

TUITION DISCOUNTING AND ITS IMPACT ON ENROLLMENT AND NET TUITION
REVENUE

by

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ABSTRACT

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This quantitative, longitudinal, correlational study analyzed a decade of tuition pricing behavior, institutional tuition discounting strategies, enrollment patterns, and net tuition revenue (NTR) outcomes among private, not-for-profit, four-year institutions in the United States from 2014 to 2023. Using secondary data from the Integrated Postsecondary Education Data System (IPEDS), the study examined the relationships among tuition discount rate, enrollment, net tuition revenue, and the effects of utilizing different proportions of funded and unfunded institutional aid. The study revealed that while tuition and fee prices increased substantially in nominal terms, real tuition growth adjusted for inflation was modest. In contrast, institutional discount rates rose nearly nine percentage points over the decade, reaching an average of 43.59% in 2023, indicating a growing reliance on institutional aid with diminishing margins in net tuition revenue. Regression analyses demonstrated that enrollment volume, rather than tuition discount

rate, was the dominant driver of net tuition revenue. Institutions enrolling more students generated significantly higher net tuition revenue regardless of average discount rate, while higher discount rates were associated with lower enrollment levels and indirectly with reduced net tuition revenue. Piecewise regression models identified a critical threshold between 35% and 40% discounting, beyond which net tuition revenue declines sharply, signaling measurable financial risk for institutions that discount significantly over that threshold. Moreover, institutions that utilize greater proportions of funded aid exhibited somewhat stronger enrollment and net tuition revenue outcomes, underscoring the strategic advantage of endowment-backed aid. The study emphasizes the urgent need to confront the persistent high price/high aid tuition pricing model in private higher education, a practice that has driven many institutions into financial distress and further eroded the industry's stability and public reputation.

CHAPTER 1: INTRODUCTION

The rising costs of higher education have brought increased scrutiny to the pricing models used by colleges and universities in the United States, particularly private, not-for-profit institutions. Among the most prevalent and debated practices in higher education is tuition discounting, a financial aid strategy in which institutional grant aid is utilized to reduce the sticker price of tuition for students (Baum & Lapovsky, 2006; Hillman, 2012). Initially conceived in the 1970s as a means to support students with financial need, tuition discounting has evolved into a multifaceted tool employed by institutions to achieve unique and diverse goals including managing enrollment, maximizing net tuition revenue (NTR), and crafting a student body that aligns with institutional mission and vision (Baum et al., 2010; Merea, 2010).

Tuition discounting now represents a critical element of enrollment management at many institutions, particularly private, not-for-profit, four-year institutions, where growing dependence on tuition revenue has essentially made it an economic necessity (Heller, 2006; National Association of College and University Business Officers [NACUBO], 2015). While its intent varies by institution, tuition discounting is often used to entice two categories of students: those unable to afford the published tuition price and those unwilling to pay it (Baum et al., 2010). Over time, this pricing strategy has come under increasing criticism, yet there has been hesitancy to change status quo. Questions surrounding the sustainability and effectiveness of tuition discounting, particularly considering ever-increasing tuition costs, declining enrollment pools, and shifting public perceptions of higher education, have prompted calls for more rigorous examination of its impact on enrollment, institutional finances and even student access to higher education (Hillman, 2012; Summers, 2004).

Despite its widespread use, research examining the relationship between tuition discounting and its effects on enrollment and net tuition revenue remain limited. Much of the existing literature focuses on descriptive trends, such as the growth in overall tuition prices and discount rates. However, there seems to be a lack of studies investigating how discounting strategies directly influence variables such as enrollment and net tuition revenue, and the financial effects of utilizing funded versus unfunded institutional aid (Harter, 2016; Levin & Van Dender, 2011). This gap in the literature leaves institutional leaders and policymakers reliant on anecdotal evidence and market trends to guide their institutional pricing and financial aid strategies, often perpetuating a *high price/high aid* model without clear evidence of its long-term viability (Hillman, 2012, Wayt, 2018).

