Economics of Recruiting Interactions in Collegiate Sport: An Analysis in Game Theory and Matching Markets

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Economics of Recruiting Interactions in Collegiate Sport
An Analysis in Game Theory and Matching Markets

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Abstract

This paper seeks to explain the interactions involved in recruiting prospective student-athletes to universities, particularly in the sport of softball. By employing the concepts of Game Theory, Prisoner’s Dilemma, and Matching Markets, the market for recruiting is explored and explained. Recent legislative changes in the market are then examined as well as possible outcomes as a result. Research on commitments in softball and lacrosse was collected in order to make claims in regard to incentives. The market for recruiting is compared to the residency placement matching system. Ideas are presented on ways to achieve a market that clears where outcomes are said to be “efficient” while also drawing attention to differences in markets which could inhibit the same models from being effective in the recruiting market.
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Introduction and Background

There are more than 460,000 athletes that compete in intercollegiate athletics under the National Collegiate Athletic Association (NCAA). Across every sport, there exist recruiting relationships which come into effect to determine where a prospective student-athlete will attend school. A coach’s general objective is to maximize each student athletes’ potential in order to field the most competitive team possible. The student athletes’ objectives vary across a wide range of factors which impact their decisions in varying degrees. Some of these factors may include, but are not limited to, things like: playing time, geographic location, proximity to home, educational opportunities, scholarship offer/cost of attendance, competitiveness of the program, historic success, and relationship with the coach. Recruiting interactions often involve means of communication such as phone calls, text messages, e-mails, but also campus visits by the prospective student-athletes and/or home visits by the recruiting coach. Coaches of any sport spend countless hours traveling all over the country (occasionally the world) to evaluate the talent of prospective student-athletes.

The NCAA is the governing body over the dominant majority of intercollegiate athletics. The scope of this paper will consider Division I (the highest level) institutions. The NCAA has a slew of rules defining permissible and impermissible recruiting interactions. However, even with a long list of restrictions on permissible recruiting activity, coaches have continually found loopholes in attempts to gain the upper hand and acquire the most coveted recruits. Specifically, with the advancements in technology and ease of communication, recruiting timelines have crept earlier and earlier into a prospective student-athlete’s high school career. In recent years, it hasn’t been abnormal to hear of athletes verbally committing to universities early as 7th grade. A “verbal commitment” is non-binding on neither the coach nor prospect according to NCAA
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(2018) but is a normal component of the recruiting process. This verbal commitment tells of a prospective student-athlete’s intent to attend a particular university in response to some type of offer to do so from the coaching staff of that university. In sports other than football, verbal commitments tend to be carried out except for in extreme circumstances. Particularly among the conferences known as the Power 5 (ACC, Big 12, Big Ten, Pac-12, and SEC) the perceived need to obtain or maintain the upper hand has led to an increase in “early” recruiting in recent years. For the scope of this paper, early recruiting will refer to the practice of collegiate coaches offering scholarships and seeking to obtain a verbal commitment prior to the student athlete’s junior year of high school. Many of these programs claim to not want to recruit kids this early. However, because their competitors continue to do so, they feel as though they must as well or else risk missing out on securing high level prospects. Penn State women’s lacrosse coach, Karin Brower Corbett said of early recruiting, "It's about five schools driving this bus, and we all felt like we had to jump on board or we're left behind.” (Fadir, 2016).

Recently, there have been pushes from coaching associations of different sports to enact changes in the realm of early recruiting. In April of 2017, lacrosse coaches became the first sport to make a compelling case and get proposed legislation before the NCAA for such changes. The proposal was passed and placed in immediate effect. Below is a table comparing prior NCAA legislation (listed as “current” in the chart because of the time which it was published), a Student Athlete Experience Committee (SAEC) proposal (approved by NCAA in April 2018 for all other sports), and the current lacrosse legislation (now applied to softball as well). Note the “Current Lacrosse Recruiting Rules” column, primarily in contrast to “Current NCAA Recruiting Rules”. All contact with prospective recruits is now moved to September 1 of the prospect’s junior year.
In December of 2017 softball coaches under the National Fastpitch Coaches Association (NFCA) began a push to be included on the lacrosse legislation. In April of 2018, the NCAA passed legislation to include softball on the lacrosse legislation that was passed in 2017. As reflected in the above figure, the most critical element of this legislation in comparison to what existed previously, as well as other changes enacted for other sports (the SAEC proposal), is that there is absolutely no contact between a prospective student-athlete and a collegiate coach before September 1 of the prospective student-athlete’s junior year of high school. To date, lacrosse and softball are the only sports under which such restrictions exist. In all other sports, while there are restrictions on coach behavior, there is no restriction on the prospective student-athlete. If a prospective student-athlete calls a collegiate coach, the coach is able to answer and make any offer (financial or otherwise) or schedule a visit—there are no limitations on what can transpire if the prospective student-athlete initiates the call. The same is true if the prospective student-athlete (that is not yet a junior in high school) decides to show up on campus. They are able to
interact with the coach, tour the campus with him/her, receive offers of aid, and engage in other recruiting conversation. These avenues are the hotbed for early recruiting. The lacrosse/softball legislation is purposeful in placing a hard boundary on any interaction until September 1\textsuperscript{st} of junior year to seek to cut off the loopholes being exploited for early recruiting purposes.

Softball and lacrosse coaches are optimistic that this legislation will allow for high school athletes to focus more on developing and competing than the lure of the highly sought-after scholarship. Simultaneously, it will give coaches more time to evaluate players, see how they develop, and enter into recruiting conversations in a similar time frame with coaches from other institutions. The September 1\textsuperscript{st} of junior year date will also move the college decision timeline much closer to the time frame when their peers are also considering college options. By moving this process back, it is believed that prospective student-athletes will be in a position to make a much more informed decision regarding elements like the kind of school they want to attend and what they want to study that they likely were not able to consider as 8\textsuperscript{th} graders. According to the NFCA (2018) over 80\% of members voted in favor of the changes, however, there remains a minority of coaches who are opposed for various reasons. The scope of this paper will be centered primarily on the interactions of the 80+\%.

It can be expected that in the wake of enactment of this legislation there will be a little bit of a transition period. Youth, high school, and travel coaches as well as prospective student-athletes have to take the time to figure out what the new rules mean for them. However, once all involved parties understand that rules of no contact mean \textit{no contact}, they should adjust their behavior accordingly. Many coaches may already have verbal commitments from younger players that aren’t in their junior year yet. These commitments can still be honored, however, coaches and even committed players are not be permitted to contact one another until September.
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1st of the student’s junior year. Although coaches won’t be able to engage in recruiting conversation until junior year, they will likely still spend much of their evaluation time on sophomores and freshmen. Due to the fact that all 295 institutions are set loose to actively recruit on the same day, coaches will likely want to have a very good idea of which recruits they want to prioritize contacting right away to avoid losing them to another school.

