

Financial Aid Effectiveness during Economic Scarcity

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Disclaimer: The views expressed on statistical, methodological, technical, or operational issues are those of the author and not necessarily those of the U.S. Census Bureau.¹

Abstract: The dynamic relationship between postsecondary education and our economic climate makes the financial aid system a key element of educational attainment in times of economic scarcity. Postsecondary enrollment reached an all time high in 2008, providing an opportunity to examine financial aid use and persistence to degree completion during an economic recession. This research uses a quasi-experimental design of propensity score matching to reduce the omitted variable and self-selection biases that accompanies financial aid research. Data from the 2008 Survey of Income and Program Participation (SIPP) assessed the effects of two types of financial aid—grants and scholarships versus work-studies and loans—on persistence to bachelor’s degree completion on a national scale. The sample size permitted further restrictions to assess the effects of financial aid on the degree completion for those students from the lowest socioeconomic group. Both types of financial aid increased persistence to degree completion, though the effects are strongest when used together. This paper discusses the differences in both the effects of financial aid on bachelor’s degree completion as well as the differences in demographic characteristics of those who rely on financial aid, using the results to make policy and research recommendations.

Economic Scarcity and Financial Aid Research

During times of economic crisis, college enrollment rates rise, which was evident in 2008 when enrollment of 18 to 24 year olds reached an all time high of 39.6% (Fry, 2009).

¹ All comparative statements in this report have undergone statistical testing, and, unless otherwise noted, all comparisons are statistically significant at the 95% significance level.

Movements like *Occupy Wall Street* demonstrate the effects of the ever-rising cost of postsecondary education, though the availability of financial aid can still be elusive to those with the most substantial need. In response to the economic crisis, the federal government passed the Emergency Economic Stabilization Act of 2008, which created programs like the Troubled Asset Relief Program (TARP).² To provide relief and stabilize the economic climate, programs like TARP provided federal financial support to banks. To minimize threats of future economic crises, the federal government also made changes to student loan programs.

In 2010, Congress eliminated the Federal Family Education Loan Program (FFELP), which allowed the federal government to secure student loans from private banks.³ While banks like Wells Fargo and Sallie Mae still offer students loans similar to those supported under FFELP, different regulations and interest rates are now in place as part of the federal government's Direct Loan program. The Department of Education also offers grant programs like the Pell Grant, with Congressional appropriations. The Pell grant appropriations increase annually and nearly doubled from \$21.8 billion in 2010 to \$41.7 billion in 2011.⁴ With federal policy playing such a substantial role in the availability of financial aid, the role of research in demonstrating the effectiveness of such spending is imperative.

Self-selection and omitted variable biases hinder the evaluative process of financial aid programs, and effectiveness and efficiency are often difficult to demonstrate (Cellini, 2008). This research uses a quasi-experimental design to minimize the effects of unmeasured bias to help inform policy makers when determining resource allocation. Propensity score modeling is a compensatory measure for these assessment difficulties, serving as a direct comparison between

² <http://www.treasury.gov/initiatives/financial-stability/pages/default.aspx#>

³ <http://www2.ed.gov/programs/ffel/index.html>

⁴ <http://www2.ed.gov/programs/fpg/funding.html>

individuals of the most similar economic, social, and demographic backgrounds, differing only by the utilization of financial aid. More specifically this research addresses the following:

1. Does the use of financial aid increase persistence to bachelor's degree completion?
2. Do these results differ by the type of financial aid (i.e. scholarships and grants, or work-study subsidies and loans)?
3. Do these results differ by economic need?
4. What can these results tell policy makers about the direction of funding, specifically during times of economic scarcity?

If financial aid increases persistence to degree completion, then during an economic recession, when programs are on the budgetary chopping block, research should inform policy decisions. This research aims to provide evidentiary support for financial aid effectiveness on a national scale, as well as provide directions for future research that can guide policy development.

Self-Selection and Omitted Variable Biases

The social and cultural capital associated with the utilization of financial aid make the evaluation of financial aid difficult (Chen, 2008; Chen & DesJardins, 2008, 2010). The intertwining roles of social, cultural, and human capital in the life course bring to light issues of both self-selection and omitted variable biases as two concerning factors when evaluating financial aid and the impact of utilization on persistence to degree completion (Cellini, 2008). Issues surrounding who applies and is qualified for financial aid, as well as obtaining and applying this knowledge often leads to issues of these types of bias that are difficult to overcome.

Self-selection and omitted variable biases stem from a complicated combination of social, political, economic, familial, psychological, and cultural characteristics that are the key determinants of postsecondary educational enrollment (Cellini, 2008). The application for, and use of financial aid relies on self-selection and not random assignment, meaning one of the main regression assumptions of continuity is violated (van der Klaauw, 2002). The majority of self-selection bias goes undetected through models like fixed-effects, difference-in-difference, and the instrumental variables approaches (Titus, 2007). In addition, when analyzing persistence to postsecondary completion, self-selection bias varies across different types of financial aid—socioeconomic need for aid versus aid awarded based on merit. In other words, those who lack the financial means to persist to degree completion may elect to drop-out, thereby self-selecting out of degree completion and skewing empirical findings (Singell, 2004). Likewise, those who benefit the most from degree completion are the most likely to persist (Card, 2001).

