Financial Aid Awards and Their Impact on College GPA at Southern Utah University

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Abstract

Performance throughout higher education institutions is important for decision makers in academia to observe due to the pressure placed on these individuals in order to prove tuition changes and subsidies as reasonable in relation to the level of impact on student academics. Using data from Southern Utah University throughout the academic years 2015-16 through 2018-19, this paper analyzes the relationship between college cumulative GPA, as a measure of academic performance, and different sources of financial aid, categorized through merit-based institutional scholarship awards, federal grants and loans obtained through the Free Application for Federal Student Aid (FAFSA), athletic financial aid, alternative student loans, and other (including private scholarships, endowments, departmental scholarships, and other uncategorized aid sources). This study finds that Academic aid, "Other" aid result in an increase in GPA, while federal grants and loans are expected to decrease in GPA; all significant at the 99% level. Out of all aid types, academic aid has the largest impact, in absolute terms, on GPA. These results provide support for SUU's generous merit-based awards, showing that they seem to be helping students perform better.

I. Introduction

Administrators and decision makers at the high level of post-secondary education look vastly at academic performance and persistence. With this being said, finding casual relationships with increases in academic performance is key for these decision makers. With the typical yearly increases in tuition and cost of attendance, financial aid is an important resource for college students to have, and provides funding to assist students' educational goals. Being how different sources of aid provide funding for college tuition and educational expenses, it can be thought that increases in financial aid may lead to better academic performance. Southern Utah University (SUU) has a fairly generous academic scholarship program. In addition to institutional aid, there are many opportunities for current students through departmental scholarships, private scholarships, and endowments. On top of these resources, many students utilize federal aid (grants and loans) to pay for their college expenses. With all of the programs at hand that assist in paying for college, there are expectations of high achievement and increased academic performance by reducing the cost to the student. This study will look for relationships between different types of financial aid and their impact on academic performance for SUU students to see if the way financial aid is structured at the university is optimal with student performance being the main focus.

There are different sources and channels in which a student can receive money to assist their college education. Some of these sources include federal grants and loans, private scholarships and loans, and institutional scholarships and grants. Federal aid is obtained through a Free Application for Federal Student Aid (FAFSA), which can be completed as both an undergraduate student and graduate student. As an undergraduate student, the FAFSA determines your eligibility for the Pell Grant, Subsidized and Unsubsidized loans, Work-study, and the Federal

Supplemental Educational Opportunity Grant (FSEOG). Graduate students can only qualify to receive Unsubsidized loans.

To complete a FAFSA, you need to input tax information for your two years prior filed taxes, as well as your parent's information if you are a dependent student, or your spouse's information if you are married. FAFSA must be renewed each year as it is an annual application that uses a new tax year every academic year. The application includes income and asset information, household size and number of people in college, marital status, and other factors that the federal government uses to calculate an Expected Family Contribution (EFC). The EFC determines a student's eligibility for federal aid. Although EFC does not matter a whole ton in relation to graduate student aid, due to the fact that only Unsubsidized loans are able to be utilized, an undergraduate student's EFC determines what type of aid they will receive.

A budget is calculated based on the school's tuition, fees, and other associated academic costs. A student's total amount of financial aid cannot exceed the calculated budget. In addition, the EFC is subtracted from the budget, equaling unmet need. Need-based aid (some scholarship types, Pell grants, FSEOG, and Subsidized loans) cannot be greater than unmet need.

If your EFC is low enough, you can qualify for the federal grants. Federal Grants have two categories: Federal Pell Grant and Federal Supplemental Educational Opportunity Grant (FSEOG). Grants can be paid to a student in any amount of credits, but will be prorated based on their credit amount. If a student is enrolled full time (12 or more credits), they will receive the full amount of their grants awarded. The Pell Grant is a federally funded grant in which the amount is adjusted every academic year to a federal limit; the 2018-2019 school year maximum Pell Grant amount was $6,195 for a full-time undergraduate student. FSEOG is defined by studentaid.gov as "a grant for undergraduate students with exceptional financial need" (Federal Student Aid

Information Center (FSAIC), 2018). Not all schools are required to distribute FSEOG, but Southern Utah University is a participating school. Both the Pell Grant and FSEOG can only be awarded to undergraduate students who have not previously received a bachelor's degree.