As the demographic composition of college-going populations changes and economic pressures mount, understanding the nuanced interplay between tuition pricing, tuition discount rates, and institutional financial sustainability becomes critical. Institutions with significant endowments may have greater flexibility to provide funded aid, potentially lessening their reliance on unfunded sources. Conversely, those without strong financial vehicles via their endowments or other restricted funds designated for scholarships may find operating budgets becoming increasingly strained, threatening their ability to sustain tuition discounting practices over time (Duggan & Matthews, 2005; Martin, 2004).

Problem and Purpose of the Study

The main problem addressed in this study is the sustainability of the current tuition discounting model. As tuition prices continue to rise alongside discount rates, questions emerge regarding whether these practices effectively balance institutional needs and desired outcomes with student affordability. Furthermore, the relative impact of being able to utilize greater

amounts of funded versus unfunded institutional aid to discount student tuition prices remains understudied, despite its potential implications for long-term institutional financial sustainability (Harter, 2016; NACUBO, 2013).

The purpose of this study is to examine the trends and effects of tuition discounting on enrollment and net tuition revenue at private, not-for-profit, four-year institutions in the United States. As history has shown, tuition discounting seems to be a common practice that will likely continue unless the current model is fundamentally challenged. Since most private institutions do not receive state or federal funding, they are heavily reliant on tuition as their primary revenue source, which means that they are typically also highly reliant on a strong enrollment figure.

This study is also designed to help private institutions determine a *fitting* discount rate for their specific circumstances. Research has indicated that more selective, prestigious institutions tend to depend less on tuition discounting as a strategy for attracting students. In fact, Redd (2000) found that institutions with more moderate increases in institutional aid often experienced larger gains in enrollment and net tuition revenue. The findings from this study will assist institutions in understanding how their tuition discounting practices influence enrollment, and net tuition revenue. This study seeks to answer the following research questions:

1. What are the trends in tuition prices and tuition discount rates for private, not-for-profit, four-year institutions?
2. What is the relationship between tuition discounting, enrollment, and net tuition revenue?
3. What is the effect of utilizing funded versus unfunded institutional aid on enrollment and net tuition revenue?

Through this study, institutions can better understand how tuition discounting practices influence their enrollment and net tuition revenue, enabling them to refine award strategies and ensure that they are meeting the needs of a diverse student body while maintaining strong fiscal health.

Significance of the Study

This study addresses issues surrounding tuition discounting practices and their sustainability within private, not-for-profit, four-year institutions, particularly as they relate to enrollment management, net tuition revenue, and access to higher education. With rising tuition prices and the growing reliance on tuition revenue, understanding the balance between the high price/high aid model and its long-term viability has become increasingly important. The high price/high aid model, in which institutions offer large amounts of institutional financial aid in the form of discounts to offset high sticker prices, has been a central feature of enrollment strategies in private higher education. However, concerns about the sustainability of this model persist, as rising discount rates may jeopardize the financial health of institutions, potentially leading to reduced academic offerings, staff layoffs, and cuts in student services, as well as other cost reductions among the institution (Baum & Lapovsky, 2006; Martin, 2004).

The findings of this study provide insight into how private institutions navigate this balance, with an emphasis on the relationship between tuition discount rates, enrollment, and net tuition revenue. This is especially relevant as small private institutions depend heavily on tuition revenue for their operating budgets, making changes in net revenue particularly impactful. The ability for an institution to effectively manage tuition pricing and discounting directly influences its fiscal health, the quality of education it provides, and its ability to remain affordable to students (Heller, 2006). Postsecondary administrators, enrollment managers, and finance leaders

may have to reconsider their discounting strategies, as the study may reveal that improper discounting practices contribute to financial strain or unsustainable growth, which could push institutions toward the brink of fiscal instability (Merea, 2010; Redd, 2000).

