Transfer Mobility: The Transfer Portal, NIL, and the Reshaping of College Football Careers

Maxwell Mitchell

Abstract

The NCAA's introduction of the transfer portal in 2018 and legalization of Name, Image, and Likeness (NIL) in 2021 represent a structural shift of athlete mobility in college football. Both the transfer portal and NIL have fundamentally altered the collegiate sports landscape in ways often discussed by players, coaches, media, partners, and fans. This study examines how the transfer portal reshapes the careers and trajectories of Division I Football Bowl Subdivision (FBS) athletes. By examining 7,993 individual player transfers between 2018 and 2024 linked to high school recruiting rankings, transfer direction, NIL valuation, and more, this study evaluates how player mobility differs by star rating and whether transferring translates into increased playing time and professional returns across pre-NIL (2018–2020) and active-NIL (2021–2024) eras. Analysis reveals that players transferring to better football programs and with higher NIL values are associated with higher NFL conversion rates, and players transferring to worse football schools are associated with greater gains in playing time. Ultimately, college football players transfer to optimize their career capital rather than solely pursuing money, playing time, or draft status.

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I. Introduction

In 2018, the NCAA introduced the NCAA transfer portal, followed by the 2021 legalization of NIL. The transfer portal has given student-athletes the opportunity to transfer to other schools on a year-to-year basis. Through NIL, student-athletes earn compensation beyond their athletic scholarship. These two policy shocks have reshaped incentives and motivations driving transfer decisions through financial, competitive, and developmental opportunities.

As the college football labor market has restructured, transfer activity has steadily increased year by year since 2018.[1] Annual transfer totals have roughly quadrupled from the pre-NIL years (2018–2020) to the NIL era (2021–2024).[2] Consistent with this trend, SportsSource Analytics reports that transfers made up 6.5% of FBS rosters in 2019 and climbed to 21% in 2023 (VanHaaren, 2023). Barber (2024) estimates a 75% increase in the total number of student-athletes transferring across all Division I institutions from 2021 to 2023.

Student-athletes enter the transfer portal for many different reasons. This study investigates three motivations of transferring: playing time, financial gain, and professional football aspirations. Wheatley (2025) identifies additional motivations in coach relationships, culture shock, medical issues, disciplinary problems, and mental health. The 2022 NCAA Student-Athlete Well-Being Study supports Wheatley's findings, indicating that 40% of male student-athletes transfer due to mental health concerns and 36% for issues related to playing time (Johnson, 2023). Many players utilize the portal because they need a "New environment … new opportunities and a place where I would have better opportunities to display my talent and play football" (Wheatley, 2025). This newfound autonomy benefits athletes, who, in turn, have

[1] The 2020 season is the only year from 2018-2024 with a year-by-year decrease in transfers influenced by the COVID-19 pandemic.
[2] See Figure 1 and Table 2 (page

largely positive sentiment toward the portal. Pittsburgh transfer Kedon Slovis captures this newfound empowerment, stating, "Having the opportunity and the freedom to look at my options … to find the best place for me as a football player and a student was huge" (ESPN Staff, 2022). Through all these motivations, players transfer in search of better opportunities.

While sentiment from players is generally positive, coaches and administrators, such as Clemson University Tigers Head Coach Dabo Swinney, believe the portal is spurring chaos and instability (Low, 2025). Former Alabama Crimson Tide Coach Nick Saban fuels the negative rhetoric of the transfer portal stating that "On the development side of it, it is not beneficial to the players" (Bahns, 2024). Paul Finebaum, an opinionated ESPN and SEC personality, believes that due to the transfer portal and NIL, "College football is at a tipping point … what is going on now is an existential threat to the future of the game" (Goldkamp, 2025). However, there is some positive perception of the transfer, such as ESPN broadcaster Greg McElroy, who is in "Favor of—I don't have any issues with transferring" (Brezina, 2022).

While coaches, administrators, and media members have largely negative perceptions of the transfer portal, this study examines whether it truly benefits the players, given that they can act in their own self-interest. This study examines how the portal reshapes career trajectories for 7,993 Division I FBS football transfers. It further examines whether players transfer to maximize their market value through increased exposure, more playing time, or enhanced financial opportunities, and what the tangible outcomes are. Ultimately, this study analyzes how the evolving transfer portal landscape has transformed college football from a rigid eligibility system into a dynamic marketplace.

II. Research Questions/Hypotheses

In the era of the transfer portal and shifting NIL landscape, Division I FBS programs face a rapid influx and outflow of talent. Yet there is a lack of standardized measures to describe who moves where, why, and with what returns. Hence, my research questions and hypotheses are:

Subsection 1: Sorting by Recruiting Star Ratings

RQ1: How do recruiting ratings shape transfer direction across the FBS?

H1: Recruiting ratings significantly shape transfer direction. Elite recruits (3–5-star) are more likely to transfer to weaker programs, whereas non-elite recruits (2-star /no-star) are more likely to transfer upward.

Subsection 2: Opportunity Returns

RQ2: Does transferring expand on-field opportunity (games/starts) and does this vary by transfer direction?

H2: Players who transfer down to weaker programs see increased playing time and more starts compared to those who transfer up to stronger programs.

Subsection 3: NIL & Professional Value

RQ3: How do transfer direction, star rating, and NIL valuation influence professional outcomes (NFL Participation)?

H3: Upward mobility in the transfer market enhances the probability of NFL participation, reflecting increased visibility, stronger competition, and development opportunities.

H4: In multivariate regressions, upward transfers and higher NIL valuations have significant positive effects on NFL playing potential, controlling for star rating.

Subsection 4: Overarching Motives

RQ4: What primary motivations, playing time, financial opportunity, or draft status best explain transfer decisions across the transfer portal era?

III. Justification

This study is significant because it examines one of the most consequential transformations in the structure of college athletics. In particular, the transfer portal and NIL represent the most significant reconfiguration of athlete mobility in college sports in decades. Yet, despite the scale of this change, systematic research has not kept pace with these developments. By distinguishing between the pre-NIL (2018–2020) and active-NIL (2021–2024) periods, this project offers the first comprehensive analysis of how transfers impact player careers through changes in playing time, program destination, and professional outcomes in college football.

Beyond athletics, this research is important from a labor economics and human capital perspective. Switching schools represent a human capital investment in which student-athletes consider their earnings potential, on-field development, and exposure. By examining the hypothesis questions, the study investigates whether transfer direction facilitates the efficiency of talent sorting. In addition, the findings have direct relevance for stakeholders in college athletics. For athletes, the findings provide evidence on which transfers are more likely to enhance long-term outcomes. For programs, the findings highlight ways in which transfer decisions can impact competition, roster stability, and future success. Collectively, this makes the topic not only timely but critical to understanding the new college football environment.

IV. Literature Review

The transfer portal is a new entity for college student-athletes to leave their current institution to compete in another program. Since the introduction of the transfer portal in 2018, the NCAA

has lowered obstacles to player mobility (Hummer, 2024; Wright, 2023; NCSA, 2025). Mobility has risen rapidly since 2018 due to decreased friction: the FBS roster share attributed to transfers roughly tripled from 2019 to 2023 (VanHaaren, 2023), and compiled FBS sample documents a sharp increase in annual transfer counts after 2018 (Table 2, Figure 1). NCAA rule changes and the ease of player mobility connect to core economic concepts. By eliminating the sit-out year and standardizing entry windows, the NCAA reduced switching costs, which theory predicts will intensify competition among programs for athletes and increase reallocation (Klemperer, 1995).

Moreover, the portal functions as a search-and-matching market. Both sides (players & coaches) learn about match quality and separate more quickly, especially earlier in a player's college career, thereby raising turnover and speeding up sorting (Jovanovic, 1979). This translates to hypothesized increases in transfer rates among players early in their college experience, as well as multiple transfers, mandated by the 2024 multi-transfer instant eligibility rule. The observed quadrupling in active-2021 transfer activity aligns closely with what economic theory would predict in a market characterized by reduced frictions and stronger price signals.

The combination of reduced frictions to mobility and more transparent NIL price signals have transformed the portal into a competitive labor market. This environment is marked by accelerated sorting and growing disparities in player capital. This new market mirrors a dynamic job-ladder framework (Burdett & Mortensen, 1998). Elite Power Four football institutions recruit established talent from worse schools. On the contrary, lower-tier programs provide development opportunities and playing time for athletes who did not start at their initial elite schools.