Sources of self-selection bias stem from individual and family demographic characteristics. The household composition largely defines the number of adults present in the household upon whom the financial burdens of postsecondary education can fall (Avery and Hoxby, 2003; Braunstein et al., 1999; Kane, 2003). Household composition adds a measure of resource demand in the household. The number of both adults and children in the household affect the socioeconomic status of the household as well as a family's decision about the student attending a postsecondary institution. The household's debt-to-income ratio, composition, poverty ratio, and income from the receipt of social welfare program benefits contribute to the eligibility for needs-based financial aid, as well as the personal decision to attend a postsecondary institution (Segal, 2010).

Access to information and the environment in which decisions are made also contribute to self-selection bias and demonstrate the prevalence of omitted variable bias. Higher levels of educational attainment among the adults in the household increase both the cultural and human capital of the overall household. This often results in additional accessibility to information surrounding the availability and use of financial aid (Chen, 2008; Chen & DesJardins, 2010; Kim, 2011; Perna, 2006). Neighborhood characteristics contribute to the household characteristics and individual decision, such that urbanicity has several attributes that contribute to both attendance and persistence in postsecondary education (Lleras, 2008). The omission is the decision-making process—who self-selects out of postsecondary education and based on what measures?

Omitted variable bias in financial aid research can include anything from the economic climate of the school to the family's influence on the decision to attend (Acemoglu and Angrist, 1999). The state and federal financial assistance to the postsecondary institution affect the type and amount of financial assistance offered by the school. Another source of omitted variable bias is the type of secondary education received and the way in which it contributes to the types and use of financial aid (Avery and Hoxby, 2004; Braunstein, McGrath, and Pescartrice, 1999; IES, 2010; Perna, 2006). Even when financial aid information is available in the high school, we cannot measure if or how students use that information.

Students may not be inclined to trust information provided by sources peripheral to the direct sphere of influence—e.g. teachers or guidance counselors—especially when considering life-course events (Chatman, 1991; Morton 1999). Proxy measures often replace the omitted influence of financial aid information dissemination. The type of high school and the program of study are inside the sphere of influence and serve as indicators of access to information that is a

determining factor in participation. In addition, omitted variables like innate ability and personal goals could result in significantly overstated results (Krueger and Lindahl, 2001). It could almost be argued that the omission of key variables negates any statistically significant findings with respect to analyses like financial aid assessments that are codependent on individual characteristics and latent traits that are not measured. While self-selection and omitted variable biases pose substantial threats to the quality of financial aid research, methods can be applied that limit the affects of these biases.

Quasi-Experimental Designs with Longitudinal Data

Random assignment and regression discontinuity are potentially useful methods for assessing the effects of financial aid independent of the recipient's characteristics. Random assignment is the preferred method for minimizing the bias in experimental designs. In regression discontinuity, the score that is generated from the model is used to determine the cutoff—or the point at which those above the score are in the treatment group and those below are in the control group (van der Klaauw, 2002). Regression discontinuity can be an informative approach, though the cutoff selected is usually limited to just a few variables of interest (Kane, 2003). A collaborative approach, combining random assignment, a type of regression discontinuity, and known influential characteristics, minimizes bias and infers causality with respect to the role of financial aid in bachelor's degree completion. Propensity score modeling, when utilizing the enhanced options, meets these criteria (Becker and Ichino, 2002; Dehejia and Wahba, 1999, 2002; Rosenbaum and Rubin, 1983).

Propensity score modeling uses existing data to imitate an experimental design, creating a treatment and control group based on characteristics specified in the model (Dehejia & Wahba, 1999; Rosenbaum & Rubin, 1983). This research utilizes the satisfaction of the balancing property. The balancing property ensures the conditional distribution of the matching characteristics specified in the conceptual framework of the model is not significantly different between the treated and the control groups (Dehejia & Wahba, 1999; Rosenbaum & Rubin, 1983). This meets the random assignment criteria as well as incorporates many variables of interest. To ensure only those with the propensity to use financial aid are included in the model, the sample is bounded by the region of common support (D'Agostina & Rubin, 2000; Dehejia & Wahba, 1999; Rosenbaum & Rubin, 1983). This restriction enables the comparisons made to be between only applicable cases and serves as a cutoff. The average effect of the treatment on the treated, or ATT, is then the inferential causal effect of financial aid on bachelor's degree completion.

To ensure adequate propensity modeling, and all of the outlined intricacies of robustness to ensure quality matching are sound, an appropriate, nationally representative dataset must be employed. The dataset must collect information from respondents in a chronological manner such that the matching characteristics have already occurred, and the treatment is at a measureable point in time prior to the expected outcome. As such, longitudinal surveys are necessary for propensity modeling, specifically when attempting to measure a change in educational attainment. The Survey of Income and Program Participation (SIPP) is a longitudinal survey with a nationally representative sample, providing data applicable to propensity modeling.

The SIPP began collecting data for the 2008 panel in September with a four-month recall period.⁵ During data collection, the SIPP divides the sample into four rotation groups, each with follow-up interviews continuing at four-month intervals (waves). The longitudinal collection of the SIPP provides adequate sampling and data collection time points for the propensity modeling approach. Surveying 52,301 households in the 2008 Wave 1 data collection, the most recent wave of data available internally for Census Bureau review is that from the Wave 6 core interview, which collected information, covering January to July 2010, depending on the rotation group. Answering the questions posed in this research requires the application of restrictions to the data.