Moreover, this study highlights the broader significance for the national landscape of higher education, where tuition discounting practices vary considerably across institutions. The study provides a model for institutions to better understand the effects of their discounting strategies and aids in identifying the most *fitting* discount rate that balances access to education with institutional financial sustainability. This understanding is essential for institutions aiming to develop a diverse student body while maintaining financial health. Institutions that fail to address the sustainability of their discounting models may risk long-term financial instability, reduced access to higher education, and diminished student enrollment (Summers, 2004). Examining these practices can offer actionable insights for policymakers and institutional leaders to make more informed, data-driven decisions about how they structure their financial aid packages and manage their tuition pricing strategies.

Additionally, the study provides a nuanced exploration of the effects of utilizing funded versus unfunded institutional aid, an aspect of tuition discounting that has received less attention. Understanding the interplay between these two sources of aid is crucial, as institutions with limited resources from their endowments may find themselves overly reliant on utilizing unfunded aid, which can strain their operating budgets and limit their ability to provide robust financial aid packages to future students. This research contributes to a more comprehensive understanding of how various financial strategies can be employed to support institutional goals, particularly in the context of changing demographic trends and economic challenges facing higher education.

In conclusion, the significance of this study extends beyond the individual institution, offering valuable lessons for higher education leaders nationwide. The findings can help institutions better align their financial aid strategies with their long-term goals, ensuring that they remain financially viable while providing equitable access to higher education for diverse student populations.

Theoretical Framework: Breneman's Microeconomic Theory of Private Colleges

This study draws upon David Breneman's (1994) microeconomic theory of private colleges, which explores the economic relationships between tuition pricing, institutional aid, and enrollment. According to Breneman, private colleges must carefully balance their tuition prices with the amount of unfunded institutional aid provided to maintain healthy enrollment levels and ensure financial sustainability. Breneman argued that because tuition is the primary revenue source for most private colleges, understanding how tuition pricing and unfunded aid intersect is critical to optimizing net tuition revenue.

Breneman's theory built on earlier models by Hopkins and Massey (1981) but specifically applied them to private liberal arts colleges. He posited that colleges must first set their desired enrollment levels and determine the resources (e.g., faculty, facilities) needed to meet those goals. From there, they adjusted tuition prices and aid offerings to maximize enrollment, ensuring that the demand curve intersected at a point that balanced both affordability and institutional revenue needs. Breneman highlighted that tuition discounting, in which institutions provide institutional aid to lower the net price of tuition, played a crucial role in achieving this balance.

Breneman's framework suggested that, for many institutions, raising tuition prices without adjusting aid strategies can hurt enrollment, whereas strategic use of unfunded aid can

attract more students, thereby increasing net revenue. This theory serves as the foundation for understanding how tuition discounting practices can impact the financial health of private colleges, particularly those that rely on tuition revenue to sustain their operations.

Definition of Terms

Tuition Discounting: A financial strategy used by colleges and universities in which institutional funds (often in the form of scholarships or grants) are utilized to reduce the published tuition price. This discount can be based on financial need, academic merit, or other criteria and helps make the cost of education more affordable for students.

Net Tuition Revenue (NTR): The amount of revenue a college or university receives (pending collections) from tuition payments after accounting for institutional aid, such as scholarships and grants. It represents the actual income generated by tuition after discounts are applied.

Sticker Price: The full, advertised cost of tuition before any discounts, scholarships, or financial aid are applied. This may not reflect the actual amount students are required to pay.

Institutional Aid: Financial assistance provided by a college or university to students, typically in the form of scholarships, grants, or work-study programs. This aid is generally not repaid and is used to reduce the cost of tuition for eligible students.

Unfunded Aid: Financial assistance provided by an institution that does not come from a restricted, designated, or external funding source. This aid is typically financed through the institution's general budget and is often part of tuition discounting strategies.