Student loans are a commonly used resource when it comes to paying for school. There are multiple different types of student loans. Direct Unsubsidized Loans are federal student loans that start accruing interest once they are paid to the student. Direct Subsidized Loans have the same interest rate as Unsubsidized Loans, but the difference lies in the fact that Subsidized loans do not begin to accrue interest until the student stops attending, drops below half credit hours, or graduates and does not continue on to a higher degree. Similarly to Subsidized and Unsubsidized loans, Direct Parent PLUS Loans are obtained through the FAFSA and are applied to student's accounts. In contrast to the other two types of federal loans, Parent PLUS Loans are taken out in the parent's name and require a credit check. In addition, they have a higher interest rate than federal student loans. Undergraduate students can utilize any of these loan options, whereas graduate students can only receive Unsubsidized loans. Graduate Unsubsidized loans have a higher interest rate than Undergraduate Unsubsidized loans. In order for any federal loans to pay out, the student must be enrolled at least half time, as defined by the federal government as six credits for undergraduate students and five credits for graduate student. Student enrolled less than half-time are not eligible to receive federal loans. Alternative loans are ones which are taken out through banks and other institutions outside of the FAFSA. Each alternative loan has their own specified stipulations, requirements, and interest rates.

Merit-based awards are funded through the university and awarded upon application and acceptance to the school. As a traditional undergraduate applicant, if the student was enrolled before that year's scholarship deadline, an index is calculated based on high school GPA

(unweighted) and ACT or SAT scores. Each undergraduate academic scholarship has a specified index range, in which, if a student's accolades upon application fall within a range, the scholarship is automatically offered to the student through acceptance to the university. Following the award offer, the student accepts the scholarship by signing off on an agreement, stating that they will uphold said scholarship requirements in order to renew their academic scholarship every following year of enrollment, up to four years (or 8 semesters) of total award. Transfer students are evaluated on the same application and deadline restrictions, but scholarship awards are given through transfer GPA qualifying the student for a scholarship range, rather than an index being calculated. These scholarships are awarded for three years (or 6 semesters). Typically, if a transfer student applies to the university within their first semester at another school, resulting in the student having zero transfer credits upon application, they will be reviewed as an undergraduate student in terms of scholarship offers and qualifications. Undergraduate and transfer student scholarships are awarded for both resident and non-resident students. International students are awarded through the International Affairs Office with different requirements and different qualifying factors to determine eligibility for these scholarships. All merit-based awards have specified scholarship requirements. For all academic scholarships, you must maintain a 70% passing rate in comparison to earned versus attempted hours. In addition, each scholarship award has a set GPA requirement that is evaluated on the student's SUU cumulative GPAs; these requirements start at 2.0 for some of the lower scholarship awards, and range up to 3.5 for full-tuition scholarship awards. No merit-based awards at the university can exceed the cost of tuition. In addition to academic scholarships, students can apply through outside companies and websites to receive private scholarships and endowments.

Not only do you need to uphold requirements for merit-based scholarships, but most sources of student aid have specified requirements. For federal aid, the government requires students to maintain a 2.0 grade point average. Although this requirement remains federally, there is the opportunity to apply for a Suspension Appeal if you are below federal requirements. If this appeal is granted, you can still receive your federal aid even though your GPA is below the stated requirements; this process is not a guarantee. Different scholarship programs often require different academic requirements; these requirements can vary.

