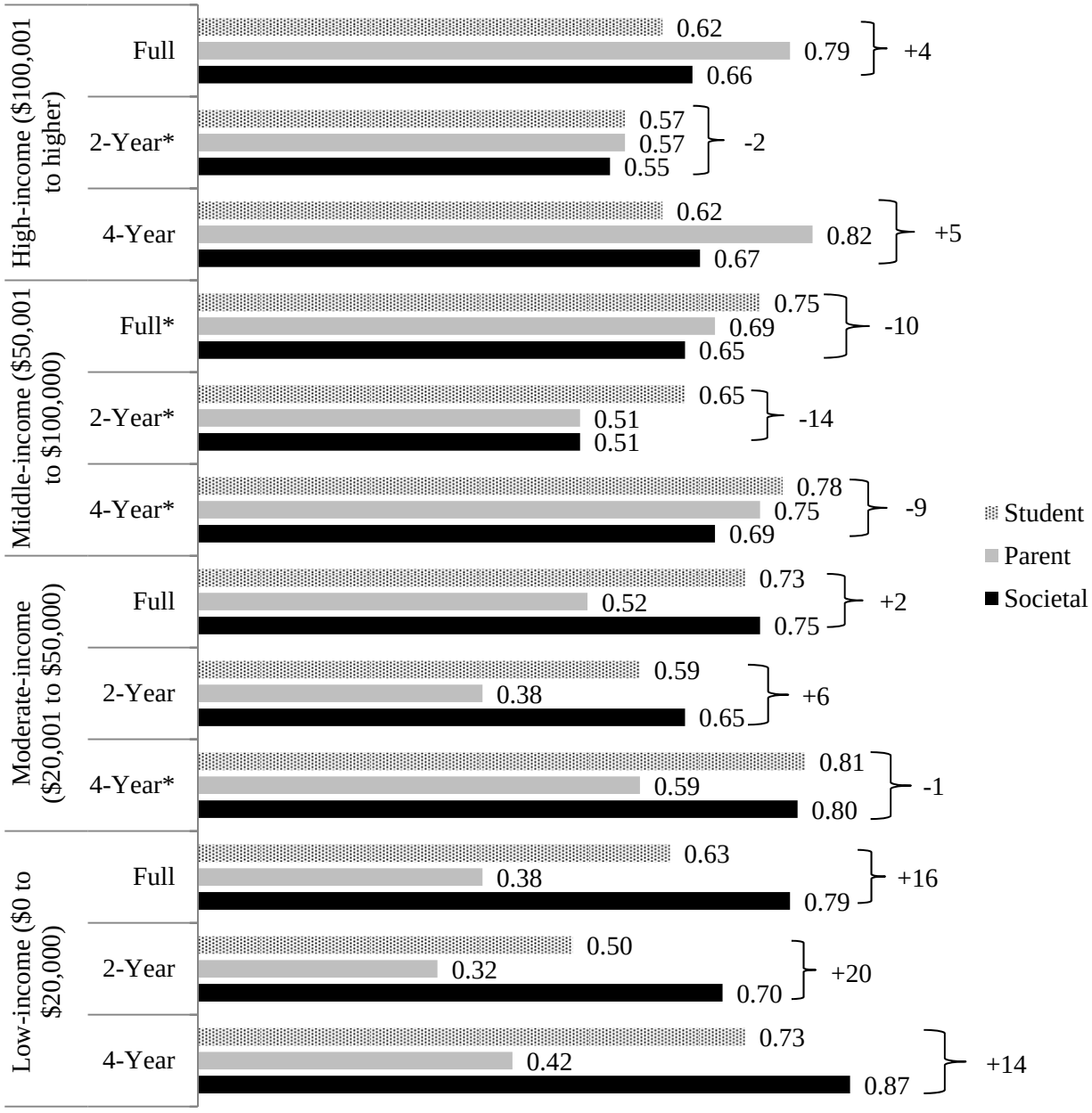
Predicted probabilities and the college cost burden by income level