Dillon Gabriel's 2024 transfer from a then-struggling University of Oklahoma Sooners team to a then-national title contender University of Oregon Ducks exemplifies this dynamic. Gabriel

made more money and the College Football Playoff in his one year as the starting Quarterback for the Ducks.[3] On the contrary, Baylor University Bears Quarterback Jacob Zeno transferred downwards to the University of Alabama at Birmingham Blazers in 2022, having played four games in two years for the Bears before becoming the successful starting quarterback for the Blazers (Goffin, 2024).[4] The two transfers above are examples of the portal functioning as a stratified yet fluid labor market, where athletes can move up, down, or even laterally within the hierarchy of program quality, financial compensation, and opportunities.

As the portal has lowered switching costs for players, illustrated by recent high-profile movers such as Dillon Gabriel and Jacob Zeno, it has also reshaped the working environment for coaches and administrators. The resulting instability among coaches mirrors predictions from job-ladder and search-and-matching models (Burdett & Mortensen, 1998; Jovanovic, 1979). Both models point out that when it becomes easier for people to move, turnover rises and managers face more instability (Burdett & Mortensen, 1998; Jovanovic, 1979).

College football has seen the same pattern: coaches now deal with unpredictable roster changes each year and often have to re-recruit players already on their roster just to keep them from leaving. Thus, this framework helps explain negative perceptions by coaches, who act as owners and managers in this framework. Twenty-five percent of Division I coaches across the major NCAA sports reported stress levels regarding the need to recruit players who they believe will not transfer out, and a third of coaches expressed concern about players transferring from their team (Johnson, 2023). Players have increased bargaining power creating the turnover risk and concern from coaches. Furthermore, 86% of 376 Division I coaches, athletic directors, and

[3] Gabriel's success at Oregon led to his third-round selection in the 2025 NFL Draft by the Cleveland Browns
[4] Zeno broke the UAB single-season completion and completion percentage records in 2023. This contributed to his upward transfer back to the SEC (Texas A&M)

university presidents believe the transfer portal's impact on Division I sports is negative (Knight Commission on Intercollegiate Athletics & Elon University Poll, 2025). Overall, these economic labor movement shifts provide context for positive perceptions among student-athletes and negative perceptions among coaches in the transfer portal environment.

Beyond players' and coaches' perceptions and motivations of the portal, scholars are also beginning to examine how the transfer portal affects a player's career path, but these studies are mainly position-specific or smaller case studies. To date, studies have examined quarterback transfers (Dohrn & Lopez, 2022) and the impact of a program's culture on whether players choose to stay or leave (Corr et al., 2024). This study builds on this literature through my report on all NCAA FBS transfers since the start of the portal in relation to program strength, playing time, professional outcomes, and recruiting star rankings.

Recruiting stars are central to the analysis and have historically provided reliable predictions to college football programs how productive a player might be in relation to their predicted NFL success. Studies show that better classes and higher-ranked players lead to improved team performance and increased chances of being drafted into the NFL (Bergman & Logan, 2014; Tice, 2020). Bergman and Logan (2014) and Tice (2020) find that the star ratings evaluations predict later team success and the likelihood of turning professional. This pattern is consistent with a recruiting market that sorts athletes by expected productivity. Highly rated high school recruits exhibit significant differences in skill, expected performance, and talent spread across the college football transfer market. The work builds on Bergman & Logan (2014) and Tice (2020) by examining how the transfer portal and NIL have transformed these talent signings into active parts of the college football labor market.

The study further tests whether transfers deliver on-field opportunity and professional returns by star tier and era. My hypothesis that upward transfers are associated with higher rates of playing in the NFL and downward transfers are associated with larger gains in games played aligns with research in sports and labor economics by Kahn (2000) and Dohrn and Lopez (2022). On the other hand, transitioning to a lower-performing school provides a more straightforward path to a starting role, offering short-term benefits (Dohrn & Lopez, 2022). This will improve immediate satisfaction and restore market value if they were previously underused.

Lastly, NIL changes this player's capital into an asset with dual returns. It allows athletes to optimize current income sources and the estimated future value of their human capital in both college and professional markets. Thus, players are able to change schools relative to where they will gain the most financial and human-capital value.

V. Institutional Background

To provide added context to the literature review and pre- and active-NIL cohorts, this section outlines the transfer portal and NIL. Before the transfer portal, undergraduate student-athletes were required to obtain approval from their university and the NCAA to submit a transfer request (Prather, 2021). Once approved, undergraduate transfers lost a year of eligibility at their new school (Prather, 2021). Under the 2011 NCAA graduate transfer exception policy, graduate transfers played immediately at their new school without a year of lost eligibility. The eligibility rule stayed in place for the first three years of the transfer portal, which opened on October 15, 2018 (Hummer, 2024).

In April 2021, the NCAA introduced the one-time transfer rule. (Hummer, 2024). The one-time transfer rule granted immediate eligibility to undergraduate transfers if they were academically eligible, had no prior transfers to a four-year university, and provided a written

notice of their intent to transfer (NCSA, 2025). In the spring of 2024, all academically eligible players received immediate eligibility at their new school, regardless of whether they had already transferred (NCSA, 2025). Another barrier was introduced in 2022 with the establishment of transfer portal windows, where players must enter their name in the portal during a specific period relative to their sport (NCSA, 2025).

Shortly after the one-time transfer rule, the NCAA introduced NIL in the summer of 2021. Prior to NIL, players' compensation was limited to athletic scholarships. Players faced severe penalties if found guilty of taking money from sponsors or fans, including loss of eligibility or suspension. A high-profile example is the University of Southern California Trojans running back Reggie Bush forfeiting his 2005 Heisman Trophy after being found guilty by the NCAA for receiving benefits from alumni boosters and agents (Schilken, 2024). In the new NIL era, student-athletes generate income from previously restricted revenue streams, such as sponsorships, social media promotions, endorsements, autographs, and camps (NCSA, 2025). Players like Reggie Bush are now making millions of dollars, as previous generations missed out on the ability to capitalize on their name, image, and likeness.

Data Collection & Methods

This study draws on five primary sources to track FBS transfer careers from 2018–2024: CFBStats (rosters and game data), 247Sports (recruiting ratings), Simmons Ratings (program strength), Pro-Football-Reference (professional outcomes), and On3 (NIL valuations).

CFB STATS

CFBStats (SportsSource Analytics) provides the foundational dataset for this study (College Football Statistics, n.d.).[5] CFBStats records comprehensive roster and game-level statistics for

[5] This dataset was built in collaboration with Andrew Hanssen, Department of Economics, Clemson University (email: fhansse@clemson.edu); and Mark Mitchell, University of Chicago Booth Business School, University of

every Division I football program since 2005. For each Division I player, CFBStats provides detailed information, including their college, height, weight, position, hometown, and high school, as well as annual measures of playing time and game-by-game statistics. Division I comprises two subdivisions: the Football Bowl Subdivision (FBS) and the Football Championship Subdivision (FCS). The FBS is the top tier of college football and the group with the most complete rosters and participation records, as there are substantial coverage gaps among players at FCS teams.[6] Thus, I focus on players transferring to FBS schools.

While the research focuses on FBS transfers from 2018 to 2024, I also include players from the 2017 season to identify those who transferred in 2018. There were 59,365 unique FBS players during the 2017-2024 period. There were 32,083 unique FCS players during the 2017-2023 period, excluding players who transferred to FCS schools in 2024. Thus, the sample of 59,365 FBS and 32,083 FCS players is my starting point for identifying transfers to FBS programs.

In this Division I sample, I identified players who transferred to FBS programs between 2018 and 2024. I limited the timeframe to transfers to this criterion because the NCAA transfer portal was established in 2018, and complete CFBStats player data was available through the 2024 season at the time of compilation. To isolate the transfers, I used the unique player codes provided by CFBStats. The program searched for player codes that indicated a different school from the one the player was listed on the roster for in the previous year. If a player appeared on different rosters (colleges) in consecutive seasons, the program recognized him as a transfer. My

Chicago and AQR Arbitrage, LLC (emails: mark.mitchell@uchicagobooth.edu and mmitchell@aqrarbitrage.com). Grand Teton Holdings, Inc. (www.grandtetonholdings.com) for an external research project.