Given the first rotation group's last observation in this wave was April 2010, the sample was restricted to those who reported a high school completion year no later than 2005 to provide at least four years time for each person in sample to complete a bachelor's degree. It takes almost half of all students attending postsecondary institutions more than four years to complete a bachelor's degree, an effect that varies across student characteristics (Ishitani, 2006). This produces conservative estimates as these individuals will be right censored and appear as someone who did not persist to completion. Additionally, to prevent a misrepresentation—and consequently underreporting—of the effects of financial aid on bachelor's degree completion, any person receiving a bachelor's degree prior to 2008 was eliminated from the sample.⁶

Refer to Table 1 for the descriptive statistics of the matching characteristics both pre- and post-sample restrictions. Table 1 also displays descriptive statistics for the low-income sample.

⁵ These data are subject to error arising from a variety of sources. For more information on sampling and non-sampling error in the SIPP 2008 Panel, see [http://www.census.gov/sipp/sources/S&A08_W1toW6\(S&A-13\).pdf](http://www.census.gov/sipp/sources/S&A08_W1toW6(S&A-13).pdf).

⁶ Financial aid questions were only asked for the reference period, not at any time point preceding the reference period. The lack of retrospective reporting prevents the analysis from being extended to all those in sample with a bachelor's degree.

To address the third research question with respect to the effects of financial aid on the bachelor's degree completion rates of students with economic need, the sample was restricted even further. If the family was living at or below 100% of the poverty line, they remained in the low-income sample. After restricting the sample, matching characteristics generate treatment and control groups.

Individuals in the sample were matched using person and family demographic characteristics. The models include measures of *Gender*, *Race*, and *Age* as previous research shows these characteristics contribute to the way in which the financial aid affects persistence to degree completion (Boschung, Sharpe, and Abdel-Ghany, 1998).⁷ The public or private sector of the high school attended was dichotomously coded such that *Private* is the value reported with *Public* serving as the reference. In the Educational Attainment Topical Module, the SIPP asked whether the each respondent aged 15 and over took an advanced course during high school for a period of two or more years on a variety of subjects.⁸ These responses were tabulated to form a scale from zero to four indicating the number of advanced subjects that were taken and is reported as *Curriculum* (Altonji, 1992; DiMaggio, 1982). The sample distribution of high school GPA had spikes at the five-place markers indicating it was an ineffective measure and was therefore not included in the models.

Additional family characteristics were included as matching criteria. Family composition was dichotomously coded with *Two-Parent Families* being the reference group for both *Step* and *Single Parent Families* (Bankston & Zhou, 2002; Beller & Chung, 1992; Caldas & Bankston, 1997). Due to the high number of single parent families, the *Parent Education* level used in the

⁷ Recent statistics are available at <http://diversitycollaborative.collegeboard.org/toolkit/financial-aid-and-scholarships-exploring-key-strategies-for-achieving-success> .

⁸ The Educational Attainment Topical Module was fielded in Wave 2, which collected data from January 2009 to April 2009.

models was that of the highest level of parental education reported in the family, regardless of parent gender or biological status to minimize missing data. The *Number of Children* in the household below the age of 18 was also included (Page & Grandon, 1979).

Two income measures were included in the model—the household’s total income-to-poverty ratio and the household’s amount of income from means tested social welfare programs-to-total household income ratio, denoted as *Poverty Ratio* and *Program Income Ratio*, respectively (Featherman & Hauser, 1978; Orr, 2003; White, 1982). The family’s home tenure status was included with *Home Ownership* being the reference for *Renting*.⁹ The final matching characteristic was the US Census Bureau’s measure of urbanicity, with *Non-Metro* status serving as the reference group while *Metro* is reported (Farkas, 2004; Lleras, 2008). Though not shown in the descriptive statistics, the regional office directing survey collection is also included in the models as a control (Walsh, 2012).

It is important to note a few things about propensity score models. First, multicollinearity is not an issue in propensity score models as the models match on the score and not the individual variables; including more characteristics in the matching process forms better quality matches (Becker and Ichino, 2002). Second, because time series is important when selecting covariates for propensity analyses, all matching covariates were taken from Wave 1. Tables 2 and 3 display the means for both the treatment and control groups for all four models—any assistance, grants and scholarships, loans and work study, and both types of aid—for the restricted sample. Table 2 displays matching characteristics for the restricted sample and Table 3 the low-income sample. These tables also contain the control-to-treated ratio, which exceeds the recommended 4:1 minimum in all of the models (Frölich, 2004).

⁹*Renting* also includes the respondent indicating the sample unit was occupied without payment of rent.

The treatments were taken from a combination of Waves 2 through 5. The first treatment was utilization of any type of financial assistance. The SIPP inquires about 11 types of financial assistance ranging from state and federal grants and loans to employer sponsored programs. To address the second research question, the treatment was subcategorized into grants and scholarships versus loans and work-study subsidies. For this research, these are not mutually exclusive categories. An individual could be receiving both *Grants/Scholarships* as well as *Loans/Work Study*. Figure 1 demonstrates the overlap of the treatments before the application of the matching characteristics for the restricted sample and Figure 2 is that of the low-income sample. Additionally, the receipt of both types of financial aid was tested, as was *Grants/Scholarships Only* tested against *Loans/Work Assistance Only*—Table 4 displays the matching characteristics of the latter. The outcome of interest was the completion of a bachelor's degree. As such, the educational attainment reported in Wave 6 serves as the dichotomous outcome measure where a bachelor's degree or higher is positively coded.

