

An Economic Model of the College Football Recruiting Process

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ABSTRACT

Major college football programs devote an enormous amount of financial resources in annual efforts to persuade high school football players to attend their schools. In this study, we develop an empirical model of the factors that recruits consider when selecting a school. We construct a database that combines school-specific attributes with recruit-specific information, and build probit models that estimate the relative importance of these factors. Our estimates imply that recruits' decisions are governed by a handful of primary factors, among them the school's recent football rankings and the geographical distance between the recruit and the college. Also, those schools that are members of conferences affiliated with the Bowl Championship Series (BCS) are found to have a significant recruiting advantage compared to other institutions. We also show that this effect is so substantial that schools adjust their recruiting behavior and targets accordingly. This recruiting imbalance may serve to create or perpetuate a quasi-monopsonistic labor market.

I. Introduction

On February 4th, 2004 linebacker Willie Williams signed a scholarship to play football at the University of Miami. During his recruitment, Williams had detailed the recruiting process in a series of interviews with *The Miami Herald*. He described the lavish treatment afforded to him and other high school football stars during their “official visits” to potential college destinations; these journal entries (though later shown to be somewhat exaggerated) also indicated that each school he visited tried to “out-do” other schools, by booking him into five star hotels, furnishing him with seven course meals, or even flying him to the campus on a private jet.

On that same day that Williams announced his decision, hundreds of other high school players also revealed their college destinations, some even live on *ESPN*, indicating that the media attention garnered by Williams was hardly unique. This increased media coverage given to high school football recruits and the recruiting process coincides with the explosive growth in the popularity and revenues associated with college football.

This study attempts to identify and quantitatively measure the factors that lead student-athletes to select particular schools, utilizing school-specific information along with detailed recruiting data. The remainder of this introductory section provides a brief review of the growth in popularity of college football, including the current bowl system, as well as an overview of the recruiting process. Section II reviews the related literature, and a theoretical model of recruiting is described in Section III. The data and empirical methodology are detailed in Section IV, and the results are presented in Section V. In this last section, we also use the results from the empirical models to predict the college choices of the top 100 ranked high school players in 2005. The findings from the model suggest that the typical recruit’s utility may depend on

multiple factors, including the opportunity for individual success and exposure, a team's recent on-field success, and the distance to the school from his hometown. The results also indicate that membership in one of the six "BCS" conferences provide a significant recruiting advantage for those schools, which may enhance or perpetuate a quasi-monopsonistic labor market.

The NCAA, the growth in college football, and the BCS

"Major" college football, along with most all other intercollegiate sports, currently operates under the rules and regulations set forth the by National Collegiate Athletic Association (NCAA).¹ This organization was initially organized in 1906, albeit under a different name, at the behest of President Theodore Roosevelt due to widespread injuries and deaths from playing college football. Naturally, its original mission was to protect the (physical) welfare of student athletes and to promote sportsman-like behavior. Even today, the self-described core purpose of the NCAA is "to govern competition in a fair, safe, equitable and sportsmanlike manner, and to integrate intercollegiate higher education so that the educational experience of the student-athlete is paramount."

Dramatic growth of college sports in the 1930's and 1940's also brought a rise in related, sordid activities surrounding the support, namely gambling and direct payment to players and recruits. As a result, the NCAA adopted the so-called "Purity Code" (later renamed the "Sanity Code") in 1948. This legislation was the first to establish eligibility and recruiting guidelines, but provided little in the way of enforcement mechanisms. Thus, it failed to stem many of the amateurism and recruiting abuses. Nevertheless, the Sanity Code was important since the member schools accepted, without opposition, the concept that the NCAA could set rules and

regulations regarding scholarships and recruiting and could penalize those schools not in compliance.

In the early 1950's attendance at college football games began to drop, albeit slightly, after many years of steady increases. Most schools blamed the growing number of television broadcasts, and in 1951 the NCAA began to substantially limit the number of television appearances of member schools.² In 1984, the University of Oklahoma and the University of Georgia successfully sued the NCAA, claiming that the organization had violated the Sherman Antitrust Act by limiting the number of television appearances of the member schools' football teams.³ Following that decision, individual schools and conferences began to negotiate directly with television broadcasters, resulting in many more televised college football games. Though the NCAA had argued that the increase in television exposure would limit the attendance at college football games, the exact opposite has occurred: the increase in exposure of the sport resulted in a higher demand by football fans. By 2003, college football teams generated over \$5 billion in revenues from ticket sales and television proceeds, and nearly 41 million fans attended college football games.⁴ The 2004 Sugar, Orange, Rose, and Fiesta Bowls collectively paid out \$112 million to the eight teams that participated in those four Bowl Championship Series (BCS) games.

Colleges and universities vie for the revenues from college football just as they compete for victories on the field. In 2003, the Atlantic Coast Conference (ACC) managed to convince three schools from the Big East conference to switch conferences, primarily on the argument that membership in the ACC would be more lucrative, for both the new and existing members. Undaunted, the Big East responded by convincing teams from Conference USA to replace their lost members, again relying on projections of higher revenue to attract those teams. The ACC

has subsequently scheduled a conference championship game at the end of the 2005 season which is expected to generate an additional \$8 to \$10 million⁵ for its members.

The BCS system was established before the 1998 season as an alternative to a playoff system. All teams are ranked at the end of the season, using a combination of (human voting) polls, computer polls, and a strength-of-schedule component.⁶ The top two ranked teams in this formulation are then paired together in one of the four BCS bowls, and the contest is advertised by ABC Sports as the “national championship game.” The other six slots in the remaining BCS bowls are then chosen by the representatives of those bowls. However, the conference champions from the following conferences are guaranteed inclusion: the Atlantic Coast Conference (ACC), Big Ten Conference, Big Twelve Conference, Big East Conference, Pacific Ten Conference (PAC-10), and Southeastern Conference (SEC). As such, these conferences are often referred to as the “BCS Conferences,” and though the result may not be causal, their members also enjoy the benefits of heightened media exposure during the football season. It would be erroneous to assume, however that the BCS conferences were randomly selected. In fact, the schools in the conferences selected for membership accounted for all but one of the national champions since 1945. So, by design, the BCS attempted to include the most successful or traditionally powerful schools.

After the conference champions automatically fill up six slots in the BCS bowl games, the two remaining berths can be filled by other top teams in the BCS rankings, including those that do not belong to a BCS conference. Yet in the seven years since the advent of the BCS system, only one of the 14 available at-large berths has been filled by a non-BCS conference team. Naturally, since the potential payout for these events is quite substantial, teams in conferences not carrying the BCS designation have publicly complained about the inequities in the system.

In order to compete viably for participation in the lucrative conference championship games and bowls, college football teams need to generate success on the playing field. To that end, schools also compete over the input factors in a football production function, namely coaches and players. As such, the average head coach is estimated to earn over \$1 million per year in salary, endorsements, and other fringe benefits.⁷ Coaches with a demonstrated history of success and winning championships command an especially high wage: after winning a share of the National Championship in the 2004 Sugar Bowl, Louisiana State head coach Nick Saban's salary was increased to over \$2.3 million per year, and long-time Florida State coach Bobby Bowden (2 National Championships and over 10 conference championships) is also paid more than \$2 million annually.⁸

The Recruiting Process

The effort by colleges and universities to attract new players is known as recruiting. This process usually begins even before the player's senior year of high school. Usually, college coaches begin to make contact with the player after his junior year through mail, phone calls, or by inviting the player to attend summer "camps" held at the school, in which they can participate in football practice sessions run by the coaching staff. Once football season begins, recruits are invited to officially visit the campus; the school pays for the travel, food and lodging of the recruit during such visits.⁹ Also, members of the coaching staff often make "in-home" visits to the athlete's residence in order to establish better relationships not only with the player, but also his family.

At some point during the process, the school may offer a scholarship to the player, which covers tuition, books, and housing. Alternatively, a school may ask a player to “walk-on”, meaning that they are invited to join the team, but not afforded financial assistance. The costs incurred by schools in the recruiting process are substantial – the average institution spent \$526,000 in 2001.¹⁰ According to NCAA rules, schools are prohibited from offering additional incentives beyond a scholarship, such as cash, vehicles, or promises of employment to the student-athlete or their family members.¹¹

The recruiting process has recently garnered headlines in the media following inappropriate behavior by both the schools and the recruits themselves. In 2004, the University of Colorado was alleged to have provided prospective student athletes with alcohol and female “escorts.” Further, the aforementioned Willie Williams was arrested three times (including a felony charge) during a single recruiting visit to the University of Florida. These events help fuel the general perception that recruiting is a sordid and tawdry affair. However, these types of events may be more of an exception rather than the rule: the number of schools found by the NCAA to have committed major violations of recruiting rules is relatively small: less than 15 in the past decade. Thus, it appears reasonable that most schools (and recruits) adhere to the recruiting guidelines and rules set forth by the NCAA. Nevertheless, the NCAA promulgated additional recruiting restrictions beginning in the 2004 academic year (and thereafter). More specifically, schools were prohibited from providing extraordinary treatment to recruits on their official visits, such as transporting them to campus in private jets and lodging them in luxurious hotels.¹²

II. Review of Related Literature

As noted by many authors, the structure of the NCAA is a classic example of an economic cartel. In particular, the members of the NCAA agree to abide by a set of rules and regulations in order to maximize their joint welfare. Initially, this would have included the safety of the players as well as the loss of financial resources when schools were openly bidding against each other for players. More recently, this would also include the maximization of revenues associated with college athletics. Some authors have attempted to measure whether this cartel structure has resulted in an equitable distribution of these benefits for each of the member schools.

Eckard (1998) examines the competitive balance across schools for the 25 year periods before and after the introduction by the NCAA of the “Sanity Rule.”¹³ He finds that the new rules and regulations effectively blocked the weaker teams from improving and therefore shielded the stronger teams from increased competition. That is, in the absence of the cartel arrangement, weaker teams could respond to their disadvantageous position by luring higher quality players to their school, most likely with additional funding above and beyond the normal scholarship, or even by providing jobs to family and friends.