Because “economics is about the efficient allocation of scarce resources and about making resources less scarce,” (Roth, 2015, p. 4), economic concepts can be used to examine and understand a wide range of interactions, decisions, and behaviors. The recruiting interaction is no different and can be evaluated using a familiar concept in economics known as “game theory”.

Game theory is a scenario in which two (or more) parties are involved in strategic decision making—the “game”. In a simple version of game theory, two choices exist for each party (or “player” as commonly referred to in game theory). Each player’s outcome is dependent, not only on his own decision, but also on the decision of the other. A key assumption of this theory is that each player is in pursuit of the best possible outcome for himself. Prisoner’s Dilemma is a classic case of game theory in which a lack of trust moves both players to an outcome in which both are less well off than if they were able to trust each other. This lack of trust results in what economists call the “Nash Equilibrium”. The Nash Equilibrium in game theory is the outcome in which neither party is able to make themselves “better off” by only changing his decision. Under Prisoner’s Dilemma, the Nash Equilibrium is not the most preferred outcome for either party.

Game theory invokes and relies heavily on the concept of payoffs. These payoffs are dependent on each players’ decision and can be measured in the terms of money, goods, or utility. “Utility” is the term in economics used to measure happiness. Utility is a unit-less measure which is only ordinal, not cardinal. Preferences are ranked in relationship to one another.
from most to least preferred. This means any numbers associated with the concept of utility are trivial, yet useful to understand the order of preferences. Higher levels of utility, thus, equate to higher levels of “happiness” and are more preferred when compared to lower levels of utility.

The purpose of this paper is to employ economic theory to examine the market for recruiting prospective student-athletes to collegiate softball. This will be done by relying heavily on Game Theory and Matching Markets as well as comparing the recruiting market to others which experienced similar failures. The intent of these applications is to arrive at a solution which allows the market to operate efficiently and would be acceptable to both coaches and prospects.

**Literature Review**

Very little evaluation has been done examining this interaction in the realm of recruiting in collegiate athletics and particularly in regard to the recent legislation. However, there is similar literature exploring the concept of game theory in companies recruiting MBA (Master of Business Administration) students. The simplified model will be a starting place in considering the interactions in recruiting. Companies recruit MBA students as early as the fall of their first year in the program. “Despite the collective benefits of a later recruiting cycle, each company is individually incentivized to attempt to recruit and hire before its competitors, obtaining first pick of top talent,” (The Harbus, 2017). This is a classic case of Prisoner’s Dilemma. By each company acting in its own best interest, both companies are forced into a suboptimal position. In this case, it is recruiting very young and underdeveloped MBA students who have barely had a chance to explore career opportunities or even dig in to their masters’ studies. No governing body has been able to move this dilemma out of the established Nash Equilibrium and back to a
space that is preferred by companies and students alike. Below are game setups used by Malik in describing Prisoner’s Dilemma and the interactions in MBA recruiting which will be useful in understanding Prisoner’s Dilemma and the discussion on recruiting to follow.


In the diagram on the left, Prisoner A and Prisoner B are each faced with two choices after their capture: to testify or not to testify. If both prisoners keep silent, both will be imprisoned for a year, because the judge has enough information to hold them, but not enough to give a heavier sentencing. However, the judge is willing to cut either one a deal: if either prisoner testifies against the other, the testifying prisoner will be released while the other is imprisoned for 10 years. But, if both prisoners try to take the deal (neither knows the decision being made by the other), each will be imprisoned for 8 years. If the prisoners could both keep silent, they would both only face one year in prison as opposed to the 8 they’ll have if they both testify. Yet, if one prisoner suspects the other will keep silent, it would be in his best own best interest to testify and be released. This self-serving decision-making moves to the Nash
Equilibrium where both testify and face 8 years in prison as a result. The same pattern of thought can be applied to the recruiting model on the right and for the models to follow in this paper.

In October of 2017, the NCAA published results from a survey taken by current student athletes concerning their recruiting process. For the sake of understanding the climate of the recruiting “market”, relevant charts from the publication are shown below.


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There are several key indications that can be seen in these responses specifically for softball. First, as seen in Charts 1 and 2, softball had the first highest percentage of athletes who report recruiting contact beginning in 9th or 10th grade and (Charts 3 and 4) the second highest in verbal commitments during the same time frame, only behind men’s lacrosse (who were the first to see the need for legislative action). Seen in Chart 5, only 70% of collegiate softball players, with an average grade of 9.7 at the onset of recruiting contact, responded that the recruiting experience was a positive one for them. A positive correlation is shown in Chart 6 between later average commitments and more positive responses to their recruiting experience. Chart 7 shows the average time for commitment as 10.7, which is the second highest, again, only after men’s lacrosse. In the same chart, it shows a difference of 10.1 average commitment time for Power 5 (“A5”) versus 10.8 for mid-major (“non-A5”). This almost nine-month difference can likely be attributed to a few different factors. First, it shows the Power 5 coaches’ willingness to eagerness to secure the best talent and highest prospects before their competitors. It also is indicative of the “trickle-down” that takes place in the recruiting process. Many prospects will hold off commitments to mid-major schools while hoping a Power 5 might give them an offer. It isn’t uncommon for prospects to commit to a mid-major only after they perceive they won’t receive a “better” offer.

The last two figures take a slightly different angle but will be important in making a case that bad matches tend to be made when recruits commit too early. Chart 8 shows the study’s findings that prospects who committed earlier had a higher likelihood of not enrolling in the institution to which they originally committed. The reasons they may not have enrolled there are negligible because regardless of the reasoning, it still indicated that the market moved too fast and bad matches were made as a result. The final chart shows the lack of information that
prospects had at the time of their commitment the younger they were. To anyone even slightly familiar with the concept of going to college, it is obvious that field of study is a key factor. However, younger prospects were more likely to have “no idea” what they wanted to study, again, leading to a higher likelihood of bad matches. These findings were instrumental in the initiative for NCAA recruiting changes across the board but were leveraged heavily in the pursuit of changes for softball.