Results

Table 5 displays the results of the propensity models for both the restricted sample as well as the low-income sample. For the sample restricted to those who are eligible for financial assistance, all of the models were statistically significant. Those who rely on any type of financial assistance are 8.6% more likely to persist to degree completion than are counterparts with the most similar demographic characteristics. With respect to the type of financial assistance used, and when compared separately to those who do not use any kind of financial assistance, grants and scholarships are 2.2% more likely to persist to degree completion than

those who rely on loans and work assistance. However, when compared to each other, those who used grants and scholarships were 3.8% less likely to complete a bachelor's degree than those who relied on loans and work assistance. Using both types in tandem produces the most substantial results. When used together, all types of financial aid result in a 13.9% increase in persistence to degree completion.

Restricting the sample to those living at or below 100% of the poverty threshold produced different results. Those from the low-income sample are 4.9% more likely to complete a bachelor's degree than those most similar to them demographically who do not use financial aid. A statistically significant difference was not seen between those who only use grants and scholarships and those who do not use any type of financial assistance. Nor was there a statistically significant difference in persistence to degree completion between those who only rely on loans and work assistance and those who do not use any type of financial assistance. When combining types of financial assistance, those who use both types of aid are 7.2% more likely to complete a bachelor's degree than those who do not use any type of financial assistance. When compared against each other, however, there is not a statistically significant difference between the types of financial assistance and bachelor's degree completion for those from the low-income subsample.

These results provide some answers to the questions posed in this research. Yes, the use of financial aid does increase persistence to bachelor's degree completion. When compared to those of most similar demographic characteristics who do not use any type of financial assistance, grants and scholarships appear more beneficial. However, when compared to each other, those who rely on loans and work assistance to complete bachelor's degrees do so at higher rates than those who rely on grants and scholarships. When focusing on those with the

most urgent financial need, financial aid does not have the same effect. When restricted to the low-income subsample, those students using both types of financial aid saw the greatest benefit, though the increase in completion rates was not as substantial as seen for the sample restricted to eligible respondents. The answer to the final research question—funding financial aid programs during times of economic scarcity—requires additional discussion.

Discussion

Using outcomes of previous research minimized self-selection and omitted variable biases in this research (Becker and Ichino, 2002; Cellini, 2008; Titus, 2007; van der Klaauw, 2002). Through a quasi-experimental design, this research demonstrates financial aid is an effective means of persisting to bachelor's degree completion. However, it also shows those in the lowest income bracket are not seeing the same beneficial outcomes from the use of financial aid as the sample population. While minimizing self-selection and omitted variable biases are important contributions to the financial aid literature, many relevant policy questions remain, for example who is benefitting from which type of financial aid.

This research demonstrates the need for targeted assessments differentiated by the type of financial aid program, drawing attention to the recipient characteristics shown to differ. Existing literature ascribes differences in financial aid effects on degree completion to differences in social and cultural capital and basic demographics (Chen and DesJardins, 2010). Tables 2, 3, and 4 echoed this through the statistically significant differences in means by type of financial aid. If sample size permits, this research should be replicated based on the 11 types of financial

assistance used to create the aggregated categories, focusing on the differences in demographic characteristics.

Of particular interest are those demographic characteristics that differ significantly by the use and type of financial assistance. Overall, race, parental education, and poverty differed significantly for those relying on some form of financial aid to persist to bachelor's degree completion. The race distribution reflects less Whites relying on financial assistance and an increase in the percent of Black students utilizing financial aid. The distribution of parental educational attainment was also skewed for those using financial aid.

Those with less than a high school diploma or GED increased for students relying of financial assistance, while the percent of parents who completed a bachelor's degree decreased. However, an important point to mention is fluctuation in attending some form of postsecondary education. Parents of students who use financial aid to persist to degree completion were more likely to attend some form of postsecondary education than those who did not use aid, though these parents did not persist to degree completion. This may imply these particular parents had sufficient social and cultural capital to persuade their children to apply for and use financial assistance to persist to degree completion, though this is only one implication.

Family income also has implications for financial aid use. Those relying on any source of financial assistance have lower income to poverty ratios. When restricting the sample to those living at or below the poverty threshold, those relying on financial aid are more likely to rent than own their residence. The subsample also had a skewed race distribution, specifically relating to the use of grants and scholarships. The percent of Blacks using grants and

scholarships is highest in this category. Grants and scholarships also have higher rates of single-parent family composition.

The grants and scholarships represented in this sample may be needs based. The distribution of the poverty ratio, race, and single-parent family reliance on grants and scholarships is skewed in relation to either those not relying on financial assistance or those utilizing loans and work-study subsidies. Those relying on grants and scholarships are disproportionately Black and from single-parent families with lower income to poverty ratios. As income and number of adult household members determine eligibility for needs based grants and scholarships, this distribution implies further investigation into the types of grants and scholarships reported is necessary in the future.