[6] FBS is the highest Division I level with larger budgets and more scholarships, whereas FCS schools are smaller with fewer resources

initial dataset identified 11,533 players transferring to Division I programs[7]. After excluding players who transferred between FCS programs, the sample consisted of 8,063 transfers to FBS programs between 2018 and 2024.

To improve accuracy, I ran multiple rounds of filtering and robustness checks. To close gaps in FCS coverage, I cross-referenced the ON3 Transfer Portal Tracker to flag key players the initial sweep missed. (On3, n.d.) [8] Through this review, I added five extra transfers to the sample, including University of Colorado Buffaloes wide receiver and cornerback Travis Hunter. I then used On3 to verify my annual transfer counts were consistent with their reported figures.

The original CFBStats-based transfer portal count undercounted the actual volume of transfers by 100-200 per year. This slight variation in player counts reflects the CFBStats inclusion criteria, which require players to appear on a Division I roster. Players who enrolled early or were sidelined for the entire year due to injury were not listed on the roster but were included in the On3 transfer portal database. An example of this is current Ohio State Buckeyes starting quarterback Julian Sayin. Sayin enrolled early at the University of Alabama Crimson Tide in December 2023 before transferring to the Buckeyes in January 2024 following the retirement of Crimson Tide head coach Nick Saban. As he did not appear on the 2023 Crimson Tide roster, Sayin's transfer is not included in my transfer dataset.

My next step in filtering was to perform checks on every star-rated recruit from the 247Sports profiles to ensure they were properly matched with the correct transfer player.[9] For every player with a star rating, I manually checked their 247Sports profile page to ensure they

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[7] This dataset includes each transfer's player code, first and last name, position, year transferred, class transferred, hometown, hometown state, high school, star rating, numerical rating, and their origin and destination schools

[8] This came to light after finding that Travis Hunter and the 2022 Jackson State roster did not appear in the primary CFBStats dataset.

[9] This came to light after finding Caleb Williams' (5-star, 2022 transfer, current Chicago Bears starting quarterback) 247 rating matched with five different Caleb Williams within the larger CFB Stats dataset

were correctly matched and had the correct star and numerical rating. My last round of filtering involved a final check to confirm all players transferred to a Division I school. This led to the late removal of ten players who transferred to North Carolina Central (FCS) and 65 who were incorrectly labeled as having "transferred" to Houston Christian.[10] After this final step of filtering, my dataset contained 7,993 transfer observations with their corresponding player code, first and last name, position, year transferred, class transferred, hometown, hometown state, high school, high school star rating, high school numerical rating, and the origin and destination school for each transfer.[11]

247 Sports

As CFBStats did not provide high school recruiting ratings, I integrated data from 247Sports.[12] 247Sports is a platform that focuses primarily on collegiate recruiting of high school basketball and football players (247Sports, n.d.). It provides player rankings based on their high school football performance and projected professional outcomes. 247Sports also provides each recruit's position, physical measurements, hometown, high school, scholarship offers, committed and signed universities, and facial image. I merged all players from the CFBStats dataset with high school star and numerical ratings provided by 247Sports to create a comprehensive dataset of Division I College football players and their corresponding recruiting ratings. Star ratings were not collected for the 15,819 2024 FBS players, as players transferring for the 2024 season were already captured within the existing merged dataset.

Within the merged sample, 18,138 players (25.2%) of Division I players from 2017 to 2023 received star ratings. Only the most highly recruited players receive star ratings. For each

[10] In 2022, Houston Baptist changed its name to Houston Christian, which resulted in players being misclassified as transfers

[11] If a player transfers multiple times, both transfers count as a unique transfer observation

[12] The merging of 247Sports and CFBStats data was also built in collaboration with Hanssen and Mitchell

recruiting class, there are typically 30-32 5-stars. This mirrors the predicted first round of the NFL draft. There are 300-400 4-stars mirroring rounds 2-7 of the NFL draft and undrafted signings. Roughly 2000 3-star players possess projected Division I (FBS) talent and aren't projected to play football beyond college. Lastly, there are a couple of hundred 1- and 2-stars representing fringe FBS and strong FCS talent. Most collegiate players do not have 247Sports profiles and are excluded from the merging process. These players account for the remaining 74.8% of Division I players from 2017 to 2023 (n = 53,781).

Creating the Four Variables

To broaden the dataset, four variables were added: professional career status, NIL valuation, transfer direction, and game participation. The participation measure records both games played and games started in the season before the transfer and in the transfer year.

I first constructed the transfer ranking system to evaluate whether a player transferred to a stronger or weaker program. I built this ranking system based on the Simmons Rating created by Brian Simmons (Simmons, n.d.). His methodology is based on a mathematical formula that incorporates win-loss record, strength of schedule, and margin of victory, while providing a stronger emphasis on games later in the season (Simmons, n.d.). I used his end-of-season rankings to create a rankings tier of all 265 Division I schools from 2015 to 2024. I categorized the rankings into ten tiers, with 27 overall tiers. Tier one contained teams ranked 1st through 10th, tier 27 contained teams ranked 251 through 260, and tier 27 with teams ranked 261 to 265.

After creating the tiers, I assessed how prior tier rankings could predict subsequent season outcomes. For each target year, the three most recent tiers were employed as predictors (e.g., 2018–2020 tiers for the 2021 tier), and linear, ridge, and lasso regression models were performed. After testing each regression model using R^2, the time-weighted linear regression

model was the most stable and interpretable fit. I used the coefficients as weights to reflect the past three years' (t-1, t-2, t-3) contribution to the focal year's tier (t), provided in table found the time-weighted linear regression model to be the most stable and interpretable fit. The resulting coefficients were used as weights, reflecting the past three years' contribution to the focal year's tier, provided in Table 1.

The regression-derived weights were then used to construct weighted tier scores for each institution in each year. I applied these weights to evaluate all transfers from 2018 to 2024. For a player transferring in 2020, I evaluated both the team they moved to and from, using the regression weights from 2017 to 2019. I applied the framework uniformly across all regression years and used year-specific weights. Transfers were coded "up" when the destination–origin score difference exceeded 0.3, "down" when it was below −0.3, and "lateral" when it fell between −0.3 and 0.3.[13] These three-year weighted averages captured recent performance consistently, while eliminating single-season anomalies. Overall, this created a standardized, regression-based measure to assess differences in program quality across the 2018-2024 period.

After completing the transfer quality index, I next examined whether players benefited on the field after making a transfer. To measure this, I used game-by-game participation data from CFB Stats, which records every Division I contest since 2005 and provides a game code along with a starter indicator (1 if the player started, 0 if they appeared but did not start) (College Football Statistics, n.d.). For every game in which a player appears, there is a corresponding row with the game code, starter variable, and year.[14] Next, I tallied starts for each transfer in the

[13] The ±0.3 threshold reflects a meaningful change in program quality, capturing substantive shifts rather than minor year-to-year variation. While the ±0.3 threshold doesn't create a uniform distribution, I find it to be the most balanced cutoff aligned with the dispersion of tier-scored differences.

[14] For each game that a player appeared in, they were given a 1 for starting and a 0 for not starting

season immediately before the move and in the first season at the new school.[15] I also added a total-participation measure by summing game-level appearance indicators (1 = appeared, 0 = did not appear), alongside starts.[16] This produced season-level participation metrics for all transfer athletes, providing a basis to assess whether their use of the transfer portal led to increased, decreased, or unchanged opportunities on the field.

The third step in the variable creation involved determining whether a transfer observation played in the NFL or any level of professional football. I first compiled every player who appeared in an NFL game between 2019 and 2024 via Pro Football Reference (Pro Football Reference, n.d.). For each NFL player in this criterion, I captured their full name, first NFL season, position, years played, last college attended, hometown, and draft details. Similar to the CFBStats dataset, a player doesn't appear on Pro Football Reference player search if they never appeared in a game. The Pro Football Reference player searching database excludes athletes were undrafted free agents, practice squad members, or drafted but never played in an official NFL game. Thus, I examined every transfer observation through Google searches to determine if they had reached any professional level, including all other North American professional football leagues.[17] I created a categorical "Pro Status" variable to classify outcomes for transfer players.[18] After individually researching every transfer and matching them to the NFL player dataset and Google searches, I captured all professional outcomes for transfer observations.

