INTRODUCTION

Understanding when and why students graduate or drop out is critical for improving outcomes in higher education. While many studies focus on whether students complete their degrees, the timing of these outcomes is equally important for identifying when students are most at risk and when support efforts may be most effective.

Traditional approaches to analyzing graduation outcomes often rely on fixed time frames and treat completion as a simple yes-or-no outcome. However, this creates a key limitation: at the end of a study period, many students are still enrolled and have not yet graduated, even though they may do so in the future. These students are neither clear completers nor non-completers and treating them as one or the other can lead to incomplete conclusions.

Survival analysis offers a powerful alternative by directly addressing this issue, commonly referred to as censoring. Rather than excluding or misclassifying students who have not yet experienced an outcome, survival analysis incorporates all available information about their progress up to the point they were last observed. This approach allows researchers to analyze both students who experience an event during the study period (such as graduation or dropout) and those who do not, without introducing bias. As a result, it is particularly well-suited to higher education contexts, where students follow diverse and often non-linear paths to completion.

Building on prior research applying survival analysis in a higher education setting, this study examines the timing of graduation and dropout among University of Texas (UT) System students. By estimating the probability of each outcome over time, we capture how the risks of graduation and attrition evolve throughout students' academic journeys. In addition, we assess how factors such as academic performance, financial circumstances, demographic characteristics, and enrollment patterns are associated with these outcomes.

This study extends earlier survival analysis work conducted by the Office of Institutional Research and Analysis in 2025. A key distinction in the current analysis is the incorporation of time-varying predictors, which allow student characteristics to change by semester rather than remaining fixed. In the prior analysis, predictors were treated as static – for example, working while enrolled was modeled with one value for each student, while the new approach allows this variable to vary across semesters, reflecting changes in students' employment status over time. Incorporating time-varying predictors provides a more precise and dynamic understanding of how these factors relate to the timing of outcomes.

Together, these methods provide a more comprehensive understanding of student success – revealing not only which students are more or less likely to graduate or drop out, but also when these outcomes are most likely to occur. This perspective helps identify critical periods where targeted interventions may have the greatest impact.

KEY FINDINGS

- **Completion rates vary across institution types** Students attending high selectivity institutions in large or mid-sized cities within the UT System have substantially higher completion rates (85%) compared to about 54 percent at medium selectivity institutions.
- **There are faster pathways at selective institutions** Students from high selectivity/large or mid-city size institutions progress to graduation more quickly and at higher rates, with about 69 percent of students estimated to have graduated by the end of Year 4, compared to around 30 percent at medium selectivity institutions.
- **Dropout is concentrated early on** Dropout occurs quickly at medium selectivity institutions, especially in Years 1 and 2, accounting for much of the lower completion rates at these institutions.

- **Academic performance is a strong predictor** Semester GPA has a strong relationship with graduation and dropout, with low GPA students facing dramatically lower completion odds.
- **Multiple student-level factors are associated with graduation and dropout outcomes** Receiving any financial aid is associated with higher graduation and lower dropout, while employment during enrollment increases dropout risk; demographic differences (e.g., gender, URM status) are also evident.

METHODOLOGY

Survival analysis was leveraged to examine completion outcomes for students within eight years after entry. Cohorts included first-time, full-time, degree-seeking (FTFTDS) undergraduates starting in a UT System academic institution in Fall 2015, Fall 2016, or Fall 2017 allowing for an examination of graduation and dropout status in the long semesters (i.e., Fall and Spring semesters) for eight years.

To ensure a more complete assessment of student outcomes, we used the extended observation window of eight years. This timeframe aligns with national data practices that extend beyond the traditional six-year graduation rate. For example, the IPEDS Outcome Measures[i] framework tracks student outcomes at four-, six-, and eight-year intervals to capture a broader range of enrollment pathways. Similarly, the National Student Clearinghouse has reports[ii] that include eight-year completion rates to provide a more comprehensive view of student progress. Although most students complete within six years, additional completions in Years 7 and 8 demonstrate the value of extended follow-up in accurately classifying outcomes.

