From Sacks to Stacks: How Team Performance Affects Athlete Earnings in the NIL Era

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Abstract:

The adoption of an interim Name, Image and Likeness ("NIL") policy by the National Collegiate Athletic Association (NCAA) in June of 2021 marked a seismic shift in the college athletics world. Athletes who previously did not receive compensation for their athletic pursuits past scholarship money and an undergraduate degree now can negotiate sponsorship deals with organizations for use of their NIL in advertising materials. Now, these student-athletes must focus on their personal brand just as much as their on-field performance to maximize earnings while in college. An open question persists, however, regarding exactly how much of athletes' earning potential via NIL deals derives intrinsically from their on-field excellence and achievement, as opposed to preexisting national renown or random variability in a player's marketability.

In this paper, I use simple linear regression to explore the relation between team performance and team NIL income. Disentangling the value tied to team performance versus exogenous traits proves critical for understanding the revised NIL incentive structures. Both athletic departments courting elite recruits and policy makers constructing guardrails around endorsement activities would benefit from understanding the connection between demonstrated athletic success and endorsement compensation, as these insights can help maximize the potential benefits from a nascent industry while minimizing harmful benefits that come from poor or misguided regulation. Likewise, athletes navigating decisions over profiting immediately

from NIL or postponing paydays to refine sport skills in college will benefit from such knowledge.

Motivation:

In the standard labor market, laborers match skills they possess with demand for those skills from firms. Wages for such labor are determined by the point where supply of a certain skill meets demand for said skill. While almost every industry in the US engages in some variant of the standard labor market, the college athletics industry followed a different structure until very recently. The NCAA has controlled college athletics for well over a century, and for almost all of its reign it has declined to allow college athletes the opportunity to make money from their athletic pursuits. Calling these young sportspeople "student-athletes" helps the NCAA skirt around normal employment laws, blurring the lines between school and athletics for the athletes who drive the value of the NCAA's product. Taylor Branch writes in the Atlantic:

> "The term student-athlete was deliberately ambiguous. College players were not students at play (which might understate their athletic obligations), nor were they just athletes in college (which might imply they were professionals). That they were high-performance athletes meant they could be forgiven for not meeting the academic standards of their peers; that they were students meant they did not have to be compensated, ever, for anything more than the cost of their studies. Student-athlete became the NCAA's signature term, repeated constantly in and out of courtrooms."

The term is used in legal defense several times. The first time was in 1955, when Ray Dennison passed away from a head injury he experienced while playing football for the Fort Lewis A&M Aggies. When his widow filed a claim for workmen's compensation, the Colorado

Supreme Court sided with the NCAA. The justices wrote in their opinion that she was not eligible for those benefits because “colleges are not in the football business” (Solomon).

Why do Division 1 college athletes continue to ply their trade for the NCAA, when it has been made clear that they are not given the same benefits (salary, worker’s compensation, etc.) that laborers in most other industries receive? Part of their motivation comes from the fact no other viable path to professional competition exists for younger athletes in the United States, especially football players. The National Football League (NFL) has ruled for years that “players must have been out of high school for at least three years and must have used up their college eligibility before the start of the next college football season” (NFL.com). Other professional sports have similar rules, leaving college as the only viable path to the next stage of these athlete’s careers.

This labor structure solidifies the NCAA as a monopsony. A monopsony is a market condition in which there is only one “buyer.” In this case, the NCAA is the only “buyer” of the product – labor from college athletes (Geiger). The issue of the NCAA’s market structure was a topic of debate in the landmark Supreme Court case *NCAA v. Alston*, the first case to open the doors to athletes’ compensation in collegiate sports. In the case, the Court ruled that the NCAA was a monopsony, with Justice Kavanaugh going so far as to say, “the NCAA's business model would be flatly illegal in almost any other industry in America” (Gregory). If the governing body did not find a way to compensate athletes, legal action would follow.

The result of this ruling was monumental: for the first time in its century-long history, the NCAA would allow college athletes to profit from their play. However, the governing body was steadfast in their commitment to preventing pay-to-play, a situation where schools would directly pay athletes to play for them. How could the NCAA allow players to profit off of their labor

while continuing to prevent colleges from directly paying their athletes? On June 29, 2021, the Division 1 Board of Directors approved an interim policy regarding athlete payments: "NCAA members voted to allow college athletes to benefit from name, image and likeness opportunities, no matter where their school is located" (Hosick). The emphasis on "name, image and likeness" is important: athletes can only make money in agreements with third-party businesses, where they are paid for the use of their likeness in promotions of the business's product. By approving payment in such a manner, the NCAA was able to achieve both of its goals: give athletes an opportunity to make money and prevent pay-to-play from materializing.