Students relying on loans and work-study subsidies tend to take more advanced course in high school, have parents who are more likely to complete a bachelor's degree, and come from families with fewer children in the home than those who do not use financial aid or those who use grants and scholarships only. When compared directly to those students relying solely on grants and scholarships, those relying on loans and work-studies are more likely to have parents who completed bachelor's degrees. Additionally these students took more advanced courses in high school and the race distribution showed higher prevalence of Whites. When looking at the same comparison for the subsample living at or below the poverty threshold, these students were more likely to come from families that rent their homes than own.

The advanced course work and disproportionately White distributions also have implications. For example, advanced course work may only be applicable in affluent high schools, which also explains the greater likelihood of the parents to have higher educational

attainment. Affluent families live in better school districts (Lleras, 2008). While this research considered these things, future financial aid research should parse out the differences and implications for the effective use of financial aid.

Economic Scarcity and Educational Attainment

Maximizing the effectiveness of financial aid programs could be as easy as evaluating existing data from a different perspective. Determining who persists to bachelor's degree completion and which programs aided in that success benefits everyone. During times of economic scarcity, inferring causality from existing data is economically sustainable. This research utilized the strengths of propensity score matching to minimize the effects of self-selection and omitted variable biases. Satisfying the balancing property and restricting the matches to those within the region of common support enhanced the matches.

Additionally these added measures of robustness provide further guidance for policy research. There are clearly differences in educational attainment between those students who use financial aid and those who do not. Attainment also differed based on the types of financial aid upon which the student relies. Though the findings were not statistically significant for the restricted subsample of those living at or below the poverty threshold, this research provides additional information that could be used to demonstrate why this was the case.

While this research does not address whether financial aid use—or lack thereof—is the result of limited financial aid resources or a lack of knowledge in acquiring financial aid, it does provide an economically sustainable research plan to enhance the existing benefits of financial aid on bachelor's degree completion. This research provides empirical evidence to support

further research. It demonstrates the potential enhancements to social and cultural capital of children through parents' postsecondary attendance (Chen and DesJardins, 2010; Singell, 2004; Tinto, 1975). Targeted assessments based on student demographics can explain who is benefitting most based on type of aid. Once identified, financial aid programs can demographically target students and modify application requirements to better serve students and increase educational attainment.