Within groups. According to the college cost burden, low-income students receive societal incentive to attend both 2-year and 4-year colleges. The incentive is higher for 2-year colleges (college cost burden = +20) than 4-year colleges (college cost burden = +14). The probability that low-income students report having used family contributions to pay for 2-year college attendance or 4-year college attendance falls considerably below .50 in both cases (.32 and .42, respectively). Moderate-income students have a small incentive to attend 2-year colleges (college cost burden = + 6). In contrast, they have a disincentive to attend 4-year colleges (college cost burden = -1). Middle-income students have the largest disincentive to attend college regardless of type of college using the college cost burden. The college cost burden for middle-income students at 2-year colleges is -10 and at 4-year colleges is -14. In the aggregate, high-income students receive an incentive to attend college (college cost burden in full sample = +4). When the data are disaggregated by type of college they receive small disincentives to attend both 2-year colleges (college cost burden = -2) and 4-year colleges (college cost burden = -5). However, particularly in the case of 4-year college attendance, almost all high-income students report having received family contributions to pay for college.

Comparing groups. A general principle of the financial aid system is that the higher your income the more of a burden you should bear for paying for college. Findings support this in regard to family contributions and societal contributions. We find that as income rises, the probability that students pay for college with family contributions also rises. Further, as income decreases, the probability that students pay for college with societal contributions increases. However, this pattern does not continue in the case of student contributions. In the case of 2-year colleges, only low-income students have a lower probability of reporting that they pay for college with student contributions than high-income students (.50 vs. .57, respectively). When we consider 4-year colleges, low-income students have a higher probability of reporting that they pay for college with student contributions than do high-income students (.73 vs. .62, respectively). This is most likely due to the low probability that low-income students receive family contributions compared to their high-income counterparts (.42 vs. .82, respectively). Moreover, according to the college cost burden, middle-income students have the least incentive to attend college regardless of the type of college when compared to all other income groups.

It is also interesting to note that middle-income students have a larger disincentive to attend 2-year colleges than they do 4-year colleges (2-year college cost burden = -14 vs. 4-year college cost burden = -9). Whereas, high-income students have a disincentive to attend 2-year colleges (college cost burden = -2) but an incentive to attend a 4-year college (college cost burden = +5). What cannot be left out from this discussion is that middle- and high-income students are almost assured of receiving family support if

Figure 2. Predicted probabilities for student, parent, and societal contributions and the financial aid by income level and type of college among students who attend college and applied for financial aid



Source: Weighted data from the ELS: 2002/06.
Notes: Estimates adjusted for clustering within schools. Data imputed using the Expectation Maximization (EM) algorithm. Full (weighted N = 1,652,963; non-weighted N = 7,366); 2-year (weighted n = 505,954; non-weighted n = 2,003); 4-year (N = 1,147,009; non-weighted = 5,363). Full (N = 1,652,963; non-weighted = 7,366); 2-year (N = 505,954; non-weighted = 2,003); 4-year (weighted n = 1,147,009; non-weighted n = 5,363).).* = student contributions are equal to or greater than societal contributions. Open brackets indicate the financial aid gap (societal contributions minus student contributions).

they attend 4-year colleges (.75 and .82, respectively) whereas there is only about a .50 probability that they report receiving family contributions to pay for college if they attend 2-year colleges (.51 and .57, respectively).

Lastly, several income groups have a negative college cost burden. High-income students have a negative college cost burden with respect to 2-year college attendance (college cost burden = -2), middle-income students with both 2-year college attendance (college cost burden = -14) and 4-year college attendance (college cost burden = -9), and moderate-income students with 4-year college attendance (college cost burden = -1).