Funded Aid: Financial assistance provided by an external source, such as a government agency, private foundation, or donor, that is awarded to students to help pay for their tuition or other educational costs. Unlike unfunded aid, funded aid does not directly impact an institution's general operating budget, except for the effect it has on the amount it reduces the need to utilize unfunded aid.

Restricted Grant Aid: A type of financial aid or grant that comes with specific conditions attached, such as being used for particular purposes (e.g., tuition, research, student support programs). This type of aid typically cannot be used for general operational costs or other expenditures beyond the stated purpose.

Unrestricted Grant Aid: Institutional aid or scholarship money that the university provides from its own unrestricted operating funds, rather than from a donor-restricted endowment, external grant, or designated fund.

Enrollment Management: A strategic approach to balancing student enrollment levels with institutional goals. It includes recruitment, retention, and the financial aid process to ensure a sustainable and diverse student body.

Private, Not-for-Profit Institutions: Colleges or universities that are not operated for profit. These institutions reinvest any surplus revenue into the institution's educational programs and services, rather than distributing profits to shareholders.

First-Generation College Students: Students who are the first in their immediate family to attend college.

Tuition Sticker Shock: The phenomenon where potential students and their families are discouraged by the high published price of tuition, despite the possibility of financial aid or discounts being available.

Selective/Prestigious Institutions: Colleges and universities with high admission standards, typically accepting only students who meet specific academic, extracurricular, or other criteria.

Affordability: The ability of students and their families to pay for the cost of college education, which includes tuition, fees, housing, and other expenses, without experiencing financial hardship.

Sustainability of Tuition Discounting: Refers to the long-term feasibility of using tuition discounting practices to attract students, maintain enrollment, and ensure the financial health of the institution.

Endowments: Financial assets, typically in the form of investments, that private colleges and universities manage in order to generate income. Endowments are often used to fund scholarships, faculty positions, and institutional operations, providing long-term financial stability to institutions.

Tuition Revenue Dependence: The degree to which a college or university relies on tuition as a primary source of revenue to cover operational costs. Institutions with high tuition revenue dependence may be more likely to use tuition discounting to manage enrollment and financial stability.

Access to Higher Education: The ability of students, particularly from disadvantaged or low-income backgrounds, to afford and attend college.

Financial Sustainability: The ability of a college or university to maintain financial health over time. This includes managing revenue sources, expenditures, and financial strategies (e.g., tuition pricing, endowment management) to ensure long-term viability.

Variables

Several key variables are explored in this study to understand the dynamic relationships between tuition discounting, enrollment, and net tuition revenue (NTR) at private, not-for-profit institutions. Variables identified for this study are categorized as independent and dependent variables, which will be analyzed to evaluate their impact on the overall effectiveness of tuition discounting strategies.

Independent variables.

Tuition Discount Rate: The tuition discount rate is a critical independent variable that refers to the percentage by which institutions reduce the published price of tuition through institutional financial aid. This reduction is intended to make college more affordable for students, attract prospective students, and, ultimately, influence enrollment decisions (Baum & Lapovsky, 2006). Tuition discounting is a strategy widely used by private, not-for-profit institutions to manage enrollment and increase diversity within their student body while balancing institutional financial goals (Hillman, 2012). The discount rate directly impacts net tuition revenue by altering the effective price that students pay (Duggan & Matthews, 2005).

Funded Institutional Aid: Funded institutional aid is financial assistance provided by the institution, supported by its own resources such as endowment income or designated funds. This type of aid is typically more sustainable because it refers to real dollars that are not just offsetting tuition revenue like unfunded aid. (Baum et al., 2010). In this study, funded aid is considered an independent variable because it is one of the variables institutions may use to influence both enrollment and net tuition revenue (Merea, 2010).