Mark Stater wrote "The Impact of Financial Aid on College GPA at Three Flagship Public Institutions", published in the *American Educational Research Journal.* To observe the question of: "What is the impact of financial aid on college GPA?", Stater used data from Indiana University-Bloomington, the University of Colorado-Boulder, and the University of Oregon. At these schools, he obtained data including demographic, high school information, and college GPA each year of enrollment. The findings within this study indicate a positive relationship between financial aid in association with GPA in the first year and subsequent years of college; more specifically, every $1,000 increase in need or merit-based aid is predicted to increase first year GPA by .1 to .19 points (Stater, 2009).

Financial aid is a largely discussed topic in relation to post-secondary education and student performance in these educational programs. A college education is not cheap, and paying for school is a big limitation when it comes to choosing a school and deciding whether or not a college degree is feasible. With helpful sources that can assist students in tuition and fee costs, as well as academic and living expenses while in school, students have potential for less stress and better performance because they do not have to worry about financial stressors or working excessively

in order to make ends meet. Ideally, these factors would lead to an increase in academic performance.

II. Data

The population of data consists of SUU students for the aid years 2015-2016 to 2018-2019. The data was first displayed across 4 excel worksheets, one containing each academic year's data. Within that data, each different type of financial aid the student received, along with each dollar amount paid, is represented. Also, age range, gender, major, and residency was reported. In addition, the data was displayed in long format; for every different fund a student got, there was a separate data point. In the original data, there would be multiple observations for the same one student. To fix this, I created a loop that ran through each aid year and collapsed a summation of each "aid type" category used in this study and reported that sum as a new variable for each student. Following this, I dropped observations to make it so every student only had one observation per year, with all of their aid in a different variable category within that single observation. If there was no aid paid for a specific category, zeros were put in place of blanks in the data set. I then condensed the 4 worksheets into one data set and created an "aid year" variable to account for which year of data the observation was reported. The aid year in which each aid type was awarded was used in order to control for the differences in tuition costs each year. This is important because many aid types are adjusted each year based on the amount of tuition. Every year, the Federal Pell Grant maximum amount increase, as well as SUU institutional scholarship amounts being adjusted in conjunction with tuition adjustments in some cases (full tuition scholarships, etc.). Observations were then dropped if GPA was 0 or credits earned was 0 because this study did not want to include individuals who withdrew from classes or did not actually complete a semester of school. After

dropping these, the data set consisted of 27,511 observations. Academic performance is measured by SUU cumulative GPA because GPA is a common representation of academic performance and integration used in analysis (Cabrera, Nora, et al., 1992).

Residency status is reported in three categories at our university: resident, non-resident, and international; these will control for the different tuitions for each group. Table 1 shows the distribution in frequency and percent for residency status among students in the data set.

Table 1

Residency	Freq.	Percent
Non-Resident	4,553	16.55%
Resident	21,947	79.78%
International	1,011	3.67%

Other control variables gathered are gender, age range, major, and year in school. Tables 2 and 3, respectively, display the distributions of gender and age range within the data set used in this study.

Table 2

Gender	Freq.	Percent
Female	24,093	87.58%
Male	3,418	12.42%

Table 3

Age Range	Freq.	Percent	Cum.
18 and Under	21	0.08%	0.08%
19 – 20	2,442	8.88%	8.95%
21 – 22	6,146	22.34%	31.29%
23 – 24	6,462	23.49%	54.78%
25 – 29	7,540	27.41%	82.19%
30 – 34	1,960	7.12%	89.31%
35 – 39	1,109	4.03%	93.34%
Above 39	1,831	6.66%	100%

I am using these variables to control for any differences in academic performance that would vary amongst different demographic groups, if any. The main thing being looked at is what sources of financial aid are having impacts on academic performance.

Within all of the awards, I created five categories to classify the aid types under. The first category created was academic aid which consisted of merit-based academic scholarships awarded through the university. Athletic aid consists of all athletic funding, including tuition, meal plan grants, stipends, and athletic grants. Federal Grants include Pell Grants and FSEOG. Direct Subsidized loans, Direct Unsubsidized loans, Parent Plus Loans, and alternative loans all fall in the Loans category. Lastly, all other aid was accounted for through "Other", consisting of private scholarships, endowments, and any other aid that did not fall within any other category.