Similarly, Sutter and Winker (2003) examine the impact of reductions in the number of scholarships allowed, per team, on competitive balance. The policy of reducing scholarships at each school is promoted as a tool to enhance overall parity by reducing the concentration of highly skilled athletes at each school. Such reasoning is relatively straightforward: if schools are limited in the number of players they can sign each year, this implies that the top-ranked recruits will be less concentrated among the “stronger” programs, and therefore able to improve

the weaker programs, leading to greater competitive balance. The authors, however, do present an argument of how such scholarship reductions could actually lead to *reduced* competitive balance. They assume that the evaluation of recruits is accompanied by a certain level of risk or uncertainty about that recruits likely performance at the college level. In fact, the authors argue that the risk associated with recruiting a middle-tier high school athlete is greater than that associated with recruiting the top-flight athlete. Reducing scholarships available to mid-level teams therefore reduces the pool of candidates available to offset this risk and consequently reduces the probability that a competitive team can be assembled. They develop multiple measures of parity and examine data from 1946 through 2000 to estimate the impact of scholarship reductions on parity. The empirical evidence associated with this effort is mixed in nature; in some cases, tighter scholarship limits are associated with *reduced* competitive balance.

As with any cartel arrangement, there are benefits to unilateral defections. The NCAA cartel is no exception: individual schools may attempt to cheat by offering players or recruits benefits beyond the permitted scholarship allowances. The NCAA, under current regulatory arrangements, has the right to investigate and, if necessary, punish potential defectors. Yet, there is some question if the enforcement of these rules actually affects the competitive balance. Fleisher, et al. (1988) examined NCAA enforcement data and found that the imposition of penalties was more likely when teams showed a sudden and drastic improvement in winning percentage. Thus, less successful teams are deterred from becoming more competitive, assuming that the associated NCAA penalties are sufficiently costly. Because traditionally strong teams demonstrate less variability in winning percentage across time, they will, *ceteris paribus*, be less likely to draw the attention of NCAA regulators.

Depken and Wilson (2004) also investigate the role of NCAA regulation on the behavior of member schools. They agree that the possibility of penalties does provide a deterrence effect, and this effect is especially pronounced for schools that have most recently run afoul of the rules.¹⁴ Therefore, those schools already on probation are extremely unlikely to commit additional infractions. According to this argument, the NCAA is fully aware of these incentives, and will be more likely to shift regulatory resources away from the schools already on probation, and towards those with lower defection costs. Thus, schools not on probation will be *less* likely to cheat within this framework, due to the increased scrutiny they face. The authors test this hypothesis by examining the relationship between rules enforcement and competitive balance; the empirical results indicate that increased NCAA enforcement tends to improve competitive balance.

Colleges and universities will naturally compete for the largest possible share of the rents secured by this cartel, and top caliber players are necessary in that pursuit. Brown (2001) relied on financial data from a sample of Division I football programs and concluded that the marginal revenue product associated with a single NFL-caliber athlete is in excess of \$500,000 per year. Yet, given the importance of college football recruiting, a relative dearth of literature exists in this particular area. Rooney (1987) does examine the quality of the college football player pool by state (measured in terms of NFL players from each state) and finds that major college football programs located in or near states with a relatively small amount of competition tend to recruit better than other football programs. That is, schools that are closer to quality recruits will be able to learn about, contact and woo these players at a lower cost, and therefore will be more successful in eventually signing those players. Langelett (2003) uses data related to the quality of recruiting classes and finds a feedback system: schools with success on the field are able to

attract quality recruits, which in turn increases the quality of future performance. Aside from these studies, which focus more on recruiting quality and team performance, little is known regarding the actual factors influencing the decisions of college football recruits.¹⁵

The recruiting process does have analogies in other markets. More specifically, the determination of college choice can be thought of as a two-sided matching process, and the problem confronting college-bound high school student-athletes and the universities competing for their services is captured within the “two-sided matching model” literature in labor economics. In such models, utility maximizing economic agents assemble in groups and must make choices *across* others in the groups. In this particular example, high school recruits are required to choose a single school (from potentially many schools) while the university must select a particular subgroup of players (from a larger pool of potential recruits). The problem addressed herein is not unlike that associated with seminal literature in the field. Gale and Shapley (1962) utilized a game theory approach to address the matching problem through an examination of the college admissions process¹⁶.

This approach requires agents on each side to hold ordinal preferences over the choice set on the other side. Students rank universities and universities rank students in a manner consistent with utility maximization. Universities then have to decide which applicants should receive admissions offers. Once offered, students must choose which university to attend. A stable solution to the problem requires that once students are enrolled in a particular university, no rearrangement of students to universities can represent a Pareto improvement. The *optimal* solution to this problem is characterized by the condition that every agent is at least as well off under it as they would be under any other stable arrangement. The authors demonstrate that

through the use of waiting lists and deferred acceptance an optimal solution to this problem exists.

Since the work of Gale and Shapley, the literature focused upon two-sided matching models has blossomed. Harvard professor Alvin Roth applied the two-sided matching model to various labor market aspects of the medical industry (Roth 1982, 1984, 1991; Roth and Peranson, 1999) as well as to the kidney donor market (Roth, Sönmez, and Ünver, 2004). Additionally, models of various design have been applied to the “market” for romantic partnership and marriage (Becker, 1981; Knuth, 1976) as well as the sorority rush ritual (Mongell and Roth, 1981). The focus of these studies, however, is not the empirical estimation of the relevant factors in determining a match. Rather, this research concentrates on the theoretical construct and the optimality of particular matching processes.

III. A Theoretical Model

In this section we describe a theoretical model that describes the behavior of recruits and institutions. We assume that universities differ with respect to their past performance (as measured by their previous ranking and number of wins), their geographic location, and the conference in which they compete. We further assume that recruits differ with respect to their location, as well as by their ability and position played.

The Recruits' Choice Problem

Each recruit is assumed to maximize their expected utility, discounted over their five years of collegiate eligibility¹⁷, which is dependent upon the expected success of their chosen university,

the distance of the university from their hometown, the conference in which the chosen university competes, the amenities (including coaches, facilities, etc.) available at the chosen university, as well as expected playing time. That is, a recruit j desires to maximize:

$$E \sum_{t=1}^5 \beta^{t-1} U(\text{WIN}_z^{t-1}, \text{DIS}_{j,z}, \text{CONF}_z, \text{AMEN}_z, \text{PLAY}_{z,k}) \quad [1]$$

where β is the subjective discount rate, WIN_z^{t-1} is the on-field success of university z in the previous season(s), $\text{DIS}_{j,z}$ represents the geographical distance between the university and the recruit's hometown, and CONF_z represents the conference that university z competes in. This variable will give an approximation of the amount of exposure to both television markets as well as professional scouts. The AMEN_z variable represents the facilities and/or coaching staff available to recruits at university z . In particular, this variables includes measures of such things as training and weight room facilities, and stadium capacity. Finally, $\text{PLAY}_{z,k}$ represents the expected playing time of the recruit of position k at university z . It should be noted that this variable will be dependent on the previous recruiting decisions of the universities; as the number of existing position k players currently enrolled at university z rises, this will lead to decreases in expected playing time for all future recruits of position type k at university z . E is the expectation operator. The momentary utility $U(\cdot)$ function is constructed such that the partial derivatives with respect to amenities, playing time, and a team's on-field success are all positive, but the gradient with respect to distance is negative. That is, a recruit will garner more utility from a school that offers more playing time, has more on-field success, and better facilities, but will receive less utility from a school that is further from his hometown, *ceteris paribus*. The sign on the conference gradient is theoretically indeterminate.

The Universities' Choice Problem

Each university differs with respect to their previous on-field success, as well as a set of characteristics that enter into the utility function of potential recruits. These characteristics include, but are not limited to, the conference in which the university competes, the facilities and other amenities that they offer to their current and future players, and their geographic location. Each university chooses the number of each type (i.e. position) of players to recruit in order to maximize their future success while minimizing current costs. In particular, each university solves the following maximization problem:

$$\max \sum_{i=1}^5 W_{t+i}^e(\mu_z) - C_t(\mu_z) \quad [2]$$

where $\sum_{i=1}^5 W_{t+i}^e(\mu_z)$ is the expected number of wins over the next five seasons given players of ability level μ_z , and $C_t(\mu_z)$ is the cost in time t of recruiting players of ability level μ_z . Note that the number of future wins for any university is unknown in the current time period, but is positively correlated with the quality of players being recruited as well as the probability that those players will actually sign with the university.

$C_t(\mu_z)$ is a recruiting cost matrix. A hypothetical example of such a matrix is shown below. In that matrix, the rows indicate “success levels” of a university (C_{1y} is the cost of recruiting for a university with the highest success level and C_{2y} represents the cost of recruiting to a university with a lower success level) and the columns indicate the caliber of recruits (C_{x1} indicates the cost of recruiting a recruit of the lowest caliber level and C_{x2} indicates the cost of recruiting a recruit of a higher level of ability.) We assume the cost matrix has the following characteristics: $\partial C/\partial \mu$

> 0 , $\partial C/\partial W_{t-1} < 0$ and $\partial C^2/\partial W_{t-1}\partial\mu > 0$. Using the matrix shown in equation [3], the first two assumptions correspond to $C_{1y} < C_{2y} < C_{3y}$ and $C_{x1} < C_{x2} < C_{x3}$, respectively. That is, recruiting costs are higher when wooing recruits of higher ability or if the school has less on-field success.

$$\begin{array}{c}
 \textit{Ability Level} \\
 \\
 \textit{University Success} \begin{bmatrix} C_{11} & C_{12} & C_{13} \\ C_{21} & C_{22} & C_{23} \\ C_{31} & C_{32} & C_{33} \end{bmatrix} \qquad [3]
 \end{array}$$

The third assumption indicates that not only do more successful schools have lower costs on average than less-successful schools, but those costs are further lowered as μ increases to higher ability levels. That is, $(C_{23}-C_{13}) > (C_{22}-C_{12}) > (C_{21}-C_{11})$. This characteristic of the cost function illustrates that it is relatively less beneficial for the most successful schools to recruit very low ability level players due to the high opportunity cost these universities face (by construction, the relative cost-savings are lower for recruiting a lower level player for a successful school than a less-successful school).¹⁸ That is, if a university spends a significant amount of time recruiting a low-ability player, this is less time that they can spend wooing a high ability player who would generate a much higher chance of future success.