**The Data**

Necessary to assumptions made in this paper, it is important to understand that coaches have more than just *perceived* incentives to recruit earlier than competing coaches. To begin to make a case that recruiting early tends to payoff, data was collected on softball All-Americans from 2018 (All-Americans are the top-performing athletes across Division I, regardless of conference affiliations, nominated by and voted on coaches across the country.) Of the 54 All-Americans, data was collected from athletes’ hometown publications or via direct contact on 47. Below is a chart outlining the breakdown of their school year when they made their initial verbal commitment.
Figure 3 2018 NFCA All-Americans by verbal commitment timing

Former prospects that committed before their junior years of high school account for 74% of All-Americans from 2018. Of the five that committed during their senior years of high school, three were a part of non-Power 5 programs (herein referred to as “mid-major”). Of the other two, one was from abroad, explaining the delay in her recruiting timeline. (The only other foreign-born All-American from 2018 also committed as a senior, but to a mid-major program). **Leaving only one All-American, of 47, from 2018 that committed to a Power 5 as a senior.**

Simultaneously, only 11 All-Americans made their original commitment to a mid-major institution (one committed to a mid-major and was an All-American only after transferring to a Power 5, and one committed Power 5 and was an All-American only after transferring to a mid-major.)

Note that this data reflects a *correlation* in early commitments and becoming an All-American—**not** a causation relationship. Committing early is not what makes a player into an
All-American but is indicative that the quality of player being recruited and the payoff of securing prospects at an early age.

It’s important to note that commitments creeping into 6th and 7th grade years is a phenomenon that has only begun to really emerge in the last 4-5 years. Players that committed in 6th or 7th grade, likely still have not begun college (most are probably just entering high school as the trend toward earlier commitments has expanded in the last few years), which explains why no commitments before 8th grade are reflected in the All-American pool from 2018.

Data was also collected and considered from lacrosse where the legislative changes have been in effect for an observable period of time. This data was collected from the InsideLacrosse.com Boys’ Commitment Database (2018). There was a sixteen-month period between the initial proposal from the lacrosse coaches, and the legislations’ approval and enactment by the NCAA. In the sixteen months immediately before the proposal, only six recruits were in the 8th grade when they committed, accounting for .89% of commitments. However, in the sixteen months after the proposal but before the approval and enactment of the new legislation (deemed the “critical period”), twenty-two commits were in the 8th grade, 2.5% of all commitments in that time period. After the enactment, 44% of commits were seniors and 55% were juniors. The remaining 1% were sophomores. (A speculated explanation for a sophomore commitment after the new legislation is that the prospective student-athletes received an offer prior to the enactment of the legislation and accepted the offer after its implementation.)

The same sort of “mad rush” to commit prospects whom it would soon be impermissible to contact is likely to have taken place during the critical period for softball as well. The University of Florida committed then 11-year-old Alexia Carrasquillo in January of 2018—just a
month after the proposal by the NFCA. After considering her decision for a month after receiving an offer from Florida coach Tim Walton, Carraquillo became the youngest athlete to commit to a university, in any sport, ever (Sievers, 2018).

**The Game**

First, assume competing coaches at two institutions which are located in the same geographic region, compete in the same athletic conference, and are both in favor of the new legislation. Such assumptions allow for a logical progression of thought in which each is able to observe the actions of the other as well as increase the likelihood that each institution is competing for recruits within a similar pool of prospective student-athletes. We will also assume that this interaction operates as a “repeated game”. ¹ This means that the game is expected to be an interaction that occurs indefinitely and thus can affect how individuals behave.

The pre-legislation recruiting environment engaged kids as early as 6th and 7th grade. For the scope of this paper, “early” recruiting will continue to be defined as recruiting interactions that take place prior to a prospective student-athlete’s first day of 11th grade.

Because both coaches are in favor of the new rules, the payoffs in the game for both are the same and ordered from most preferable to least preferable in terms of utility as listed below. Note, while each coach is in favor of the new rules, both have a most favored outcome of

¹ There are instances where the assumption of a repeated game may be stripped away from a coaches’ decision making, specifically in the case of the new legislation. A single-shot game approach could be present if a coach doesn’t plan to remain at a given institution (risk securing prized recruits to be more successful and land a better job or is indifferent to remaining in coaching long term). If any given coach approaches the game as a single-shot game, he or she has increased likelihood of cheating—if he gets away with it, he wins; if he gets caught, the punishment doesn’t bother him.
recruiting earlier while the competing coach does not because of the perceived benefit of being able to secure prized recruits before competing coaches.

Coach A and Coach J’s Preferences (in favor of new legislation)

4: Recruit early while the competing coach does not
3: Don’t recruit early while competing coach also does not
2: Recruit early while competing coach also recruits early
1: Don’t recruit early while competing coach does

As seen in the figure above, each coach’s individual decision to recruit early takes the outcome away from an ideal outcome where neither party recruits early. This is because there is at least a perceived advantage for each party individually in moving away from not recruiting early, eventually landing in a space where both do.
To understand how that happens, consider a recruiting environment only between these two coaches where neither coach is recruiting early. One day, Coach J realizes that there is benefit for him to recruit early, under the assumption that Coach A will continue to not recruit early. Coach J then gets the benefit of what he believes to be priority recruitment of younger prospective student-athletes. However, even if Coach A also was deciding to recruit early, it would still be in Coach J’s best interest to also recruit early or risk losing all priority recruitment to Coach A. This moves both parties to their second least preferred outcome where both are recruiting early.

The example above is an extremely simplified version of the game for the sake of understanding only the decision to recruit early or not. It is modeled simply to understand coach behavior without yet considering how decisions of prospects play into understanding the interactions.

*How the Game Changes*

Under the recent legislation, however, the game is forced away from the established Nash Equilibrium. The NCAA, as the regulating body of the game, in theory, moves both players back to the “Not Early” decision, the most desirable of sustainable alternatives given the aforementioned setup. Under the assumption that neither player cheats, all parties are said to be better off. As long as the game operates as an indefinitely repeated game, this should be a sustainable outcome. Now, neither coach has a motivation to move away from the “not early” option. The NCAA’s interference, in essence, is taking away the “recruit early” option. However, each party does still have an incentive to cheat. A player may cheat if the perceived reward from doing so outweighs some function of the consequence for doing so and the
likelihood of being caught. The NCAA operates primarily as an overseer which relies heavily on the self-policing of their constituents. For that reason, there are several interactions, or cases of “cheating”, that may be difficult to detect.