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[15] For a 2024 transfer, I record starts for the 2023 season (pre-transfer school) and 2024 season (new school)

[16] Players who never saw the field in a given season, such as redshirts or those sidelined by injury, were recorded as blanks for the starter columns and 0 for the games played column, allowing me to differentiate between players who didn't play at all during the season versus those who did and never started.

[17] Other North American professional football leagues include the Canadian Football League, Arena Football League, United Football League, and Indoor Football League

[18] For the Pro Status Categorical Variable: 0 = never played professional football, 1 = appeared in an NFL game, 1* = Never played in a NFL game but were, drafted, undrafted free agent, or practice squad, 2 = Played in non-NFL professional leagues (e.g., CFL, UFL, AFL, IFL)

The final component integrated into this framework was Name, Image, and Likeness valuations. For this, I used the Rivals/On3 player database to identify NIL estimates for players in my transfer dataset (Rivals, n.d.). I individually looked up all 6,423 transfers from 2021 to 2024 on the Rivals NIL tracker page (Rivals, n.d.). When a player had no NIL valuation listed on On3, I inputted $39,944 as the default value, attributed to the NCAA college football median NIL value (Lyons, 2024). The median value of $39,944, provides a lower-bound estimate of the actual Division I FBS NIL value (Lyons, 2024).[19] Overall, including player's NIL values allows me to connect transfer behavior to playing time, professional outcome, and market value.

Merging

After building the transfer direction, games started/played, pro, and NIL datasets, I ran matching processes on my 2018-2020 and 2021-2024 transfer datasets. For the 2018-2020 period, I matched via player code to the professional games started and transfer direction data. For the 2021-2024 transfer dataset sample, I again matched records using player code to the professional, game started, transfer direction, and NIL data. I merged all four datasets into one, creating two master files that encompassed all transfers from 2018 to 2020 and from 2021 to 2024, along with their corresponding variables.

VI. Summary Statistics

Growth and Composition of the Transfer Market (2018-2024)

The study first documents the annual transfer count since the portal's launch and compares the pre- and active-NIL cohorts by star rating. Tables 2–3 illustrate the rapid expansion of the market after 2021, with participation concentrating among 3-star and no-star athletes and limited but notable movement among 4–star and 5–star recruits.

[19] The $39,444 median value combines all FBS and FCS football players

In Table 2, 7,993 players transferred to Division I FBS schools from 2018 to 2024. There is a year-by-year increase in transfers for every year except the 2020 COVID-19 season. In 2018, the first year of the portal, 445 players transferred. This was followed by 572 transfers in 2019 before the dip down to 553 transfers in 2020. In the pre-NIL cohort (2018-2020), there are 1,570 transfers. In 2021, the sample saw the first significant increase in the portal, with a 89% increase. In 2021, there were 1,045 transfers, an almost 90% increase. The growth continued with 1,434 transfers in 2022, 1,884 transfers in 2023, and 2,060 transfers in 2024. This results in 6,423 transfers in the active-NIL cohort and over three times the number of transfers per year than in the pre-NIL cohort. As barriers to transferring to decreased, the number of players to transfer across the college football landscape skyrocketed.

Figure 1 compliments Table 2 providing a visual representation of annual growth in transfers from 2018 to 2024. The graph illustrates that the number of transfers grew by about 32% annually. The most significant growth rate occurred in 2021 with an 89% increase in transfers, followed by 2022 (37.2%) and 2023 (31.4%). Growth was slow in the pre-NIL environment, prior to the introduction to NIL and the immediate eligibility rulings.

Table 3 presents the distribution of star ratings for transfers throughout the pre- and active-NIL cohorts. Among the pre-NIL transfer sample (n = 1,570), no-star players make up the largest chunk of transfers at 38.7% (n = 607). Among the transfers with high school star ratings, 3-star recruits comprised the largest group at 36.2% (n = 568), followed by 4-star recruits at 13.6% (n = 214), and 2-star recruits at 10.4% (n = 164). At the very top of the distribution, 5-star recruits were exceedingly rare, transferring only 17 times (1.1%). The early portal thus skewed heavily toward the lower and middle tiers of the recruiting spectrum. These skews reflect the makeup of

high school recruiting classes, which typically feature around 32 5-stars, 400 4-stars, over 2,000 3-stars, 500 2-stars, and tens of thousands of unrated prospects.

Amid college football's reconstruction, the introduction of NIL and the 2021 transfer exemption drove portal activity to 6,423 transfers in just four years. During this stretch, 3-star athletes made up a growing share of movers at 41.5% (n = 2,665), and the proportion of 4-star players jumped to 14.3% (n = 919). Together, these shifts suggest that even highly recruited players became increasingly open to switching programs. However, the share of 2-star transfers declined by nearly half to 5.8% (n = 374), while the proportion of no-star transfers remained at 37.5% (n = 2,406). Five-star transfers were scarce, representing just 0.9% of active-NIL portal moves (n = 59). Yet with roughly 32 five-star prospects per recruiting class, that total equates to almost two full classes of elite talent switching schools between 2021 and 2024.

Sorting in the Portal: Upward vs. Downward Mobility by Tier and Era

Building on the market growth and composition, Tables 4–5 map how recruits transfer up, down, or laterally across program strength, and how these patterns differ by recruiting pedigree and time period. I then connect direction to downstream NFL participation rates to assess whether upward movement is associated with greater professional exposure, as shown in Table 6. These sorting patterns naturally raise the question: Do transfers deliver on-field opportunities and professional returns for the players who make them?

Table 4 groups the transfers into two categories, elite (3-5star) and non-elite (no-star, 2-star) recruits, and evaluates their transfer direction. In the first three years of the portal, non-elite player transfers were more likely to transfer upwards at 57.3%, with downward transfers occurring at 40.3%. By contrast, elite players overwhelmingly moved down: nearly seven in ten (68.1%) transferred to weaker programs, while only 28.4% transferred to stronger programs. In

the active-NIL cohort, non-elite players transferred upward at significantly higher rate (61.9%), with 35.3% transferring downward. Elite recruits, on the other hand, still transferred down far more often (58.5%) than they did up (36.8%). In fact, 68.2% of 4-and 5-star recruits transferred down. This variance lends credence to the hypothesis that non-elite athletes utilize the portal to transition into better programs. At the same time, elite high school recruits transfer to mid-major or worse Power-5 schools at higher rates in the hopes of securing more starting opportunities. This suggests that transfer direction is driven by high school recruiting pedigree and star rating.

Table 5 provides a more comprehensive view of whether collegiate football players transferred to better or worse football schools in the pre- and active-NIL transfer portal environments. In the early portal years (2018-2020), most transfers represented either upward or downward movements across program tiers, with only a small fraction classified as lateral. Of the 1,600+ events in this period, 855 (54.5%) were downward transfers, compared to 669 (42.6%) upward transfers. Only 46 players (2.9%) moved to a school in the same tiered ranking, suggesting that players use the portal to drop down to a more competitive tier in search of increasing playing time, consistent with H2, that players who transfer to worse schools have more playing time and starts versus those who transfer to better programs. Following the introduction of NIL and the one-time transfer exemption, transfer activity shifted toward greater uniformity for players transferring to better or worse schools. In the active-NIL era (2021-2024), 3,114 players transferred down (48.5%), 3,061 transferred up (47.7%), and 248 (3.8%) players transferred laterally. The more balanced distribution reflects structural changes in the portal and the maturing NIL marketplace.

Table 6 summarizes NFL outcomes by transfer direction (up vs. down) and era (pre-NIL vs. active-NIL), reporting draft rates and the number of transfers. In both eras, players who moved to

stronger programs were more likely to appear in an NFL game than those who moved to weaker programs. In the pre-NIL window (2018–2020), the NFL played rate was 9.7% for Up movers (N=669) versus 6.4% for Down movers (N=855), a +3.3 percentage-point difference and roughly +52% higher on a relative basis. In the active-NIL window (2021–2024), the Up advantage persists, with 3.7% for Up (N≈3,061) versus 2.1% for Down (N=3,114). Notably, absolute rates are lower active-NIL because many 2023–2024 transfers are still in university and are not eligible to enter the NFL draft and play professionally. The consistent Up>Down pattern related to NFL playing rates is aligned with sorting toward higher-productivity environments that raise exposure and downstream professional opportunities.