The nature of NIL determinants motivates my study. Athletes are not being paid directly for playing; rather, the payment is in exchange for promoting the business involved in the deal. This prompts my question: what exactly drives NIL deal value? Are businesses willing to pay more for stellar players with poor brand awareness, or for average players with well-known personal brands who attract eyes for reasons apart from their athletic prowess? In this study, I will disentangle the determinants of NIL deal value, to demonstrate what aspects are important to maximizing earnings for college athletes.

Question and Hypothesis:

In this paper, the question I aim to answer is "What is the quantitative effect of a change in team performance over the course of a season on aggregate team "Name, Image and Likeness" income?" My hypothesis is that improving team performance as measured by win percentage in a season will result in a positive return to aggregate NIL income. Logically, businesses are willing to pay more to have a better athlete represent their brand, and the best athletes tend to positively impact their team's performance.

Methods:

In analyzing the connection between team athletic performance and team NIL income, I examine the components of NIL income through the hedonic pricing model. This model was proposed by Sherwin Rosen in his landmark work, "Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition." In the paper, Rosen states: "Hedonic prices are defined as the implicit prices of attributes and are revealed to economic agents from observed prices of differentiated products and the specific amounts of characteristics associated with them." Essentially, a product's price is determined by the quantitative value assigned to the endogenous attributes and external factors that make up the bundle of the product's overall value. Here, the product in question is the sum of NIL payments going to athletes on a particular team. When considering the factors that comprise the NIL bundle, I single out on-field performance and player branding. I segment this further: on-field performance can be broken down to both individual player performance and team success in terms of wins and losses, while player branding can be segmented into sport viewership, social media following, individual personality, and gender. Both buckets of the hedonic pricing model are fulfilled – the endogenous attribute (those within the athlete's control) would be the on-field performance, and the exogenous factors are those that have to do with branding and exposure.

Having determined what contributes to the NIL pricing bundle, I construct the regression model. The aim of this regression is to measure how much NIL income increases or decreases for an increase of win percentage by one. For the independent performance variable, I use win percentage as a proxy for team performance. Win percentage is defined as the percentage of contests that a team wins in a given season. This is the most straightforward and cleanest

measure of performance as a team, and using a percent instead of raw wins allows cross-sport comparisons. A clean proxy for team performance takes care of the 'internal factors' portion of our hedonic model. For team NIL data, I use data provided by the schools themselves of total realized NIL income for each team. With this data, the regression equation will fit the following format:

$$(NILinc) = \beta_0 + \beta_1 * (Wpct) + \varepsilon$$

Where β_1 is the coefficient of the causal relation being sought. By focusing on win percentage in the regression and leaving all external factors related to branding in the error term, the regression can reliably derive how much of team NIL income is tied to an improvement in team athletic performance and how much is tied to those external factors – a pricing method consistent with the hedonic pricing model mentioned earlier.

Data and Results

Because I use win percentages instead of total wins and am interested in how that measure affects NIL income across sports programs, I am not limiting my study to just one sport or one gender. This is a potential shortcoming in the study: the popularity of the sport you play will affect an athlete's payment. More people watch football and men's basketball, so those sports typically (with certain exceptions) pay more money than softball or squash to players at any professional level. However, such an effect is one of the external factors influencing pricing as outlined by the hedonic pricing model. A sport like football generates more NIL income than a sport like squash because of the increased media attention. More people are willing to watch

football, so the branding opportunities are higher. Branding is part of the external factors that affect the value of an NIL deal, and thus is kept in the error variable in this regression.

The schools in my study are University of Maryland (UMD), University of Virginia (UVA), and Virginia Polytechnic Institute and State University (VT). These three schools play in Power 5 Conferences (the top five sports conferences in NCAA competition); VT and UVA play in the ACC, while UMD plays in the Big Ten. Both of these conferences are comparable in terms of revenue and operate the same NIL regulations, so there should be no confounding variable due to conference difference.