This model suggests universities make the decision of which players to recruit based on the marginal cost and expected benefits (wins) that the particular player provides, and that simply recruiting the highest level ability players is not necessarily the optimal decision for each school due to the nature of the conditional probability matrices. Similarly, if expected playing time and distance from home dominate the utility function of the recruits, then the optimal decision may be to go to a much less successful program that is closer to home or provides more chance for

playing time. An empirical investigation of the relative strengths of these factors will provide evidence as to which dominate in the optimal outcome of the recruits' choice problem.

IV. Data and Methodology

The increased media attention focused on college football recruiting, coupled with the growing popularity of the internet has resulted in a market niche for firms such as Rivals.com. This company is a subscription-based internet service that maintains team-specific websites, fueled by a central database of high school football recruits. Among the recruit-specific information in this database are: the location (city and state) of the recruit, the position played (e.g. quarterback), a ranking of the player, which school(s) the recruit is visiting and considering attending, and the ultimate selection made by the recruit. Rivals.com provided us with this data for the players who were recruited between 2002 and 2004. We were able to utilize mapping software to calculate the straight-line distance between the recruit's location and each of his potential college destinations, limited to those schools in which he expressed an interest. The resulting data set has multiple observations per recruit, with each record representing a (potential) recruit-school selection.¹⁹

Data on each team's performance (e.g. AP rankings, championships and bowl appearances), and the number of NFL draft picks from each school are available in numerous places in both the print and electronic media.²⁰ Graduation rates of football players for each school are compiled by the NCAA, based on submitted reports by the member institutions. These data are available on the NCAA website, www.ncaa.org. Additionally, we extracted information from the NCAA's database on major violations of Division 1-A institutions. This database indicates the

specific sanctions imposed on member schools, such as reductions in scholarships, limitations on recruiting activity, and restrictions from post-season play or television appearances.

This school specific information was matched to the recruit data, and variables were constructed so that they would be “time-consistent.” That is, a recruit in the year 2002 would be aware of a school’s performance in the years up through the 2001 season, but not for subsequent football seasons. We excluded from the data those schools that a recruit was considering but did not offer the player a scholarship (7,579 observations). We also removed from the database those recruits that were in junior-college (2,027 observations) or considered only one school (3,025 recruits). These restrictions resulted in 13,394 records for 3,395 unique players. Table 1 shows some descriptive statistics associated with the database, by year.

From 2002 to 2004, the typical recruit chose from among approximately four schools when deciding where to play football. Most striking is the consistency from year to year in the average distance between a recruit’s hometown and their potential college destination (between 470 and 480 miles). Not surprisingly, recruits tend to consider those schools that are members of the BCS conferences. On average, more than 75% of the schools under consideration by recruits are members of such conferences, while just 55% of the 117 schools belong to those conferences.

The “ability” distribution of the recruits, as evaluated by Rivals.com, seems to vary from year to year. Other than the 5-star rating, (defined as the top 20-30 players in a given year, regardless of position) the star-ratings are not necessarily defined according to a fixed distribution. For example, a 2-star player is defined as a “mid-major college prospect.” More specifically, the percent of recruits that are deemed to be 4-star players declined each year, from 28% in 2002 to less than 15% in 2004.

V. Empirical Results

The Universities' Decision: Which Players to Recruit?

The model described in Section III describes how each university is faced with the annual decision of how best to allocate their recruiting resources. In particular, the model suggested that while every school has an incentive to recruit the “best” players, the costs of doing so vary from one university to another. Those universities that have less on-field success will be, *ceteris paribus*, less likely to convince high-quality players to attend their school. Conversely, those schools that are consistently ranked high in the rankings and regularly compete for national and conference championships will have an easier time wooing a highly-coveted prospect. The implications of the model can be restated as follows: if the marginal cost of recruiting a given player is assumed to be fixed for every university, then the marginal benefit of recruiting that player does differ across schools, since the marginal benefit of recruiting a player can be thought of as the *combination* of the player’s skill level and the likelihood he will sign with a particular school.

The model assumes that universities are aware of these factors, and as such, direct their recruiting resources towards the players that are more likely to be interested in (and eventually sign with) their school. If the theoretical model is accurate, universities will focus their recruiting activities on those players that they are most likely to successfully convince to attend their respective universities. To verify this, we classified the 117 schools into three equal-sized groups, based on their average winning percentage from 1999 through 2003. We then computed

the average characteristics for the recruits who were offered scholarships by schools in each of those groups.²¹ The results are shown in Table 2.

The data indicate that those schools with the highest winning percentage recruit a higher tier of player than those with less on-field success. All of the measures of player ability, such as number of stars and the likelihood of being ranked among the top 10 and top 100 players by position and overall, are higher for those schools with the highest winning percentage from 1999 through 2003. The measures relating to distance indicate that the most successful schools tend to recruit from a wider geographic area than less successful schools.

The results shown in Table 2, however, do not make a distinction as to whether the school is a member of a BCS conference. As will be shown, these schools are better able to sign high quality players, holding other factors constant. Table 3 provides the same data as shown in Table 2, but bifurcated by BCS conference designation.

It is apparent from Table 3 that schools in a BCS conference recruit different players than those not in a BCS conference. For example, at least 5% (on average) of the recruits offered by BCS-affiliated schools are ranked among the top 100 players, regardless of position. However, less than 1.5% (on average) of the players recruited by non-BCS schools have such an accolade. Likewise, 24.2% of the players recruited by the BCS schools with the highest on-field success rate are ranked among the ten best players at their position, compared to just 1.6% of the players recruited by non-BCS schools with the lowest on-field success.

Table 3 also indicates that BCS schools recruit from a wider geographic area than do non-BCS schools. On average, the players recruited by BCS schools are between 476 and 533 miles from the school, and no more than 25% of those players reside in the same state as the university. On the other hand, the typical distance between a non-BCS school and their recruits range from

307 to 430 miles, and between 37% and 49% of those recruits reside in the same state as the non-BCS school.

The results shown in Table 3 make it clear that the BCS designation is a much greater determinant of which players a school recruits than the on-field success rate. In fact, those BCS schools with the lowest on-field success recruit a higher quality of player, on average, than the most successful non-BCS schools. That is, the typical recruit of a low performing BCS school garners 2.9 stars, as compared to 2.6 stars for the best performing non BCS schools. The same pattern is found in all other measures of recruit quality. Further, a poor performing BCS school recruits from a wider geographic area than does a top-performing non-BCS school.

The following tables provide some anecdotal evidence of the import of the BCS designation by comparing pairs of schools in close proximity to each other and with similar on-field success rates, but differences in their BCS affiliation. The selected schools are shown in Table 3-A, along with the distance between the institutions and their respective winning percentages over the past five seasons.

As can be seen, the selected school-pairs are all within 120 miles of each other, and generally have similar winning percentages over the prior five seasons. When there are sizable differences, such as seen between Baylor and TCU and between Vanderbilt and Middle Tennessee State, it is the BCS-affiliated school that has the lower winning percentage. Thus, any differences between the paired schools are due primarily to their BCS status.²²

Table 3-B indicates that in all but one school pair, the school in the BCS conference (as indicated with a “**”) was able to recruit a higher quality of athlete, as indicated by the average number of stars assigned to those players. The exception to this finding is the Baylor-TCU pairing, but as Table 3-A shows, this is the one case in which the BCS school’s winning

percentage (19.5%) was far lower than the non-BCS school (73.6%). Yet, even in this case, the average number of stars for the players recruited is similar, and Baylor still is more likely than TCU to be recruiting players ranked in the Top 10 or Top 100 by position or across all positions. As expected, that pattern is found in the other school-pairings as well. For example, 9% of Colorado's recruits are among the Top 100 players in the country, yet none of the players recruited by Colorado State are. Similarly, nearly 42% of Ohio State's prospects are ranked among the top 10 in their position, compared to less than 2% of Marshall's recruits.

All of the selected school pairs indicate that a BCS school recruits from a wider geographic area than the non-BCS schools. For example, the typical recruit of the University of Florida lives over 400 miles from the school, compared to just over 150 miles for the average player recruited by South Florida. In all but two cases, the recruits for the non-BCS school are more likely to already be living in the same state as that school.

To further identify the role of BCS in a school's ability to attract top-tier recruits, we regressed the average "star" ranking of a school's recruiting class on the on-field success components and other university specific measures, such as stadium capacity. BCS affiliation was not considered in this regression. This model explains nearly 60% of the variation in recruiting class quality, and the coefficients generally have the expected signs, as shown in Table 4.

As expected, the lower a team's ranking (i.e. closer to 1st place), the better recruiting quality it can attract. Also, recruiting quality is positively correlated with older and larger stadiums and the total number of NFL draft picks from the school in the five most recent seasons. On the other hand, a new head coach and the school's most recent graduation rate for student-athletes

are negatively associated with recruiting quality. The prior value of the student-athlete graduation rate, however, has the opposite sign.

We then examined the distribution of residuals from this regression by BCS affiliation. If BCS membership is an important factor in an ability of a school to attract recruits, then the actual recruiting quality of a BCS school would be higher than predicted based on the factors listed in Table 4. Likewise, non-BCS schools would tend to have lower quality recruiting classes than predicted. A chi-square analysis of these residual distributions, summarized in Table 5, confirms that they are indeed statistically significantly different between BCS and non-BCS affiliated institutions.