Unfunded Institutional Aid: Unfunded institutional aid refers to financial assistance provided by the institution that is not backed by its own financial resources. Instead, it is typically drawn from the institution's operating budget or other revenue sources (Harter, 2016). Although this aid may be necessary to attract students, particularly in institutions with fewer resources, it poses a challenge to an institution's long-term financial health when utilized too heavily (Breneman, 1994). Unfunded aid is a variable of interest because it may influence the institution's enrollment strategies and the overall financial viability of tuition discounting practices (Hillman, 2012).

Endowments: An institution's endowment, which includes funds donated by alumni and other benefactors, plays a key role in determining the financial aid strategies it can implement (Duggan & Matthews, 2005). Institutions with larger endowments have greater flexibility in funding both funded and unfunded aid without relying as heavily on tuition revenue (Merea, 2010). This variable is significant in understanding how private institutions with varying endowment sizes may approach tuition pricing and financial aid allocation, influencing both student enrollment and net tuition revenue.

Dependent variables.

Enrollment: Enrollment refers to the total number of students registered at an institution. It is a critical dependent variable because the number of students enrolled directly influences tuition revenue, institutional budgets, and overall financial sustainability (Levin & Van Dender, 2011). Tuition discounting, including the use of funded and unfunded aid, is designed to influence enrollment by making higher education more financially accessible to students (Baum et al., 2010). The enrollment figure is thus a key measure of the effectiveness of tuition discounting and financial aid strategies (Breneman, 1994).

Net Tuition Revenue (NTR): Net Tuition Revenue represents the actual amount of tuition income an institution receives after factoring in financial aid, including both institutional aid (discounts) and other forms of student assistance (Harter, 2016). NTR is a crucial indicator of an institution's financial health (Hillman, 2012). It is dependent on both enrollment levels and the amount of institutional aid provided. As such, NTR is an important variable in understanding the financial outcomes of tuition discounting practices, as higher discount rates can result in higher enrollment but may reduce the overall revenue institutions receive from tuition, or vice versa (Duggan & Matthews, 2005).

By analyzing the relationships between these independent and dependent variables, this study aims to provide a comprehensive understanding of how tuition discounting practices impact both enrollment and financial sustainability at private, not-for-profit, four-year institutions. The interaction between these variables will offer insights into the most effective strategies to manage enrollment and grow net tuition revenue.

Methodology

This study adopts a quantitative research design to explore the relationship between tuition discounting practices and institutional outcomes, specifically enrollment and net tuition revenue at private, not-for-profit, four-year colleges and universities in the United States. The study follows a post-positivist inquiry paradigm, using empirical data to uncover patterns and correlations among key financial and enrollment variables. This research draws on secondary data from the Integrated Postsecondary Education Data System (IPEDS), which provide comprehensive longitudinal data on tuition rates, discounting practices, financial aid allocations, and enrollment trends (Creswell & Creswell, 2018; Levin & Van Dender, 2011).

Statistical analysis, including descriptive statistics, correlation coefficients, and regression analysis, are employed to assess institutional variables such as tuition discount rates, utilizing funded versus unfunded aid, and endowment size and their respective impact on enrollment and net tuition revenue. These analyses will help determine the sustainability and effectiveness of tuition discounting strategies and their influence on the financial health of private colleges (Harter, 2016; Hillman, 2012). The study seeks to answer critical questions about the interaction between tuition pricing, financial aid strategies, and enrollment outcomes, contributing to the broader understanding of tuition discounting in higher education (Breneman, 1994). Through this methodology, the research aims to provide data-driven insights that can inform institutional leaders and policymakers in making more informed decisions about financial aid award strategies and pricing strategies.

