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The 2015 NCAA Cost-Of-Attendance Stipend and its
Effects on Institutional Financial Aid Packages

by

Sara Greene

Honors Thesis

Submitted to:

Department of Economics
University of Richmond
Richmond, VA

April 28, 2022

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1. Abstract

In 2015, the National Collegiate Athletic Association (NCAA) allowed “Cost of Attendance” (COA) stipends to be offered to athletic recruits for Division I schools. These stipends are intended to allow schools to grant aid to student-athletes beyond a full-ride scholarship to cover additional costs imposed on student-athletes. These stipends created an opportunity for the “Autonomy” Power 5 programs to utilize a competitive tactic to try to win over the top recruits. There is evidence that these COA stipends have caused an increase in the estimated cost of attendance reported by the university. This paper examines if the COA stipends have any relationship with financial aid offered to non-student-athletes by the institution. Using a logistic regression and propensity scoring to create treatment and non-treatment groups, along with a difference-in-differences regression, I test for a relationship between the 2015 policy and the percentage of students receiving institutional financial aid. I find that there may be some evidence of a negative correlation when looking comparing the Autonomy Power 5 schools to the non-treatment group. However, when comparing all Division I football schools to the non-treatment group, no significant relationship was found. Inferences for explanations of these effects are included in the Discussion/Conclusion section.

2. Introduction

For many athletes, the opportunity to continue their sport in a collegiate environment while obtaining higher education is one that is worth close to six figures across their four years. In 2022, the NCAA Division I awarded 58% of its student-athletes some amount of athletic aid; Division II awarded 67% of its student-athletes athletic aid. Combined, Division I and Division II schools provided more than \$3.7 billion in athletic scholarships to roughly 190,000 athletes in 2022. Broken down, this averages \$19,474 per student-athlete, if each student-athlete were to receive equal scholarship amounts (National Collegiate Athletic Association, Fall 2022). For perspective, consider a recent U.S. News article reporting on the average tuition and fees for the 2022-2023 school year: at public, in-state universities, the average tuition was \$10,423; public, out-of-state universities, \$22,953; and private universities, \$39,723 (Kerr & Wood, 2022). Historically, NCAA athletes have been amateurs, thus they are not able to receive any monetary compensation beyond the full cost of tuition, room and board, and books.

However, recent NCAA policies have allowed many Division I athletic programs to offer monetary stipends beyond the “full-ride” value of their school, raising questions about the schools’ financial sources, as well as the payoffs, of spending extra money on athletic recruiting. This paper will discuss the possible effects of this extra stipend on other areas of an institution, specifically on the financial aid packages of non-student athletes.

2.1 A Background into NCAA Collegiate Sports

The National Collegiate Athletic Association (NCAA), founded in 1906, is the governing organization of college athletics dedicated to providing scholarship opportunities, graduation support, and general life-long success for student-athletes. The NCAA sponsors 90

championships in 24 different sports across 1,100 schools in all 50 states, the District of Columbia, Puerto Rico, and Canada. With over 500,000 college athletes, a three-division structure was adopted in 1973 to ensure college athletics compete in a fair playing field while still providing competitive opportunities for athletes. (National Collegiate Athletic Association, 2022).

The top division, Division I, is the most well-known to college sports fans, and it has the most competitive athletic programs along with the most funding and athletic scholarships available. Division II also offers athletic scholarships; however, there are not as many offered, and the competitiveness of the athletic teams is not as elite. Division III, while the biggest division in terms of the number of student-athletes, does not offer athletic scholarships and places more of an emphasis on the balance between athletics and academics.

Division I is further divided into 3 subdivisions depending on the level of football program that the institution has. The first is the Football Bowl Subdivision (FBS), which allows institutions to offer up to 85 full football scholarships and typically has the most athletic resources. The second is the Football Conference Subdivision (FCS), which only allows institutions to offer up to 63 full football scholarships and are typically a lower-talent level than the FBS. Lastly, Division I non-football programs are institutions that sponsor other Division I sports but do not sponsor a football team.

Within each subdivision, there are conferences that make up a group of schools that are similar in athletic characteristics and compete against each other during most in-season games. The most attractive schools for football athletes are generally within the following conferences, which as a group are referred to as the Power 5 conferences (also known as the Autonomy conferences): Southeastern Conference, Atlantic Coast Conference, Big 10 Conference, Big 12

Conference, and Pac 12 Conference. The Power 5 Conferences are the top-level of collegiate sports, generally featuring the most talented athletes and the most competitive collegiate programs. [Appendix 1](#) shows visual representation of the organizational structure of the NCAA's Division system.

2.2 The 2015 Cost-of-Attendance Stipend

In accordance with the NCAA's goal to ensure the fairness and competitiveness of college athletics, the NCAA has long stood behind its amateurism policy, which prohibits college athletes from receiving any sort of compensation for their athletic talents, other than scholarships. The scholarship guidelines allow a school to give up to a "full-ride" scholarship, which includes the full cost of tuition, room and board, and books (Jones, 2022).

There has been recent discussion surrounding NCAA student-athlete compensation, specifically if a full-ride scholarship is a fair compensation for athletes. Those in favor for a greater compensation system have used anti-trust arguments against the NCAA and the large role that student-athletes play in producing the NCAA's income stream as their arguments. Additionally, there is evidence that there is a gap between student-athlete expenditures and their full-ride scholarships (Edmunds, 2014), suggesting that compensation should be increased to truly cover all athletes' expenses. Many have also argued for college student-athletes to receive direct pay for their efforts, but the NCAA has been reluctant to change that policy and has held their stance of maintaining amateurism for college athletes.