The primary outcome of interest in this analysis was time to graduation. Dropout was also examined as a secondary outcome as this is considered a competing risk under survival analysis methodology. These two outcomes are treated as competing risks because if a student drops out, they are no longer able to be observed as having graduated. As described by Allison[iii], the defining feature of competing risk scenarios is that when one type of event occurs, it prevents the possibility of the other event occurring for that individual.

Graduation was defined as completion of a baccalaureate degree from the student's initial institution within eight years of entry. Dropout was defined as students who did not graduate and were not enrolled in the final four semesters of the observation window (i.e., Fall and Spring terms in Years 7 and 8) at the student's initial institution. Students who remained enrolled at their initial institution in any term of Year 7 or 8 were treated as right-censored, as no outcome (graduation or dropout) was observed within the eight-year window.

Establishing these definitions was an important aspect of the analytical approach. A two-year non-enrollment window at the end of the observation period provides a conceptually grounded definition of dropout by distinguishing sustained disengagement from temporary stop-out behavior. Prior research[iv] highlights the importance of separating permanent dropout from temporary departure to avoid misclassification, and several studies[v] [vi] operationalize dropout using multiple consecutive terms of non-enrollment.

To account for differences by institution type, we grouped students based off their institutional selectivity (i.e., first-time-in-college student acceptance rates) and city size. This approach helps highlight overall trends while still acknowledging variation across UT System.

Table 1. Institution Groups

Institution Group	Institutions Included
Medium Selectivity/Mid or Small City Size	UT Permian Basin, UT Rio Grande Valley, Stephen F. Austin, UT Tyler
Medium Selectivity/Large City Size	UT Arlington, UT El Paso, UT San Antonio
High Selectivity/Large or Mid City Size	UT Austin, UT Dallas

Numerous variables were explored to assess characteristics associated with graduation and dropout. These included:

- Gender: male and female
- Underrepresented minority (URM) status: grouped into a) international, b) non-URM which included White and Asian, or c) URM which included African American, Hispanic, American Indian or Alaskan Native, Native Hawaiian or Other Pacific Islander, and unknown or not reported
- Residency: in-state and out-of-state/foreign

Table 2 shows the distribution of these student characteristics by institution type.

Table 2. Cohort Characteristics, by Institution Group

	Medium selectivity/mid or small city size		Medium selectivity/large city size		High selectivity/large or mid city size		Total	
Gender								
Female	12,898	58.4%	16,774	52.5%	17,093	51.4%	46,765	53.6%
Male	9,170	41.6%	15,205	47.5%	16,151	48.6%	40,526	46.4%
URM Status								
International	321	1.5%	1,100	3.4%	926	2.8%	2,347	2.7%
Non-URM	5,957	27.0%	8,749	27.4%	21,699	65.3%	36,405	41.7%
URM	15,790	71.6%	22,130	69.2%	10,619	31.9%	48,539	55.6%
Residency Status								
In-State	21,502	97.4%	30,176	94.4%	29,633	89.1%	81,311	93.1%
Not In-State	566	2.6%	1,803	5.6%	3,611	10.9%	5,980	6.9%

Additionally, several time-varying covariates (i.e., the value is specific to the semester rather than being static over time) were used to understand how changes in student characteristics and academic experiences over time influence the risk of dropout and graduation. These included:

- Enrollment status: part-time, full-time
- Pell status: recipient, non-recipient
- Other need-based grant/scholarship status: recipient, non-recipient (note, excludes Pell Grant)
- Any aid status: recipient, non-recipient
- Semester grade point average (GPA): <2.0 or missing, 2.0-2.4, 2.5-2.9, 3.0-3.4, 3.5 or higher
- Working while enrolled: grouped into a) not working, b) <$1,500 semester earnings, c) $1,500-3,499 semester earnings, or d) $3,500+ semester earnings

Student characteristics were sourced from CBM 0C1, completion data was sourced from CBM 009, semester GPA was sourced from CBM 00S, financial aid data was sourced from FADS, and earnings during enrolled semesters were evaluated using Texas Workforce Commission Unemployment Insurance (UI) Wages. We used a discrete-time survival analysis with a competing risks framework, estimated via multinomial logistic regression, to model the likelihood of different outcomes (graduation, dropout) across semesters.