One example of cheating that could realistically go unreported would be interactions and impermissible conversations with a prospective student-athlete’s coaches. Under the legislation, coaches are not permitted to say anything outside of “I am interested in Player A” and “I am not interested in Player B”. Even saying “I am very interested in Player A” falls under impermissible action under the new rules. Assuming the player’s coach wants to act in whatever is believed to be in the best interest of all of his/her players, it is unlikely that he or she would report a college coach for stepping outside of what established permissible behavior.

Cheating could also realistically take place at camps where coaches are permitted to talk to prospective athletes of all ages within the scope of the camp. However, in the same way, conversations that venture outside of the scope of what is permissible would also be difficult to detect.

Especially because the NCAA relies so heavily on self-reporting, the new legislation is heavily dependent on coaches’ commitment to act ethically and within the bounds of the rules. This idea is not specific to the new rules regarding recruiting, but most of the rules the NCAA has put into effect. Each school has an athletic compliance department that is responsible for making sure coaches and administrators act in accordance with NCAA rules. By and large, the new recruiting legislation is expected to be followed. However, when a coach detects it may be more beneficial to curtail the rules in pursuit of a “game-changing” recruit, cheating could be expected.
Why Some Coaches Are Opposed to Legislation

The proposal and subsequent approval received a staggering amount of support from Division I coaches as well as the softball community as a whole. That does not negate the reality that for a myriad of reasons there are a handful of coaches that are opposed to the recent changes.

The bulk of this opposition comes from coaches of mid-major programs. Mid-major programs, in general, are at an automatic disadvantage in recruiting interactions, specifically when it comes to the most coveted prospects. According to a study conducted by the NCAA in 2017, the average timing of commitment for a softball student-athlete to a Power 5 school was 10.1 grade, versus 10.8 for non-Power 5 schools (NCAA). Apparent in this fact is the reality that Power 5 on average secure commitments eight-nine months earlier than their non-Power 5 competitors. Softball is one of only six (out of fifteen NCAA sponsored sports) to have a difference of at least half a year between average Power 5 and non-Power 5 commitments. Further, the study showed that 38% of student-athletes that committed in 10th grade or earlier didn’t even end up enrolling in the school to which they originally committed.

In recent years, as recruiting and verbal commitments have crept earlier and earlier, some mid-major programs claim to be surviving on a particular crop of prospects deemed “late bloomers.” The Power 5 programs have been the ones leading the charge in securing recruits even into their middle school years. As a result, when an athlete reaches, say, her junior year, most Power 5 programs have already promised out all their scholarship money for that class. This is where mid-major programs have been able to win out with prospects that have developed further into their high school careers. Because of this, there exists a school of thought amongst some mid-major coaches that the new legislation favors the Power 5 in this realm. By lining up
all Division I schools at the same starting line on September 1, Power 5 programs will now be in a position to scoop up some of the late bloomers they may have otherwise missed out on. (Anonymous, personal communication, December, 2017). However, Power 5 programs could continue to put higher priority on prospects they have been watching longer and still pass on the seemingly riskier choice of the late bloomer. Regardless of whether or not this train of thought is accurate, it is a popular argument for mid-major coaches who are opposed to the changes.

Coaches are also generally opposed in some capacity because of the unknown. There are plenty of opinions on how the new legislation may flesh out in different areas, yet no one can define exactly how it will play out in reality. This will force all coaches, in some capacity, to change how they approach recruiting. Systems and approaches and thoughts of the past will have to be altered to accommodate the new restrictions. Coaches that once spent recruiting time watching mostly 8th graders may have to transition to watching sophomores. Coaches that banked on a 2-3 year window to communicate with prospects before giving determining whether or not to offer them scholarships will have to find new ways to get to know them in a much shorter window.

While there exists some level of opposition, much of the opposition would be at bay with a September 1 of sophomore year date to begin recruiting. For whatever reason, coaches that are opposed claim to be more in favor of a date moved just one year earlier. Claiming that this will affect their recruiting strategy less, they believe they could be on board for such changes.

The Game When One Coach is Opposed

Due to the landscape of recruiting, the game could also be observed (in a simplified, two-coach interaction model) between a coach that is in favor of the legislation and a coach who is
The game will be evaluated using these coaches’ attitudes on the legislation to reveal their preferences, but assumed first that they are interacting before the enactment of the changes. Note, again, that both coaches’ most preferred outcome is to recruit early while the other coach does not. Notice that each coach’s second and third favored outcome are flipped compared to the other’s while most and least preferred alternatives are the inverse. Coach A will again be in favor of the new legislation, while Coach S is opposed. Coach A’s preference remain unchanged from the previous model, while Coach S’s preferences are ordered below.

Coach S’s Preferences (opposed to new legislation)

4: Recruit early while competing coach does not

3: Recruit early while competing coach also recruits early

2: Don’t recruit early while competing coach also does not

1: Don’t recruit early while competing coach does
Without the legislation changes, when coaches act in their own best interest, as economics assumes, the Nash Equilibrium again arrives in a spot where both coaches recruit early. In this interaction, Coach S is better off than she is with the intervention of the NCAA and the new legislation. Conversely, Coach A is worse off under the natural Nash Equilibrium, and better off when the NCAA imposes the legislation.

However, the consequences for cheating behavior are vague at best. As explained by the NFCA Educational Material, “Like all other allegations of NCAA rules violations, the coach and/or program will need to be turned into the compliance office and penalties are determined based on multiple factors. Some penalties include no longer being able to recruit the student-athlete and, in some instances, can result in the termination of the offending coach. Many coaches have NCAA rules violations provisions in their contracts, so intentional or repeated
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recruiting violations could be cause for termination.” While the gamut of potential consequences is seemingly unlimited, it is difficult to say definitively how coaches may respond. It is important to note, however, that “cheating” could not necessarily take the form of contacting recruits and securing commitments before the allowed date but could also look like impermissible conversations with prospects’ coaches before the allowed date. Such kind of violations would likely be seen as “minor” in the eyes of the NCAA, and as such, are much more likely to take place. However, due to the potential severity (termination) of violations as well, coaches will likely avoid blatant violations. The payoff to win more games by securing a prized recruit would be irrelevant if the coach is fired for being caught violating the rules.

**The Game When Both Coaches are Opposed**

When both coaches are opposed to the new legislation and prefer to recruit earlier than September 1 of prospects’ junior years they have identical preferences. Coach S’s preferences will remain the same as in the above model and Coach M’s preferences will be the same.
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The natural, ungoverned interactions between these two coaches that are both opposed to the new legislation would result in a Nash Equilibrium where both recruits early. However, when the NCAA enters as the governing body and enforces the recent changes to the rules, the coaches are forced into an equilibrium where neither recruit early and each is less well-off under their given preferences.