In January 2015, the NCAA granted the Power 5 conferences the "autonomy" to create or amend their own rules in a representative committee voting format. This allowed the schools within these 5 conferences to have a say in regulations regarding athletic personnel, academic support, student-athlete time demands, and student-athlete financial aid. Shortly after this, the

Power 5 conferences voted to amend the scholarship guidelines to allow Cost-of-Attendance (COA) stipends for student-athletes. This COA stipend allows schools to offer athletes money beyond the full-ride scholarship as a form of compensation for any extra expenditures they may incur while living at college. Schools in the Power 5 conferences immediately implemented this stipend; it remained optional for all other Division I football programs. Within a year, the majority of both FBS and FCS football programs had also adopted the COA stipend (Jones, 2022).

The COA stipend is capped at the “cost-of-attendance” estimate published by the institution, and this number must reflect reasonable cost-of-living expenditures by an average student at the institution. This was intended to place a limit on the monetary amount that institutions can offer recruits. However, the cost-of-attendance estimates are self-reported by the institutions, and therefore it is possible there may be some inflation of the estimates to allow coaches to offer a higher amount. In accordance with this theory, Jones (2022) found that the introduction of the COA stipend has a statistically significant relationship with higher university published cost-of-attendance estimates.

2.3 The Finances of Intercollegiate Athletics

Where does the funding to support such high-performing athletic teams come from? The following information is pulled from the NCAA Research database, where they break down the associated revenues and expenses in their “Finances of Intercollegiate Athletics Dashboard”.

Over the last 10 years, Division I athletics have seen a steady increase in the total revenue generated, with the largest increase amongst Autonomy Power 5 schools. In 2012, the median total revenue for all sports at Autonomy Power 5 schools was \$78.7 million, followed by a

steady increase until a peak of \$121.6 million in 2019. The increase is more modest for FBS Non-Autonomy and FCS schools. The median total revenue for all sports in 2012 for FBS Non-Autonomy and FCS schools was \$29.1 million and \$13.8 million, each hitting their peaks in 2019 at \$38.2 million and \$19.9 million, respectively (National Collegiate Athletic Association, 2023).

When broken down further into the sources of their revenue, there is a very clear difference in the Autonomy Power 5 schools as compared to other Division I subdivisions. The NCAA defines *generated revenue* as the “revenue produced by the athletics department and is comprised of: Ticket Sales; Media Rights; NCAA/Conference Distributions; Bowl Revenues; Donor Contributions and Endowments; Royalties; Licensing & Advertising; and Others”, while *allocated revenue* is “comprised of: Institution & Government Support and Student Fees”. Allocated revenue is a much smaller proportion of revenues for Autonomy Power 5 schools at 7.5% than for all other Division I schools. FBS Non-autonomy schools attribute 55.7% of revenue from allocated revenue while FCS schools attribute 71.1% in 2019.

In [Appendix 2](#), a line graph of the median athletic revenues for NCAA Division I schools is shown. Specifically, the graph shows the amount of revenue produced from student fees. As shown in the figure, there is a very large increase in the revenue generated from student fees for DI FBS Non-autonomy schools right after 2015, when the COA stipends were introduced. The other three subdivisions do not show similar increases. This shows evidence that Division I Non-autonomy FBS schools generate revenue from areas outside of athletics, specifically from student fees. Additionally, this provides evidence that the finances among the different subdivisions in Division I are very different.

In an overview, Division I athletic revenue has steadily increased over the past decade. However, athletic expenses have also steadily increased over the past decade. Net generated revenue has taken a steady decline in all Division I subdivisions, and with the introduction of the new COA stipends, along with amped-up recruiting efforts, it raises the question: where are these additional recruiting efforts and athlete scholarships/stipends being financed from, and are there spillover effects of this increase in athletic spending on other areas of the institution? As there is evidence that FBS Non-autonomy schools already generate revenue from areas outside of athletics at the expense of student fees, this motivates my research on other areas, such as financial aid, that may be affected due to the COA stipends.

2.4 Theoretical Motivation

Athletic departments are incentivized to offer COA stipends in order to stay competitive against other schools during recruiting. S. Wyld and D. Wyld (2021) found evidence that better football recruiting leads to a better team performance, which also leads to more athletic revenue. Institutions will be motivated to spend money in the areas where they can maximize their returns, and with a very competitive high school athlete recruiting market, the COA stipends allow the institutions to increase their athletic expenditures in order to offer the stipends as a monetary way to compete for top recruits (Ngo et. al., 2022). These COA stipends may even sway football recruits' college choices (Bradbury and Pitts, 2017). Economic theory then suggests that for each marginal dollar the institution can spend, they must decide where to spend it using a marginal cost/benefit framework. If the marginal benefit per dollar of spending more on athletic scholarships is greater than that of other areas, then the institution will be motivated to reallocate more resources to accommodate the COA stipends.

My research will examine if there is a relationship between the introduction of the COA stipend in 2015 and the institutional financial aid packages¹ offered to non-athlete students. I hypothesize that if institutions are using more funding to aid student-athletes, then these funds will be pulled from other areas, possibly including the financial aid packages offered to other non-athlete students. As found in other research, the sources of athletic funds differ across the different subdivisions of Division I football schools, and smaller (non-Power 5) FBS and FCS programs pull a larger percentage of athletic funds from other student and institutional funds than the Power 5 programs (Desrochers, 2013). This leads me to further hypothesize that there may be differing effects of the COA stipend on the financial aid packages of institutions in different football conferences and subdivisions.

3. Literature Review

The literature on the financial operations of universities, including the role that athletics play in university finances, is extensive. Berry (2017) and Desrochers (2013) both discuss the sources and funds of institutions and how athletics fit into the larger institutional budget. Berry argues for a rebalance of the distribution of funds within universities, and his research is very critical of how many institutions use student fees to subsidize their athletic programs (Berry, 2017). Desrochers also looks at the disparity between athletic spending and academic spending, finding that institutions tend to spend up to 3-6 times more per athlete than per student (Desrochers, 2013).