Within these schools, I use data from teams competing in a variety of sports. Some sports, like basketball and football, are represented in the table at all three schools. These sports tend to drive the bulk of viewership and television deal revenue for schools, so more money is devoted to them across the country. Other sports were only represented at one or two of the schools. The represented sports were not held constant because the data released by these schools is redacted for sports that generate under a certain amount of NIL income for a given season (the exact hurdle amount being different at each school). Regardless, this variation in represented sport will not affect the regression, as we are using panel data from the same program over three years to measure variation. The variation in NIL income due to changes in win percentage over three years can be compared across sports.

Team	Deal Value	Win Percentage
UMD Football 21/22	200,881.00	53.80
UMD Football 22/23	578,642.00	61.50
UMD Football 23/24	841,003.00	61.50
UMD Women's Basketball 21/22	18,309.00	71.90
UMD Women's Basketball 22/23	18,207.00	80.00
UMD Women's Basketball 23/24	1,083.00	57.60
UMD Softball 21/22	960.00	56.00
UMD Softball 22/23	3,441.00	68.00
UMD Softball 23/24	247.00	42.00
UMD Baseball 21/22	830.00	77.00
UMD Baseball 22/23	5,776.00	67.00
UMD Baseball 23/24	150.00	63.00
UMD Women's Lacrosse 21/22	3,805.00	91.00
UMD Women's Lacrosse 22/23	11,544.00	68.00
UMD Women's Lacrosse 23/24	310.00	73.00
UMD Women's Soccer 21/22	2,310.00	31.00
UMD Women's Soccer 22/23	1,416.00	38.00
UMD Women's Soccer 23/24	1,550.00	31.00
UMD Field Hockey 21/22	4,460.00	68.00
UMD Field Hockey 22/23	6,956.00	83.00
UMD Field Hockey 23/24	638.00	74.00
UVA Men's Baseball 21/22	10,190.00	67.00
UVA Men's Baseball 22/23	43,833.49	77.00
UVA Men's Baseball 23/24	16,517.07	76.00
UVA Men's Basketball 21/22	247,380.00	60.00
UVA Men's Basketball 22/23	278,501.91	76.00
UVA Men's Basketball 23/24	942,137.30	68.00
UVA Football 21/22	67,968.25	50.00
UVA Football 22/23	23,915.94	30.00
UVA Football 23/24	670,363.71	25.00
UVA Softball 21/22	1,418.00	52.00
UVA Softball 22/23	1,809.54	58.00
UVA Softball 23/24	1,915.36	67.00
UVA Woman's Soccer 21/22	6,610.00	83.00
UVA Woman's Soccer 22/23	12,429.09	76.00
UVA Woman's Soccer 23/24	2,907.27	65.00
UVA Women's Volleyball 21/22	8,085.00	29.00
UVA Women's Volleyball 22/23	9,725.00	41.00
UVA Women's Volleyball 23/24	305.76	39.00
VT Men's Basketball 21/22	54,414.00	64.00
VT Men's Basketball 22/23	196,841.00	56.00
VT Men's Basketball 23/24	12,445.00	56.00
VT Football 21/22	79,262.00	46.00
VT Football 22/23	113,202.00	27.00
VT Football 23/24	7,512.00	54.00
VT Baseball 21/22	54,414.00	76.00
VT Baseball 22/23	20,970.00	57.00
VT Baseball 23/24	3,006.00	71.00
VT Women's Basketball 21/22	1,709.00	70.00
VT Women's Basketball 22/23	42,902.00	86.00
VT Women's Basketball 23/24	32,990.00	76.00
VT Softball 21/22	3,078.00	82.00
VT Softball 22/23	5,765.00	66.00
VT Softball 23/24	1,575.00	71.00
VT Women's Soccer 21/22	943.00	65.00
VT Women's Soccer 22/23	1,637.00	58.00
VT Women's Soccer 23/24	5,693.00	47.00
VT Wrestling 21/22	64,035.00	69.00
VT Wrestling 22/23	33,673.00	77.00
VT Wrestling 23/24	30,825.00	69.00

This table shows the 60 data points I analyzed – 21 from UMD, 18 from UVA, and 21 from VT. In this data, each point is a specific team in a specific season. For example, UVA Men's Basketball is evaluated over three seasons, and each season counts as a separate data point. This is because each season consists of new players and situations (coaches, schedules, etc.) and should be evaluated separately to derive a true correlation between NIL income and win percentage. As mentioned earlier in this paper, some sports were omitted from certain schools; for example, wrestling was only evaluated at VT, and women's lacrosse was only evaluated at UMD. Again, data was not released for every sport from these schools, but because we are using units that are consistent across sports (dollars and win percentage), each data point can be evaluated using the same regression.