RESULTS

Table 3 presents student completion outcomes eight years after entry, disaggregated by institution group. Looking across all academic institutions, 65.8 percent of our FTFTDS cohorts completed their degree within eight years, while 31.8 percent did not complete within eight years, and 2.4 percent remained enrolled (in Years 7 and/or 8).

Completion rates vary substantially by institution group. Students attending high selectivity/large or mid city size institutions demonstrate the highest success rates, with 85.3 percent completing a baccalaureate degree at their institution within eight years. In contrast, medium selectivity/large city size institutions show more moderate outcomes, with 54.0 percent completing. Students at medium selectivity/mid or small city size institutions have similar completion rates, with about half (53.5%) completing within eight years. Overall, the data reveals a strong relationship between institutional selectivity/size and completion of a baccalaureate degree at their institution within eight years.

Table 3. Completion Status 8 Years After Entry, by Institution Group

Institution Group	Completer		Non-completer		Still enrolled	
	#	%	#	%	#	%
Medium selectivity/mid or small city	11,799	53.5%	9,454	42.8%	815	3.7%
Medium selectivity/large city size	17,282	54.0%	13,642	42.7%	1,055	3.3%
High selectivity/large or mid city size	28,360	85.3%	4,628	13.9%	256	0.8%
Total	57,441	65.8%	27,724	31.8%	2,126	2.4%

While Table 3 highlights differences in completion outcomes across institution types, we will now examine whether similar patterns emerge in the time it takes students to earn a degree. Table 4 summarizes time to degree, measured as the number of long semesters, for students who completed a degree within eight years. Overall, completers took an average of 8.6 semesters, with a median of 8.0 semesters, indicating that most students finished close to a traditional four-year timeline.

Differences across institution groups are relatively modest but still noteworthy. Students at high selectivity/large or mid city size institutions completed their degrees the fastest on average, with a mean of 8.3 semesters and a median of 8.0 semesters. In contrast, students at medium selectivity/large city size institutions took the longest, with a mean of 9.1 semesters and a median of 9.0 semesters. Students at medium selectivity/mid or small city institutions fall between these groups in terms of time to degree, with a mean of 8.8 semesters and a median of 8.0 semesters. While completion rates differ substantially by institution group, differences in time to degree among completers are comparatively small.

Table 4. Time to Degree for Students who Completed a Degree Within 8 Years, by Institution Group

Institution Group	# Students Completing	Mean # of Long Semesters	Median # of Long Semesters
Medium selectivity/mid or small city	11,799	8.8	8.0
Medium selectivity/large city size	17,282	9.1	9.0
High selectivity/large or mid city size	28,360	8.3	8.0
Total	57,441	8.6	8.0

To more deeply understand these completion outcomes, this study draws on survival analysis, a framework for modeling time to event. Specifically, the cumulative incidence function (CIF) estimates the probability that a student has graduated by a given semester. This approach accounts for students who are still enrolled (right-censored observations) as well as students who have dropped out (competing risks), providing a more complete picture of how degree completion unfolds over time.

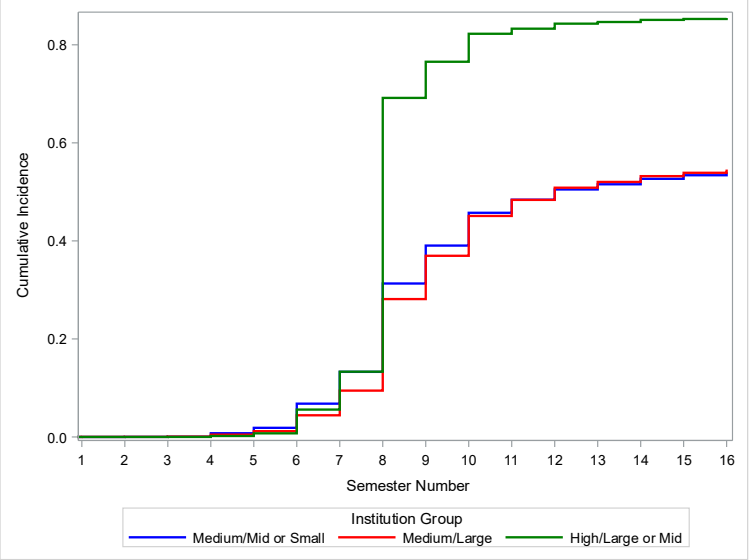
Table 5 & Figure 1 present the cumulative incidence of graduation by semester in tabular and graphic form, illustrating how the probability of graduation increases throughout the eight-year observation period. Another table shown below the graph reports the number of students still at risk (i.e., the number of students who are still enrolled and have not yet dropped out or graduated), providing context on the sample size at key time points – the end of Years 4, 5, and 6. Note that the tables label terms using a year and semester format such as “Year 1 Fall,” while the graph uses term numbering (semesters 1-16) to conserve space; these correspond to Year 1 Fall through Year 8 Spring.