Regardless of the preferences of the coaches interacting in the game, each scenario ends up in the same Nash Equilibrium where both coaches are recruiting early—including those who claim to not want to. This explains much of why early recruiting became such a widespread phenomenon and has gotten to a place where the NCAA has been pushed to step in and regulate it.

Matching Markets

While the aforementioned setups give a fair representation of the interactions that take place, all are limited to explaining only one side of the market. The models used above would be sufficient in traditional markets where an equilibrium is achieved on the basis of supply and demand. The coach would “buy” the best recruits each was able to afford and recruits would be “allocated” accordingly. However, in recruiting, each party (the coach and the prospective student athlete) has to agree in order for a transaction to take place—a decision that can be thought of as mutually exclusive. A coach has a pool of potential recruits. Within her pool, there are different calibers of players—each “commodity” (prospect) is not identical to another. With that in mind, a coach has preferences from most to least preferred. Simultaneously, each prospect is not faced with identical packages from different coaches. A slew of factors will impact a prospect’s decision, so she, likewise, has programs she would prefer over others.
Economists have deemed these markets where each party has to agree in a transaction as “matching markets”. Contrary to popular belief in the collegiate coaching circle, the problem of early recruiting is not one that is unique to sport. Alvin Roth, winner of a Nobel Prize in Economics in 2012, has done extensive research and analysis concerning this idea. In his book, Who Gets What—And Why, he explains a range of matching markets from competitive clerkship offers to law students, to college Bowl Game selections, to residency program placements for aspiring doctors. A trend amongst each of these markets, which has become a glaring trend in recruiting as well, is that each slowly inched to an earlier and earlier timeline, arriving at a place of “failure” because it is less than ideal for both parties. Generally, coaches would rather wait longer before committing to a recruit to see how a she develops throughout her high school career. Recruits, likewise, would rather wait longer to be able to gather more information and gauge interest from different programs and make an educated selection at an age-appropriate time. “That’s one of the dangers associated with early transactions:” Roth says, “they can come before important information is available. And that can mean bad matches made and good ones missed,” (60). Not only that, but making matches early means that coaches are making commitments when they don’t know what the landscape of their team will be in five years when the prospect finally enrolls. Players may quit or get hurt, leaving positions that need to be filled before anticipated.

However, much like in the matching markets examined by Roth, the pressure for coaches to secure top prospects has encouraged them toward committing them earlier and earlier in recent years. Simultaneously, prospects began to face more and more pressure to accept offers from a particular school or else risk the offer being rescinded if they waited. Roth explains “college admissions and labor markets are more than a little like courtship and marriage: each is a two-
sided matching market that involves searching and wooing on both sides. A market involves matching whenever price isn’t the only determinant of who gets what,” (2015, p. 6).

At its core, the failure in the recruiting market is a problem Roth deems “unravelling”. He defines unravelling as a failure of self-control—“participants just can’t stop themselves from transacting early, because if they resist the urge, they’ll lose out to someone else,” (Roth, 2015, p. 67). As of September of 2018, there are already rumors of coaches contacting prospects at midnight of September 1, the earliest they possibly could under the new legislation from the NCAA. The key difference between the recruiting market and many of the markets explained by Roth is that the NCAA is a governing body with the ability to enforce high levels of punishment on its constituents for cheating. With that in mind, it is slightly more promising that this intervention could hold up, unlike similar fixes in many other matching markets. However, as mentioned previously, in the face of a big-time recruit and in a market where cheating is difficult to detect, it would not be surprising for a coach to act in his or her best interest in risking early contact.

This risky interaction is made even more complex because of the nature of the matching market. In a commodity market, the commodity does not care (or even notice) if the “purchaser” cheats in obtaining it. However, in a matching market, the prospect is able to recognize cheating behaviors should a coach choose to engage in them. The coaches’ behavior is what economists refer to as a “signal”. A prospect may or may not be able to clearly determine the kind of person a coach is or the kind of character her or she embodies, but a decision to evade the rules (cheat) could be interpreted as a signal of poor personal character. For prospects to whom the quality of character of the coach is an important factor in the decision-making process, attempting to transact early could actually hurt the coach’s chances of making a successful match. Not to
mention the potential for the prospect (or her family or friends) to be the one to report the violation to the NCAA. Because the recruiting interaction acts much like the one for a job interview, both parties are in a position where they have to rely on signals from the other. The signal given by a coach willing to cheat on the rules could be that he or she is unethical, willing to win at any cost, or thinks he or she is above rules. Any of these signals received by a prospect could sway her decision because of the perceived character of person she would be committing to play for. On the converse, there are prospects who would be flattered by a coach’s willingness to circumvent the rules. The signal could instead be interpreted that the coach is views the prospect as “worth the risk” or that he or she highly values winning. Some players could interpret those characteristics as positive characteristics and be swayed to also evade the rules. This is of course hard for a recruiting coach to detect before gambling on it and as such, further adds to the risk of the cheating behavior.

*Failures in Matching Markets*

Roth identifies four common problems this kind of market can face which lead to market failure. These failures arise because the market 1) is too risky 2) gets congested 3) moves too fast and 4) moves too soon (or any combination of the four mentioned problems). When a market is too risky, individuals don’t want to participate in transactions. This can look like the threat of physical harm or danger in making a transaction or not trusting the market to make a sustainable and acceptable match. A market gets congested when a party has to wait on the decision of another after an extended offer and in the meantime, is missing out on other potential matches while they wait. A market moves too fast when offers become “exploding”—meaning recipients have a very short period of time in which they can accept or decline offers, both of which can be risky decisions. Finally, a market moves too soon when the fear of missing out on ideal matches
encourages one party to begin to seek out a match earlier than competitors, continually pushing the timeline earlier in order to secure the match. The recruiting market does not appear to be inherently risky, however, it is not difficult to see how each of these problems can be seen in the market.

Congestion, a problem that existed before the new legislation, is one that will continue as a prospect takes her time to consider individual offers while a coach has to wait to see if she accepts before offering the same scholarship money to another prospect. Congestion is a problem which is left almost completely unaltered with the legislative changes and will continue to keep the recruiting market from operating efficiently.

The market clearly moved too soon prior to the legislation. Implementing this date for contact is the NFCA and NCAA’s attempt to move the process back to a “more appropriate” time frame. However, under legislation changes, it could still be expected that coaches will continually inch earlier to a point where they are contacting prospects at midnight on September 1st (the absolute earliest the legislation allows). Generally, the definitive date for contact in recruiting can be expected to solve the problem of the market moving too soon, which was its aim.