Discussion

Rising college costs along with changes in financial aid policies raise questions about whether minority and low-income students are being asked to shoulder more of the burden of paying for college than their white and higher-income counterparts. To examine this and other related questions, we estimate three trivariate probit models using three separate samples of students who attend college and apply for financial aid by 2006. Trivariate probit models provide correlation coefficients. We find that the only statistically significant, positive correlation across all three samples is between student contributions and family contributions. We conclude from this that the same unmeasured variables that increase the chance of student contributions also increase the chances of family contributions. It is as if the parents say to their children, "you pay your share, we'll pay our share." If the parents say "we won't pay," it appears that children are also less willing to pay.

With regard to the full and 2-year samples, the idea that there is a type of meta-message communicated by parents and children, "you pay your share, we'll pay our share" is strengthened by our findings on student and parent expectations. When students expect to graduate from college, we find that they are more likely to report that their parents contribute to paying for college. Similarly, when parents expect their child to graduate from college, they are more likely to report contributing to paying for college. It appears that one way that positive expectations may work is by signaling to the other that it is safe to contribute: "you can trust me." For example, for parents to invest in college, they must accurately predict that their child will complete college in order to receive a return on their investment. Positive student expectations may provide parents with much needed confidence that the student will graduate. Student expectations remain an important predictor of family contributions in the 4-year sample, but parent expectations do not. Carrying our line of reasoning forward, this suggests that among 4-year college goers it remains important for parents that students provide them with a type of insurance that it is safe to invest. However, it appears it might be less important that parents signal to students that it is safe to invest. Perhaps, when students attend a 4-year college the meta message is, "If you don't pay, we won't pay. "

The correlations between student and societal contributions and family and societal contributions are both significant and negative in the full and 2-year samples. As such, we suggest that both sets of

relationships can be interpreted as substitutes for one another. For example, if the unmeasured effects raise family contributions, they also reduce societal contributions in all three samples. Since the fitted model accounts for the financial status of the parents, this effect may be interpreted as a substitution effect. The student and societal correlational relationship may also be interpreted as a substitution effect in both the full and 2-year sample. Since the student and societal correlation is not significant in the 4-year sample it cannot be interpreted as a substitute effect.

Further, in this study we ask, "Are students as likely as or more likely to bear the responsibility of paying for college than society?" The answer seems to be yes, particularly in the case of 4-year college attendance. The college cost burden among white, Latino/Hispanic, and African American students who attend a 4-year college is negative in each case. Similarly, it is negative among middle- and moderate-income students. This indicates in each of these cases, students have a higher probability of reporting paying for college with student contributions than societal contributions. SallieMae (2011) reports that the percentage of student contributions (i.e., student borrowing and student income and savings) is slightly lower than societal contributions (26% vs. 33%, respectively). The most important reason for this difference might be that SallieMae (2011) uses descriptive data; they do not attempt to predict which students use different types of contributions while controlling for a variety of factors. The college cost burden may be exacerbated by the fact that in each of the cases where there is a negative gap there is also a higher probability that students report paying for college with student contributions rather than family contributions. Moreover, the bulk of student contributions are in the form of student loans which can have long-term negative effects (e.g., American Student Assistance, 2010).

The second research question we examined was, "Are minority and low-income students as likely as or more likely to be asked to carry the responsibility of paying for college than white and higher income students?" In the case of Asian students, the answer is a resounding "no" regardless of the type of college. This might be because of the shift to more merit-based aid. Research suggests that Asian students have the highest test scores of any racial/ethnic group (Kao & Thompson, 2003). Therefore, it might be said that they receive more of an incentive to attend college than other groups. Moreover, of any minority group, they have the highest probability of paying for college with family support. This is in line with King's (1999) finding which indicates that Asian students are more likely than either African American or Latino/Hispanic students to have an expected family contribution of more than $12,500 per year.