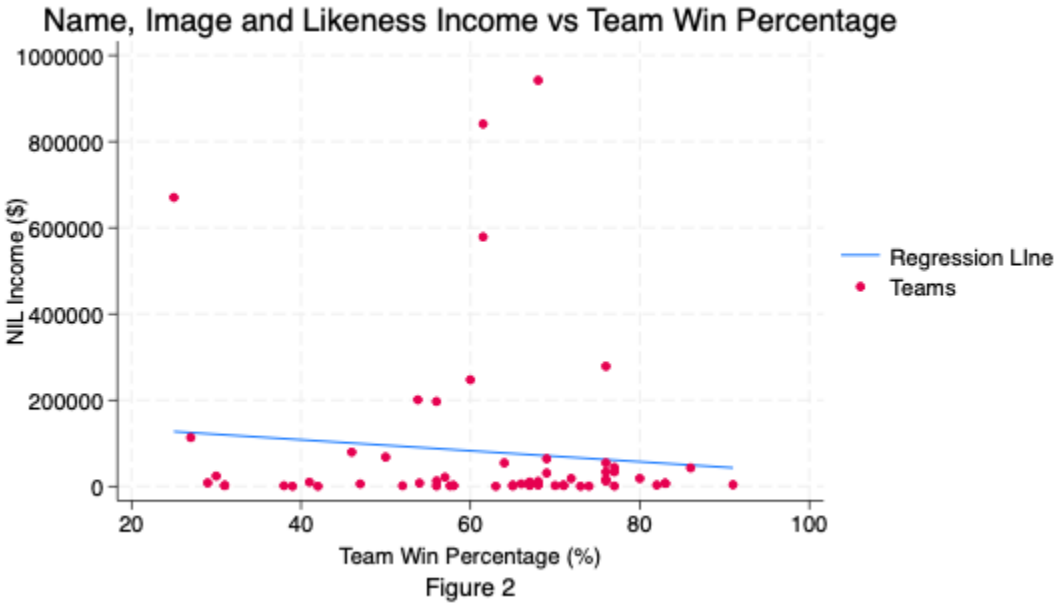

Figure 2

Figure 2 is a simple linear regression with all 60 team measurements that I found. The equation of the line of best fit is:

$$NILinc = 159049.1 + (-1278.30) * (WinPCT) + \varepsilon$$

This model estimates a negative return of $1278.30 for every 1 unit increase in win percentage. According to the regression, only 1.1% of the variability in NIL income for each team could be explained by their win percentage in that season, which is statistically insignificant. Even if the result was statistically significant, this is a nonsensical result; common sense dictates that increasing team performance on the field should lead to an overall increase in team NIL income. After all, why would advertisers pay more money to have their products represented by a worse-performing team? The negative correlation can be attributed to a few significant outliers:

UMD Football 21/22	200,881.00	53.80
UMD Football 22/23	578,642.00	61.50
UMD Football 23/24	841,003.00	61.50
UVA Men's Basketball 21/22	247,380.00	60.00
UVA Men's Basketball 22/23	278,501.91	76.00
UVA Men's Basketball 23/24	942,137.30	68.00
UVA Football 23/24	670,363.71	25.00
VT Men's Basketball 22/23	196,841.00	56.00
VT Football 22/23	113,202.00	27.00

It is no surprise that the football and basketball programs at these schools have created several outliers in our study. These two sports have outpaced all other college sports in terms of viewership. In 2023, the NCAA Bowl Championship Series (BCS) college football championship drew in 17.22 million viewers, while the NCAA 'March Madness' college basketball championship drew in 14.69 million viewers – numbers that are the lowest for each event on record (Sports Media Watch). The sheer attractiveness of the sports means that

regardless of team performance, these teams will draw in viewers and thus attract more NIL money.

One explanation for a high NIL commitment to underperforming teams can be framed as an investment. Putting more money via NIL into the team can theoretically attract better players and improve the team over the years, meaning that the expected relation is flipped – instead of a higher winning percentage leading to higher NIL income, the investment theory says that higher NIL income will eventually lead to a higher team winning percentage. This is a theory worth exploring, but it would only make sense in high-viewership sports like basketball and football because the expected payback to the school in revenue down the line must be high enough to rationalize the present investment.