In general, the market didn’t move too fast in regard to exploding offers before the legislation. Because the process started for many prospects at a young age, it would have been abnormal to hear of a coach giving a prospect a day, or even a week, to consider the offer before accepting or declining it. However, this is a potential problem that will being to arise because congestion is still present. Now, though, coaches don’t have three or four years for the process,

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2 At the time of this paper, about a month after the first September 1 under the new rules, rumors have already circulated that some coaches did actually contact recruits at midnight.
they have two or less. In all likelihood, coaches will not be willing to wait very long to get an answer from a prospect they have extended an offer to. The result will likely be “exploding offers” where prospects are given a very short timeline (as short as a few hours if it operates anything like many of the markets Roth studies) in order to make a decision.

Another separate, but key problem with the legislation is operates as self-reporting system. As a result, those who follow the rules get passed up by those who didn’t when the regulating (NCAA) agency can’t process or track information. This means that coaches who are able to engage in activity that is cheating under the new rules, but fly under the radar, are likely to gain an upper-hand on those who don’t. This incentivizes some cheating behavior—at the very least that which coaches deem to be in the “gray area” of the rules. The most likely cheating behavior, again, is engaging in otherwise impermissible conversations with or asking impermissible questions of a prospect’s coach.

*How the Recruiting Market Operates Like the Residency Market*

To better understand each of these problems in matching markets, as well as how the recruiting market is a matching market, consider one example from Roth. The market is that for medical school students to residency programs at a hospital. Residency placements have been a typical component of doctoral training since about 1900 and are a requirement to becoming licensed to practice medicine. Residents are helpful to hospitals because they act as a sort of cheap labor as well as potential full-time hires upon completion of residency. Medical students/graduates need a resident placement in order to gain field training as well as to fulfill requirements, and the better placements they can obtain, the better job outlook after their completion, whether at the same hospital or another.
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each year, just as a softball coach recruits a handful of players for each year. Some hospitals and programs have a better reputation than others, just as some universities have better reputation/appeal than others. As a result, medical students and prospective student athletes alike have preferences for matches they would prefer over others.

As the residency “market” grew more commonplace over the course of the early 1900s, it naturally grew more competitive. According to Roth (2015) by the 1940’s, offers were being made to students with as much as two years of medical school left to be completed. This case of the market moving too soon (as aforementioned), was clearly less than ideal for both the hospitals and the students. Hospitals were gambling on students that showed some initial promise without any certainty of how they would develop in later classes and what their interests might be. Similarly, students were locking in to programs without a cultivated idea of what they may want to specialize in. This, unsurprisingly, resulted in bad matches.

The recruiting market has been operating in much the same way. While offers will continue to be made while prospects have two years of high school left, the recruiting market had moved even further, reaching to students that hadn’t even entered high school yet. In much the same train of thought, prospects could not have a good idea of what they would want to study in college (an otherwise obvious factor when choosing a university). Coaches, like the hospitals, were gambling by obtaining commits from players that show potential as seventh and eighth graders—prospects whom oftentimes had their offers rescinded as juniors or seniors if the college coach didn’t like how they developed. While some good matches were made, as seen in the data collected on All-Americans, there were some bad matches, as well as untapped “late bloomers” who played at lower level universities. Again, bad matches were made.
In 1945, the residency market attempted a fix which echoed much of the legislation enacted for the recruiting market. Change finally began to take place when “a third party—medical schools—agreed not to release information about students before a specified date, was the timing of offers controlled,” (Roth, 2015, p. 135). Note that the recruiting interaction, composed primarily of interactions between coaches and prospects, also required a third-party interaction from the NCAA to control the timing of offers. What happened next, and what could reasonably be expected in the recruiting market as well, is the problem of moving too fast. Exploding offers became more and more common as hospitals didn’t want to lose out on their second-tier candidate options if their first tier took their time to ultimately decline an offer. Ultimately, the market arrived at a place where the problem of early offers was fixed, but they were faced with a completely new problem, which still led to an inefficient market where bad matches were made.

**“The Match”**

Once the market unraveled, again, by attempting to control the timing of offers a completely different kind of fix was implemented. Rather than trying to control either party with restrictions and withholding information, the market sought a way in which good matches could be made for both parties. The answer for a sustainable residency market—a clearinghouse system, “The Match”. This system, cited by Roth to be deemed the “deferred acceptance algorithm”, was developed by David Gale and Lloyd Shiple. A stable outcome of matches is achieved under this system where no “blocking pairs” exist. A blocking pair would be where two parties would both prefer each other over the match they were given. This means “there aren’t any applicants and employers that aren’t matched to each other but that both wish they were,” (Roth, 2015, p. 142).
The clearinghouse system starts with candidates and hospitals both submit an ordered list of their preferred choices into the database. Then the algorithm does the rest. That algorithm goes through each party’s preferences one at a time. The system first matches to the hospital their most preferred candidates and applicants tentatively accept the offer ranked highest in their preferences. Next, employers that have had offers rejected extend offers to the next tier of applicants. If an applicant receives an offer that ranked higher on his or her preference list, the tentative acceptance of the first is withdrawn and the more preferred offer is now tentatively accept. And so the process continues until no offer is rejected. This whole process, after applicants and employers submit their preference list, happens within The Match, and both parties are given only the final results (they don’t know what offers were tentatively accepted and later rescinded within the process). The outcome of The Match does not force either party into that match but has been proven to create the best outcomes for both parties when accurate preferences are submitted. “The Match”, first implemented with this algorithm in 1962, remains in use for residency placements today.4

“The Match” and Recruiting

The natural question to follow is, would this solution work in the recruiting market? One of the most notable difference between the market for softball players and that for medical students is the need for specialization within a team. In the residency market, programs are specialized by nature. For instance, a pediatric residency would be preferred by students desiring to enter into pediatrics. On the contrary, all coaches are offering essentially the same “opportunity” — to play college softball. Within that opportunity, a coach needs matches with

4 The Match underwent some slight modifications (led by Roth) in the 70’s to account for married couples seeking residencies in the same area. The process for singles remains the same and is the pattern of thought that will be employed in evaluating the system in terms of the recruiting market.
slightly different “specialties”—pitchers, catchers, infielders, outfielders. One side of the market under the clearinghouse system could be compared to making an auto-draft list of options in fantasy football. If a fantasy owner puts a quarterback as his top four preferences in an auto-draft, there is a possibility that he could end up with four quarterbacks, when he really only needed one or two. Even if he spaces out his quarterback preferences with other positions, if the players he puts in between them get chosen before his next quarterback, he could still end up with more than he needs. Taking that train of thought, a coach in the recruiting market would have to very carefully indicate the order of absolute preferences under The Match as it exists currently, and still possibly end up with too many players for any given position and not enough of another. A potential, simple fix for this that would allow the clearinghouse system to be a legitimate possibility would be to have different list preferences based on position. A coach could indicate how many players from a given category they are wanting to recruit in a given year and then be matched in each pool accordingly.