Returns to Mobility: Playing Time and Professional Advancement

To determine whether transferring translates into on-field opportunities and professional success, this study tracks changes in games and starts, and professional football outcomes. Table 7 summarizes NFL and professional football outcomes by era (pre- vs. active-NIL) and recruit tier (elite vs. non-elite), reporting the number of players in each group along with the shares who played in the NFL, landed as an undrafted free agent/practice squad/did not play, reached the NFL in any capacity, or played professionally at any level.

In the pre-NIL era, elite recruits (N = 799) achieved higher outcomes across all measures compared to non-elite recruits (N = 771). Roughly 1 in 10 elite players played in the NFL (9.9%), compared to 6.1% of non-elites. Including those were drafted, undrafted, or on the practice squad without ever playing a game, the NFL rate rose to 24.4% for elites versus 10.9% for non-elites. When extending to all North American professional leagues including the NFL, 32.7% of elites versus 17.0% of non-elites reached the professional level. In the active-NIL era, the baseline rates are lower for both groups, though the elite advantage remains. Among elites

(N=3,643), only 3.3% played in the NFL, while 11.7% reached the NFL in any form and 14.6% were rostered on a North American professional football roster. For non-elites (N=2,780), 2.5% played in the NFL, 7.7% reached NFL rosters and NFL played, and 10.5% reached North American professional football overall. The absolute values are lower in this cohort as many of the 2022-2024 transfers are still in college at the time of compilation and not eligible to play professional football. Combined with the larger sample size, this decline reflects a compositional effect rather than an actual collapse in conversion rates. Overall, this table highlights that elite recruits are more likely to transition to the NFL and professional football than non-elite recruits, and absolute conversion rates into the NFL have declined for transfers in the NIL era.

Table 8 reports the distribution of transfer players who ended up with more games, fewer games, more starts, or fewer starts following their transfer, mapped by era and star rating. In the pre-NIL period (2018–2020), 64.7% of 5-star players played and 52.9% started (52.9%) more games after transferring, the most among all star ratings. 50.5% of 4-stars played and 46.3% started more games. Contrastingly, lower-ranked high school recruits experienced the least amount of on-field playing time improvement overall; 48.9% of 3-stars played in more games, and 39.8% started in more games, while 48.2% of 2-stars played in more games, and 29.9% started in more games. Unranked players disrupted the pattern of more games played by star rating, as 52.6% played in more games, while a modest 20.8% started more games. For players, 42.54% started the same number of games, and 15.56% played the same number of games.

Following the enactment of NIL in 2021, the share of games played increased across every star rating, with growth varying by star rating. 61.0% of 5-stars played more games, followed by 59.5% of 4-stars, 57.9% of 3-stars, 54.0% of 2-stars, and 52.0% of no-stars. Regarding games started, a similar trend continued with a higher percentage of starts for each star rating, except

that only 5-star players started more games. 54.2% of 5-stars started more games, followed by 44.8% of 4-stars, 37.6% of 3-stars, 34.0% of 2-stars, and 25.9% of no-stars. For all transfers between 2021 and 2024, an average of 54.28% of players played the same number of games and 76.95% started the same number of games within each star rating group.

Next, Table 9 complements Table 8 by reporting paired-sample T-tests results of whether transferring schools produced statistically significant results in games played and started. From the T-tests, transferring schools is statistically significant for players appearing in and starting more games following their transfer than in the previous season (Games played: $t = -24.08$, $p < .001$; Games started: $t = -13.19$, $p < .001$). The negative t-statistics reflect the pre minus post coding, and the highly significant p-values indicate that these gains are consistent across the 2018–2024 sample.

Table 10 reports on whether the transfer direction increased, decreased, or had no effect on the percentage of players who played and started more games after transferring across both cohorts. 27.2% of upward transfers started more games, 35.0% started few games, and the remaining 37.7% started the same number of games. Lateral transfers showed similar figures, with 33.3% starting more games and 24.8% starting fewer. Downward transfers showed the most improvement in starting opportunities, with 40.1% increasing and only 13.5% declining in the number of games started. The pattern for games played is positive across all directions. Over half of downward (59.6%) and lateral (56.8%) transfers increased their playing time, compared to 49.3% of upward transfers. Decreases in participation were most common among upward movers (37.9%), with fewer than 28% of downward transfers seeing reduced game appearances.

NIL Market Stratification and Career Mobility in the Active-NIL Era

Lastly, the study examines how NIL value varies by star rating and is associated with transfer direction and playing in the NFL. Table 11 reports the distribution of NIL values across star ratings for players with reported NIL values in the ON3 database. Reported NIL values are highly concentrated among a small share of players. Within this sample, 4.1% of unrated and 3.7% of 2-star players report NIL deals, with mean valuations of $299,046 and $134,436, respectively. Among 3-star recruits, 7.3% report NIL values averaging $324,793, while 4-star players average $419,878 with 14.7% participation. The 5-star cohort stands apart, with over half (52.2%) reporting NIL deals averaging $906,111, with some deals exceeding $5 million. Each additional star rating increases NIL value by 17% on average.

Building on Table 11, Table 12 presents the ordinary least squares (OLS) regression model that estimates the determinants of log(NIL). The model restricts the sample to transfers with both a recorded 247Sports star rating and a classified transfer direction (upward or downward) based on program strength differentials. The estimated coefficient on Upward Transfer ($\beta = 0.131$, $p < 0.001$) suggests that, holding player quality constant, athletes transferring to stronger programs have NIL valuations approximately 14% higher than those transferring to weaker programs. A similar pattern appears for the star-rating measure. The coefficient on Star Rating ($\beta = 0.204$, $p < 0.001$) implies that, after accounting for transfer direction, each additional recruiting star corresponds to roughly a 22.6% increase in NIL value. Both estimates are significant at the 1% level, indicating that a player's transfer move and their high school rating each play a meaningful role in explaining NIL valuations in Table 12.

Extending the analysis from valuation to outcomes, Table 13 presents the logistic regression results estimating the probability that a player reached a professional league (Pro = 1) as a function of transfer direction, recruiting pedigree, and NIL valuation. The logistical regression

shows that both upward moves and NIL are significant predictors of playing in the NFL. Upward transfers have nearly twice the odds (OR = 1.96, $p < 0.001$) of turning professional compared to downward transfers. A one-unit increase in log(NIL) more than doubles the odds of playing in the NFL (OR = 2.05, $p < 0.001$). In contrast, star ratings are statistically insignificant when controlling NIL and transfer direction on professional outcomes ($p = 0.187$). While star rating strongly predicts NIL, it loses significance for professional outcomes when NIL is included. This suggests that NIL valuations captured the information traditionally signaled by recruiting rankings for transfer athletes.

VII. Analysis

This section interprets the quantitative evidence and summary statistics from 7,993 Division I transfers. Key emerging themes include the following: recruiting pedigree influences transfer direction, the NIL/portal era accelerates transfer volume, downward transfers boost playing time while upward movement increases NFL conversion rates, and a combination of NIL and transferring up best predicts professional outcomes. Taken together, the tables and regressions demonstrate that no single motive fully explains why athletes transfer in the modern college football labor market.

Sorting By Recruiting Pedigree

Related to the second summary statistics section, *Sorting in the Portal: Upward vs. Downward Mobility by Tier and Era*, the first key point of analysis in this study concerns whether star ratings/recruiting pedigree influence transfer direction. In both eras of the transfer portal, non-elite players were more likely to transfer upward to better schools, whereas elite recruits disproportionately transferred downward. This supports H1 as in the pre-NIL era, 57.3% of non-elite and 28.4% of elite recruits transferred up (Table 4A). In the active-NIL era, this split

further increased to 61.9% of non-elite and 36.8% of elite recruits transferring up (Tables 4B). As the portal evolved, non-elite recruits transferred to better schools at higher rates, consistent with the job-ladder and search and matching dynamics (Jovanovic, 1979; Burdett & Mortensen, 1998). Within the job-ladder framework, lower-rated players transfer up for exposure and resource gains, whereas the elite recruits transfer down for immediate roles. This is supported by Table 10, which shows that players who transfer downwards play and start more games at a higher rate in the subsequent season.