As can be seen, over two-thirds of the non-BCS schools have a recruiting class of a lesser caliber than their on-field performance would predict. Similarly, nearly 60% of the BCS affiliated institutions attract a higher quality recruiting class than predicted by the model. Since the regression explicitly controls for those factors related to current and recent on-field success, any differences relating to BCS status may be due to a “halo effect.” That is, even less successful teams in BCS conferences have a recruiting advantage (and conversely those not in BCS conferences are disadvantaged), perhaps owing to the additional media exposure afforded them. It is likely, therefore, that through their own experiences, schools have learned of these differences and adjust their recruiting behavior accordingly, as previously suggested.

Taken together, it is clear that colleges and universities tend to recruit different types of players, and those decisions appear to be consistent with the theoretical model developed in Section III: Schools with lower success rates find it more costly to recruit the highest quality players, and vice-versa. Moreover, the evidence suggests that another factor, a school’s BCS affiliation, is equally as important when a school assesses the pool of players for recruitment.

The following portion of this section analyzes the factors that affect the players' choices among the schools that recruit them.

The Recruit's Decision: Which School to Attend?

The estimation technique used to model a given recruit's college selection is a probit analysis, estimated by maximum likelihood. The estimated equation is shown in equation [4], which is consistent with equation [1] in section III:

$$p_{ij} = \Phi(X_i\beta + Y_j\delta + Z_{ij}\theta) \quad [4]$$

Where Φ is the normal cumulative distribution function and p_{ij} is the probability that recruit i selects school j . The vector X_i are recruit-specific characteristics, such as the player's ability ranking and the position he plays. These variables are fixed with respect to every school the recruit is considering. The vector Y_j are the school-specific characteristics (e.g. the institution's recent graduation rate of football players or stadium size) that do not vary with respect to each recruit considering that school. Lastly, the vector Z_{ij} represents those factors that are unique to the possible player-school "match" (e.g. the geographic distance between the player and the school or the number of recent recruits signed by the school in the same position as the recruit). The probit models also adjust the covariance structure to reflect the lack of statistical independence from repeated observations on the same decision-maker (i.e. recruit). That is, since the choice of one school precludes the recruit from choosing another school, the error terms associated with the probit model are not independent among those observations on the same

recruit. The selection process is assumed to be statistically independent, however, from one recruit to another.

The specification of the probit models shown in equation [4] assumes that all variables not included in the model are constant from one potential choice to another. For example, the “quality” of the official visit from one school to another for each recruit is assumed the same, as is the relationship between the recruit and the coaches that are recruiting him. If, as it seems likely, these omitted variables do vary from one potential choice to another and are correlated with a recruit’s decision, then the coefficients of the probit model may be biased. However, while this bias may be reflected in predicting a specific recruit’s college destination, there is no reason to believe the overall coefficients may be biased (when measured across recruits). For example, recruit John Smith may be more likely to pick Stanford if his brother is already on the team. But unless Stanford has a relative on the team for each and every recruit that is considering them, then the coefficients should not be biased for the “typical” or average recruit. Put another way, as long as the differences not captured by the probit model are randomly distributed across recruits, then there is no reason to believe there is systematic bias in the model’s estimates. By the same token, however, the model assumes that the amount of illegal recruiting tactics are identical from one school to another.

The coefficients from the probit model can be used to construct the predicted probability of a recruit selecting a particular school. We assume that the choice with the highest calculated probability for each recruit among those schools he is considering to be the predicted choice. A comparison between the actual and predicted choice provides an indication of the predictive accuracy of the models. Since that the average number of possible choices for a recruit is between 3.8 and 4.2, a completely random selection method would correctly predict, on average,

the college choices for approximately 25% of the recruits. In Table 6, we include the accuracy rates of the predictions from the probit models, along with the coefficients, the associated statistical significance, and the estimated marginal effects of each variable.

The first specification of the model includes only the recruit-specific characteristics. Since none of these variables vary from one (potential) school choice to another, it is not surprising that this specification does not predict college destinations much better than a random model (only 28.5% of recruits selections correctly predicted.) The negative coefficients on the player rankings are attributed to the scarcity of such players. That is, since there are only a handful of highly ranked players, the raw probability that such a player will select a particular school is quite low (without controlling for other variables).

The second specification (Model 2) adds the school-specific characteristics to the model, which are those variables that are identical for every recruit considering that school in a given year (e.g. a school's most recent poll ranking.) As expected, greater on-field success leads to a greater probability that a recruit will select the school. The coefficient on the institution's five-year average winning percentage is positive and statistically significant, and the coefficient for the most recent year's AP poll ranking is negative and significant. That is, teams with lower rankings (meaning a ranking closer to 1st place in the polls) are more likely to attract recruits. More specifically, an increase of 10% in the average winning percentage increases the probability of selection by over 1%. Likewise, an increase of ten positions in the final AP poll from the prior season reduces the probability of selection by nearly 2%. Also included and positively correlated with a recruit's school selection is an indicator of whether the school is a member of one of the six BCS conferences. Compared to otherwise similar schools in non-BCS conferences, recruits are more than 5% more likely to select these institutions. A new head

coach, perhaps owing to the uncertainty associated with such a turnover, reduces the probability a recruit will select that school by 2.5%.

This second specification includes some other measures which, perhaps surprisingly, are negative or not statistically significant. For example, the graduation rate of student-athletes from the school (both the most recent and the prior reported measure), are not correlated with the probability a recruit will select that school. This finding is particularly notable, since the NCAA has recently decided to penalize schools if their student-athletes do not make sufficient academic progress.²³ Likewise, the number of players taken in the NFL draft from the school, both most recently and over the prior five seasons is not a statistically significant factor in the recruit's selection. Taken together, the non-significance of these variables may suggest that recruits are less concerned about the prior athletic or academic success of prior student-athletes at the school, and are simply focused on their own abilities. Further, a team's winning of the national championship in the prior season does *not* statistically affect the likelihood of a high-school player selecting that school. Perhaps even more surprisingly, for every additional appearance in a BCS bowl in the prior five seasons, a recruit is 2.23% less likely to select that institution. Recruits may consider immediate playing time to be much more scarce at such perennially successful schools, and therefore more unattractive destinations, *ceteris paribus*, consistent with equation [1].

This specification also includes three variables that indicate whether the school has recently run afoul of NCAA rules and has incurred sanctions. More specifically, these variables indicate whether the school is unable to participate in post-season play (i.e. a bowl ban) in the following year or whether the school has a reduction in the number of official visits and scholarships which they can offer new recruits.²⁴ An additional variable is included (NCAA sanctions "rumor") to

indicate whether the school is under NCAA investigation, but has not yet been formally penalized.²⁵ Among these measures, the negative and significant coefficients on the ban on post-season play and the possibility of future sanctions (as indicated by the “rumor” variable) indicates that recruits are 7.7% and 4.5% less likely, respectively, to select schools that have incurred (or are about to incur) the “wrath” of the NCAA. That is, to the extent that future sanctions may also ban the institution from appearing on television or in post-season games, these sanctions would lead to less exposure for the players on those teams, which is consistent with the hypothesis that players garner utility from increased media exposure. Lastly, this model includes some measures of the athletic facilities at the school, such as the size and age of the football stadium, and whether it is an on-campus facility or not. The results show that those schools with larger stadiums are more likely to attract recruits than those with smaller stadiums. That is, an increase in stadium size of 10,000 seats significantly increases the likelihood of selection by 1.3%. This specification correctly predicts the college selections for 42% of the recruits analyzed.

Model 3 adds the variables that are unique to the specific school-recruit combination, most importantly the distance between the recruit and the university and whether the recruit formally visited the school.²⁶ Making an official visit to the school has a large and significant effect (23.5%) on a recruit selecting that school. The signs on the distance-related coefficients are as expected: the further a school is from the recruit’s hometown, the less likely he is to pick that school. However, the coefficients on the quadratic distance terms are all positive, indicating that the effect of distance moderates itself after a certain point.²⁷ We also include measures as to whether the recruit resides in the same geographic region, state, or city as the school (i.e. defined as within 50 miles of the school). The coefficients for the latter two variables are positive and

statistically significant. The interpretation on the variable measuring whether the recruit is in the same state as the college is notable: if a recruit is considering two otherwise identical schools and is equidistant from each of them (though one is in a different state than where he lives), then he will be 7.6% more likely to select the school in the same state as his residence. Further, even after accounting for the effects of distance on college choice, recruits are still 3.7% more likely to select the school in their hometown.

Also included in this specification are counts of the number of players (and highly ranked players) that the school signed in the prior year who play the same position as the recruit. For example, this variable would indicate the number of running backs signed by Florida State University in 2003 for a running back recruit considering that school in 2004. The negative coefficient indicates that the more players (regardless of their skill level) a school has already acquired for that position, then the less likely it is (0.5% per previous player signed) to attract additional players. This result is consistent with the hypothesis that recruits positively value playing time. On the other hand, the more highly ranked players signed by the school in the prior season for the same position as the recruit is positive and significant, suggesting that a recruit is 1.0% *more* likely (per highly ranked player signed) to select those schools. This seemingly contradictory conclusion invites further investigation. It is very possible that these coefficients are dependent upon the particular position of the recruit. For example, an offensive lineman may not be deterred from signing with a school that just recently signed four other highly rated offensive linemen, since (at least) five offensive linemen are needed on every play. On the other hand, only one quarterback plays at a time, so the signing of a highly rated QB in a prior year may indeed affect the probability that a QB recruit would consider that same school in

the following year. This specification correctly predicts the college destination for over 52% of the high-school recruits.²⁸

Lastly, Model 4 includes only those variables that are statistically significant and/or notably contribute to the predictive prowess of the model. Compared to Model 3, the specification is rather sparse. Again, the distance between a recruit and the prospective college is an important factor, as is whether the school is in the same state as the recruit. This distance effect is strongest in the South region, and weakest in the West. Membership in a BCS conference is a noticeably important factor in a recruit's selection process, as such affiliation increases the absolute chances of selection by nearly 7%, and the *relative* chances of selection by more than 27%.²⁹

The other variables in this specification generally have the expected signs. Recruits are more likely to select schools that have won conference championships (0.53% per conference title) and finished near the top of the polls. Further, they are attracted to those schools with large, on-campus stadiums, provided it is not too old of a facility. On the other hand, if a school has a ban on post-season play or is undergoing (or about to undergo) NCAA investigation, recruits are less inclined, 9.3% and 4.7% respectively, to select that school, other things being equal. Somewhat surprising is that those schools with already-assessed scholarship reductions are slightly, but yet still statistically significant, more likely to attract recruits. Again, this is consistent with the hypothesis from the theoretical model of Section III that recruits value exposure and playing time. That is, the variable relating to scholarship reductions measures the reduction in *total* scholarships a school may give out in a given year. However, since the data only include records of recruits with scholarship offers from the institution, this restriction does not affect the probability of a recruit receiving a scholarship offer, but rather implies that the amount of playing time for that school will be distributed among a smaller group of players. A bowl ban or

a possible bowl ban reduces the potential (television) exposure of the recruit, however, since those games are almost always nationally televised. Thus, the opposite signs on the different types of NCAA penalties are not necessarily contradictory.