While The Match points to an outcome that is sustainable and efficient for the recruiting market, it is not likely that it would be met without opposition. Coaches would likely have trouble giving up the illusion of control, even if matches proposed by the system were non-binding. Coaches, and players, would have to trust the system and be willing to submit their true order of preferences in order for the system to work. If any group of coaches were unwilling to partake in the system, it wouldn’t work because matches made outside of the system would interfere with its ability to make matches based on preferences of both parties involved. However, if coaches were somehow able to buy in to the clearinghouse system, recruits would follow suit.
While the presence of an automated matching system dependent on preferences can be trusted to make initially good matches, it does not mean that it will eradicate players quitting, transferring, or being cut. The recruiting interaction, again, is one of limited information. As such, coaches and players alike don’t have a complete picture of the person or atmosphere they are committing to—each show only what he or she wants the other to see. As a result, problems can still arise that cause players or coaches to no longer wish to continue to work together, and transferring, quitting, or getting cut can be the result. Similarly, players can develop quickly in college to a level which makes them a good match for a higher-level program. These players, too, could still end up transferring before graduating from the program they were initially matched with.

In order for this system to work in combatting early recruiting and exploding offers, recruits could take their entire junior year to explore options, go on visits, and interact with coaches. By a specified date, likely around the beginning of their senior years, coaches and prospects could enter their preferences into the system and receive their best matches. Recruits would make their decisions all at the same time, removing the exploding offer and naturally taking away the coach’s incentive to recruit them earlier knowing prospects won’t make a decision before the clearinghouse can offer the best match.

However, did this market already have essentially the same algorithm, played out over time in real life rather than instantaneously within the confines of a clearinghouse system? Consider the idea of the “verbal commitment”. This common component of the recruiting process has been employed, and generally upheld, in recruiting interactions in softball in recent history. Remember that a verbal commitment is said to be non-binding on either party and is not even recognized by the NCAA. As such, there is no enforceable punishment on either coaches or
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players for withdrawing their verbal commitment—a part of the process the matching system would do on its own in the algorithm to arrive at the best matches. However, because these commitments have had a tendency to be upheld and give a perception of “locking in” a given recruit, the process has continued to move earlier across the board prior to the legislative changes. This is in large part because of ethical considerations of both parties. However, if coaches and players really looked at the verbal commitment as it is defined, as non-binding, would the result be matches which look much more similar to the ones arrived at under a clearinghouse like The Match? If coaches knew that verbal commitments they received were genuinely non-binding, both ethically and legally, there could be removed incentive to recruit early. At any time, a better offer could come along, and the recruit would be (and feel) free to decommit from one program commit to the one which she prefers more. As a result, coaches would waste much time and effort recruiting players at too young of an age.

The most likely problem that coaches would have with both a clearinghouse like The Match and in a shifted view of the verbal commitment stems from a fundamental difference in these two markets. While competition exists in some forms between hospitals for prestige, grants, or status, they don’t tend to compete head-to-head the way college softball programs exist. At the core, hospitals operate to help patients—to save lives. Softball teams, however, operate with the goal of winning championships. Because winning championships is exclusive and requires creating the best team, coaches don’t necessarily clear the market “clears” or operates efficiently. If a coach can secure a recruit that, in theory, could play at a “bigger” school, he wins. It is likely less important to a coach that good matches are made throughout the country than it is that he gets the best commits for his program to be in the best position to win a championship. Many of the problems discussed in the scope of this paper could be addressed if
coaches were more concerned with the market as a whole and the best matches for all parties involved than just his own team. However, coaching and intercollegiate sport is highly competitive and winning in head-to-head matchups is mutually exclusive—one team wins and one team loses. The vast majority of coaches are tend to care much more about being on the winning side of that deal than on every prospect and every other school receiving the best match.

For Further Investigation

As is always the case in the social sciences, the applications of theories and outcomes from other markets are educated speculation of how the recruiting market will respond in the wake of the legislative changes. Research should be collected in the future as to how it plays out in reality. Does the market arrive at sustainable outcomes consistently? Do coaches act in accordance with the rules? Can cheating behavior be detected? Would a matching system, like the one implemented in the residency market, be a viable option? Is it something coaches could be on board with, or interested in learning more about? Survey data could be collected regarding coaches’ attitude toward the system. However, a solid understanding of the problems faced in other markets, troubles faced in other attempted fixes similar to the new legislation, how The Match really works would be necessary to gain any kind of traction amongst coaches. Survey data could also be collected on coaches’ and players’ ideas of removing the ethical enforcement of the verbal commitment and returning to a system, not regulated by a specified start date, where a matching system would be able to play out naturally.
## Appendix A: 2018 All-American Commitment Timings