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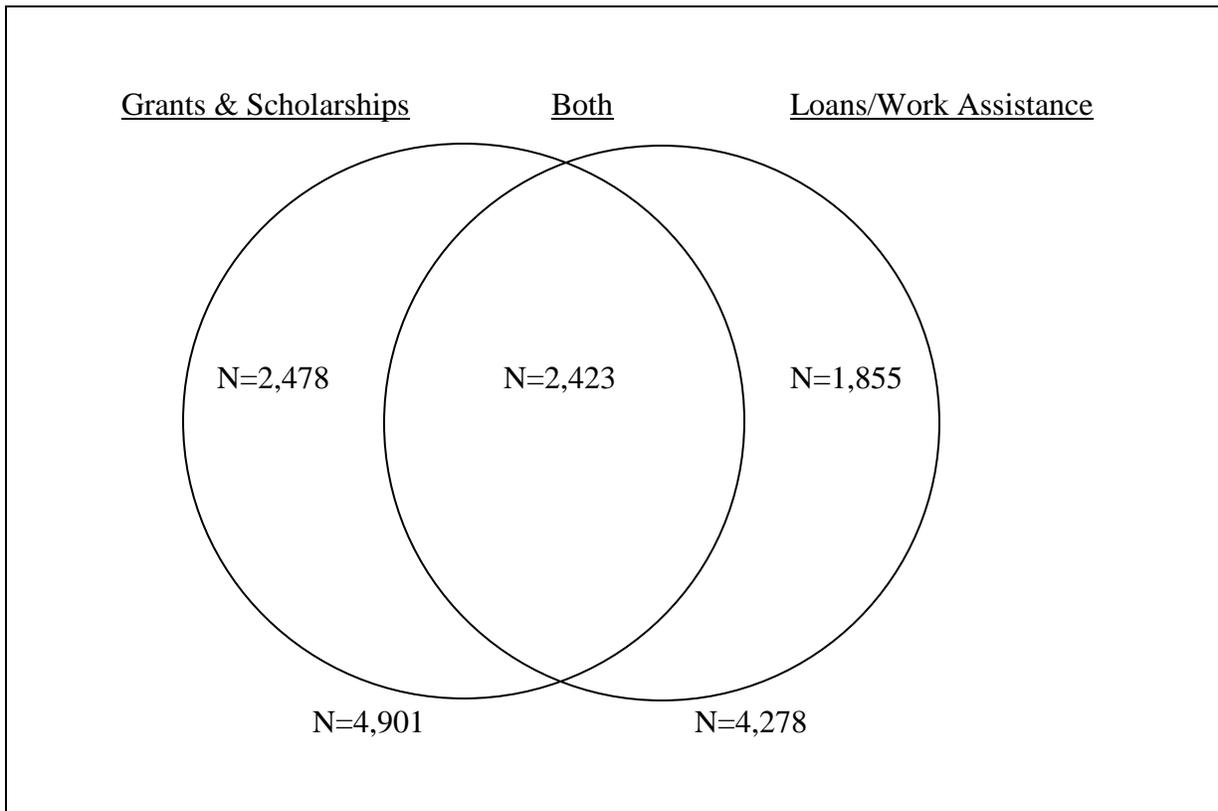
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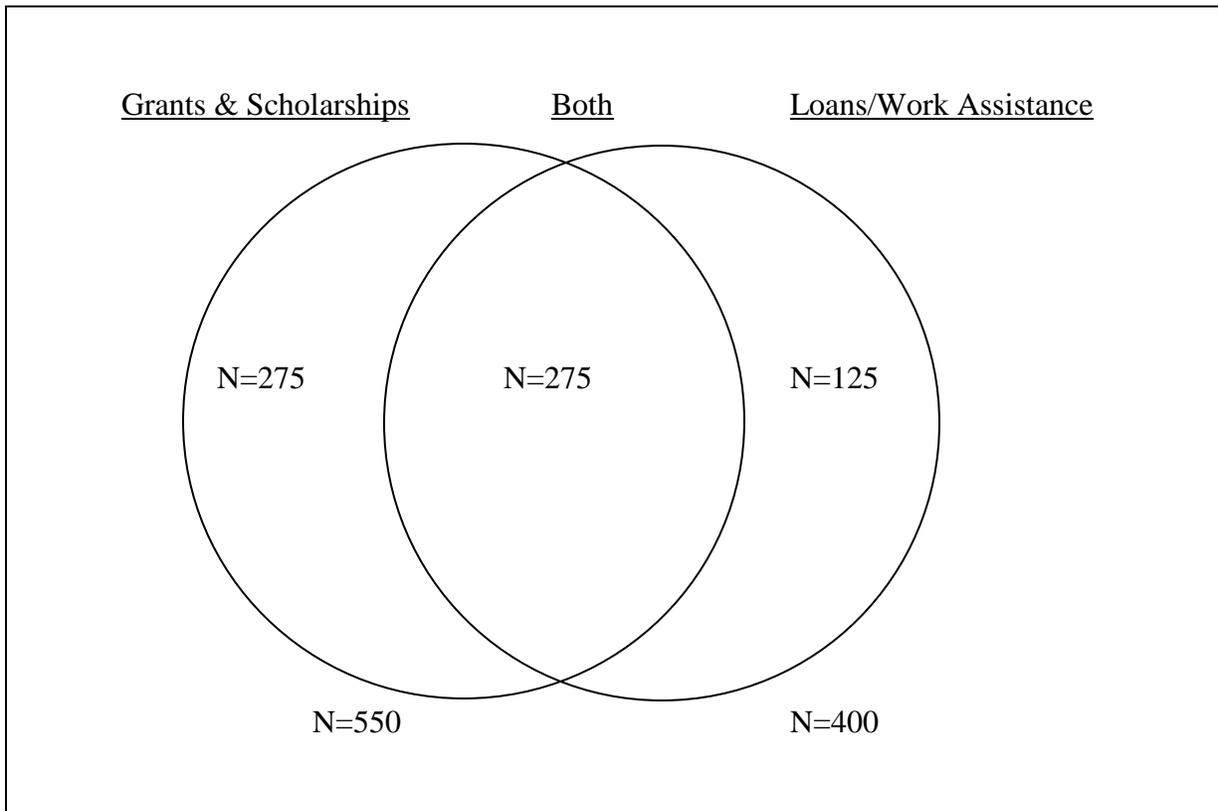
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Figure 1. Financial Aid Decomposition for Restricted Sample.

Source: US Census Bureau, Survey of Income and Program Participation, 2008 Panel. For more information on sampling and nonsampling error see <http://www.sipp.census.gov/sipp/source.htm>

Figure 2. Financial Aid Decomposition for Low-Income Sample.

Source: US Census Bureau, Survey of Income and Program Participation, 2008 Panel. For more information on sampling and nonsampling error see <http://www.sipp.census.gov/sipp/source.htm>

Table 1. Descriptive Statistics.

	Full Adult Sample		Restricted Sample		Low-Income Sample	
	Mean	S.E.	Mean	S.E.	Mean	S.E.
Educational Attainment						
Less than High School	0.14	0.35	--	--	--	--
High School Equivalent	0.27	0.44	0.29	0.45	0.30	0.46
Some College	0.75	0.43	0.38	0.49	0.29	0.46
Bachelor +	0.25	0.43	0.33	0.47	0.12	0.32
Male	0.47	0.50	0.47	0.50	0.41	0.49
Age	45.42	18.76	48.63	16.52	45.43	16.31
Race						
White Only	0.80	0.040	0.82	0.62	0.70	0.58
Black Only	0.12	0.32	0.11	0.31	0.20	0.40
Asian Only	0.04	0.19	0.03	0.18	0.05	0.21
Other	0.04	0.20	0.04	0.20	0.05	0.21
Private High School Curriculum	0.08	0.27	0.09	0.29	0.07	0.25
	2.14	1.44	2.35	1.32	2.16	2.16
Family Composition						
Two, Biological Parents	0.66	0.30	0.68	0.53	0.58	0.57
Single Parent	0.28	0.28	0.27	0.44	0.38	0.49
Step Parent	0.06	0.06	0.05	0.22	0.04	0.19
Parent Education						
Less than High School	0.06	0.23	0.01	0.10	0.15	0.36
High School Equivalent	0.10	0.30	0.09	0.29	0.16	0.37
Some College	0.19	0.39	0.18	0.39	0.19	0.40
Bachelor +	0.18	0.38	0.19	0.39	0.08	0.27
Number of Children	0.69	1.12	0.60	1.03	0.86	1.27
Poverty Ratio	3.96	3.82	4.31	3.99	0.49	0.35
Pgrm Income Ratio	0.17	0.32	0.16	0.31	0.33	0.58
Rent	0.27	0.45	0.24	0.43	0.50	0.50
Metro	1.19	1.19	1.18	0.39	1.20	0.40
N	76708		59803 (78%)		6369 (8%)	