It is worth noting the variables that do not enter Model 4. As mentioned previously, the graduation rate of a school's prior student athletes or the number of NFL draft picks from that school do not significantly affect the likelihood a player will choose that institution. Perhaps surprisingly, a new head coach at a school does not matter either. This may be due to the fact that coaching changes can occur for several reasons, not all of which reflect poorly on the school. Lastly, winning a national championship in any of the prior five years has no statistically significant effect on the probability of a recruit choosing a school.

The distance variable and the related interaction terms provide significant explanatory power in Model 4. In fact, the model will often (54.4%) predict that the recruit will choose the school that is closest to his hometown. However, relying on such a simplistic decision-rule would not result in a higher rate of successful predictions than this specification, as only 40.4% of recruits actually selected the school that was closest to them, among those they were considering.

This specification correctly predicts the college choice for nearly 63% of the recruits from 2002 to 2004. As mentioned at the outset, a purely random model would only correctly predict the college destinations for approximately 25% of the recruits. Further, the predictions from the model appear to be quite robust, as they have roughly the same levels of precision across years and geographic region, as shown in Table 7.

Predicting the college destinations of the Top 100 Players in 2005

Rivals.com also furnished us with information relating to the top 100 ranked players in the 2005 signing year. These data are identical in every respect to the data described earlier with one notable exception: most of the players had not yet decided which school they would attend. Using the parameters from our model, we produced estimated probabilities for each of the schools these recruits were considering, and assumed that the school with the highest probability would be the institution the player would ultimately select. The probit model shown in specification 4 of table 2 was able to correctly predict the college destination of 71% of the top 100 recruits in 2005.³⁰ (The specific results are listed in Appendix A). For the 29 recruits that the model did not correctly predict the college selection, eight selected the school closest to them from among their choice set.

VI. Summary, Discussion and Conclusions

This article has examined the factors that are associated with the recruitment of high school football players. Our theoretical model suggests that universities will face different marginal costs in recruiting players. In particular, less successful schools will find it more costly to recruit higher quality players. Our theoretical model also suggests that recruits will seek to maximize their utility by selecting among colleges that may differ with respect to on-field performance, conference affiliation, facilities, playing time opportunities, and the geographic distance from the recruit.

Our empirical results provide specific insights into those factors that, on average, lead recruits to select particular schools. Primary among these factors is the distance between a recruit and the college under consideration. We find that increased distance serves to lessen the probability that a recruit will select a college, though that effect moderates itself after a certain point. Second, we found that the institution's track record of graduating football players in years past also does not affect the typical recruit's decision.

We also found that the choices that recruits make are consistent with valuing media exposure. We find evidence that recruits may select those schools that have more success and those that are members of the six largest and most visible conferences, whose champions are automatic participants in the four Bowl Championship Series (BCS) games. Simply put, schools in those conferences are able to attract higher-quality recruits than schools not in those conferences and recruits (of any level of ability) are more likely to select those schools, other things being equal. In fact, we found that the effect of this affiliation is strong enough to "outweigh" on-field success. That is, teams that consistently win but are not members of the BCS are still not able to attract that same quality of recruits as a team that is a perennial loser, but is also a member of a BCS conference.

The ability of BCS conference teams to more easily attract recruits has serious implications for the competitive balance in the college football industry. If recruits do indeed obtain higher utility from increased (media) exposure that the BCS schools offer, then those schools will be able to select the better college prospects than non-BCS schools. This in turn would make it more difficult for non-BCS teams to win games, obtain a high poll ranking, and qualify for an at-large BCS berth. In effect, the BCS may have created (or perhaps enhanced) a near monopsony in this unique labor market

Though it may be argued that BCS status is merely a proxy for those schools with a history of high-level performance, this bifurcation of schools would still be problematic for two reasons. First, we found evidence of a “halo effect”, in which some schools that have not historically performed well on the athletic field, but merely happen to be in the same conference as historical powers enjoy a recruiting advantage that they might not otherwise receive. It is in these specific cases that the artificial construct of the BCS may have created competitive imbalances that did not previously exist. Second, even in the absence of a “halo effect,” the empirical results show that non-BCS schools may face significant obstacles when competing with the BCS schools and therefore the BCS designations perpetuate a permanent, caste-like structure within college football.

¹ Not all colleges and universities with intercollegiate sports belong to the NCAA. There are two other organizations, the National Association of Intercollegiate Athletics (NAIA) and the National Junior College Athletic Association (NJCAA). However, both of these organizations pale in terms of membership size and recognition when compared to the NCAA.

² For a more comprehensive history of the NCAA, see *College Football*, by John Sayle Watterson, originally published in 2000.

³ In particular, schools were limited to no more than six appearances over two years, but were guaranteed that at least 80 different schools would appear on television at least once every two years.

⁴ “College Football: Search for Revenues, protection for athletes”, *CBS Sportsline.com*, Sept 30, 2004.

⁵ *Ibid.*

⁶ The strength-of-schedule component has not been used in the BCS rankings since the 2003 season.

⁷ “College Athletics Money Go Round,” *College Athletic Clips*, <http://www.collegeathleticsclips.com/archives/000059.html>

⁸ www.thecharlottepost.com/05_06_editorials

⁹ According to NCAA rules, a recruit may take no more than five “official” visits to prospective schools. Official visits are those in which the institution covers the costs of food, lodging and travel. There is no limit to the number of “unofficial” visits a recruit may take, in which the school does not pay expenses for the recruit.

¹⁰ “Big Spending No Guarantee of Big Revenue,” Steve Wieberg, *USA Today*, August 14, 2003. This figure reflects the recruiting costs for all sports at a university, but football recruiting undoubtedly accounts for the bulk of those expenses. Moreover, the larger universities surely exceed this average amount in their recruiting budgets.

¹¹ The complete set of bylaws for Division I institutions can be found at http://www.ncaa.org/library/membership/division_i_manual/2004-05/2004-05_d1_manual.pdf

¹² “NCAA aims to take glitz out of recruiting”, Ralph D. Russo, *The Associated Press*, February 1, 2005.

¹³ This rule, which was described in more detail in the prior section, is often cited as the point of origination for the NCAA’s cartel-like authority.

¹⁴ Since, 1985 NCAA rules allow for especially punitive sanctions for schools if they are a “repeat offender,” meaning that the institution was found to have committed multiple major violations in a five-year period.

¹⁵ Many researchers, such as Card (1995), Light and Strayer (2000), and Frenette (2004, 2005), have documented the factors that are associated with a greater propensity to attend college among all high school students, rather than just high school football players. One notable and consistent finding in these cited works is that distance from a college or university is inversely related to the likelihood of attending.

¹⁶ The authors also focused on marriage in their effort. However, given the nature of the problem at hand, the college admissions decision process will be the focus of this discussion.

¹⁷ The NCAA permits a player five seasons to use his four years of athletic eligibility, specifically due to the risk of injury. In cases of severe injury, players may be awarded an additional year of eligibility.

¹⁸ The following numerical example of a conditional cost matrix satisfies the described properties: Row 1: 1, 2, 3; Row 2: 2, 4, 9; Row 3: 3, 9, 27.

¹⁹ One important characteristic of the data furnished by Rivals.com is that the data are truncated according to the self-reported interest of the recruit. More specifically, if a recruit does not show any interest in a particular school, then there is no record corresponding to that specific recruit-school combination, even if the school is recruiting that player. So, while Willie Williams had a scholarship offer from most, if not all, of the 117 Division 1-A schools in this study, the database only includes records for the four schools that Williams indicated he was most strongly considering.

²⁰ We collected information on AP rankings, wins, losses, BCS bowl appearances, and conference/national championships from www.cfbwarehouse.com.

²¹ As indicated previously, the data only include those records in which the recruit reports an interest level with the particular school. So, in this case, the averages are taken among those persons who were offered scholarships by a school and in return, have a non-zero interest in attending the institution. Further, a recruit is considered only once per group, even if he was being recruited by more than one school in that group, except for those measures that relate to distance (those marked with a "*" in Table 2). In those cases, all records for a recruit are considered.

²² There could also be differences in the paired schools due to the academic rigor and/or reputation of the schools. However, it is not clear, *a priori*, how differences in academic reputation would affect the athletic profile of the players recruited or the likelihood of a student-athlete being interested in such schools.

²³ See "NCAA Looking to Adjust New Academic Standard," Steve Wieberg, *USA Today*, July 13, 2005, for more details.