<table>
<thead>
<tr>
<th>Mid-Major?</th>
<th>University, Conference</th>
<th>Grade at commitment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>University of Washington, Pac12</td>
<td>8th</td>
</tr>
<tr>
<td></td>
<td>Michigan University, Big10</td>
<td>8th</td>
</tr>
<tr>
<td></td>
<td>University of Georgia, SEC</td>
<td>8th</td>
</tr>
<tr>
<td></td>
<td>Florida State University, ACC</td>
<td>8th</td>
</tr>
<tr>
<td></td>
<td>University of Tennessee, SEC</td>
<td>freshman</td>
</tr>
<tr>
<td></td>
<td>Oklahoma University, Big12</td>
<td>freshman</td>
</tr>
<tr>
<td></td>
<td>University of Florida, SEC</td>
<td>freshman</td>
</tr>
<tr>
<td></td>
<td>Oklahoma University, Big12</td>
<td>freshman</td>
</tr>
<tr>
<td></td>
<td>University of Oregon, PAC</td>
<td>freshman</td>
</tr>
<tr>
<td></td>
<td>Texas A&amp;M, SEC</td>
<td>freshman</td>
</tr>
<tr>
<td></td>
<td>University of California Los Angeles, PAC</td>
<td>freshman</td>
</tr>
<tr>
<td></td>
<td>Northwestern University, Big10</td>
<td>freshman</td>
</tr>
<tr>
<td></td>
<td>University of Texas, Big12</td>
<td>freshman</td>
</tr>
<tr>
<td></td>
<td>University of Washington, Pac12</td>
<td>freshman</td>
</tr>
<tr>
<td></td>
<td>University of Georgia, SEC</td>
<td>freshman</td>
</tr>
<tr>
<td></td>
<td>Oklahoma University, Big12</td>
<td>freshman</td>
</tr>
<tr>
<td></td>
<td>University of Oregon, PAC</td>
<td>sophomore</td>
</tr>
<tr>
<td></td>
<td>Arizona State University, PAC</td>
<td>sophomore</td>
</tr>
<tr>
<td></td>
<td>University of Florida, SEC</td>
<td>sophomore</td>
</tr>
<tr>
<td></td>
<td>University of Arizona, PAC</td>
<td>sophomore</td>
</tr>
<tr>
<td></td>
<td>University of California Los Angeles, PAC</td>
<td>sophomore</td>
</tr>
<tr>
<td></td>
<td>Oklahoma State, Big12</td>
<td>sophomore</td>
</tr>
<tr>
<td></td>
<td>University of Georgia, SEC</td>
<td>sophomore</td>
</tr>
<tr>
<td></td>
<td>University of Minnesota, Big10</td>
<td>sophomore</td>
</tr>
<tr>
<td></td>
<td>University of Alabama, SEC</td>
<td>sophomore</td>
</tr>
<tr>
<td>Yes</td>
<td>Texas State, Sunbelt</td>
<td>sophomore</td>
</tr>
<tr>
<td>Yes</td>
<td>James Madison University, Colonial</td>
<td>sophomore</td>
</tr>
<tr>
<td></td>
<td>University of Tennessee, SEC</td>
<td>sophomore</td>
</tr>
<tr>
<td></td>
<td>University of Michigan, Big10</td>
<td>sophomore</td>
</tr>
<tr>
<td></td>
<td>Oregon University, PAC</td>
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</tr>
<tr>
<td></td>
<td>transfer from Utah to Kennesaw (Power to mid)</td>
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</tr>
<tr>
<td></td>
<td>University of Florida, SEC</td>
<td>sophomore</td>
</tr>
<tr>
<td>Yes</td>
<td>University of Houston, AAC</td>
<td>sophomore</td>
</tr>
<tr>
<td>Yes</td>
<td>Florida State University, ACC</td>
<td>sophomore</td>
</tr>
<tr>
<td></td>
<td>University of Houston, AAC</td>
<td>sophomore</td>
</tr>
<tr>
<td></td>
<td>Louisiana State University, SEC</td>
<td>sophomore</td>
</tr>
<tr>
<td>Yes</td>
<td>Original commitment to Florida Atlantic University, Conference USA; All-American only as graduate transfer to Florida State University, ACC</td>
<td>sophomore</td>
</tr>
<tr>
<td></td>
<td>University of Oregon, PAC</td>
<td>junior</td>
</tr>
<tr>
<td>University</td>
<td>Conference</td>
<td>Year</td>
</tr>
<tr>
<td>--------------------------</td>
<td>--------------</td>
<td>-------</td>
</tr>
<tr>
<td>Baylor University, Big12</td>
<td>junior</td>
<td></td>
</tr>
<tr>
<td>Drake University, MVC</td>
<td>junior</td>
<td></td>
</tr>
<tr>
<td>Brigham Young University, West Coast</td>
<td>junior</td>
<td></td>
</tr>
<tr>
<td>Elon University, Colonial</td>
<td>junior</td>
<td></td>
</tr>
<tr>
<td>James Madison University Colonial</td>
<td>junior</td>
<td></td>
</tr>
<tr>
<td><em>Commit to University of Tennessee, SEC; All-American at Long Beach State University, Big West</em></td>
<td>junior</td>
<td></td>
</tr>
<tr>
<td>Kent State, American</td>
<td>senior</td>
<td></td>
</tr>
<tr>
<td>Eastern Kentucky University, OVC</td>
<td>senior</td>
<td></td>
</tr>
<tr>
<td>University of Washington, Pac 12</td>
<td>senior</td>
<td></td>
</tr>
<tr>
<td>Gardner Webb, Big South</td>
<td>senior</td>
<td></td>
</tr>
<tr>
<td>Boston College, ACC</td>
<td>senior</td>
<td></td>
</tr>
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</table>
Appendix B: Lacrosse Commitments

<table>
<thead>
<tr>
<th>Classification at Commitment</th>
<th>Number of Commitments</th>
<th>Percentage of Commitments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior</td>
<td>85</td>
<td>12.57%</td>
</tr>
<tr>
<td>Junior</td>
<td>223</td>
<td>32.99%</td>
</tr>
<tr>
<td>Sophomore</td>
<td>233</td>
<td>34.47%</td>
</tr>
<tr>
<td>Freshman</td>
<td>127</td>
<td>18.79%</td>
</tr>
<tr>
<td>8th</td>
<td>6</td>
<td>0.89%</td>
</tr>
<tr>
<td>Post Graduate</td>
<td>2</td>
<td>0.30%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>676</strong></td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Classification at Commitment</th>
<th>Number of Commitments</th>
<th>Percentage of Commitments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior</td>
<td>191</td>
<td>21.73%</td>
</tr>
<tr>
<td>Junior</td>
<td>329</td>
<td>37.43%</td>
</tr>
<tr>
<td>Sophomore</td>
<td>234</td>
<td>26.62%</td>
</tr>
<tr>
<td>Freshman</td>
<td>94</td>
<td>10.69%</td>
</tr>
<tr>
<td>8th</td>
<td>22</td>
<td>2.50%</td>
</tr>
<tr>
<td>Post Graduate</td>
<td>9</td>
<td>1.02%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>879</strong></td>
<td></td>
</tr>
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<table>
<thead>
<tr>
<th>Classification at Commitment</th>
<th>Number of Commitments</th>
<th>Percentage of Commitments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seniors</td>
<td>358</td>
<td>43.55%</td>
</tr>
<tr>
<td>Junior</td>
<td>450</td>
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<tr>
<td>Sophomore</td>
<td>14</td>
<td>1.70%</td>
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<tr>
<td>Freshman</td>
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</tr>
<tr>
<td>8th</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td>Post Graduate</td>
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</tr>
<tr>
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ECONOMICS OF RECRUITING

References