Findings are mixed in the case of African Americans. With respect to 2-year college attendance, clearly African Americans receive a far greater incentive to attend with a college cost burden of +25. An explanation for this is African American students often come from low-income families with little assets (King, 1999). As a result, they often are not expected to make any financial contribution toward paying for college. For example, King (1999) finds that 36% of African American students are not expected to pay anything toward college costs. Furthermore, King (1999) suggests that a reason why African American students use grants and scholarships at higher percentages than other

racial/ethnic groups is because a high percentage of African American students are independent students with dependents. In turn, they have a lower income profile making them more likely to be eligible for grants and scholarships. However, this explanation is less convincing in the case of 4-year colleges. With respect to 4-year colleges, the college cost burden for African American is negative and nearly equal to that of white students. When the 2-year and 4-year findings are considered together, it provides an explanation for why research might indicate that African American students are overrepresented at two-year universities where there is less chance that students continue on for a 4-year degree (Louie, 2007).

Alternatively, one might suggest that while college cost burden is upside down for African American students, the probability of using societal contributions to pay for college is roughly equal for 2-year and 4-year college attendance (73 vs. 76, respectively). However, this does not take into consideration that African American students are the only group for which the probabilities of paying for college with societal goods at a 2-year college and 4-year college are about equal. For all other racial/ethnic groups, the probability of paying for college with societal contributions is noticeably higher with respect to 4-year colleges. Moreover, this line of reasoning does not get at the problem of students' college cost burden because it only looks at societal contributions without considering student contributions. The financial aid incentive structure with respect to African American and white students are even more distorted when we consider family contributions. African American students have the lowest probability of reporting using family support to pay for college than any other racial/ethnic group. The family contributions disparity may be explained with the family composition argument articulated by King (1999) earlier in this paragraph.

While white students have a larger negative college cost burden than Latino/Hispanic students, the college cost burden still appears to be unfavorable, if not inequitable for Latino/Hispanic students. An explanation for why the gap for Latino/Hispanic students might not be as large as it is for African American students, for example, is that Latino/Hispanic students are more averse to borrowing to pay for college than African American students (Cunningham & Santiago, 2008). Consistent with Cunningham's and Santioago's (2008) findings, our descriptive data also suggest that Latino/Hispanic students are less likely to pay for college with student loans than all other groups but Asian students. Their aversion to borrowing may work to reduce the college cost burden they face since college loans are the primary ways students contribute. Despite this, the college cost burden is likely worsened by the fact that Latino/Hispanic students have a lower probability of reporting paying for college with family contributions than white students.

In the case of low-income students, there appears to be little evidence from this study that low-income students are being asked to bear more of the burden of paying for college when compared to other income groups based on their college cost burden. However, there are large disparities in family contributions when compared to other income groups, particularly high-income students. Given this, it is important to note that we are unable to ascertain whether the amount of grants and scholarships is sufficient to make up for low family contributions among low-income students. That

is, while the basic pattern of how students pay for college is one of creating equality of opportunity, it may not be in sufficient amounts to actually provide equality (e.g. ACSFA, 2002; 2006; 2010).

Moderate-income and middle-income groups appear to have the most regressive college cost burden of any income groups, especially when 4-year colleges are considered. While both moderate-income and middle-income students are discouraged to attend 4-year colleges according to the college cost burden, high-income students are encouraged. This provides evidence that lower-income students, with the exception of the lowest income bracket, are being forced to bear more of the responsibility for paying for college when compared to high-income students. Like in the case of race, this problem is only exacerbated when family contributions are considered. Further, when family contributions are considered, it might be argued that the financial system least favors moderate-income students because the probability that they receive family contributions is far less than that of middle-income students. In line with this, SallieMae (2011) reports that among high-income students, 43% of the cost of college is paid through family income and savings with an additional 8% being paid through family loans. That means that over half of the cost of college for high-income students is paid for through family contributions. In contrast, only about 25% of college costs are paid for by family contributions among low-income students (SallieMae, 2011).[1]

We also examined whether college assets increase or reduce the likelihood that students report paying for college with student, family, and/or societal contributions. We find that different types of college assets affect how students pay for college in different ways. Planning to mortgage a home to pay for college and telling a student to put aside earnings for college in 10th grade are positive predictors of student contributions. Conversely, when parents open a savings account, start a state-sponsored savings plan, or open a college investment fund, students are less likely to pay for college with student contributions in all three samples. Investment in real estate/stocks reduces the chances of reporting paying for student contributions only in the 4-year sample.