²⁴ The NCAA often reduces the number of scholarships an institution may give as punishment since schools are usually unable to attract marquee players without the promise of financial aid. Therefore, a reduction in scholarships often reduces a team's success on the field for several playing seasons. The NCAA can also or alternatively limit the number of official visits a school may offer to recruits in a recruiting year(s). Since recruits and their families do not incur expenses on these visits, these limits are likely to result in fewer players being signed by the school, as the pool of available players that have seen and visited the school is reduced.

²⁵ Quite often the NCAA's investigation of rules violations is a lengthy process, and is usually public knowledge. Moreover, schools have been known to impose penalties (including scholarship restrictions) before the formal investigation is even concluded.

²⁶ We ran a Chow Test on a linear probability selection model, controlling for just distance and its square, as well as the four regional dummy variables. The results indicated that the effect of distance is not identical for each region, so in the probit models, we interacted the distance measures with the geographic region of the recruits.

²⁷ We computed the "break-even" point for each region, after which increasing distance actually enhances the probability of selection. Those distances are 1,150 miles (South Region), 1,322 miles (Midwest), 1,564 miles (Northeast) and 2,196 miles (West).

²⁸ The variables measuring position depth were only available for the 2003 and 2004 signing years, so in this specification, only those two years of data are used.

²⁹ The marginal effect of BCS membership is 6.87%, but when compared to the sample proportion of potential school-choice combinations that result in selections (25.3%), this implies that BCS membership increases the relative chances of a school attracting recruits by 27.2% (6.87% / 25.2%).

³⁰ We correctly predicted 70 of 99 selections. One player failed to sign with any school due to low grades.

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Table 1
Descriptive Statistics

| | | Recruiting Year | | |
|--|---|-----------------|-------|-------|
| | | 2002 | 2003 | 2004 |
| <i>Sample Size</i> | | | | |
| | Number of Records | 3,849 | 4,358 | 5,187 |
| | Number of Recruits | 1,008 | 1,138 | 1,249 |
| | Avg. Choices/Recruit | 3.8 | 3.8 | 4.2 |
| <i>Recruit's Choice Characteristics</i> | | | | |
| | Avg. Distance (miles) | 470.8 | 479.7 | 471.2 |
| | Median Distance (miles) | 316.4 | 336.7 | 336.6 |
| | Percent of choices in the same town | 9.4% | 8.5% | 8.7% |
| | Percent of choices in the same state | 29.2% | 28.5% | 25.8% |
| | Avg. Graduation rate of choice | 50.8% | 51.5% | 54.1% |
| | Avg. Number of draft picks from school choice | 2.6 | 2.8 | 2.7 |
| | Percent of choices on NCAA probation | 8.2% | 8.5% | 10.2% |
| | Percent of choices with NCAA sanctions | 8.6% | 8.6% | 9.5% |
| | Percent of choices in a BCS Conference | 78.5% | 76.3% | 75.4% |
| <i>Conference Breakdown (* =BCS conference)</i> | | | | |
| | ACC* | 15.6% | 14.5% | 14.8% |
| | Big Ten* | 14.3% | 13.2% | 14.2% |
| | Big 12* | 14.3% | 13.2% | 11.6% |
| | Big East* | 6.86% | 7.4% | 7.0% |
| | Conference USA | 6.39% | 6.8% | 7.8% |
| | Mid-American Conference (MAC) | 4.7% | 6.1% | 5.7% |
| | Mountain West Conference | 3.2% | 3.5% | 4.6% |
| | Pac-10* | 9.9% | 12.2% | 11.3% |
| | SEC* | 17.5% | 15.9% | 16.5% |
| | Sunbelt | 1.3% | 2.3% | 2.1% |
| | WAC | 4.1% | 3.5% | 2.9% |
| | Independent (no conference affiliation) | 1.8% | 1.5% | 1.6% |
| <i>Recruit Characteristics</i> | | | | |
| | Percent of recruits with a 2-star rating | 29.0% | 25.9% | 47.5% |
| | Percent of recruits with a 3-star rating | 39.1% | 53.2% | 35.4% |
| | Percent of recruits with a 4-star rating | 28.0% | 18.7% | 14.9% |
| | Percent of recruits with a 5-star rating | 3.7% | 2.0% | 2.0% |
| <i>Position Breakdown</i> | | | | |
| | Defensive Back (safety or cornerback) | 14.5% | 16.0% | 15.5% |
| | Defensive End | 9.9% | 9.1% | 8.9% |
| | Defensive Tackle | 6.4% | 6.8% | 7.0% |
| | Kicker (punter or place-kicker) | 1.0% | 1.6% | 1.2% |
| | Linebacker | 12.6% | 12.0% | 11.0% |
| | Offensive Lineman | 16.2% | 17.1% | 16.9% |
| | Quarterback | 6.4% | 6.7% | 6.1% |
| | Running Back (fullback or tailback) | 11.3% | 8.8% | 10.7% |
| | Tight End | 5.1% | 4.9% | 4.9% |
| | Wide Receiver | 10.2% | 11.1% | 10.6% |
| | Athlete | 6.6% | 6.0% | 7.5% |

Table 2
Profiles of Recruits Offered Scholarships, By On-Field Success Groupings

| Recruit Characteristic | Winning Percentage Group | | |
|--|--------------------------|--------|-------|
| | Low | Medium | High |
| Average Number of Stars | 2.7 | 2.9 | 3.0 |
| Percent of Recruits ranked in the Top 100, by position | 50.8% | 54.0% | 53.7% |
| Percent of Recruits ranked in the Top 100, across positions | 3.3% | 7.7% | 9.7% |
| Percent of Recruits ranked in the Top 10, by position | 8.7% | 14.8% | 17.9% |
| Percent of Recruits ranked in the Top 10, across positions | 0.1% | 0.7% | 1.1% |
| Average Distance between Recruit and School (miles)* | 419.7 | 476.5 | 498.1 |
| Percent of Recruits in same Region as School* | 69.5% | 65.9% | 76.7% |
| Percent of Recruits in same state as School* | 31.7% | 26.2% | 26.8% |
| Percent of Recruits in a state with a conference member of the School* | 71.7% | 61.8% | 66.5% |

* See footnote 18

Table 3
Profile of Recruits Offered Scholarships, By On-Field Success Groups and
BCS Conference Designation

| Recruit Characteristic | Non-BCS Schools | | | BCS Schools | | |
|--|--------------------------|--------|-------|--------------------------|--------|-------|
| | Winning Percentage Group | | | Winning Percentage Group | | |
| | Low | Medium | High | Low | Medium | High |
| Average Number of Stars | 2.3 | 2.5 | 2.6 | 2.9 | 3.0 | 3.3 |
| Percent of Recruits ranked in the Top 100, by position | 36.5% | 42.1% | 45.9% | 56.1% | 58.1% | 58.7% |
| Percent of Recruits ranked in the Top 100, across positions | 0.6% | 1.3% | 1.4% | 5.2% | 9.0% | 13.6% |
| Percent of Recruits ranked in the Top 10, by position | 1.6% | 4.9% | 4.8% | 11.8% | 17.0% | 24.2% |
| Percent of Recruits ranked in the Top 10, across positions | 0.0% | 0.0% | 0.4% | 0.4% | 0.9% | 1.5% |
| Average Distance between Recruit and School (miles)* | 332.9 | 307.1 | 430.2 | 476.3 | 495.7 | 533.1 |
| Percent of Recruits in same Region as School* | 78.1% | 85.3% | 83.3% | 67.7% | 62.1% | 73.9% |
| Percent of Recruits in same state as School* | 37.5% | 48.6% | 38.6% | 23.3% | 22.4% | 25.0% |
| Percent of Recruits in a state with a conference member of the School* | 71.4% | 73.9% | 71.0% | 70.7% | 56.2% | 66.8% |
| * See footnote 18 | | | | | | |

**Table 3-A
Selected School Pairs**

| BCS School | Non-BCS School | Distance (miles) | 5-Year Winning Percentage | |
|------------|----------------------|---------------------|---------------------------|----------------|
| | | | BCS School | Non-BCS School |
| Vanderbilt | Middle Tennessee St. | 31.0 | 27.3% | 48.9% |
| Colorado | Colorado State | 38.8 | 58.7% | 71.9% |
| Alabama | UAB | 49.0 | 51.4% | 49.1% |
| Auburn | Troy | 62.5 | 55.4% | 68.7% |
| LSU | Tulane | 71.0 | 56.4% | 54.1% |
| Kentucky | Cincinnati | 73.1 | 38.0% | 45.8% |
| Baylor | TCU | 84.0 | 19.5% | 73.6% |
| Ohio State | Marshall | 111.0 | 73.3% | 84.6% |
| Florida | South Florida | 117.8 | 79.2% | 70.9% |