Another body of literature examines the question of fair compensation for student athletes. Edmunds (2014) examines the financial gap between athletic scholarships and the average

¹ Institutional financial aid is defined as any aid, grant, or scholarship offered to a student directly from the school

expenditures of Division I football players receiving full-ride scholarships at an ACC or SEC school. He compares tuition plus personal expenses with the actual scholarship amount received by these student-athletes and finds a significant financial gap of roughly \$15,000 (Edmunds, 2014). Davis and Malagrino (2013) also argued for an additional stipend to be awarded to student-athletes as an appropriate amount of compensation, citing past NCAA anti-trust cases and the difference in full-ride scholarships and actual cost of college living incurred by students.

Many bodies of literature discuss both the athletic and the non-athletic effects of the COA stipend after its introduction in 2015. Bradbury and Pitts (2017) and Coyner (2022) study the athletic effects of the COA stipend. Bradbury and Pitts used an ordinary least squares regression to determine the relationship between the 2015 COA policy and football recruiting in the year immediately following the introduction of the stipend. They specifically looked at the published cost-of-attendance for each institution and examined its effect on football recruiting quality through the use of recruits' rankings for each institution. They found that for every \$230-\$483 increase in the published cost-of-attendance, schools were able to capture a one spot improvement in their recruits' rankings (Bradbury and Pitts, 2017). Although finding little evidence that the competitive balance of the NCAA was affected by the stipend, Coyner also noted that the stipend likely exacerbated the inequality among competitiveness of football programs by allowing top programs another way to continue to capture top recruits when compared to smaller programs (Coyner, 2022).

Extending these findings to look at financial effects of successful football programs, S. Wyld and D. Wyld (2021) found that some football performance statistics may have a significant correlation with the financial performance of an athletic department, through sources such as donor contributions, corporate sponsorships, ticket sales, and overall profit.

Thus, a connection between the increase in the published cost-of-attendance and the financial performance of an athletic department can be made using the findings of both Bradbury and Pitts (2017) and S. Wyld and D. Wyld (2021). Bradbury and Pitts (2017) assert that the increase in the cost-of-attendance allows an institution to capture more talented recruits. These more talented recruits should contribute positively to a program's football performance, which S. Wyld and D. Wyld (2021) found to have a potential correlation with an athletic department's financial performance.

In addition to the possibility of better financial performance of the athletic program found from the COA stipend, there has also been other non-athletic effects researched. Willis (2020) found a significant relationship between the COA stipends and an increase in the estimated cost-of-attendance for non-athletes. Jones (2022) later confirmed these findings with evidence that there was increased cost-of-attendance estimates immediately following the introduction of the stipend. This could indicate that there may be motivation for the institutions to inflate their cost-of-attendance estimates in order to allow the athletic department to offer higher stipends to student-athlete recruits.

To my knowledge, there has not been an economic empirical study on the effects of the COA stipend on financial aid offered to the general student population at an institution. A few opinion pieces, such as an article written by Jake New published on Inside Higher Ed in 2015 titled "More Money ... If You Can Play Ball", have been written speculating a negative correlation between the increase in athletic scholarship and non-athlete student debt, but there has not been data collected to test these claims. There have also been multiple news articles written about the increase in student fees being used for athletics, such as a 2015 Wall Street Journal article titled "How students foot the bill for college sports, and how some are fighting back", and a 2020 NBC

News article titled “Hidden Figures: College students may be paying thousands in athletic fees and not even know it”. More generalized research, as seen in Dynarski and Scott-Clayton (2013), has been conducted on financial aid policies for higher education and the inner-workings of the sources of financial aid (federal, state, institutional) as well as the different types of financial aid (loans versus grants), but has not connected these financial aid policies to college athletics expenditures.

Motivated by these previous findings, and in an attempt to fill the gap around empirical studies relating financial aid and athletics, I will test the hypothesis that there is a significant negative correlation between the introduction of the COA stipend in 2015 and institutional financial aid packages. As seen in Desrochers’ and Coyner’s research, there is also a clear disparity among the competitiveness of football programs, the sources of athletic funds, and the overall size of athletic expenditures between Power 5 institutions and non-Power 5 institutions. This motivates an extension to my hypothesis that there may be a different effect of the COA stipend for schools within the Power 5 and schools not within the Power 5, and thus separate tests will be performed to analyze this potential difference.

4. Data and Methods

I collected data on the athletic characteristics of universities and colleges from the National Collegiate Athletic Association (NCAA) website and other data from the National Center for Education Statistics Integrated Postsecondary Education Data System (IPEDS)². The level of observation is at the school level, by year, from 2007 until 2020. I keep only schools that are NCAA affiliated and Division I or II, and then collected the conference and subdivision of each.

² Data on U.S., public 4-year and private, not-for-profit, 4-year, degree granting institutions was collected from the IPEDS data base.

I also discard any institutions that did not have complete data for the entire time series as well as the U.S. Service Academies³. My final dataset includes 373 institutions: 280 Division I, 93 Division II. Of the Division I schools, 50 are Non-Autonomy FBS, 103 are FCS, and 67 are Autonomy Power 5, and 60 Division I non-football schools. For each of the 373 schools, the dataset includes financial aid metrics and other institutional characteristics from the IPEDS and NCAA database. [Appendix 3](#) defines the variables in the dataset.

To create the treatment and non-treatment groups, a propensity scoring method was used, as motivated by Jones's research. Since the COA stipend was initially adopted by all schools in the Power 5 conferences but remained optional for other FBS and FCS schools, it was difficult to collect the appropriate data to create an accurate and balanced control group. According to Jones (2022), most FBS and FCS schools outside of the Power 5 adopted the policy in 2015 or just after. Therefore, Division II and Division I non-football schools were used as a control group. A color-coded version of the NCAA Organizational Chart by treatment vs. non-treatment groups can be found in [Appendix 4](#).