Opportunity Returns

The second point of analysis connects directly to the third summary statistics subsection *Returns to Mobility: Playing Time and Professional Advancement)* regarding whether transferring expands on-field opportunity and if those returns vary by transfer direction. Supporting H2, the data shows that downward transfer experiences the most significant gains in starts and games played. This is supported by Table 10, in which 40.1% of downward transfers started more games versus 27.2% of upward transfers. Moreover, in Table 10, 59.6% of downward transfers played more games versus 48.3% of others. The paired sample test in Table 9 further supports the directional effects presented in Table 10. The statistically significant increase in games played and started suggests that transferring schools is associated with increased on-field opportunities across the sample.

Once again, the findings align with the search-and-matching and job-ladder models (Jovanovic, 1979; Burdett & Mortensen, 1998). In these models, reduced market frictions improve employee sorting efficiency and turnover. The transfer portal functions in this way by giving players easier access to mobility and enabling programs to reassess and reallocate talent more quickly. At the same time, the portal reinforces existing performance hierarchies: as shown

in Table 8, higher-rated recruits continue to play and start more games, reflecting persistent stratification in opportunity. Although NIL and immediate eligibility have expanded participation in the portal, they have also amplified disparities across the star-rating spectrum.

NIL & Professional Value

The third area of analysis tests how transfer direction, star rating, and NIL valuations among transfers predict NFL conversion (RQ3). Moreover, it directly relates to the summary statistics subsection, *NIL Market Stratification and Career Mobility in the Active-NIL Era,* and the corresponding Tables 6-7 and 11-13. Table 6 supports H3, which states that upward transfers, where players move to higher-tiered schools, are more likely to occur in the NFL than downward transfers across both eras. Noticeably, there are higher rates in the pre-NIL cohort (9.7% for upwards movers, 6.4% for downwards) than in the active-NIL era (3.7% for upwards movers, 2.1% for downwards) due to right censoring of the 2023-2024 players, who are a majority still in college and are not eligible for the NFL draft. Still, the directional pattern remains intact, suggesting that upward mobility continues to correlate with better long-run professional outcomes even amid the expanded movement and changing incentives of the NIL era.

Table 7 indicates that elite recruits had much higher NFL playing rates than non-elite recruits. Elite players often choose stronger programs because they believe those environments will sharpen their skills, give them a better shot at the next level, and put them in position to compete for championships right away. Playing for a well-resourced program with high-level coaching, better training support, and deeper competitive standards can meaningfully shape how prepared they are for professional football, if they are talented enough. This is consistent with theory that indirectly operating in higher competition, working with better coaches, and having larger media exposure, all enhance the possibility of professional outcomes (Kahn, 2000).

Logistic regressions in Table 13 support H4, which states that upward transfers and higher NIL valuations have significant positive effects on NFL playing rates, even when controlling star rating. Upward transfers have 1.96 times the odds ($p < 0.001$) while each unit increase in log(NIL) more than doubles the odds ($p < 0.001$) over playing in the NFL (Table 13). Furthermore, the logistic regression suggests that star rating is statistically insignificant ($p = 0.187$) when controlling for NIL and transfer direction. NIL absorbs the predictive signaling of future NFL success that was once conveyed by star ratings when collegiate transfers were still in high school. Within the context of Division I FBS transfers, NIL serves as a more accurate measure of player capital, encompassing their on-field performance, draft stock, and market visibility.

ON3 reports players' most recent NIL valuations rather than showing their NIL value has changed by year and transfer, presenting an analytical limitation. Without pre- and post-transfer NIL data, this study cannot specifically determine whether the player's transfer increased their NIL valuation or whether players with an already high NIL value are more likely to transfer to stronger programs. While it's logically a mix of both, this relationship between transfer direction and NIL should be interpreted as correlational rather than causal.

Despite this limitation, the above results are consistent with H3, H4, and the underlying economic frameworks of this study. Players transfer up the mobility ladder to generate current and future earning potential. On the contrary, players also transfer to worse football schools to manufacture use (playing time) to recover the loss in value that results from their initial commitment (Jovanovic, 1979; Burdett and Mortensen, 1998). If a talented running back commits to a top school and is beaten out to the starting job by another equally talented player, the mobility ladder suggests they would transfer to a worst school to immediately guarantee

playing time and lost value. For the most elite recruits, they can find the most significant returns from transferring up by walking into an immediate starting role at the top programs in the country, yielding both immediate NIL income and long-term NFL draft potential.

Notably, only a small percentage of college football players earn substantial money playing football after graduation. This makes NIL a pivotal means of monetization for the majority who do not reach the professional ranks. Unlike many collegiate professions, football is not a skill that typically translates into a non-football-related profession. Hence, NIL acts as a way for them to receive additional value and cash-in while they can on their short-term economic value. This creates a structural shift. Rather than solely focusing on academics or preparing to be a professional football player, a majority of student-athletes can now capitalize on their present-day performance and likeness while in school. Table 11 documents the stratification of the average NIL value by star rating. The patterns mirror the inequality within the broader transfer portal labor market, where a handful of elite recruits capture a majority of the value, many of whom go on to receive additional income professionally, while the median athlete for lower star ratings remains minimal.

These results demonstrate how the transfer portal and NIL have spurred a functional labor market. Lowering switching costs and clearer price signals (Klemperer, 1995) has sped up sorting (rates of switching schools). This improves how athletes and programs reevaluate opportunities within the transfer portal hierarchy. Downward transfers generally act as developmental reallocations and upward transfers aim to maximize capital. NIL supports this hierarchy, rewarding more visible and/or better-performing players, while ensuring non-elite players have the opportunity to transfer (or stay at a non-elite program) without much opportunity to capitalize on NIL or further their potential exposure. Ultimately, NIL and the

transfer portal create a system where opportunity, income, and professional advancement are contingent upon ability, marketability, and program quality.

Overarching Motives

Lastly, the fourth and primary question this study aims to answer is whether players transfer to make more money, increase playing time, or to improve draft status. The empirical results across all 7,993 documented Division I FBS transfer events suggest that no single factor fully explains transfer behavior. The three motives of money, playing time, and draft status vary in relation to player quality, program strength, and market era. Taking a holistic view, players transfer to optimize their career capital rather than a single motive.

The optimal transfer path is a strategic decision influenced by several factors. Beyond star rating, a player's position and the quality of other players competing for opportunities on the field at their current and prospective schools. The competitiveness of the roster environment plays a crucial role in determining whether transferring up, down, or laterally will provide the most significant short-term and long-term benefits. Therefore, all three motivations for transferring depend on the direction of the transfer.

The majority of players transfer downward to weaker programs for immediate on-field opportunity. This pattern is evident throughout Table 10 reiterating that downward transfers have higher rates of games played and started than both downward and lateral transfers. The paired sample T-tests in Table 9 confirm these differences, indicating that transfers experience statistically significant increases in games played and started for transfers ($p < 0.001$). In short, players who transfer downwards are trading national exposure for playing time. This pattern is most pronounced among 2- and 3-star recruits who face limited pathways and stiff competition at strong Power Four programs but can secure larger roles at less competitive Power Four schools

and all other FBS conferences. On the contrary, upward transfers tend to sacrifice immediate playing time for longer-term professional opportunities and short-term NIL gains. Table 6 confirms that players moving to stronger programs are more likely to play in the NFL than those transferring to weaker programs, both in the pre-NIL and active-NIL cohorts. The data confirms the fourth hypothesis that upward mobility yields greater downstream exposure and NFL conversion as players climb towards higher-productivity environments. Transferring up acts as a signaling mechanism that both enhances visibility for professional scouts and improves the quality of their competition, even if it results in short-term decreases in playing time.

As transfer direction creates different motives for transfer observations, NIL acts as a third monetary dimension to players' transfer motivations. Table 12 regression indicates that players transferring upwards earn approximately 14% higher NIL valuations, controlling for star rating. Each additional star rating adds approximately 23% to NIL value. NIL also acts as a predictor for NFL advancement. As per Table 13, a 1 unit increase in log(NIL) more than doubles the odds of playing in the NFL. Instead of star rating, NIL acts as a proxy for marketability, on-field success, and draft potential in the transfer portal environment. This combines financial and exposure incentives into a single measure of player capita.