Table 3-B
Profile of Recruits Offered Scholarships for Selected School Pairs

| School | Stars | Top 100 (Position) | Top 100 (Overall) | Top 10 (Pos) | Top 10 (Overall) | Distance | Same Region? | Same State? | Conf in State? |
|---------------|-------|-----------------------|----------------------|-----------------|---------------------|----------|-----------------|----------------|-------------------|
| Vanderbilt** | 2.6 | 55.3% | 0.7% | 5.7% | 0.0% | 431.2 | 78.0% | 9.2% | 64.5% |
| MTSU | 2.5 | 42.1% | 0.0% | 2.6% | 0.0% | 259.3 | 97.4% | 15.8% | 42.1% |
| Colorado** | 3.2 | 66.2% | 9.0% | 17.5% | 1.3% | 860.7 | 38.9% | 6.4% | 41.9% |
| Colorado St. | 2.6 | 45.5% | 0.0% | 5.7% | 0.0% | 685.5 | 66.7% | 14.6% | 56.9% |
| Alabama** | 3.2 | 61.1% | 12.2% | 18.3% | 0.0% | 215.8 | 97.7% | 43.5% | 85.5% |
| UAB | 2.4 | 37.3% | 0.0% | 3.9% | 0.0% | 134.0 | 100.0% | 66.7% | 82.4% |
| Auburn** | 3.2 | 58.0% | 7.7% | 17.8% | 1.8% | 238.5 | 100.0% | 24.3% | 100.0% |
| Troy | 2.5 | 35.7% | 0.0% | 0.0% | 0.0% | 196.8 | 97.6% | 31.0% | 33.3% |
| LSU** | 3.5 | 52.9% | 23.5% | 37.7% | 2.9% | 409.5 | 93.1% | 22.5% | 64.7% |
| Tulane | 2.7 | 61.9% | 2.4% | 9.5% | 0.0% | 334.4 | 90.5% | 36.9% | 85.7% |
| Kentucky** | 2.7 | 57.0% | 3.9% | 7.0% | 0.8% | 362.7 | 79.7% | 22.7% | 74.2% |
| Cincinnati | 2.3 | 33.7% | 3.6% | 3.6% | 0.0% | 329.3 | 53.0% | 44.6% | 71.1% |
| Baylor** | 2.6 | 40.8% | 1.3% | 5.3% | 0.0% | 163.0 | 98.7% | 88.2% | 88.2% |
| TCU | 2.7 | 60.0% | 0.0% | 3.8% | 0.0% | 151.2 | 98.8% | 95.0% | 97.5% |
| Ohio State** | 3.6 | 52.0% | 27.4% | 41.9% | 2.8% | 521.7 | 34.6% | 27.4% | 41.3% |
| Marshall | 2.4 | 44.4% | 0.0% | 1.9% | 0.0% | 403.4 | 79.6% | 5.6% | 24.1% |
| Florida** | 3.7 | 49.8% | 26.2% | 42.7% | 5.2% | 417.4 | 89.6% | 43.4% | 75.7% |
| South Florida | 2.7 | 54.9% | 1.6% | 4.9% | 0.8% | 158.2 | 97.5% | 93.4% | 75.4% |

Table 4
Determinants of Average Recruiting Class Quality

| Variable | Coefficient | t-value |
|--|-------------|---------|
| Intercept | 2.43732 | 16.20 |
| AP Ranking | -0.01588 | -2.69 |
| No AP Ranking | -0.48428 | -4.56 |
| Stadium Capacity (in 1000s) | 0.00785 | 6.00 |
| Total Players Drafted (5 prior years combined) | 0.02065 | 5.95 |
| Student-Athlete Graduation Rate | -0.00504 | -2.67 |
| Previous Student-Athlete Graduation Rate | 0.00408 | 2.01 |
| “Rumor” of possible future NCAA sanctions | 0.42855 | 2.42 |
| Stadium Age (Years) | 0.00189 | 2.08 |
| Conference Championship | -0.12152 | -1.62 |
| New Head Coach | -0.10386 | -1.78 |

Table 5
Distribution of Regression Residuals

| Residual Category (Difference in Actual Star Quality from Predicted) | Percent of Observations | |
|---|-------------------------|-----------------|
| | BCS Schools | Non-BCS Schools |
| -1.0 to -0.5 Average Stars Less Than Predicted | 5.2% | 4.3% |
| -0.5 to 0.0 Average Stars Less Than Predicted | 36.5% | 62.6% |
| 0.0 to 0.5 Average Stars More Than Predicted | 50.5% | 25.9% |
| 0.5 to 1.0 Average Stars More than Predicted | 7.8% | 7.2% |

Table 6
Probit Coefficients, Predictive Results, and Selected Marginal Effects

| | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| <i>Log Likelihood</i> | -7,527.1 | -7,410.2 | -4,335.0 | -6,200.5 |
| <i>Percent Correctly Predicted</i> | 28.5% | 42.0% | 52.2% | 62.8% |
| Variable | Coefficients <i>Marginal Eff.</i> | Coefficients <i>Marginal Eff.</i> | Coefficients <i>Marginal Eff.</i> | Coefficients <i>Marginal Eff.</i> |
| Intercept | -0.6226 ^a | -1.2705 ^a | -1.8405 ^a | -1.3095 ^a |
| # of Stars | -0.0485 ^a -1.22% | -0.0724 ^a -1.79% | -0.1016 ^a -2.07% | -0.1510 ^a -3.15% |
| Position Ranking | 0.0018 ^a 0.05% | 0.0038 ^a 0.09% | 0.0048 ^a 0.10% | --- |
| Player Ranking (across positions) | -0.0006 ^c -0.02% | -0.0007 -0.02% | 0.0004 0.01% | 0.0051 ^a 0.11% |
| Geographic Region Indicators | Included | Included | Included | --- |
| Average Winning Percentage (5 Previous Years) | --- | 0.4137 ^a 10.21% | 0.3170 ^b 6.46% | --- |
| AP ranking in prior year | --- | -0.0078 ^a -0.19% | -0.0074 ^c -0.15% | -0.0048 ^c -0.10% |
| Total BCS Bowl Appearances (5 Previous Years) | --- | -0.0902 ^a -2.23% | -0.0652 ^c -1.33% | --- |
| Member of BCS Conf (Y/N) | --- | 0.2141 ^a 5.28% | 0.2903 ^a 5.92% | 0.3287 ^a 6.87% |
| Total Conference Titles (5 years) | --- | 0.0072 0.18% | 0.0485 0.99% | 0.0254 ^c 0.53% |
| Conf Champ (prior year) | --- | -0.0003 -0.01% | -0.0410 -0.84% | --- |
| Draft Picks (most recent yr) | --- | -0.0064 -0.16% | -0.0002 0.00% | --- |
| Total # Drafted (5 years) | --- | -0.0009 -0.02% | -0.0007 -0.01% | --- |
| School's graduation rate | --- | 0.0001 0.00% | 0.0008 0.02% | --- |
| Prior value of schools graduation rate | --- | 0.0011 0.03% | 0.0021 0.04% | --- |
| Nat'l Champ | --- | -0.0329 -0.81% | -0.0312 -0.64% | --- |
| National Champions in 4 prior years | --- | Included | Included | --- |
| School has a bowl ban | --- | -0.3106 ^a -7.66% | -0.6543 ^a -13.34% | -0.4449 ^a -9.29% |
| NCAA sanctions "rumor" | | -0.1802 ^c -4.45% | -0.1748 -3.56% | -0.2244 ^b -4.69% |
| # of scholarship reductions at school | --- | 0.0170 0.42% | 0.0180 0.37% | 0.0170 ^c 0.36% |

Table 6
Probit Coefficients, Predictive Results, and Selected Marginal Effects

| | Model 1 | Model 2 | Model 3 | Model 4 |
|--|----------------|---------------------------------------|---------------------------------------|---------------------------------------|
| Restrictions on # of visits by school | --- | 0.0467 <i>1.15%</i> | 0.0771 <i>1.57%</i> | --- |
| Stadium Capacity (in thousands) | --- | 0.0053 ^a <i>0.13%</i> | 0.0030 ^a <i>0.06%</i> | 0.0029 ^a <i>0.06%</i> |
| Age of Stadium (in years) | --- | 0.0009 <i>0.02%</i> | -0.0011 <i>-0.02%</i> | -0.0011 ^c <i>-0.02%</i> |
| On-Campus Stadium (Y/N) | --- | -0.0173 <i>-0.43%</i> | 0.1062 ^b <i>2.17%</i> | 0.0995 ^a <i>2.08%</i> |
| New Head Coach (Y/N) | --- | -0.1015 ^a <i>-2.50%</i> | -0.0500 <i>-1.02%</i> | --- |
| Made official visit to school | --- | --- | 1.1547 ^a <i>23.54%</i> | 1.1213 ^a <i>23.42%</i> |
| Distance * Midwest Region | --- | --- | -0.1269 ^a <i>-2.59%</i> | -0.0693 ^a <i>-1.45%</i> |
| Distance * Northeast Region | --- | --- | -0.0344 <i>-0.70%</i> | -0.0553 ^a <i>-1.15%</i> |
| Distance * South Region | --- | --- | -0.0690 ^a <i>-1.41%</i> | -0.0936 ^a <i>-1.95%</i> |
| Distance * West Region | --- | --- | -0.0527 ^a <i>-1.07%</i> | -0.0416 ^a <i>-0.87%</i> |
| Distance Squared * Midwest Region | --- | --- | 0.0048 ^a <i>0.10%</i> | .0023 ^b <i>0.05%</i> |
| Distance Squared * Northeast Region | --- | --- | 0.0011 <i>0.02%</i> | .0015 ^c <i>0.03%</i> |
| Distance Squared * South Region | --- | --- | 0.0030 ^a <i>0.06%</i> | .0040 ^a <i>0.08%</i> |
| Distance Squared * West Region | --- | --- | 0.0012 ^b <i>0.02%</i> | .0010 ^a <i>0.02%</i> |
| Recruit is in same region as school | --- | --- | 0.0209 <i>0.43%</i> | --- |
| Recruit is in same state as school | --- | --- | 0.3722 ^a <i>7.59%</i> | 0.4232 ^a <i>8.84%</i> |
| Recruit is in same town as school | --- | --- | 0.1819 ^a <i>3.71%</i> | --- |
| # of recruits signed in same position in prior year | --- | --- | -0.0257 ^a <i>-0.52%</i> | --- |
| # of "star" recruits signed in same position in prior year | --- | --- | 0.0484 ^a <i>0.99%</i> | --- |

a, b, c indicates the variable is statistically significant from zero at the 5%, 10%, and 15% level, respectively.