Source: US Census Bureau, Survey of Income and Program Participation, 2008 Panel. For more information on sampling and nonsampling error see <http://www.sipp.census.gov/sipp/source.htm>

Table 2. Restricted Sample Distributions for Matched Cases.

	No Financial Aid		Any Assistance [‡]		Grants/Scholarships Only		Loans/Work Assistance Only		Both [‡]	
	Control	S.E.	Treat.	S.E.	Treat.	S.E.	Treat	S.E.	Treat	S.E.
Male	0.475	0.003	0.367*	0.010	0.354*	0.017	0.420	0.018	0.330*	0.016
Age	42.656	0.769	31.567*	0.188	31.260*	0.332	34.278*	0.355	29.307*	0.285
Race										
White Only	0.794	0.003	0.719*	0.009	0.691*	0.016	0.772	0.015	0.695*	0.016
Black Only	0.112	0.002	0.195*	0.002	0.223*	0.015	0.146*	0.013	0.214*	0.138
Asian Only	0.036	0.001	0.045	0.004	0.048	0.008	0.036	0.007	0.050	0.007
Other	0.058	0.001	0.041*	0.004	0.038	0.007	0.046	0.007	0.051	0.007
Private High School	0.096	0.002	0.083	0.005	0.062*	0.008	0.101	0.011	0.091	0.010
Curriculum	2.403	0.008	2.561*	0.026	2.436	0.045	2.775*	0.044	2.522	0.044
Family Composition										
Two, Bio. Parents	0.329	0.003	0.329	0.009	0.296	0.016	0.355	0.017	0.336	0.016
Single Parent	0.563	0.003	0.564	0.010	0.614*	0.017	0.532	0.018	0.543	0.017
Step Parent	0.108	0.002	0.107	0.006	0.090	0.010	0.112	0.011	0.120	0.011
Parent Education										
Less than High School	0.019	0.001	0.028*	0.003	0.027	0.006	0.024	0.005	0.034*	0.006
High School Equiv.	0.196	0.003	0.140*	0.007	0.165	0.013	0.094*	0.010	0.144*	0.012
Some College	0.379	0.003	0.482*	0.010	0.558*	0.017	0.342	0.017	0.538*	0.167
Bachelor +	0.405	0.003	0.350*	0.009	0.250*	0.015	0.539*	0.018	0.283*	0.015
Number of Children	1.283	0.007	1.198*	0.024	1.261	0.042	1.186*	0.040	1.131*	0.042
Poverty Ratio	4.250	0.024	3.533*	0.059	2.819*	0.087	4.528	0.108	3.347*	0.105
Pgrm Income Ratio	0.067	0.001	0.062	0.007	0.064	0.007	0.032	0.004	0.065	0.006
Rent	0.211	0.003	0.311*	0.009	0.358*	0.017	0.200	0.014	0.355*	0.015
Metro	1.170	0.002	1.152	0.007	1.170	0.013	1.136	0.002	1.149	0.012
N	24434		2545		808		785		880	
Control:Treated			10:1		30:1		31:1		28:1	

*Indicates statistically significant Wald test at the 0.05 level.

‡The balancing property was not satisfied in this model.

Source: US Census Bureau, Survey of Income and Program Participation, 2008 Panel. For more information on sampling and nonsampling error see <http://www.sipp.census.gov/sipp/source.htm>

Table 3. Low-Income Restricted Sample Distribution for Matched Cases.