Since many Division II schools have very different institutional characteristics when compared to Division I schools, I calculated propensity scores for each school using a logistic regression to find the conditional probability of each institution being in the treatment group in 2007⁴, determined by the following 5 variables: control, percent over 25, percent Pell, price of in-state on-campus, and price of out-of-state on-campus⁵. These 5 variables, as noted by Jones (2022), are likely related to the institution's cost-of-attendance, so they were used in order to find

³ Due to the differing nature of the military service academies in the U.S. and their application process, recruiting process, and financial aspects of their athletic programs, they were not included in this dataset.

⁴ The first year of the time-series (2007) was used to determine the non-treatment group.

⁵ The price to live on campus for both in-state students and out-of-state students was used as this metric broke down the cost of housing specifically for in-state vs out-of-state students, as compared to the more general metric used in the later empirical analyses, room and board.

institutions with similar cost-of-attendance characteristics as the treatment group. Propensity scores were created using the coefficients for each metric from the logistic regression to calculate the estimated probability of each school being in the treatment group. Any non-treated institutions that had a propensity score lower than one standard deviation below the mean propensity score of the treated institutions (~0.31) were dropped from the dataset. The full logistic regression results can be found in [Appendix 5](#).

After adjusting the non-treatment group, a t-test for the difference in means was used to calculate the probability that the means in the treatment group vs. the non-treatment group are statistically different. For each of the 5 institutional characteristic metrics, the p-value did not indicate a significant difference across means. Additionally, the mean of the dependent variable of interest, the percent of students receiving institutional financial aid, was not found to be statistically different in 2007. [Appendix 6](#) shows the summary statistics for the treatment (N=220) and non-treatment (N=153) group after adjustment via propensity scores. In [Appendix 7](#), the percent of students receiving institutional financial aid from 2007-2020 is shown, comparing the full treatment group with the non-treatment group. Additionally, in [Appendix 8](#), there is a comparison of Autonomy Power-5 schools with the non-treatment group. The p-value for the t-test of difference in means indicates that there is no significant difference in means when looking at the full treatment group. When only comparing the Autonomy Power 5 schools with the non-treatment group, there is a significant difference in the means for years after 2015.

There are some data limitations that should be noted in my dataset. First, not all Division I institutions were included due to lack of data or other reasons, as stated above in the Data Description section. This could cause some important observations to be omitted from the analysis that may have an influence on the results. Additionally, institutions that did not report

data to the IPEDS database may have a common reason for their lack of reporting, which could be a potential source of bias not accounted for. Second, the institutional characteristic variables were collected for the first year of the time series (2007), however some of the institutions may have switched divisions or had other big changes within the time frame that may not be accounted for in my dataset. This may lead to some observations in each subset of data having some measurement error due to these changes, which should be noted when analyzing the results. Additionally, as a more accurate control group was not attainable due to difficulty obtaining data on the exact timing that each institution outside the Power 5 adopted the COA stipend policy, a control group was made using propensity scores for Division II and Division I non-football scores that have similar characteristics to those schools in the treatment group. However, this may cause some limitations to the analysis of this research, as it is unclear if the trends between Division II/Division I non-football and Division I football schools regarding financial aid packages are comparable throughout the time-series studied, and thus bias may exist. Lastly, there may also be measurement or reporting errors within the IPEDS database, as this data is self-reported by the institutions.

I will be testing to determine if there is a relationship between the introduction of the COA stipend and financial aid packages offered to students by their institutions. I will look at the effect of the policy on a treatment group versus a non-treatment group on each financial aid metric. A difference-in-differences regression will be run with the following specification:

$$\begin{aligned}
 & \text{Percent of Students} \\
 & \text{Receiving} \\
 & \text{Institutional Aid}_{it} = \alpha + \beta_1(\text{policy}) + \beta_2(\text{treatment}) + \beta_3(\text{policy} * \text{treatment}) + \\
 & X_{it} + \gamma_i + \mu_t + \varepsilon_{it}
 \end{aligned} \tag{1}$$

where α is the intercept, X_{it} is a set of control variables, γ_i captures institutional fixed effects, μ_t captures year time effects, and ε_{it} is a random error term. The dependent variable will be the percent of students receiving institutional financial aid. The causal variable of interest is the *policy* dummy variable⁶ and the (*policy * treatment*)⁷ interaction variable, which represents the impact of the policy given treatment. X_{it} represents a set of control variables that could impact the dependent variable; specifically, *percent_change_endowment* and the sum of the costs of *tuition, room and board*, and *books* are included. γ_i captures any un-measured non-time-varying effects of each individual school, and μ_t captures any un-measured time-varying effects across the span of the time series.

Following my hypotheses that the COA stipend will pull funds from institutional financial aid packages, I predict that the policy treatment will have a negative correlation on the percentage of students receiving institutional financial aid. While institutions are chasing academic and athletic excellence and prestige, they are also looking to maximize their monetary returns, thus allocating their money towards places where the greatest marginal benefit of each dollar (either in monetary revenue or in terms of prestige and excellence) is.

5. Empirical Results

[Appendix 9](#) shows regression results for the percent of students receiving institutional financial aid. Specification (1a) depicts coefficients when the full treatment group was compared to the full non-treatment group. Only the coefficients for endowment and the cost of tuition,

⁶ The *policy* dummy variable equals 0 in years before the policy (<2015) and 1 in years after the policy (> or =2015)

⁷ The *policy * treatment* interaction variable equals 1 for any year observation in/after 2015 for a school in the treatment group, 0 otherwise

room and board, and books were statistically significant, indicating no correlation between the 2015 policy on the percentage of students receiving institutional financial aid on the entire treatment group (Division 1 football programs as a whole).

Specification (1b), however, shows a statistically significant coefficient of -3.606 for the (*policy * treatment*) variable. This specification compared the Autonomy Power 5 schools to the full non-treatment group. This indicates that there is a negative correlation between the 2015 COA policy and the percentage of students receiving institutional aid in the Power 5 schools. The coefficients on endowment and the cost of tuition, room and board, and books were also statistically significant.