The methodology also emphasizes the use of longitudinal data, which allows for a robust examination of trends over a specific time period, providing a clearer picture of how changes in tuition pricing and discounting practices influence long-term enrollment patterns and financial outcomes. By using multiple years of data from IPEDS, the study accounts for potential

fluctuations in enrollment and tuition discounting practices across different economic cycles. This approach ensures that the findings are not influenced by short-term anomalies, offering a more reliable understanding of the long-term effects of tuition discounting on institutional sustainability (Heller, 2006; Martin, 2004). Furthermore, by focusing specifically on private, not-for-profit institutions, the study isolates a key group of higher education institutions that rely heavily on tuition revenue, which is critical for understanding the unique financial dynamics of these institutions (Baum & Lapovsky, 2006; NACUBO, 2014). The study's findings will be particularly useful for administrators and policymakers at private colleges and universities who are navigating the complexities of balancing affordability, enrollment, and financial stability in the volatile higher education landscape.

Assumptions

This study is based on several key assumptions. First, it assumes that the data collected from the Integrated Postsecondary Education Data System (IPEDS) is accurate and reliably represents the financial and enrollment practices of the institutions included in the sample. The study also assumes that the reported tuition discount rates and financial aid allocations reflect the true financial strategies employed by the institutions. While institutional reporting practices may vary, it is assumed that the data provided by these sources is consistent enough to allow for meaningful analysis.

As someone working in finance at a private, not-for-profit institution like those being analyzed in this study, I bring a particularly unique but somewhat biased perspective to the research. My role naturally leads me to assume that tuition discounting is a necessary tool for enrollment management, given the reliance of many private institutions on tuition revenue.

Additionally, I assume that the financial decisions made by institutions in the study are, at least

in part, driven by similar pressures to maintain or grow enrollment. These assumptions may introduce a degree of bias, but they are acknowledged and provide a useful lens for interpreting the findings.

Limitations

This study acknowledges several key limitations. First, the reliance on existing data raises concerns about accuracy, completeness, and potential reporting biases, as variations in institutional reporting practices may affect data consistency (Creswell & Creswell, 2018; Heller, 2006). Additionally, focusing on private, not-for-profit institutions may limit the generalizability of the findings to public or for-profit institutions, which have distinct financial models and regulatory frameworks (Duggan & Matthews, 2005). The study's longitudinal approach provides valuable trend insights, but it does not account for external factors, such as economic conditions, policy changes, or global events, which could significantly impact enrollments and net tuition revenue (Martin, 2004). Lastly, future research could benefit from qualitative methods, such as interviews or case studies, to gain deeper insights into institutional decision-making and stakeholder perspectives on tuition discounting practices (Creswell & Poth, 2018).

Tuition discounting remains a central, yet complex, element of financial and enrollment strategies at private, not-for-profit, four-year institutions, directly shaping both net tuition revenue and student access. By investigating the interplay among tuition pricing, discount rates, and the utilization of funded versus unfunded institutional aid, this study offers critical insights into the sustainability of current pricing models and addresses notable gaps in the literature concerning long-term financial viability. Grounded in Breneman's (1994) microeconomic theory of private colleges and supported by a quantitative, longitudinal approach drawing on IPEDS data, this research aims to illuminate how these discounting practices can help, or hinder,

institutional efforts to balance affordability, fiscal health, and diverse institutional goals. As higher education leaders continue to face escalating costs, shifting demographics, and greater accountability for value and outcomes, a nuanced understanding of tuition discounting is increasingly important. The next chapter will delve into the existing literature on tuition discounting, reviewing its historical context, theoretical underpinnings, and researched impacts on enrollment and net tuition revenue, ultimately setting the stage for the study.

CHAPTER 2: REVIEW OF LITERATURE

Although not a new phenomenon in higher education, tuition discounting has continued to become more prevalent and utilized for reasons counter to its initial intent. With the rising cost of higher education, specifically private higher education, institutions are seeking ways to offset this increase in price to consumers, mainly through offering discounts on tuition through institutional aid. However, the intent of utilizing financial aid to discount tuition and attract students to an institution has received criticism, and many doubt its sustainability (Baum, Lapovsky, & Ma, 2010). What once was used as a means to aid needy students on their path to educational achievement has quickly become a method to attract necessary students to reach enrollment goals and capture necessary net tuition revenue to balance institutional budgets.