Across all groups, graduation rates are minimal in the first three years, with clearer separation emerging in the fourth year and growing over time. By the Spring semester of Year 4, a sharp contrast appears between institution groups. The estimated probability of graduating is approximately 69 percent for students at high selectivity/large or mid city size institutions, compared to 31 percent at medium selectivity/mid or small city and 28 percent at medium selectivity/large city size institutions, indicating that students in the highly selective, large or mid city size institution group are substantially more likely to complete on a traditional four-year timeline.

Beyond the fourth year, the probability of graduation continues to increase across all groups, but at different rates. At high selectivity/large or mid city size institutions, this probability rises quickly to 82 percent by Year 5 Spring and 85 percent by Year 7, after which it stabilizes. In contrast, medium selectivity/large city size institutions show more gradual increases, reaching 55 percent by Year 8, while medium selectivity/mid or small city institutions level off at 54 percent. Medium selectivity/mid or small city and medium selectivity/large city size institutions show similar patterns overall. These trajectories indicate that the probability of graduating is both higher and accumulates more quickly at high selectivity/large or mid city size institutions, with differences emerging in Year 4 and widening over time.

Table 5. & Figure 1. Cumulative Incidence Function (CIF) for Graduating, by Institution Group

Semester	Medium selectivity/ mid or small city	Medium selectivity/ large city size	High selectivity/ large or mid city size
Year 1 Fall	0.00	0.00	0.00
Year 1 Spring	0.00	0.00	0.00
Year 2 Fall	0.00	0.00	0.00
Year 2 Spring	0.01	0.00	0.00
Year 3 Fall	0.02	0.01	0.01
Year 3 Spring	0.07	0.04	0.06
Year 4 Fall	0.13	0.09	0.13
Year 4 Spring	0.31	0.28	0.69
Year 5 Fall	0.39	0.37	0.77
Year 5 Spring	0.46	0.45	0.82
Year 6 Fall	0.48	0.48	0.83
Year 6 Spring	0.50	0.51	0.84
Year 7 Fall	0.52	0.52	0.85
Year 7 Spring	0.53	0.53	0.85
Year 8 Fall	0.53	0.54	0.85
Year 8 Spring	0.54	0.55	0.85



Number at Risk (Have not Graduated/Dropped Out Yet)

Group	Year 4 Spring	Year 5 Spring	Year 6 Spring
Medium/ Mid-Small	10,921	4,580	2,083
Medium/ Large	16,988	7,324	3,089
High/ Large-Mid	25,047	3,548	1,007