In specification (1c), the Non-Autonomy FBS schools and the FCS schools were compared to the full non-treatment group. Similar to specification (1a), there is no significant coefficient on the interaction variable, but significant coefficients on the endowment and cost of tuition, room and board, and books variables.

6. Discussion/Conclusions

Findings from this study indicate there is no significant relationship between the 2015 NCAA Cost-of-Attendance Stipends and the percentage of students offered institutional aid by Division I football schools in general. However, there is a significant negative correlation of 3.606 percentage points on the percentage of students offered institutional aid by Autonomy Power 5 schools. This possible negative relationship raises many interesting inferences to explain the effect.

Non-autonomy and FCS Division I football schools were not found to have a significant relationship with the introduction of the stipends. With smaller athletic budgets and less

competitive athletic programs, we can infer that these schools may not have utilized the COA stipends to the extent that the Autonomy Power 5 schools did, and did not see the same negative effects. Due to the small dollar amount of the COA stipends, if Non-autonomy FBS/FCS schools do not offer a large enough amount of COA stipends, this may contribute to the lack of significant effect for this subset of schools.

This result is contrary to my hypothesis, however, as I inferred that the Non-Autonomy FBS and FCS schools would see a larger negative correlation than the Autonomy Power 5 schools due to their smaller athletic budgets and the need to pull funds from outside of the athletic department to fund the stipends. If FBS and FCS schools are not able to competitively recruit the top athletic talent as compared the Autonomy Power 5 schools, then there may not have been a need for the COA stipends to be used extensively within these programs.

It should be noted that the metric for the percent of students receiving institutional financial aid includes student-athletes receiving athletic scholarships. However, the NCAA has a fixed number that each Division I program is allowed to offer per sport, per conference. There are also many regulations around the amount of spending that is allowed comparatively across genders and sports, such as Title IX regulations⁸. It is assumed that the Autonomy Power 5 schools meet their maximum number of scholarships allowed. Since the COA stipends are intended to be given to athletes as additional aid on top of a full-ride scholarship, it is also assumed that any athlete who receives a COA stipend would have already been receiving a full-ride scholarship.

However, with a significant negative correlation on the percent of students receiving institutional aid at the Autonomy Power 5 schools, it is possible that there could be a transfer of

⁸ Title IX requires that schools provide equal access to athletic aid for male and female student-athletes; it does not specifically state that each sport should have equal funding. Rather, the aggregate athletic aid for all men's sports and all women's sports should be equal

money from less profitable or competitive sports to football or basketball programs. For example, a school could pull one less scholarship from a non-revenue men's sport⁹ and use those funds to provide COA stipends to football recruits. Since these football recruits would have already received a full-ride scholarship, this would create a negative net effect on the percent of athletes, and therefore students, receiving institutional aid. A diagram is shown in [Appendix 10](#) to illustrate this potential effect. It is unclear from my research whether the funding for the stipends comes from within the athletic department or is pulled from other areas.

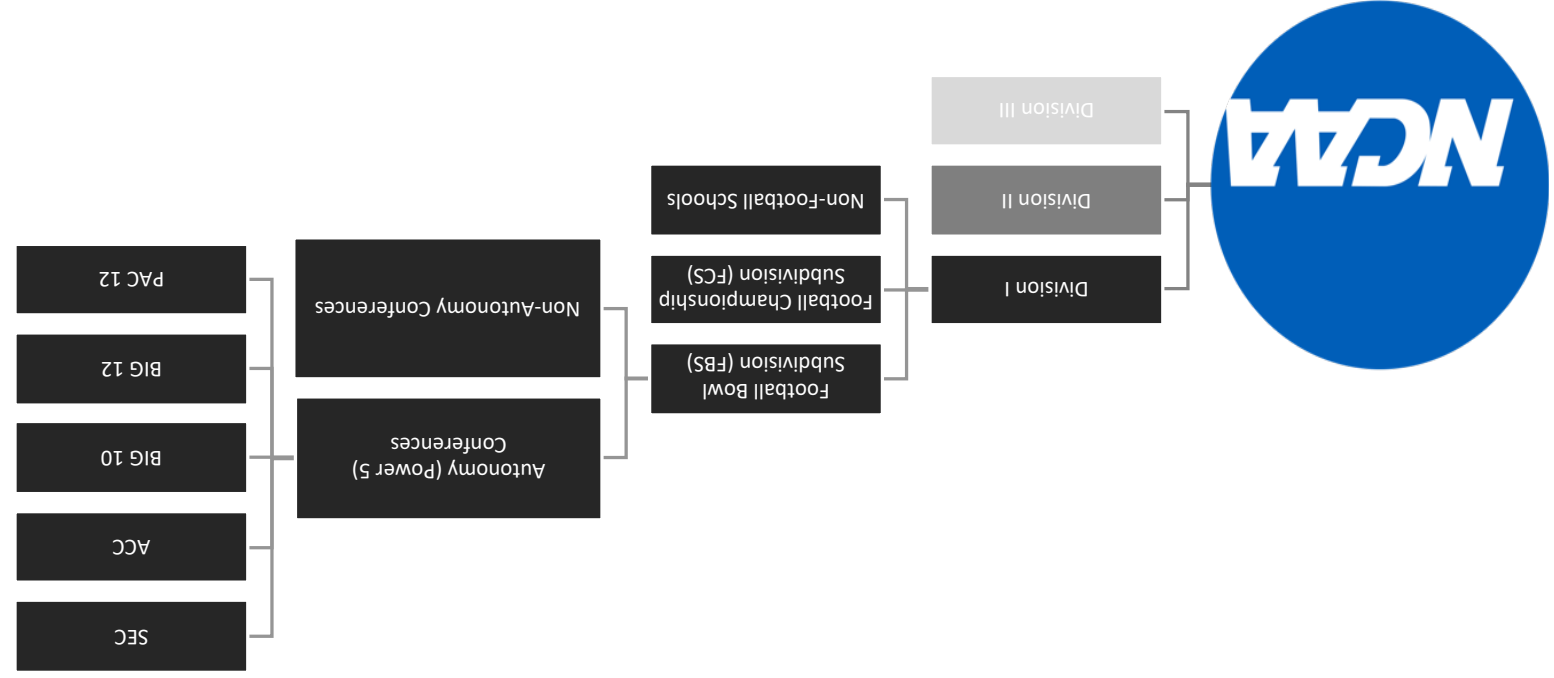
Another explanation of the net negative effect for Autonomy Power 5 schools could be stemming from the COA stipends capturing better recruits which then leads to better team performance, as found in previous literature. Better football team performance could increase the attractiveness of the school for general students, leading to a larger application pool. This larger application pool could allow for the admissions department to admit a higher percentage of students who do not require financial aid to afford the cost of tuition, room and board, and books. This would lead to a decrease in the percentage of students receiving institutional financial aid. However, in order to conclude which explanation most likely holds, further study is required.