Much has been written on tuition discounting, its growing prevalence in higher education, and the rising costs of higher education. There is also plenty of research showing the growth in tuition prices and tuition discounting. However, little literature depicts the relationship between tuition discounting and its effect on enrollment and net tuition revenue. Since private institutions typically do not receive federal or state appropriations and are highly tuition dependent, it is critical for these institutions to understand the unique interplay between tuition discounting, enrollment, and net tuition revenue. Behaunek (2015) investigated the relationship between tuition discounting at private colleges and its effect on tuition revenue to determine if there was a threshold at which tuition discounts diminished the returns on total tuition revenue. Harter (2016) also conducted a similar study on the impact of tuition discounting on net tuition revenue, determining that a specific rate of discounting resulted in a decline in net tuition revenue. However, since both Behaunek's (2015) and Harter's (2016) studies, tuition prices have grown steeper, and the reliance on tuition discounting is greater amongst private institutions. As a

result, this study aims first to analyze the more recent trends in tuition pricing and tuition discounting and determine if there is a relationship between tuition discounting, enrollment, and net tuition revenue. Similar to Behaunek's (2015) work, this study aims to determine if there is a specific percentage of tuition revenue that institutions discount, resulting in maximum net tuition revenue. With these results, institutions could optimize their financial aid strategies to enroll necessary students and ultimately capture the greatest net tuition revenue.

This section begins by outlining Breneman's (1994) microeconomic theory of private colleges as found in his book *Liberal Arts Colleges: Thriving, Surviving, or Endangered?* Breneman's (1994) theory provided an understanding as to why private colleges utilize tuition discounting and how these institutions can maximize net tuition revenue through tuition discounting. Following Breneman's (1994) theoretical framework, literature regarding tuition pricing in private higher education will be discussed. This section will specifically develop an understanding of the history of tuition and the introduction of the high price/high aid pricing model, the rising costs of higher education, and the implications of these rising costs. The final section will focus on tuition discounting at private institutions. More specifically, this section will highlight the history of tuition discounting. It will provide context as to the different types of institutional aid used in tuition discounting, such as funded and unfunded aid and merit-based and need-based aid. The annual NACUBO Tuition Discounting Study will then be discussed and will provide context for the final theme of this section pertaining to the intersection of tuition discounting and net tuition revenue.

Theoretical Framework: Breneman's Microeconomic Theory of Private Colleges

To frame the theory surrounding the use of tuition discounting and its effect on net tuition revenue and to draw connections and contextualize the ensuing literature, this study specifically

called upon the microeconomic theory of private colleges as presented in David Breneman's (1994) *Liberal Arts Colleges: Thriving, Surviving, or Endangered?* Breneman (1994) developed this theory acknowledging the importance for private institutions to understand and utilize tuition discounting. In fact, Breneman (1994) stated that:

Because tuition is the dominant revenue source for most private colleges, the linkage among the published tuition price, unfunded student aid, and enrollments is the central financial puzzle that must be solved if the financing of these colleges is to be understood.