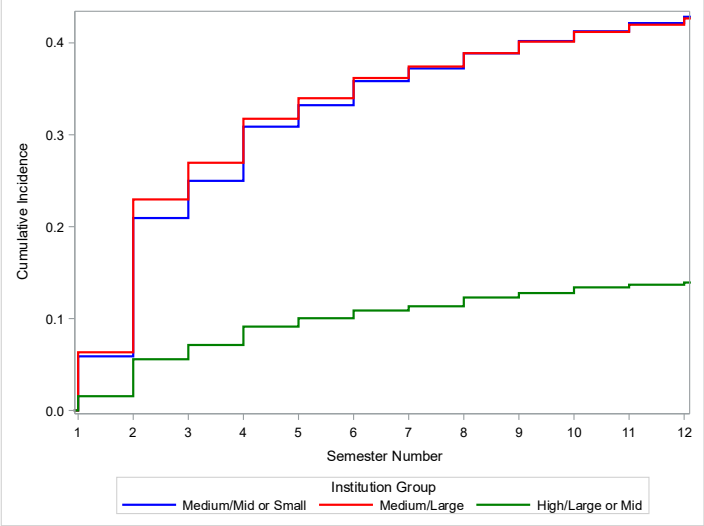
Table 6 and Figure 2 present the cumulative incidence of dropout by semester, in tabular and graphic form, illustrating how the estimated probability of dropout increases across semesters. The cumulative incidence of dropout is truncated at Year 6, reflecting the study's definition of dropout as those who have not received a degree combined with no record of enrollment during Years 7 and 8. This restriction ensures that students classified as dropouts have exited the enrollment pipeline by the end of the eight-year window. Another table shown below the graph reports the number of students still at risk (i.e., students who have not yet dropped out or graduated), providing context on the sample size at key time points – the end of Years 1, 2, and 3. Note that the tables label terms using a year and semester format such as "Year 1 Fall," while the graph utilizes term numbering (semesters 1-12) to conserve space; these correspond to Year 1 Fall through Year 6 Spring.

Unlike graduation, dropout occurs early and rises rapidly, particularly among students at less selective institutions. By the end of the first year (Year 1 Spring), the estimated probability of dropout is already substantial and varies widely by institution type: approximately 21 percent for students at medium selectivity/mid or small city institutions, 23 percent at medium selectivity/large city size institutions, and just 6 percent at high selectivity/large or mid city size institutions. This indicates that early attrition is a key driver of overall non-completion, especially at certain institutions.

Dropout probabilities continue to increase during Years 2 and 3. By Year 3 Spring, the estimated probability of dropout reaches 36 percent for medium selectivity/mid or small city institutions, 36 percent for medium selectivity/large city size institutions, and 11 percent for high selectivity/large or mid city size institutions, reflecting a persistent and wide gap across groups. After this point, the probability of dropout increases across every semester but at a slower rate and largely plateaus by Years 5-6. Overall, these trajectories show that the probability of dropout accumulates quickly and varies greatly by institution type, with students at medium selectivity/mid or small city and medium selectivity/large city size institutions facing much higher risks of early exit.

Table 6. & Figure 2. Cumulative Incidence Function (CIF) for Dropout, by Institution Group

Semester	Medium selectivity/ mid or small city	Medium selectivity/ large city size	High selectivity/ large or mid city size
Year 1 Fall	0.06	0.06	0.02
Year 1 Spring	0.21	0.23	0.06
Year 2 Fall	0.25	0.27	0.07
Year 2 Spring	0.31	0.32	0.09
Year 3 Fall	0.33	0.34	0.10
Year 3 Spring	0.36	0.36	0.11
Year 4 Fall	0.37	0.37	0.11
Year 4 Spring	0.39	0.39	0.12
Year 5 Fall	0.40	0.40	0.13
Year 5 Spring	0.41	0.41	0.13
Year 6 Fall	0.42	0.42	0.14
Year 6 Spring	0.43	0.43	0.14



Number at Risk (Have not Graduated/Dropped Out Yet)

Group	Year 1 Spring	Year 2 Spring	Year 3 Spring
Medium/ Mid-Small	20,768	16,543	14,326
Medium/ Large	29,951	23,338	20,737
High/ Large-Mid	32,728	30,874	29,661

Table 7 presents odds ratios from survival models estimating the likelihood of graduation and dropout over time. To help interpret the results, it is useful to understand how to read odds ratios. An odds ratio is a way of comparing how likely an outcome is for one group relative to another. These estimates help translate statistical models into more intuitive comparisons. In this context, it shows how different factors are associated with the likelihood of graduating or dropping out, compared to continuing enrollment. An odds ratio of 1 indicates no difference between groups, values above 1 indicate a higher likelihood of the outcome, and values below 1 indicate a lower likelihood.

Several covariates were modeled as time-varying – including enrollment intensity, financial aid receipt (Pell, other need-based aid, and any aid), semester GPA, and employment – to capture how changes in students' academic and financial circumstances across semesters relate to their progression toward different outcomes.