In conclusion, there is no relationship between the NCAA's 2015 policy allowing Division 1 schools to provide stipends past full-ride scholarships to their athletes and the percentage of students receiving institutional financial aid within Non-Autonomy FBS and FCS schools. However, there may be a significant negative correlation within the Autonomy Power 5 schools, but more evidence and research should be conducted in order to make any further conclusions.

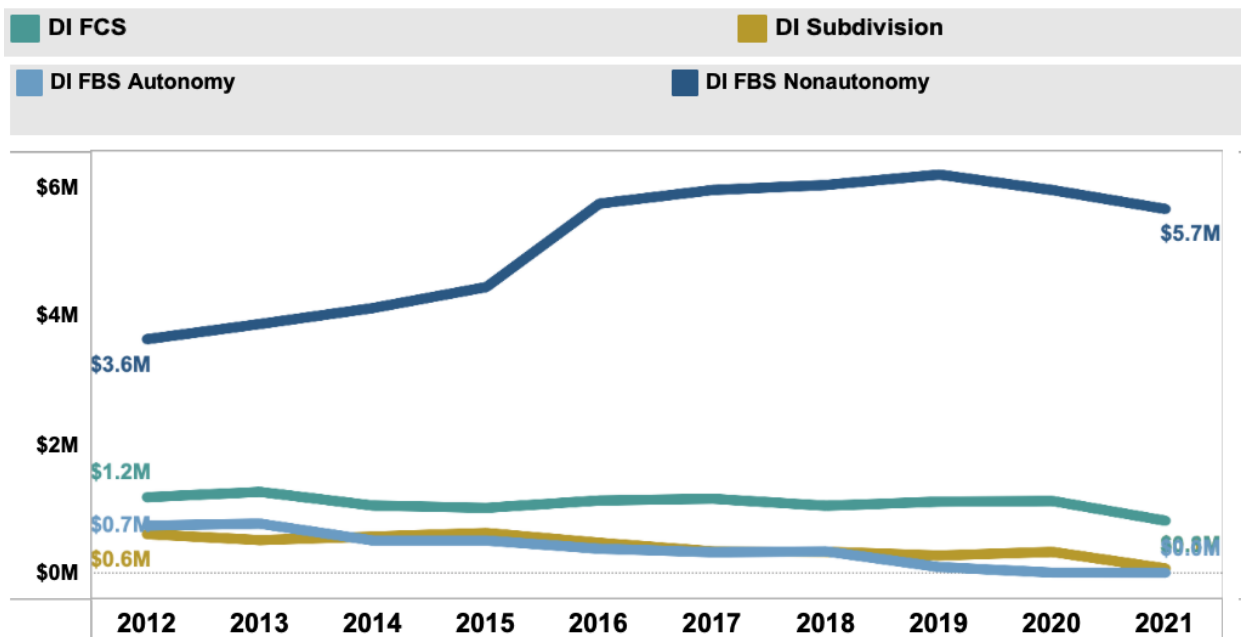
⁹ Pulling funding from non-revenue men's sports may be more common as it ensures schools are meeting Title IX regulations but still allows them to allocate more funding to men's basketball or football programs

7. Appendices

7.1 - Appendix 1: Organizational Chart of the NCAA's Division System



**7.2 - Appendix 2: Median Athletic Revenue for NCAA Division I School;
Student Fees. Sourced from the NCAA Intercollegiate Finances Database**



Published October 2022.