Again, the previously discussed limitation of NIL valuations serving as a final point-in-time estimate is a key consideration for RQ4. The lack of time-series NIL Valuations makes it difficult to quantify whether increased NIL checks directly influence the decision to transfer. In a professional environment, employees largely want to work for higher wages. Within the college football player environment, motivations are more complex as players balance money, winning, and player time in their decision to transfer or start a new job. Despite this limitation, NIL still serves as a proxy for both player capital and market visibility in the transfer portal landscape.

One final limitation is key to inferring whether transferring up and larger NIL valuations are associated with, rather than causal effects regarding playing in the NFL after college. The relationships presented in Table 6 and Table 13 are associational, as NIL valuations and transfer directions are endogenous. Other factors that contribute to higher NIL values of NFL success rates are overall talent, coaching caliber, university prestige, and position-specific demand. NIL estimates can also inflate NFL potential, thus introducing reverse causality. To fully establish causation, future work could test matched players from the same school, recruiting class, and star rating, comparing those who stayed versus those who transferred, better to isolate the effect of mobility decisions on professional outcomes.

Future studies could specifically employ matched-pair or quasi-experimental designs (matching on recruiting class, star rating, position, school, etc.) to better isolate whether upward transfers lead to improvements in professional outcomes. For example, Christian Holmes, a 2016 3-star cornerback who transferred up from the Missouri Tigers to the Oklahoma State Cowboys and was later drafted by the Washington Commanders, contrasts with DeMarkus Acy, another 2016 3-star Missouri Tigers defensive back from the same class who stayed and went undrafted. Similarly, Tyree Gillespie remained at the Tigers after the 2017 season and reached the NFL with the Raiders, while Adam Sparks, a fellow 2017 3-star defensive back who transferred down to the University of Louisiana-Monroe Warhawks, never appeared in an NFL game. These two Missouri Tigers defenders highlight how similar players can experience divergent outcomes. This needs to be performed in a much larger double-masked sample to produce causal estimates that move beyond the correlational patterns documented in this study. The patterns documented here reflect a system still settling into its new incentives, one where mobility, opportunity, and earnings intersect will continue to evolve as more data becomes available through time.

VIII. Conclusion

This study shows that the transfer portal, amplified by NIL, has reconfigured college football into a high-velocity mobility market with clear but uneven returns. Transfers, especially downward moves, reliably expand on-field opportunity (gains in games and starts), while upward moves, often coupled with higher NIL valuations, are associated with better professional conversion odds; once NIL and move direction are considered, legacy recruiting stars carry far less explanatory power. Together, these patterns depict a classic job-ladder/search-and-matching environment: players trade off immediate snaps versus long-run exposure and earnings, and programs sort talent along a tiered hierarchy. The portal illustrates how lowering switching costs can increase allocative efficiency, more athletes find viable roles, but also intensify stratification, as resource-rich programs capture a disproportionate share of player capital and NIL dollars. Limitations include roster-based undercounts of transfers who never appeared, incomplete NIL valuation reporting, and right-censoring for the active-NIL cohort. Despite these limitations, this study does make efforts to control transfer observations related to star ratings, providing a picture of how player quality and mobility interact with professional outcomes. It is difficult to perfect this due to the short sample size and recency of the NIL and transfer portal landscape. Despite these limitations, the evidence offers actionable guidance for college football players, coaches, athletic administrators, and policymakers. This study clarifies how athlete movement now mirrors employee mobility, with direct implications for university governance, policy, and player welfare. As college football shifts toward an employment model, transfer and NIL rules will determine both how efficiently talent is allocated and who captures the gains from this major pathway to economic mobility.

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IX. Appendix

Table 1: Regression Coefficient Weights by Year/Tier

Transfer Year (t)	Tier (t-3)	Tier (t-2)	Tier (t-1)
2018	2015 tier = 0.126	2016 tier = 0.265	2017 tier = 0.609
2019	2016 tier = 0.112	2017 tier = 0.254	2018 tier = 0.634
2020	2017 tier = 0.132	2018 tier - 0.262	2019 tier = 0.596
2021	2018 tier = 0.089	2019 tier = 0.265	2020 tier = 0.646
2022	2019 tier = 0.102	2020 tier = 0.254	2021 tier = 0.644
2023	2020 tier = 0.142	2021 tier = 0.262	2022 tier = 0.596
2024	2021 tier = 0.220	2022 tier = 0.126	2023 tier = 0.587

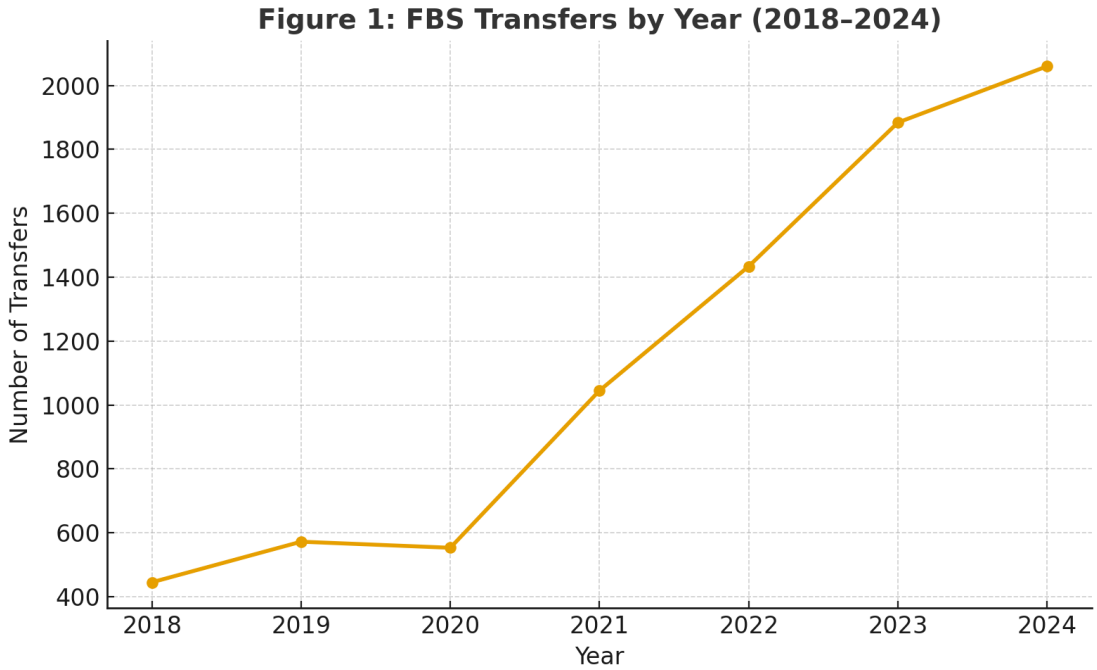
Notes. Coefficients represent the estimated weights from a time-weighted linear regression that predicts each year-t program tier using its three preceding Simmons Ratings tiers (t-1, t-2, t-3). The coefficient weights are then used to compute the direction score for each transfer observation.

Growth and Composition of the Transfer Market (2018-2024)

Table 2: Transfers by Year (2018–2024)

Year	Count
2018	445
2019	572
2020	553
2021	1,045
2022	1,434
2023	1,884
2024	2,060

Notes: Counts reflect FBS-destination transfers per season. The transfer counts show an increase in transfers per year, except in 2020. The 2020 count is suppressed due to COVID-19 and pandemic disruptions. As CFBStats requires roster presence, totals may undercount portal entrants who do not appear on a fall roster (early enrollers/season-long injuries).



Notes: This figure displays the number of annual FBS transfers. The figure shows annual positive growth in transfers, except in 2020, when the COVID-19 pandemic hindered it.

Table 3: Star Distribution

Panel A: 2018-2020 (N=1,570)

Star	Events	Share %
5	17	1.1
4	214	13.6
3	568	36.2
2	164	10.4
No-star	607	38.7
Total	1,570	100.0

Panel B: 2021-2024 (N=6,423)

Star	Events	Share %
5	59	0.9
4	919	14.3
3	2,665	41.5
2	374	5.8
No-star	2,406	37.5
Total	6,423	100.0

Notes: This table reports the distribution of transfers by star rating and era. Each transfer is classified by the player's 247Sports Composite high star rating. "No-star" includes unrated players who don't have a 247 profile. Panels are split between pre-NIL (2018-2020) and active-NIL (2021-2024) eras. No-star and 3-star players make up the majority of transfer observations, while 5-stars remain quite rare, accounting for around 1% of transfers per transfer portal era.