The results reveal meaningful differences across student characteristics. Male students have lower odds of graduating compared to female students (OR = 0.76), corresponding to approximately 24 percent lower odds of graduation at a given point in time, with no meaningful difference in dropout (OR = 1.02). Non-URM students (OR = 1.29) and international students (OR = 1.14) have higher odds of graduating relative to remaining enrolled compared to URM students – about 29 percent and 14 percent higher odds, respectively. While international students have lower odds of dropout (OR = 0.69), non-URM students have slightly higher odds of dropout (OR = 1.10), suggesting different persistence dynamics across these groups.

Table 7. Odds Ratios for Dropout and Graduation by Covariate Comparison Groups, with Significance Levels

Comparison	Odds Ratio for Graduation	Odds Ratio for Dropout
Male vs Female	0.761**	1.015
International vs URM	1.136*	0.692**
Non-URM vs URM	1.293**	1.100**
Not In-State vs In-State	0.962	1.112*
Part-Time vs Full-Time Enrollment	2.248**	2.042**
Pell Recipient vs Not	0.819**	1.259**
Recipient of Any Aid vs Not	1.150**	0.674**
Other need-based Grant/Scholarship Recipient vs Not	1.053*	0.614**
<2.0 or Missing GPA vs 3.5 or Higher GPA	0.125**	9.355**
2.0-2.4 GPA vs 3.5 or Higher GPA	0.250**	1.865**
2.5-2.9 GPA vs 3.5 or Higher GPA	0.404**	1.221**
3.0-3.4 GPA vs 3.5 or Higher GPA	0.569**	1.048
<$1,500 Semester Earnings vs Not Working	1.048	1.298**
$1,500-3,499 Semester Earnings vs Not Working	0.987	1.235**
$3,500+ Semester Earnings vs Not Working	0.971	1.323**
High selectivity/large or mid city size vs Medium selectivity/large city size institution group	1.647**	0.385**
Medium selectivity/mid or small city vs Medium selectivity/large city size institution group	1.178**	1.060**

**<0.01 significance, **<0.001 significance*

Financial aid also plays an important role. Students receiving any financial aid have higher odds of graduating (OR = 1.15, ~15% higher odds) and lower odds of dropping out (OR = 0.67, ~33% lower odds), indicating aid is associated with a greater likelihood of progressing toward completion rather than attrition. In contrast, Pell recipients have lower odds of graduating (OR = 0.82, ~18% lower odds) and higher odds of dropout (OR = 1.26, ~26% higher odds). Students receiving other need-based grants or scholarships have slightly higher odds of graduating (OR = 1.05, ~5% higher odds) and substantially lower odds of dropout (OR = 0.61, ~39% lower odds). Although these financial aid measures are moderately correlated (~0.4 correlations), including all three financial aid types highlight how different forms of aid are associated with distinct patterns in persistence and completion, an important insight given that schools can adjust certain types of aid, in turn potentially better supporting students.

Part-time students have higher odds of both graduating (OR = 2.25) and dropping out (OR = 2.04) relative to remaining enrolled, reflecting greater movement toward outcomes in either direction. However, relatively few students in this sample exhibit part-time enrollment patterns, so this finding should be interpreted with caution. It likely reflects a small subset of students, potentially those nearing completion or following nontraditional pathways, rather than a general advantage of part-time enrollment. For example, only 3.6 percent of students still enrolled in the Year 1 Spring term were part-time, increasing slightly to 6.5 percent by the Year 2 Spring term. In a population with greater variation in

enrollment intensity, as would likely be observed outside of FTFTDS cohorts, full-time enrollment would likely show more favorable completion patterns.

The relationship between working while enrolled and student outcomes varies across levels of earnings. Students earning less than $1,500 per semester have similar odds of graduating as non-working students (OR = 1.05) but higher odds of dropout (OR = 1.30, ~30% higher). Those earning $1,500–$3,499 also show no meaningful difference in graduation (OR = 0.99) but elevated dropout odds (OR = 1.24, ~24% higher). Students earning $3,500 or more have slightly lower odds of graduating (OR = 0.97) and higher odds of dropout (OR = 1.32, ~32% higher), suggesting that higher levels of employment may interfere with academic progress.