Regardless of the explanation, the other teams that I analyzed have more comparable viewership and revenue outcomes, so an interesting exercise is removing football and basketball teams' data points from the regression and rerunning:

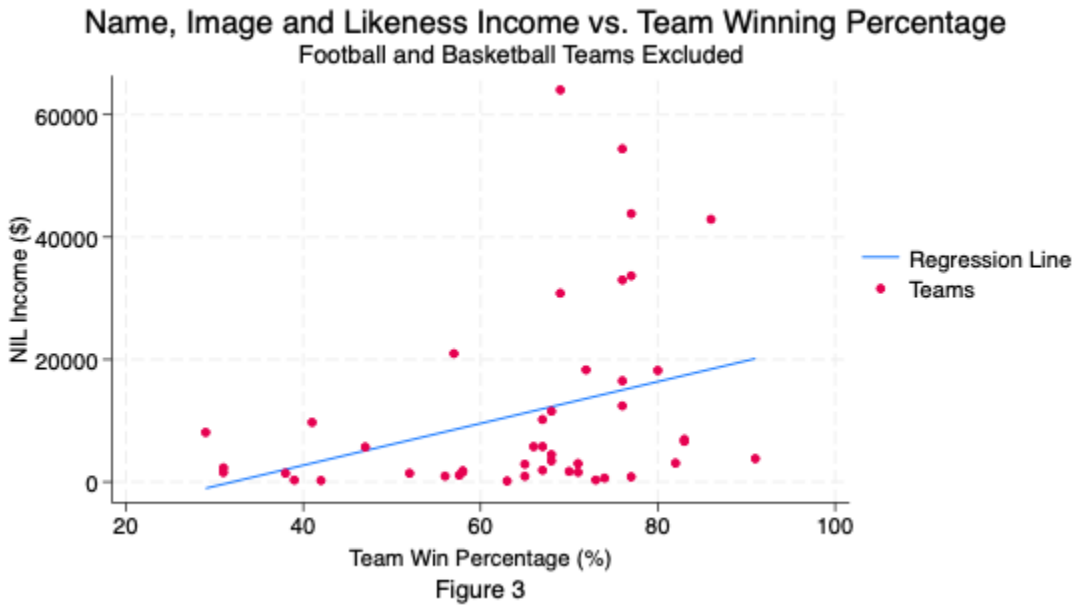

Figure 3

After removing football and basketball team data, the regression looks very different. Now, the coefficient on the explanatory variable is positive, as shown in figure 3 and its regression equation below:

$$NILinc = -10954.03 + (341.60) * (WinPCT) + \varepsilon$$

Translating the equation, omitting football programs from the regression generates a positive return of $341.60 in NIL income for every one unit increase in team win percentage. The significance measures show that 11.5% of the variability in NIL income is explained by changes in team win percentage, meaning this regression yields more significant results than the previous one. This is expected, as we have excluded the two sports that give rise to outlying data points. The way the regression results change after omitting that data shows that for sports programs that are not generating exponentially higher viewership than their peers, there is a positive return to team NIL income as teams improve their win percentage. This takeaway matches my original hypothesis that an improvement in team performance on the field will lead to a greater aggregate NIL income level for the team.

Conclusion

From the acquired data and subsequent regressions, I draw simple causal conclusions for further testing. In Figure 2, I find that when including all sports without adjusting for the difference in media attention and viewership, the estimated causal relationship between team winning percentage and team NIL income is nonsensical. The regression yielded a negative coefficient for increases in win percentage – a result that does not match what economic logic says should happen. Including football/basketball in the same regression as smaller-viewership sports does not allow us to extract true returns to team performance, as the highest performing

volleyball team in the country will not see nearly as much revenue as a middling football team from a large market. Thus, it is best to exclude those sports.

Figure 3 gives a more significant result, as I remove three football teams and two basketball teams from the rest of the data and rerun the regression. The results show that there is a positive return of $341.60 to team NIL income for every one unit increase of team win percentage. This result fits the economic intuition that higher performing teams can expect to make more in NIL income. Although there are still significant differences in media attention and branding opportunity between the sports included in the second regression, excluding the two outlier sports of football and basketball reduces the effect that such branding differences have on isolating the effect of team performance on NIL income changes. The results do not carry much statistical weight, however – only 11.5% of the variability in NIL income comes from variation in win percentage. This indicates that while team winning percentage certainly has an effect on team NIL income in smaller-viewership sports, there are other, more significant aspects of the pricing bundle that contribute to changes in NIL income.