Sorting in the Portal: Upward vs. Downward Mobility by Tier and Era

Table 4: Transfer Direction by Recruit Tier

Panel A: 2018-2020

Recruit Tier	Up (%)	Down (%)	Lateral (%)
Elite	28.4	68.1	3.5
Non-elite	57.3	40.3	2.3

Panel B: 2021-2024

Recruit Tier	Up (%)	Down (%)	Lateral (%)
Elite	36.8	58.5	4.7
Non-elite	61.9	35.3	2.8

Notes: This table shares the percentage of transfers by direction and recruitment tier. Shares are within each tier (rows sum to ~100%). “Elite” aggregates 3-5-star; “Non-elite” aggregates 2-star/no-star recruits. Panels are split between pre-NIL (2018-2020) and active-NIL (2021-2024) eras. Across both eras, elite recruits are more likely to transfer down, whereas non-elites are more likely to transfer up.

Table 5: Transfer Direction by Time Period

Panel A. Direction Totals (2018-2020)

Direction	Events
Up	669
Down	855
Lateral	46

Panel B: Direction Totals (2021-2024)

Direction	Events
Up	3,061
Down	3,114
Lateral	248

Notes: This table compares the number of transfers by direction and era. Transfers count events are classified as Up, Down, or Lateral based on three-year weighted program strength tiers from Table 1. Each panel covers a distinct era (pre-NIL vs. active-NIL). Per cohort, there are more downward transfers than upward, with a small percentage of lateral transfers. After the introduction of NIL and the one-time transfer exception, upward and downward transfers became nearly balanced, with around 3,100 transfers each.

Table 6: Transfers Up vs Down and NFL Played %

Era	Transfer Direction	NFL Played %	N
Pre-NIL (2018-2020)	Up	9.7	669
Pre-NIL (2018-2020)	Down	6.4	855
Active-NIL (2021-2024)	Up	3.7	3,061
Active-NIL (2021-2024)	Down	2.1	3,114

Notes: This table compares the percentage of transfer observations who played in an NFL game by transfer direction and era. Players who were drafted and did not play a game or appear on a practice squad are not included. Active-NIL rates are depressed by right-censoring (2023-2024 transfers who are still in college). Players who transfer up play in the NFL at higher rates in both the pre- and active-NIL cohorts.

Returns to Mobility: Playing Time and Professional Advancement

Table 7: NFL outcomes by era & recruit tier (Elite = 3–5★)

Panel A. Pre NIL (2018-2020)

Recruit Tier	N	NFL Played (1) %	NFl UDFA/PS/DNP (1*) %	NFL any %	Any Pro (1, 1*, 2)%
Elite	799	9.9	14.5	24.4	32.7
Non-elite	771	6.1	4.8	10.9	17.0

B. Active-NIL (2021-2024)

Recruit Tier	N	NFL Played (1) %	NFl UDFA/PS/DNP (1*) %	NFL any % (1, 1*)	Any Pro (1, 1*, 2)%
Elite	3,643	3.3	8.5	11.7	14.6
Non-elite	2,780	2.5	5.2	7.7	10.5

Notes: This table summarizes professional outcomes by recruiting tier and transfer portal era. “Elite” aggregates 3-5-star; “Non-elite” aggregates 2-star/no-star recruits. Panels are split between pre-NIL (2018-2020) and active-NIL (2021-2024) eras. “NFL Played” indicates at least one NFL game appearance. “UDFA/PS/DNP” includes undrafted free agents, practice squad signees, or drafted players who never appeared. “NFL Any” sums both categories. “Any Pro includes transfers on CFL, UFL, AFL, and other professional leagues rosters. Elite recruits outperform non-elite recruits in every professional metric in both eras. The absolute conversion rates are lower in the NIL due to right censoring, as many of the recent transfers are still in college.

Table 8: % with more/less games and more/less starts (by era & star rating)

Panel A. Pre-NIL (2018-2020)

Star Rating	More Games %	Less Games %	More Starts %	Less Starts%
5	64.7	35.3	52.9	29.4
4	50.5	36.9	46.3	13.6
3	48.9	36.1	39.8	18.1
2	48.2	34.8	29.9	25.6
None	52.6	24.2	20.8	10.9

Panel B. Active-NIL (2021-2024)

Star Rating	More Games %	Less Games %	More Starts %	Less Starts%
5	61.0	33.9	54.2	25.4
4	59.5	33.0	44.8	20.2
3	57.9	32.1	37.6	26.9
2	54.0	36.1	34.0	35.8
None	52.0	33.3	25.9	25.7

Notes: For each star level and era, this table shows the share of transfers who play more games, fewer games, more starts, and fewer starts in their first season after transferring compared to the prior season. “More/less” is computed by comparing the season they transfer versus the immediate pre-transfer season for the same player. Percentages are within-star-band and do not sum to 100% because some players play/start the same number of games before and after transferring. % of games played and started increases by each additional star rating.

Table 9: Paired Sample Test: Games Played and Started Pre/PostTransfer

Test	T-Statistic	P-Value
Games Played	-24.08	<0.001
Games Started	-13.19	<0.001

Note: Reports paired sample t-tests comparing each player's games played and games started before vers after transferring. Reports test-statistics and p-values for the difference (pre – post). Negative t-statistics indicate an increase in games played/started after transferring. Transfers improve on-the-field opportunities and are statistically significant in both games and starts across 2018-2024.

Table 10: Increase/Decrease/No Change in Games Played/Started when Transferring

Panel A: Games Started change after transferring

Transfer Direction	Increase	No Change	Decrease
Up	1016 (27.2%)	1407 (37.7%)	1307 (35.0%)
Lateral	98 (33.3%)	123 (41.8%)	73 (24.8%)
Down	1590 (40.1%)	1842 (46.4%)	537 (13.5%)

Panel B: Games Played change after transferring

Transfer Direction	Increase	No Change	Decrease
Up	1839 (49.3%)	478 (12.8%)	1413 (37.9%)
Lateral	157 (56.8%)	38 (12.9%)	89 (30.3%)
Down	2366 (59.6%)	498 (12.5%)	1105 (27.8%)

Notes: Panel A reports the share of transfer events with increases, no change, and decreases in games started, and Panel B does the same for games played. Players who transferred down saw the biggest increase in games played and started after the transfer, with about 40% starting more games and 60% playing more. Upward transfers still play more games but start less consistently due to tougher competition at stronger programs.

Table 11: NIL by Star Rating (excluding players with no value) 2021-2024

Star Rating	N	N_with_NIL	Mean_NIL	Max_NIL
No-star	2406	98	$299,046	$2,000,000
2	374	14	$134,436	$453,000
3	2665	194	$324,793	$1,900,000
4	919	135	$419,878	$6,500,000
5	59	32	$906,111	$5,700,000

Note: Restricts on transfers with reported ON3 NIL valuations. Players without a listed NIL value in the Rival player search are excluded from this table. Only players who transfer between 2021 and 2024 have NIL values. NIL figures are ON3 point-in-time estimates. NIL value is unequal and strongly tied to recruiting star rating. Only a fraction of no- and 2-stars report NIL deals, with averages around the low six figures. Over half of the 5-stars have NIL valuations, with the highest average at around $900,000.

Table 12: OLS Regression: Determinants of log(NIL)

Variable	Coefficient	% Effect on NIL	p-value
Upward Move	+0.131	+ 14.0%	<0.001
Star Rating	+0.204	+22.6%	<0.001

Note: Reports on how upward transfer moves and recruiting star ratings relate to log(NIL) among 2021-2024 transfers. Regressions only contain 2021-2024 transfers with a star rating and up/down transfers, omitting 2,592 transfers. NIL equals the ON3 estimate when present; otherwise, they equal $39,944 (NCAA median NIL value). Both upward transfers and star rating are statistically significant when the Nil valuation increases.

Table 13: Logistical Regression: Professional Outcome (Pro = 1)

Variable	Coefficient	Odds Ratio	p-value
Upward Move	0.673	1.96	<0.001
Star Rating	0.221	1.25	0.187
log(NIL)	0.717	2.05	<0.001

Note: The dependent variable is whether a player appears in an NFL game (pro = 1). Predictors include upwards versus downwards movement, star rating, and log(NIL). Upward transfers and NIL rating are statistically significant for professional outcomes, whereas star rating is not.