Semester grade point average (GPA) is one of the strongest predictors. Students with GPAs below 2.0 have substantially lower odds of graduating (OR = 0.13, ~87% lower odds) and dramatically higher odds of dropping out (OR = 9.36, more than nine times as likely), compared to those with GPAs of 3.5 or higher. Even moderate GPA differences matter: students with GPAs between 2.0–2.4 (OR = 0.25) and 2.5–2.9 (OR = 0.40) face progressively lower graduation odds and higher dropout risks.

Institution type also remains a key factor. Students at high selectivity institutions have higher odds of graduating (OR = 1.65, ~65% higher) and lower odds of dropping out (OR = 0.39, ~61% lower) compared to those at medium selectivity/large city size institutions. Students at medium selectivity/mid or small city institutions also show somewhat higher graduation odds (OR = 1.18) but slightly higher dropout odds (OR = 1.06), indicating more mixed outcomes relative to the reference group.

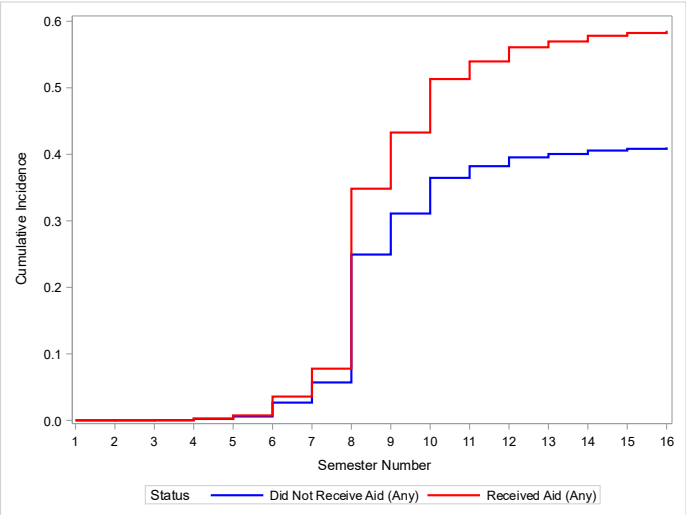
Overall, these results highlight how academic performance, financial support, institutional context, and student characteristics jointly shape the likelihood of progressing toward graduation or exiting through dropout over time.

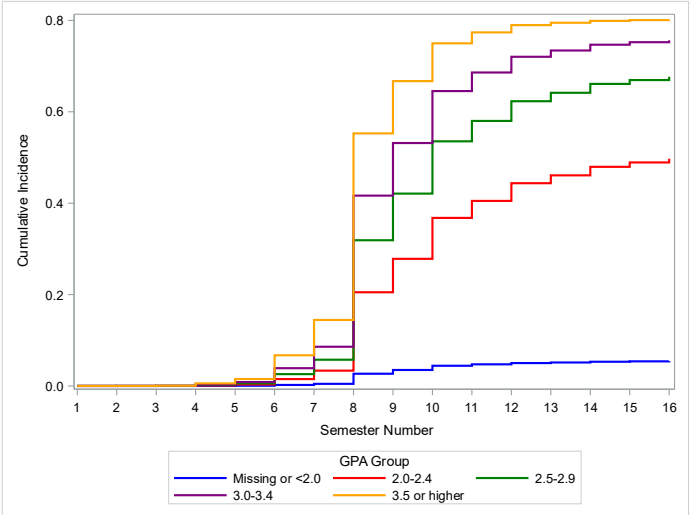
Given the pronounced differences observed across several predictors, further examination is warranted to better understand how these factors influence the timing of student outcomes. The next section presents cumulative incidence functions (CIFs) for selected covariates to visually demonstrate differences in probability of graduation over time. Because these predictors vary over time, students may move between categories across semesters. The CIFs therefore reflect outcomes associated with each category at a given time, rather than fixed groups of students who remain in the same category throughout the study period. For conciseness, only CIFs for graduation outcomes for selected covariates within the medium selectivity/large city size institution group are presented, though follow-up analysis across additional covariates, outcomes, and institution types at a later time would provide valuable insight.