	<u>No Financial Aid</u>		<u>Any Assistance</u>		<u>Grants/Scholarships Only</u>		<u>Loans/Work Assistance Only</u>		<u>Both</u>	
	Control	S.E.	Treat.	S.E.	Treat.	S.E.	Treat	S.E.	Treat	S.E.
Male	0.389	0.011	0.263*	0.022	0.216*	0.032	0.419	0.076	0.280*	0.036
Age	38.181	0.208	30.604*	0.417	30.509*	0.645	32.535*	1.297	30.140*	0.646
Race										
White Only	0.673	0.010	0.593*	0.025	0.538*	0.038	0.674	0.072	0.605	0.039
Black Only	0.223	0.009	0.307*	0.023	0.357*	0.037	0.233	0.065	0.287	0.036
Asian Only	0.055	0.005	0.061	0.012	0.064	0.019	0.023	0.023	0.076	0.021
Other	0.049	0.005	0.038	0.010	0.041	0.015	0.070	0.039	0.032	0.014
Private High School	0.059	0.005	0.051	0.011	0.047	0.016	0.116	0.049	0.038	0.015
Curriculum	2.143	0.029	2.228	0.066	2.386	0.100	2.349	0.210	2.083	0.102
Family Composition										
Two, Bio. Parents	0.186	0.008	0.164	0.019	0.164	0.028	0.259	0.067	0.153	0.029
Single Parent	0.736	0.010	0.790	0.021	0.795	0.031	0.721	0.069	0.790	0.033
Step Parent	0.078	0.006	0.046	0.011	0.041	0.015	0.023	0.023	0.057	0.019
Parent Education										
Less than High School	0.022	0.003	0.041	0.010	0.029	0.013	0.023	0.023	0.064*	0.020
High School Equiv.	0.354	0.010	0.212*	0.021	0.234*	0.032	0.116*	0.049	0.178*	0.031
Some College	0.414	0.011	0.634*	0.024	0.643*	0.037	0.535	0.077	0.669*	0.038
Bachelor +	0.210	0.009	0.113*	0.016	0.094*	0.022	0.326	0.072	0.089*	0.023
Number of Children	1.717	0.029	1.670	0.068	1.684	0.104	1.535	0.174	1.650	0.108
Poverty Ratio	0.567	0.006	0.543	0.015	0.522	0.024	0.534	0.053	0.564	0.022
Pgrm Income Ratio	0.172	0.012	0.163	0.045	0.209	0.099	0.070	0.039	0.131	0.023
Rent	0.505	0.011	0.652*	0.024	0.623*	0.036	0.465	0.077	0.662*	0.038
Metro	1.179	0.008	1.164	0.019	1.175	0.029	1.140	0.053	1.146	0.028
N	2152		391		171		43		157	
Control:Treated			6:1		13:1		50:1		14:1	

*indicates statistically significant Wald Test at the 0.05 level.

Source: US Census Bureau, Survey of Income and Program Participation, 2008 Panel. For more information on sampling and nonsampling error see <http://www.sipp.census.gov/sipp/source.htm>

Table 4. Sample Distribution of Financial Aid Type by Income.

	<u>Restricted Sample</u>				<u>Low-Income Restricted Sample</u>			
	Grants	S.E.	Work	S.E.	Grants	S.E.	Work	S.E.
Male	0.343	0.011	0.420*	0.018	0.254	0.024	0.419	0.076
Age	30.358	0.215	34.278*	0.355	30.627	0.458	32.535	1.297
Race								
White Only	0.695	0.011	0.772*	0.015	0.602	0.027	0.674	0.072
Black Only	0.217	0.010	0.146*	0.013	0.318	0.026	0.233	0.065
Asian Only	0.049	0.005	0.036	0.007	0.043	0.011	0.023	0.023
Other	0.039	0.005	0.046	0.007	0.037	0.010	0.070	0.039
Private High School	0.075	0.006	0.101	0.011	0.046	0.012	0.116	0.049
Curriculum	2.465	0.031	2.775*	0.044	2.196	0.072	2.349	0.210
Family Composition								
Two, Bio. Parents	0.316	0.011	0.355	0.017	0.153	0.020	0.256	0.067
Single Parent	0.579	0.012	0.532	0.017	0.804	0.022	0.721	0.069
Step Parent	0.105	0.007	0.112	0.011	0.043	0.011	0.023	0.023
Parent Education								
Less than High School	0.028	0.004	0.024	0.005	0.024	0.009	0.023	0.023
High School Equiv.	0.161	0.009	0.094*	0.010	0.217	0.023	0.116	0.049
Some College	0.544	0.012	0.343*	0.017	0.667	0.026	0.535	0.077
Bachelor +	0.266	0.011	0.539*	0.018	0.092	0.016	0.326*	0.072
Number of Children	1.205	0.029	1.186	0.040	1.694	0.075	1.535	0.174
Poverty Ratio	3.094	0.068	4.528*	0.108	0.544	0.016	0.534	0.053
Pgrm Income Ratio	0.064	0.004	0.032*	0.004	0.108	0.015	0.070	0.039
Rent	0.361	0.011	0.200*	0.014	0.667	0.026	0.465*	0.077
Metro	1.160	0.009	1.136	0.012	1.165	0.020	1.162	0.019
N	1758		785		327		43	
Control:Treated		2:1				8:1		

*Indicates statistically significant Wald Test at the 0.05 level.

Source: US Census Bureau, Survey of Income and Program Participation, 2008 Panel. For more information on sampling and nonsampling error see <http://www.sipp.census.gov/sipp/source.htm>

Table 5. ATT Values for the Restricted and Low-Income Sample.

	B	<u>Restricted Sample</u>			<u>Low-Income Sample</u>			
		S.E.	Treated	Control	B	S.E.	Treated	Control
Any Assistance	0.086***	0.006	2547	23971	0.049***	0.012	391	2152
Grants/Scholarship Only	0.086***	0.006	2547	23971	0.020	0.013	170	2286
Loans/Work Assistance Only	0.064***	0.009	785	23567	0.084	0.045	43	2217
Both v. None	0.139***	0.012	880	24095	0.072***	0.021	157	2157
Grants/Scholarship v. Loans/Work Assistance	-0.038**	0.013	785	1758	0.057	0.047	42	327

*p-value \leq 0.05; **p-value \leq 0.01; ***p-value \leq 0.001

Source: US Census Bureau, Survey of Income and Program Participation, 2008 Panel. For more information on sampling and nonsampling error see <http://www.sipp.census.gov/sipp/source.htm>