Table 4 displays the mean, standard deviation, minimum, and maximum amounts for each category of financial aid used in my study. The dollar values reported within these variables are the total aid paid. If aid was offered to the student but did not pay, it was not observed.

Table 4

Aid Type	Obs	Mean	Std. Dev.	Min	Max
Academic	27,511	$ 2,958	$ 4,244	$ -	$ 24,600
Athletic	27,511	$ 551	$ 3,080	$ -	$ 35,944
Federal grant	27,511	$ 1,908	$ 2,513	$ -	$ 9,795
Loan	27,511	$ 2,460	$ 4,353	$ -	$ 106,600
Other	27,511	$ 561	$ 1,550	$ -	$ 24,000

III. Hypothesis

The ultimate goal for supplying financial aid is to provide assistance to student's in relation to the cost of attendance for their degree(s). Some articles have suggested that the financial factors of higher education, whether it be high tuition costs or low financial aid awards, reduce the time

and energy able to put forth towards academic achievement due to the stressors placed on students trying to pay for school out of pocket (Bean & Metzner, 1985). With this being said, it should be expected that academic performance should show a positive relationship with increased financial aid awards. Specifically, our institution awards academic scholarships on a merit basis, requiring students to maintain eligibility throughout the course of their degree in order for their scholarship to renew each year. Due to the GPA requirement needed to keep these awards, I expect them to lead to larger increases in GPA than other aid types.

IV. Method and Model

Within the data, all dollar value for each aid type was divided by 1,000 prior to running the models in order for the regression output coefficients to be in terms of $1,000s of dollars for a clearer understanding of how GPA is impacted. Linear regression models were ran in order to find relationships between GPA and financial aid paid. Through different controls, the models ran are displayed below.

- Basic Model

$$College\ GPA = ß_0 + ß_1(total\ aid) + u$$

- Model (1)

$$College\ GPA = ß_0 + ß_1(academic\ aid) + ß_2(federal\ grants) +$$
$$ß_3(loans) + ß_4(athletic\ aid) + ß_5(other\ aid) + u$$

- Model (2)

$$College\ GPA = ß_0 + ß_1(academic\ aid) + ß_2(federal\ grants) +$$
$$ß_3(loans) + ß_4(athletic\ aid) + ß_5(other\ aid) + \beta_6(male) + u$$

- Model (3)

$$College\ GPA = ß_0 + ß_1(academic\ aid) + ß_2(federal\ grants) + ß_3(loans) + ß_4(athletic\ aid) + ß_5(other\ aid) + \beta_6(male) + \lambda(year) + u$$

- Model (4)

$$College\ GPA = ß_0 + ß_1(academic\ aid) + ß_2(federal\ grants) + ß_3(loans) + ß_4(athletic\ aid) + ß_5(other\ aid) + \beta_6(male) + \lambda(year) + \lambda(residency) + u$$

- Model (5)

$$College\ GPA = ß_0 + ß_1(academic\ aid) + ß_2(federal\ grants) + ß_3(loans) + ß_4(athletic\ aid) + ß_5(other\ aid) + \beta_6(male) + \lambda(year) + \lambda(residency) + \lambda(age\ range) + u$$

- Model (6)

$$College\ GPA = ß_0 + ß_1(academic\ aid) + ß_2(federal\ grants) + ß_3(loans) + ß_4(athletic\ aid) + ß_5(other\ aid) + \beta_6(male) + \lambda(year) + \lambda(residency) + \lambda(age\ range) + \lambda(major) + u$$

**Where λ represents fixed effects for the categorical variable specified

The main model looked at in this study was Model (6) which was used to look at different aid types, such as academic, federal, athletic, and other sources, controlling for gender, aid year, residency status, age range, and major, and how these aid sources impact college GPA. All other models show bias, and this model arguably accounts for everything necessary. Aid types are grouped together in variables to accounts for different impacting amongst different financial aid awards. In addition, differences in academic performance between male and females is controlled for in this model. Tuition and aid amount changes between different years and different residency status is accounted for through the aid year and residency fixed effects. Differing performance

amongst different age ranges and majors are controlled for through the fixed effects for age range and major.