7.3 - Appendix 3: Variable Descriptions

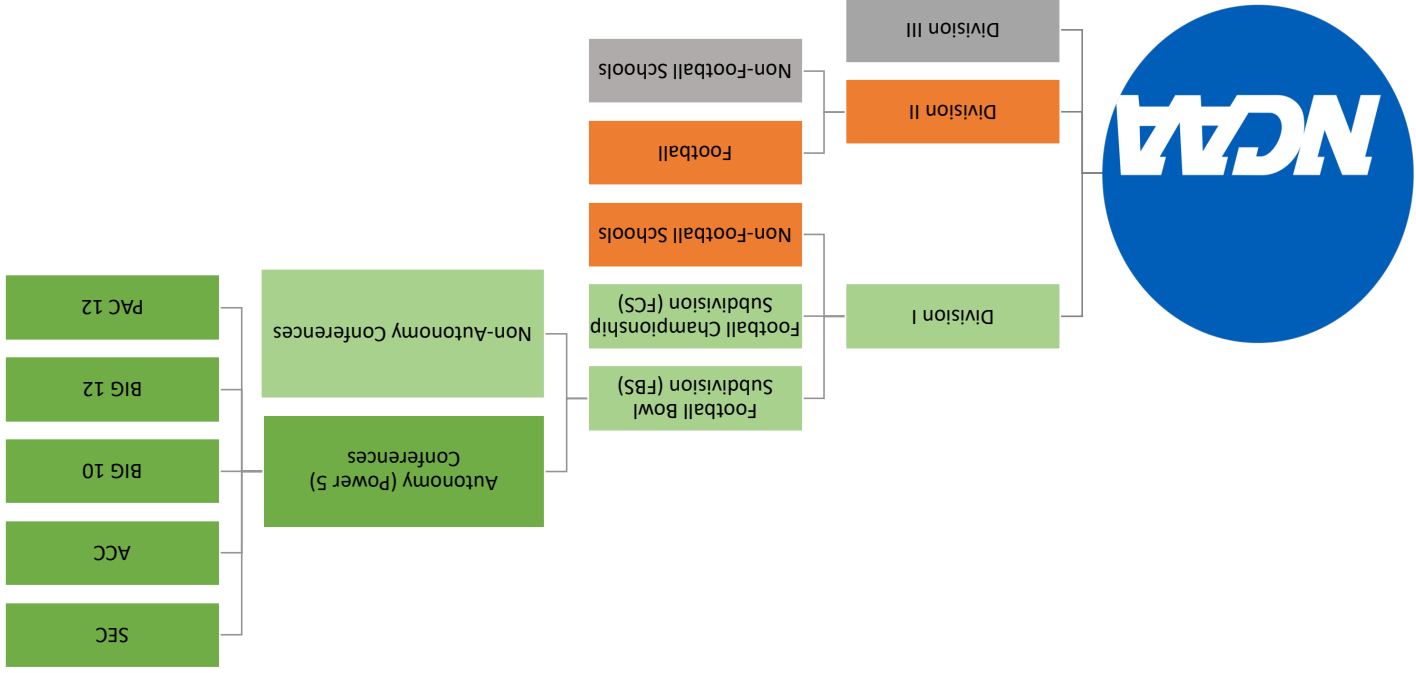
Variable Name	Description	Units of Measurement	Source
division	The NCAA division that the institution is a part of	1 = Division I 2 = Division II	NCAA
autonomy	A dummy variable to identify if the institution is a part of the Power 5 autonomy conference	1 = autonomy 0 = non-autonomy	NCAA
fbs	A dummy variable to identify if the institution is part of the FBS subdivision	1 = FBS 0 = non-FBS	NCAA
fcs	A dummy variable to identify if the institution is part of the FCS subdivision	1 = FCS 0 = non-FCS	NCAA
control	A dummy variable to identify the control (public or private) of an institution	1 = Public 0 = Private, not for profit	IPEDS
percent_over25	The percentage of students at the institution that are between the ages of 25 and 64 years old in 2007	Percentage	IPEDS
percent_pell	The percentage of students receiving a Pell grant at the institution in 2007	Percentage	IPEDS
percent_instaid	The percentage of students receiving institutional financial aid per year	Percentage	IPEDS
price_instate_onsampus	The reported average price to live on campus for in-state students for given institution in given year	Dollar amount	IPEDS
price_outstate_onsampus	The reported average price to live on	Dollar amount	IPEDS

	campus for out-of-state students for given institution in given year		
tuition_instate ¹⁰	The reported tuition cost per in-state student at given institution in given year	Dollar amount	IPEDS
books	The reported cost of books per student at given institution in given year	Dollar amount	IPEDS
room_board	The reported cost of on-campus room and board per student at given institution in given year	Dollar amount	IPEDS
tuition_room_books	The sum of the variables tuition_instate, books, and room_board, divided by 1000, at a given institution in given year	Dollar amount (in thousands)	-
treatment	A dummy variable assigned to each institution apart of the treatment group (all DI with football)	1 = Treatment group 0 = Control group	-
endowment	The amount of endowment at a given institution in a given year	Dollar amount	IPEDS
percent_change_endowment	The percentage change in endowment per year (using a 3-year rolling average)	Percent	-

¹⁰ In-state tuition was used for each school as it depicted the lower dollar amount when compared to out-of-state tuition. In-state tuition cost is used consistently across each institution in the empirical analysis to represent the lower bound, and therefore more modest effect of this variable.

7.4 - Appendix 4: Organizational Chart of NCAA Division System Color-Coded for Treatment vs. Non-Treatment Groups

Treatment = Green; Non-Treatment = Orange



7.5 - Appendix 5: Propensity Scoring Method: Logistic Regression Model Results

Logistic Model Used for Propensity Scoring Method	
control	-1.702*** (0.1639)
percent_over25	-0.04650*** (0.003004)
percent_pell	-0.01915*** (0.02335)
price_instate_onsampus	-0.00004776*** (0.00001234)
price_outstate_onsampus	0.0001018*** (0.00001045)

**7.6 - Appendix 6: Summary Statistics of 2007 Institutional Characteristics
After Propensity Scoring Method**

	Treatment	Non- Treatment	P-value
Percent Over 25	13.07 (9.81)	13.50 (8.27)	0.64
Percent Pell	24.05 (14.58)	24.75 (10.31)	0.59
Control (Public = 0, Private = 1)	0.27 (0.52)	0.26 (0.49)	0.85
Price On Campus In State	\$23,488 (11,522)	\$23,639 (11,679)	0.90
Price On Campus Out of State	\$30,669 (8,877)	\$29,907 (9,035)	0.42
Percent Institutional Aid	46.63 (21.58)	48.32 (26.96)	0.52

7.7 - Appendix 7: 2007-2020 Means of Average Percent of Student Receiving Institutional Financial Aid, Treatment vs. Non-Treatment Groups