Table 7
Predictive Accuracy of the Probit Model
by Year and Region

| Year or Region | Predictive Accuracy |
|--------------------|---------------------|
| 2002 Recruits | 62.5% |
| 2003 Recruits | 63.4% |
| 2004 Recruits | 62.6% |
| Midwest Recruits | 65.4% |
| Northeast Recruits | 53.3% |
| South Recruits | 64.3% |
| West Recruits | 59.6% |

Appendix A

Predicted College Selections of the Top 100 Recruits

| Rivals Player ranking | Recruit Name | Position | Closest School to Recruit | Predicted School from Model | Actual Choice |
|------------------------------|---------------------|-----------------|----------------------------------|------------------------------------|----------------------|
| 1 | Derrick Williams | ATH | Penn State | Penn State | Penn State |
| 2 | Jerrell Powe | DT | Ole Miss | Ole Miss | Ole Miss |
| 3 | Eugene Monroe | OL | Rutgers | Virginia | Virginia |
| 4 | Fred Rouse | WR | Florida State | Florida State | Florida State |
| 5 | Callahan Bright | DT | Purdue | Florida State | Florida State |
| 6 | Mark Sanchez | QB | Southern Cal | Southern Cal | Southern Cal |
| 7 | Martellus Bennett | TE | Texas A&M | Texas | Texas A&M |
| 8 | Reginald Youngblood | OL | Texas | LSU | Miami-FL |
| 9 | Justin King | DB | Pittsburgh | Penn State | Penn State |
| 10 | Patrick Turner | WR | Tennessee | LSU | Southern Cal |
| 11 | Jonathan Stewart | RB | Oregon | Washington St. | Oregon |
| 12 | DeMarcus Granger | DT | Oklahoma | Oklahoma | Oklahoma |
| 13 | Melvin Alaeze | DE | Maryland | Maryland | Maryland |
| 14 | Marlon Lucky | RB | Southern Cal | Nebraska | Nebraska |
| 15 | Toney Baker | RB | North Carolina | NC State | NC State |
| 16 | Kenneth Phillips | DB | Miami-FL | Miami-FL | Miami-FL |
| 17 | Tray Blackmon | LB | Auburn | Auburn | Auburn |
| 18 | Ryan Perrilloux | QB | LSU | LSU | LSU |
| 19 | Victor Harris | ATH | Virginia | Virginia Tech | Virginia Tech |
| 20 | Kevin Grady | RB | Michigan | Michigan | Michigan |
| 21 | Darren McFadden | ATH | Arkansas | Arkansas | Arkansas |
| 22 | Rey Maualuga | LB | Oregon | Southern Cal | Southern Cal |
| 23 | Ekem Udofia | DT | Arizona State | Southern Cal | Stanford |
| 24 | Alex Boone | OL | Notre Dame | Ohio State | Ohio State |
| 25 | Jamario O'Neal | DB | Michigan | Ohio State | Ohio State |
| 26 | Dan Doering | OL | Notre Dame | Iowa | Iowa |
| 27 | Ryan Reynolds | LB | UCLA | Oklahoma | Oklahoma |
| 28 | Kade Weston | DT | Maryland | Georgia | Georgia |
| 29 | Jason Gwaltney | RB | West Virginia | Southern Cal | West Virginia |
| 30 | Antone Smith | RB | Miami-FL | Miami-FL | Florida State |
| 31 | Eugene Hayes | LB | Florida State | Florida State | Florida State |
| 32 | DeSean Jackson | WR | Southern Cal | Southern Cal | California |
| 33 | Jamaal Charles | RB | Texas A&M | Texas | Texas |
| 34 | Luthur Brown | LB | Southern Cal | Southern Cal | Southern Cal |
| 35 | James Davis | RB | Georgia | Alabama | Clemson |
| 36 | Marques Slocum | OL | Maryland | Michigan | Michigan |
| 37 | Averell Spicer | DE | Southern Cal | Southern Cal | Southern Cal |
| 38 | Eric Huggins | WR | Clemson | Oklahoma | Oklahoma |
| 39 | Kyle Moore | DE | Georgia | Tennessee | Southern Cal |
| 40 | Mohamed Massaquoi | WR | North Carolina | Georgia | Georgia |
| 41 | Leon Jackson | ATH | Washington St. | Nebraska | Nebraska |
| 42 | Antonio Bass | ATH | Michigan State | Michigan | Michigan |
| 43 | Matt Hardrick | OL | Florida | Florida State | Florida State |
| 44 | Ndamukong Suh | DT | Oregon State | Oregon State | Nebraska |
| 45 | Aleksey Lanis | OL | UCLA | UCLA | UCLA |

| Rivals Player ranking | Recruit Name | Position | Closest School to Recruit | Predicted School from Model | Actual Choice |
|------------------------------|---------------------|-----------------|----------------------------------|------------------------------------|----------------------|
| 46 | Mario Manningham | WR | Michigan | Michigan | Michigan |
| 47 | C.J. Byrd | ATH | Georgia | Georgia | Georgia |
| 48 | Anthony Moeaki | TE | Notre Dame | Iowa | Iowa |
| 49 | O.J. Murdock | WR | South Florida | Florida State | South Carolina |
| 50 | Brian Cushing | LB | Boston College | Boston College | Southern Cal |
| 51 | Dace Richardson | OL | Iowa | Michigan | Iowa |
| 52 | Dajleon Farr | TE | Texas | LSU | Miami-FL |
| 53 | Will Harris | DB | UCLA | Southern Cal | Southern Cal |
| 54 | Michael Oher | OL | Memphis | Tennessee | Ole Miss |
| 55 | Jonathan Crompton | QB | Clemson | Tennessee | Tennessee |
| 56 | Ricky Jean-Francois | DE | Florida | Tennessee | LSU |
| 57 | Curtis Crouch | OL | NC State | NC State | NC State |
| 58 | Al Jones | DE | LSU | LSU | LSU |
| 59 | Curtis Lofton | LB | Oklahoma State | Oklahoma | Oklahoma |
| 60 | Henry Melton | ATH | Texas A&M | Texas | Texas |
| 61 | Reggie Smith | DB | Oklahoma | Oklahoma | Oklahoma |
| 62 | Justin Mincey | DE | Florida | Florida State | Florida State |
| 63 | Malcolm Kelly | WR | Texas | Oklahoma | Oklahoma |
| 64 | Christopher Barney | OL | Miami-FL | Miami-FL | Miami-FL |
| 65 | LaMarcus Coker | RB | Tennessee | Tennessee | Tennessee |
| 66 | Maurice Wells | RB | Florida | Southern Cal | Ohio State |
| 67 | Avery Atkins | DB | Florida | Florida State | Florida |
| 68 | Travis Beckum | LB | Wisconsin | Wisconsin | Wisconsin |
| 69 | Bryan Evans | DB | Florida | Georgia | Georgia |
| 70 | Keenan Clayton | DB | Oklahoma | Oklahoma | Oklahoma |
| 71 | Everette Brown | DE | NC State | North Carolina | Florida State |
| 72 | Doug Worthington | DE | Ohio State | Ohio State | Ohio State |
| 73 | Rashard Mendenhall | RB | Northwestern | Northwestern | Illinois |
| 74 | Roy Miller | DT | Texas | Texas | Texas |
| 75 | Kevin Thomas | DB | Southern Cal | Southern Cal | Southern Cal |
| 76 | Cory Zirbel | OL | Kentucky | Kentucky | Michigan |
| 77 | Courtney Harris | DE | Miami-FL | Miami-FL | Miami-FL |
| 78 | Carlos Thomas | WR | South Carolina | South Carolina | South Carolina |
| 79 | Spencer Adkins | LB | Miami-FL | Georgia | Miami-FL |
| 80 | Jake Christensen | QB | Northwestern | Iowa | Iowa |
| 81 | Matt Reynolds | OL | Brigham Young | Utah | Brigham Young |
| 82 | Demetrice Morley | DB | Florida | Tennessee | Tennessee |
| 83 | Selwyn Lymon | WR | Purdue | Purdue | Purdue |
| 84 | Chris Keys | DB | Alabama | Alabama | Alabama |
| 85 | Michael Ray Garvin | DB | Rutgers | Georgia | Florida State |
| 86 | Aaron Ware | ATH | UCLA | UCLA | UCLA |
| 87 | Michael Shumard | OL | Texas A&M | Texas A&M | Texas A&M |
| 88 | Austin Usher | WR | California | California | None |
| 89 | Josh McNeil | OL | LSU | Mississippi State | Tennessee |
| 90 | Nic Harris | DB | Texas A&M | Oklahoma | Oklahoma |
| 91 | Deveon Simmons | LB | NC State | Virginia Tech | Virginia Tech |
| 92 | Chris Scott | OL | Tennessee | Tennessee | Tennessee |
| 93 | Kalvin Bailey | RB | Miami-FL | Iowa | Iowa |
| 94 | Jonathan Hannah | TE | NC State | NC State | South Carolina |
| 95 | Paul Freney | DE | Texas A&M | Texas A&M | Texas A&M |
| 96 | Rico McCoy | LB | Pittsburgh | Ohio State | Tennessee |

| Rivals Player ranking | Recruit Name | Position | Closest School to Recruit | Predicted School from Model | Actual Choice |
|------------------------------|---------------------|-----------------|----------------------------------|------------------------------------|----------------------|
| 97 | Kevin Bemoll | OL | UCLA | California | California |
| 98 | Terrance Taylor | DT | Michigan | Michigan | Michigan |
| 99 | James McKinney | DT | Louisville | Louisville | Michigan |
| 100 | Harrison Beck | QB | Florida | Nebraska | Nebraska |

Appendix B

Data Sources

The principal source of data relied upon in this study is a proprietary data set furnished to the authors by Rivals.com. This data set covered high school and junior college football recruits for the recruiting years 2002 to 2004. To this data, we calculated the straight-line distance between each recruit's home town and their potential college choice using mapping (i.e. GIS) software. By agreement with Rivals.com, we are not allowed to provide this data to others. However, Rivals.com is likely to provide this same data to others if they agree to the same stipulations. In that case, we would be willing to provide the distance calculations we have calculated. Contact: Greg Gough, Chief Technology Officer of Rivals.com (greg@rivals.com).

We collected the school information such as AP rankings, wins, losses, BCS bowl appearances, etc., from www.cfbwarehouse.com. Data on NCAA sanctions was collected using the search engine at the NCAA website (www.ncaa.org). We limited our search to major violations at Division I-A institutions, from 1994 to 2004. Both of these data sets are available upon request.