V. Results and Conclusion

Table 5

	Basic Model
VARIABLES	GPA
Total Aid Paid	0.00158***
	[0.000613]
Constant	3.246***
	[0.00655]
Observations	27,445
R-squared	0.000

Standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

The linear regression output for the basic model ran is displayed above in Table 5. What this model suggests is that for every additional $1,000 in financial aid paid to a student, GPA is expected to increase by 0.00158; significant at the 99% level. This model includes all aid paid, no matter the source, clumped into one category and has not additional control variables. This model violates the zero conditional mean assumption as it has omitted variable bias. Overall, this model indicates that having funding that assists in paying for educational costs leads to higher academic performance in terms of GPA.

With this model, there can be no direct conclusions made due to the omitted variable bias present. Omitted variable bias is when a model creates bias by leaving out variable(s) that are relevant to the model due to these variables being correlated with both the x and y variables. Due to this model violating the zero conditional mean assumption of an unbiased model, more models were ran using additional control variables.

Table 6

Model	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	GPA	GPA	GPA	GPA	GPA	GPA
Academic	0.0214***	0.0215***	0.0210***	0.0662***	0.0805***	0.0782***
	[0.000941]	[0.000941]	[0.000944]	[0.00133]	[0.00135]	[0.00131]
Federal Grant	-0.0245***	-0.0242***	-0.0241***	-0.0290***	-0.0324***	-0.0140***
	[0.00157]	[0.00157]	[0.00157]	[0.00152]	[0.00150]	[0.00149]
Loan	-0.00832***	-0.00822***	-0.00807***	-0.000703	-0.00755***	-0.0132***
	[0.000905]	[0.000905]	[0.000904]	[0.000893]	[0.000893]	[0.000884]
Athletic	-0.00514***	-0.00494***	-0.00500***	0.0164***	0.0204***	0.0195***
	[0.00127]	[0.00127]	[0.00127]	[0.00131]	[0.00128]	[0.00122]
Other	0.0576***	0.0578***	0.0575***	0.0657***	0.0495***	0.0394***
	[0.00253]	[0.00253]	[0.00253]	[0.00244]	[0.00241]	[0.00243]
Sex (Male=1)		-0.0746***	-0.132***	-0.108***	-0.165***	-0.110***
		[0.0118]	[0.0148]	[0.0143]	[0.0141]	[0.0137]
2018-2019			0.0838***	0.0603***	0.250***	0.161***
			[0.0129]	[0.0124]	[0.0134]	[0.0129]
2017-2018			0.0227**	0.0133	0.110***	0.0644***
			[0.0113]	[0.0109]	[0.0110]	[0.0105]
2016-2017			0.0192*	0.00921	0.0549***	0.0256**
			[0.0114]	[0.0110]	[0.0108]	[0.0103]
Resident				0.580***	0.633***	0.534***
				[0.0218]	[0.0212]	[0.0208]
Non-Resident				-0.0980***	-0.0720***	-0.135***
				[0.0223]	[0.0217]	[0.0210]
Age 18 and under					-0.506***	-0.0686
					[0.133]	[0.126]
Age 19-20					-0.665***	-0.323***
					[0.0205]	[0.0212]
Age 21-22					-0.512***	-0.208***
					[0.0173]	[0.0183]
Age 23-24					-0.358***	-0.0852***
					[0.0169]	[0.0177]
Age 25-29					-0.228***	-0.0173
					[0.0162]	[0.0168]
Age 30-34					-0.201***	-0.0655***
					[0.0198]	[0.0194]
Age 35-39					-0.0561**	-0.00154
					[0.0231]	[0.0221]
Constant	3.234***	3.242***	3.216***	2.620***	2.816***	2.701***
	[0.00674]	[0.00685]	[0.00968]	[0.0236]	[0.0268]	[0.0268]
Observations	27,445	27,445	27,445	27,445	27,445	27,445
R-squared	0.052	0.054	0.055	0.126	0.175	0.270

Standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

As seen in Table 6 (displayed on the previous page), in every model ran, all aid types were found to have statistical significance at the 99% level. The coefficients on each model change when controlling for additional variables. Academic and Other aid remained significant across the board and had positive coefficients in each model, indicating increases in academic performance. Both Federal Grants and Loans remained significant and have negative coefficients, indicating decreases in academic performance. Athletic aid remained constant as far as significance level, but had negative coefficients in Models 1 through 3, and positive coefficients in Models 4 through 6. Looking at Model (6) which controls for all of the variables at hand, academic scholarships have the largest coefficient, in absolute terms, out of all the aid categories. For every additional $1,000 in academic scholarships a student has, their GPA is expected to increase by 0.0782. For every additional $1,000 in federal grants a student receives, their GPA is expected to decrease by 0.0140. Every additional $1,000 in loans is expected to decrease GPA by 0.0132. In regards to athletic aid, every additional $1,000 is expected to increase GPA by 0.0195. Every additional $1,000 of "Other" aid, GPA is expected to increase by 0.0394. As stated before, all of these are significant at the 99% level.

A reason for merit-based awards causing an increase, and having the largest impact, in GPA can partly be explained by the fact that our university has GPA requirements for these awards, and the GPA requirements for each has a positive relationship with the dollar amounts of the scholarships. For example, our highest offered merit-based scholarship is a full-tuition award, for both residents and non-residents, which requires an SUU cumulative GPA of 3.5 in order for the scholarship to renew the following academic year. With this being said, the positive relationship between GPA and academic scholarships can be expected even before running any type of analysis on data.

Both federal aid and loans leading to decreases in GPA can be partly understood due to federal student aid having a requirement of 2.0, which is below the model's constant (intercept) value. An explanation for athletic aid can be the idea that coaches hold higher standards for their athletes and require study hall hours to assure the team's players are staying on top of their schoolwork. Other aid being positive can be made sense of through the fact of outside scholarship applications often having set requirements of their own. Many students apply for each scholarships, so the ones who are getting awarded these scholarships and endowments can be expected to stand out from other students. In addition, some private scholarships and endowments require specific academic performance throughout the time of utilizing the award. Of course, there are many additional potential explanations for how each aid type is expected to affect academic performance.

Another interesting finding is that being a male student is expected to decrease GPA by 0.110 points compared to when a student is female, significant at the 99% level, concluding that males are found to perform at a lower academic level than females, when looking at college GPA as the measure of academic performance and controlling for all other variables in the model. This is interesting due to the evidence that women were found to have lower expectations than men when looking at their personal performance (Crandall, 1969). This is also interesting due to the many studies that men are often placed in post graduate jobs at a higher rate than women. Van W. Kolpin and Larry D. Singell, Jr. analyzed and concluded that higher ranked departments in the economic fields, as a measure of scholarly publications per faculty member, were found least likely to hire female faculty (Koplinn and Singell, 1996).

These findings are only based on data from one institution, so they cannot be standardized and representative of the entire population of college universities. In addition, only four years of

data was observed, so there is potential for increased fluctuations and differing results if a larger time-span is observed. There is the possibility that there are other factors explaining these results in these years, such as the fact that our institution has been growing at a high rate, creating the chance that SUU could simply be getting better performing students that are receiving academic scholarships attending our school, accredited to the growth that has been occurring.

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