	Treatment	Non-Treatment	p-value
2007	46.63	48.35	0.520
2008	49.02	50.00	0.710
2009	50.42	51.58	0.667
2010	51.17	53.29	0.434
2011	52.72	54.78	0.435
2012	54.55	56.20	0.533
2013	56.54	57.06	0.843
2014	58.42	59.14	0.779
2015	59.09	60.59	0.558
2016	60.52	62.28	0.478
2017	62.27	65.23	0.227
2018	63.72	66.55	0.454
2019	65.35	68.34	0.217
2020	67.61	72.51	0.043

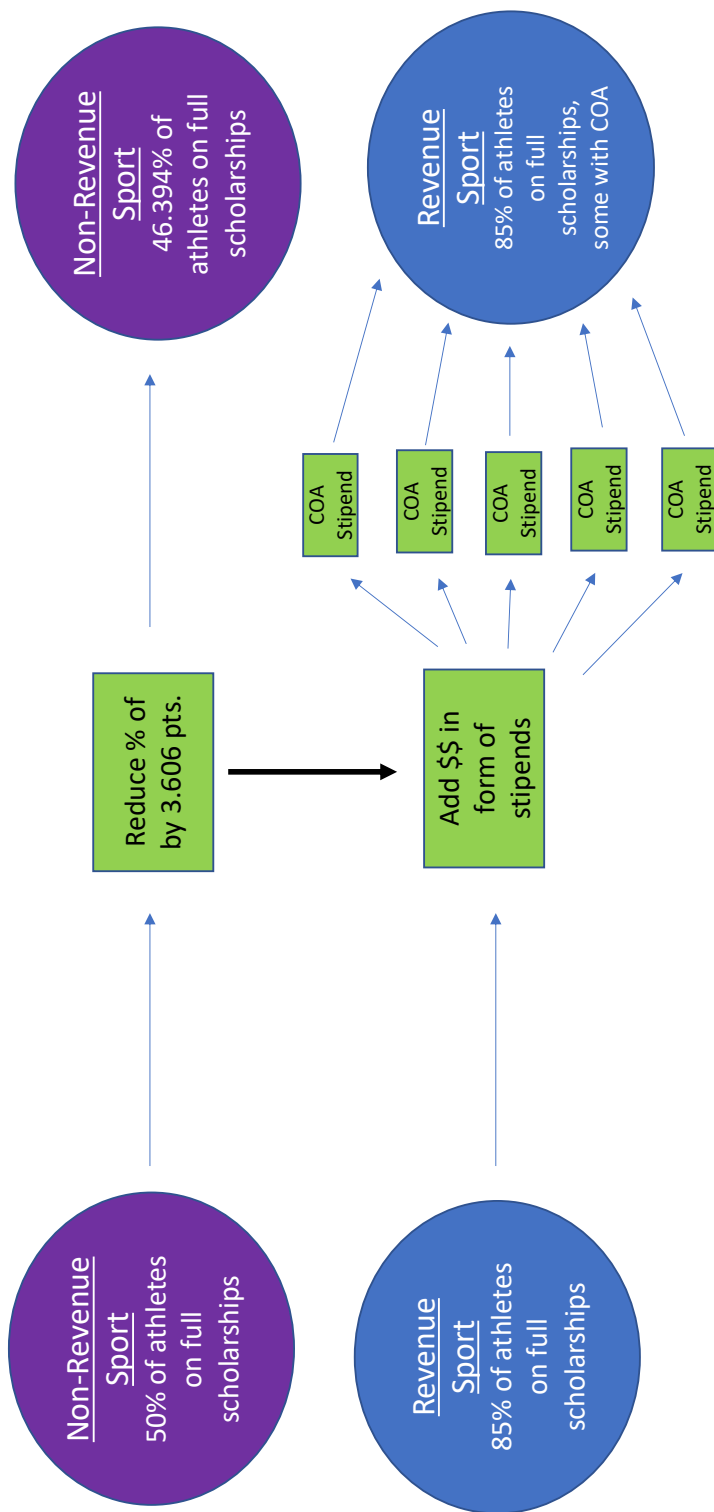
7.8 - Appendix 8: 2007-2020 Means of Average Percent of Student Receiving Institutional Financial Aid, Autonomy Power 5 vs. Non-Treatment Groups

	Autonomy P5	Non- Treatment	p-value
2007	48.01	48.35	0.905
2008	49.06	50.00	0.751
2009	51.34	51.58	0.935
2010	51.22	53.29	0.476
2011	51.84	54.78	0.301
2012	52.33	56.20	0.174
2013	52.79	57.06	0.119
2014	54.18	59.14	0.081
2015	55.69	60.59	0.088
2016	56.76	62.28	0.052
2017	58.16	65.23	0.011*
2018	59.36	66.55	0.012*
2019	60.51	68.34	0.007**
2020	62.34	72.51	0.001***

7.9 - Appendix 9: Difference-in-Differences Regression Results

Percent of Students Receiving Institutional Aid			
	Full Treatment Group vs. Full Non-Treatment Group	Autonomy Only vs. Full Non-Treatment Group	Non-Autonomy vs. Full Non-Treatment Group
	(1a)	(1b)	(1c)
policy	0.1088 (1.530)	0.8436 (1.788)	-0.7901 (1.651)
treatment	-1.483 (0.9849)	-3.573** (1.360)	-0.5473 (1.090)
(policy * treatment)	-1.560 (1.334)	-3.606* (1.839)	-0.7165 (1.476)
percent_change_endowment	0.07083*** (0.01563)	0.08487* (0.03455)	0.06260*** (0.01602)
tuition_room_books	0.5476*** (0.02046)	0.659*** (0.02815)	0.6711*** (0.02308)
time effects?	yes	yes	yes
institutional fixed effects?	yes	yes	yes
Adjusted R-Squared	0.2193	0.2723	0.2707

7.10 - Appendix 10: Illustration of a Hypothesized Explanation for Empirical Results and Net Negative Effect on Percent of Students Receiving Institutional Financial Aid



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