First, we look at financial aid receipt for the medium selectivity/large city size institution group only. The figure shows clear differences in graduation outcomes by financial aid receipt (of any aid). Students who receive aid graduate at higher rates, reaching nearly 60 percent completion by the end of the observation period, compared to about 40 percent for non-recipients. The gap becomes most noticeable around semesters 7-10, indicating that financial aid is associated with both higher likelihood and somewhat faster progression to graduation.

For semester GPA, the CIF shows a clear relationship between GPA and both the timing and likelihood of graduation. Students with higher GPAs graduate more quickly and at higher rates, with the 3.5+ GPA group reaching about 80 percent completion, compared to roughly 50 percent for the 2.0–2.4 group. In contrast, students with GPAs below 2.0 have very low graduation rates, highlighting semester GPA as a strong predictor of completion.

Figure 3. and Figure 4. Graduation CIF for Any Financial Aid, GPA, Medium Selectivity/Large City Size Institution Group





Taken together, the set of results points to clear patterns in both graduation and dropout over time. The graduation data shows little separation across groups in the first three years, but the fourth year emerges as a key turning point when students begin to follow more distinct paths toward completion, with differences continuing to grow after that. In contrast, the estimated probability of dropout is already substantial at the end of Year 1 and continues to increase during Years 2 and 3. These patterns suggest that early semesters represent a critical window for identifying and addressing dropout risk, even though differences in graduation outcomes take longer to fully emerge.

Among modifiable factors, semester GPA is the strongest predictor of success, with higher academic performance closely tied to better graduation outcomes and lower dropout risk. Financial support also plays an important role – students receiving any financial aid show higher odds of graduation and lower odds of dropout, although effects vary by type of aid. These findings point to several practical implications: institutions may benefit from investing in early academic support (e.g., advising, tutoring, and early alert systems) to help students build momentum in their first year, while also ensuring consistent access to financial resources that reduce barriers to persistence. At the same time, sustained support beyond the early years remains important, as differences in graduation outcomes continue to widen over time. These results highlight the dual importance of early intervention to reduce dropout risk and ongoing support to keep students on track toward completion.

CONCLUSION

Survival analysis is a helpful technique to examine the occurrence and timing of graduation since it makes appropriate adjustments for students who do not graduate within the timeframe as well as for students who drop out. Applying this technique to study graduation outcomes for three cohorts of FTFTDS students at UT System academic institutions, we identified several interesting findings.

Institution selectivity and city size are a central factor, and using survival analysis provides a more nuanced understanding of these trajectories. This approach highlights that students at highly selective institutions are not only more likely to graduate, but also to do so earlier, while those at our medium selective institutions experience substantially higher rates of early attrition and slower progression. In addition, variation in outcomes by student characteristics – particularly academic performance, along with financial and demographic factors (e.g., gender, URM status, Pell recipient, recipient of any financial aid, semester GPA, working while enrolled) – underscores the importance of considering both institutional context and individual attributes when examining completion outcomes and dropout risk, with different factors influencing graduation and dropout in distinct ways. Together, these results illustrate how

survival analysis offers a valuable framework for understanding the complex and unequal pathways to graduation and underscores the importance of considering contextual variables when studying these educational milestones.

[i] National Center for Education Statistics. (n.d.). *IPEDS Outcome Measures survey component*. U.S. Department of Education. https://nces.ed.gov/ipeds/

[ii] National Student Clearinghouse Research Center. (2023). *Completing College: National and state reports with six- and eight-year completion rates*. https://nscresearchcenter.org/completing-college/

[iii] Allison, Paul D. *Survival Analysis Using SAS: A Practical Guide.* SAS Institute, 2012.

[iv] Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research, 45*(1), 89–125. https://doi.org/10.3102/00346543045001089

[v] Grau-Valldosera, J., & Minguillón, J. (2014). Rethinking dropout in online higher education: The case of the Universitat Oberta de Catalunya. *The International Review of Research in Open and Distributed Learning, 15*(1). https://doi.org/10.19173/irrodl.v15i1.1628

[vi] National Student Clearinghouse Research Center. (n.d.). *Some college, no credential: Definitions and methodology*. https://nscresearchcenter.org/