It might be that the first two types of assets signal to students that parents do not have enough money put aside to pay for college and students will have to contribute if they want to go to college. It appears that this might be interpreted positively, at least among students who apply for financial aid and who attend college. These students might interpret parents' plans to mortgage their home or parents telling them to put aside money as meaning that even though their parents cannot afford to pay for college, their parents see it as a worthwhile investment. That is, it might be an outward manifestation of parent expectations for them to attend college. In line with this, research suggests that parents' college expectations are a strong predictor of students' predispositions toward college (Hamrick & Stage, 2004). Moreover, in the full and the 2-year samples parent college expectations are a positive predictor of students contributing toward college costs. Conversely, starting a savings account, a state-sponsored savings plan, college investment fund or investing in real estate/stocks may provide students with actual resources for covering the cost of college which drive down the

[1] SallieMae (2011) defines low-income as <$35,000 and high income as $100,000 or more.

need for student contributions. Therefore, we find a negative relationship between these types of college assets and student contributions.

With respect to family contributions, starting a savings account, having students put aside earnings, investing in real estate/stocks, and buying U.S. savings bonds all are related to students being more likely to report paying for college with family contributions. However, whether they have a significant positive effect varies by the type of college students are attending. On the one hand, putting aside earnings and U.S. savings bonds are significant in the 2-year sample but not the 4-year sample. On the other hand, starting a savings account and college investment funds are significant in the 4-year sample but not in the 2-year sample. Non-significant results for both telling students to put aside earnings and buying U.S. savings bonds in the 4-year sample may be due to the cost of 4-year colleges compared to 2-year colleges. Since both types of assets may result in far less actual accumulation of assets, they may hold less sway on whether or not students report paying for college with family contributions at more costly 4-year colleges than they do at less expensive 2-year colleges. State-sponsored savings plans are negative predictors of family contributions. There might be several reasons for the negative relationship. A reason might be that state-sponsored savings plan companies do a poor job of informing families about how state plans can be used to finance college. For example, SallieMae (2011) finds 76% of families who opened a state-sponsored savings plan report that savings plan companies are "neither" helpful nor unhelpful, "fairly unhelpful," or "very unhelpful" in providing information about financing college. The lack of information about the utility of state plans to help finance college, coupled with negative media coverage about the potential of these plans to reduce the amount of need-based aid available, might have a negative effect on whether students report paying for college with family contributions.

Having student put aside earnings is the only college asset variable that is a significant predictor of societal contributions. It has a positive relationship in the 4-year sample. This is likely for some of the same reasons for why it has a positive relationship in regards to student contributions described above. Clearly, more research is needed that attempts to understand why different types of college assets might have different effects.

Limitations

There are several notable limitations that should be mentioned when interpreting the study results. First, while each school was supposed to include 26 randomly-selected students, there was considerable variation in the number of students whose data were collected throughout the 2004 and 2006 waves, which reduces the representativeness of the population. Second, missing data varied across the different items contained in the surveys, and many of the later items in the student questionnaire were not missing at random. Steps were taken to counter this potential threat by imputing data to replace missing data. Nevertheless, estimates may contain a degree of missing data bias. A third limitation is the inability to examine contribution amounts—for example, whether the amount of family contributions is higher for high-income students than the amount of societal

contributions is for low-income students. A fourth limitation is the use of student reports; it might be that some students do not see some things as family contributions that are. For instance, living at home provides students with considerable resources to help make college affordable (such as, not having to pay room and board). However, because students may not see that as money to pay for tuition costs or books they may not report it as a family contribution.