These results will interest athletes and teams who compete in sports other than basketball and football. The positive return I derived shows that athletes in sports with smaller viewer bases can increase their earnings by performing better, if the other factors affecting NIL income are held constant. Thus, the road to maximizing earnings for a college athlete involves – at least in part – working towards improving the overall team performance.

Critique and Extensions

While this paper contributes to understanding the nature of NIL payments and their influencing factors, there are limitations on this study that support further refining to understand the economics of NIL more fully. Firstly, I use aggregate team NIL income in this model. This is

because FERPA rules prohibit the publication and distribution of individual NIL deal details without express approval from the athlete. When a business is looking to engage in an NIL deal, it works with individual athletes instead of the team. This means they are buying into the individual's athletic performance and branding. While this study uses team income and team win percentage as adequate proxies for changes in income and performance, there are some examples of truly talented individuals who suffer from a poor team environment and can drive their value higher without playing on a successful team. A true hedonic pricing breakdown of NIL deals would require working with individual college athletes' NIL income and their changes in performance, likely by tracking their individual performance statistics.

Secondly, using three schools' sports programs across three years of data collection is not a strong sample size for deriving a statistically significant relationship between improvements in on-field performance and changes in NIL income. In my data collection process, I reached out to about 30 schools, and almost all of them denied my requests. Although the Freedom of Information Act states that citizens have a right to certain data collected by public institutions, FOIA rights are only enforced in-state, so I was unable to secure data from any school outside of Virginia. Additionally, the difference between Figures 2 and 3 shows that using a variety of sports has an outlier effect on the regression I ran. While I initially thought that not controlling for media attention would be the best way to model the relation due to its inclusion in the "external factors" side of hedonic pricing, the results show that there exists such a large discrepancy in viewership between football/basketball and other sports that it renders finding a causal relationship between team performance and NIL income for all sports at once nearly impossible. The second regression gave more insights into that relation, but a football and basketball-specific investigation will have to occur separately.

Finally, the aforementioned 'investment theory' is one that should be explored further to confirm the validity of the relationship I propose in this paper. While economic intuition suggests that teams performing better on the field via a higher winning percentage should attract higher NIL income, an alternative relationship may show that higher winning percentages come because of higher NIL income. The investment theory describes this proposed relationship, claiming that universities and affiliated third parties can direct more money to underperforming programs to raise the performance within those programs. If this theory is true, then it would reverse the relationship that I propose, and a new structure would be needed to explore NIL payments.

Taking these limitations into account, I propose an extension of this work that specifically focuses on college football programs, using a multi-year differences-in-differences method instead of the simple linear regression to find a causal relation between a change in team win percentage and changes in team NIL income. In this extension, the data sources expand to include about 80 college football programs across the country, all competing at the Division 1 level in a Power Five conference. The data I will collect is team NIL income from each football team for the 2021, 2022 and 2023 seasons. FOIA proved to only be helpful to residents of the state in which data is being requested, so I will work with colleagues from those states to acquire the requisite data. I will also collect win percentage data for both years. Using differences-in-differences regression and greatly expanding the data source, while standardizing the sport used to make sure that sport-based branding is not a factor, I can quantify the causal relationship between a change in win percentage and its corresponding effect on NIL income. Extending this further, the study can be carried out on each Division 1 sport to quantify the differing effects across sports.

Another extension of this study can focus on more individual measurements to get closer to the core elements of the NIL hedonic pricing bundle. NIL deals are made with individuals, not whole teams, and so our model says that there must be at least some individual aspects that drive the value of deals that are not measured by team success. While team winning percentage is an acceptable proxy in our study – teams with more talented players will generally win more games – using an individual measure of skill or popularity would get closer to the heart of NIL valuation. In a study like this, we can use individual football stats (e.g. touchdowns, catches, yards, tackles) as our independent variable and individual NIL income as the dependent variable.

Acquiring individual data on NIL income is challenging now due to FERPA regulations, but if this becomes possible it would provide a more accurate picture of how much of an individual's NIL income is driven by performance on the field. Alternatively, the focus can shift to the marketability aspect of individuals and see how that factor drives valuation. In this case, we can use follower count on several social media platforms as an accurate proxy for an athlete's marketability. With that as the independent variable and NIL deal value as the dependent variable in the standard linear regression model, this would enable disentangling the internal and external determinants of NIL valuation for college athletes. Carrying out such studies would allow me to carry forward on my mission to determine how college athletes can maximize their earning potential in the four years they spend in school – a mission that will help 520,000 young adults make the most of the expanding NIL frontier.

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