Implications

Research has consistently shown that student expectations are an important predictor of student education outcomes (Cook et al., 1996; Marjoribanks, 1984; Mau, 1995; Mau & Bikos, 2000; Mickelson, 1990). However, little research examines the role of student expectations on family contributions for financing college. Our findings indicate that students who have positive college expectations are more likely to have parents who help pay for their education. How might this work? We speculate that programs that help increase student expectations may not only improve student educational outcomes, but that they might also help students signal to parents that they can trust their child to complete college.

In regard to race and income, Asian students appear to be the best equipped to take advantage of the current financial aid system and its emphasis on merit-based aid. With regard to African American students, they are being incentivized to attend 2-year colleges over 4-year colleges. Research shows that students who attend 2-year colleges are less likely to complete a degree (McIntosh & Rouse, 2009) and less likely to go on to a 4-year college (Long & Kurlaender, 2008). Given this, we suggest providing both more and higher dollar grants and scholarships at 4-year colleges so that African American students have to rely on paying for college with student contributions less. We suggest higher amounts because the probability of using grants and scholarships is about equal at both 2-year and 4-year college so it is not necessary the availability of grants that is at issue. However, African American students are far more likely to pay for college with student contributions at 4-year colleges than they are at 2-year colleges which suggest that higher dollar scholarships and grants are needed. In contrast, Latino/Hispanic students receive no incentive in the case of 2-year colleges and a disincentive in the case of 4-year colleges. Therefore, we suggest that there is a need to create more grants and scholarships that target Latino/Hispanic students. With respect to income, while the lowest-income students have garnered most of the media and research attention for good reasons, our findings indicate that financial aid policies must pay closer attention to the opportunities they provide for moderate-income students to attend 4-year colleges in particular.

Another implication of this study is that college assets may serve as a means for reducing student contributions by increasing family contributions. However, among lower-- income and minority families, with the exception of Asian students, there is a great need to find ways to help more families contribute toward paying for college. Family contributions are a major source of financing college for higher-income, white, and Asian families and potentially a huge source of inequality in

the financial aid system. A problem that lower income, African American and Latino/Hispanic families face is that they have very little money to save or to use for college after they pay all of their other expenses. So, while we find that college assets can help to reduce the burden of paying for college on students and increase family contributions, lower-income families are less likely to benefit from existing college savings instruments because of their low marginal tax rate (Maag & Fitzpatrick, 2004).[2] These instruments are largely designed as tax subsidies. Examples of these instruments are state-sponsored savings plans, college investment funds, and education bonds.

Given this, lower income and minority families may need access to specially designed accounts called Child Savings Accounts (CSAs), sometimes referred to as Child Development Accounts (CDAs). CSAs have been proposed as a potentially novel and promising mechanisms for helping students and their families finance college (Boshara, 2003; Goldberg & Cohen, 2000; Sherraden, 1991). An example of a CSA policy is the America Saving for Personal Investment, Retirement, and Education (ASPIRE) Act. ASPIRE would create "KIDS Accounts," or a savings account for every newborn, with an initial $500 deposit, along with opportunities for financial education.[3] Students living in households with incomes below the national median would be eligible for an additional contribution of up to $500 at birth and a savings incentive of $500 per year in matching funds for amounts saved in accounts. When account holders turn 18, they would be permitted to make tax-free withdrawals for costs associated with post-secondary education, first-time home purchase, and retirement security.

[2] The marginal tax rate is the rate on the last dollar of income earned. This is different from the average tax rate, which is the total tax paid as a percentage of total income earned.

[3] At this writing, the ASPIRE Act remains on the Congressional agenda (http://www.newamerica.net/publications/policy/aspire_act_bill_summary).

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