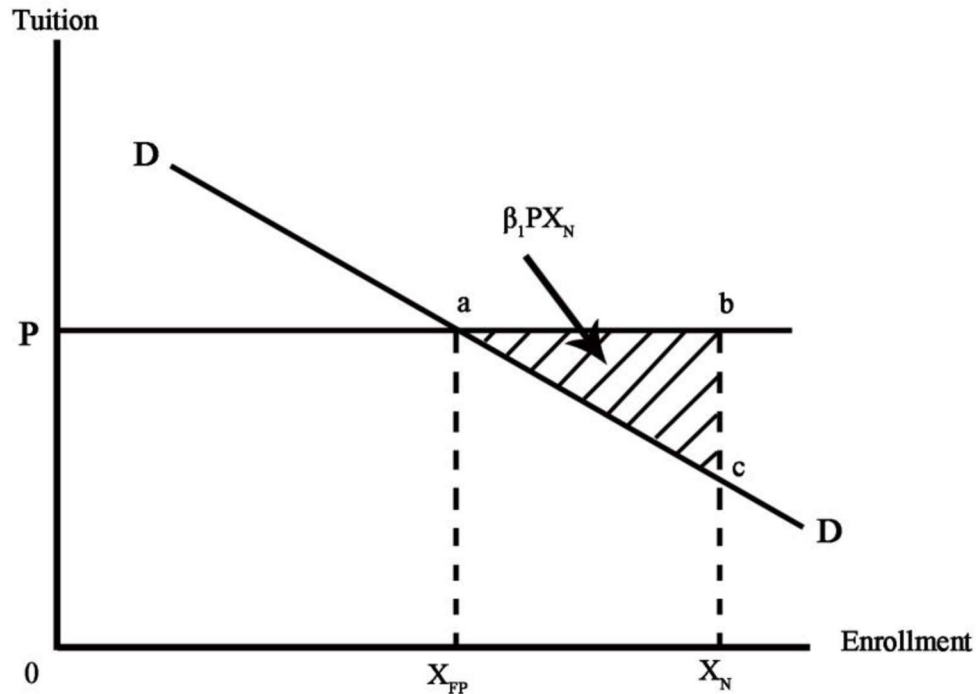
Previous studies (Behaunek, 2015; Martin, 2012) also utilized Breneman's (1994) microeconomic theory of private colleges to help deduce the tuition discounting phenomenon at private institutions. Breneman's (1994) microeconomic theory was derived from the prior work of David Hopkins and William Massey in their 1981 book entitled *Planning Models for Colleges and Universities*. In this book, Hopkins and Massey developed a theory surrounding the behavior of nonprofit institutions but then tailored the model to fit that of a research university. Breneman (1994) revisited and revised this model to complement his understanding of the ways in which private institutions behave and effectively developed his microeconomic theory on private colleges. Following Hopkins and Massey's two-stage approach to the value optimization of private colleges, Breneman (1994) suggested in his microeconomic theory that every college has a desired enrollment figure and that the first stage of value optimization for these institutions starts with establishing desired enrollment levels and determining the inputs (faculty, staff, facilities, etc.) needed to serve that specific enrollment at a sustainable quality. Breneman (1994) further described the second stage of value optimization of private colleges as increasing the quality of the student body, faculty, and facilities as much as possible, acknowledging the desired enrollment established in stage one, and the overall budget constraints of the institution.

In developing his microeconomic theory on private colleges, Breneman (1994) delineated the subset of private institutions used in his study by asserting a key economic distinction between private institutions pertaining to their intended use of unfunded aid. For instance, institutions that have highly selective admissions standards, could, in theory, decide not to utilize tuition discounting at all and fill their incoming class of students each year with full-paying students, assuming they were fine with not using unfunded aid to increase diversity to their student body. Breneman's emphasis for the sakes of his microeconomic theory was on that of the institutions which must rely on the use of tuition discounting to meet enrollment goals. Ultimately, Breneman's (1994) microeconomic theory was developed "to understand how most private colleges, apart from the highly selective few, make intelligent decisions about tuition, student aid, and enrollments" (p. 39). As a result, Breneman eliminated institutions awarding more than 60 percent of degrees in professional fields and those he viewed as being highly selective and settled on specifically studying 212 private institutions which he felt were most in line with a true emphasis on the liberal arts.

In *Liberal Arts Colleges: Thriving, Surviving, or Endangered?* Breneman (1994) developed a theoretical presentation, shown in Figure 1 (below), of a demand pattern that depicts the relationship between a college's tuition price and the number of students able and willing to pay it. More specifically, Figure 1 features a representation of a downward sloping demand curve (DD) for institutions displaying how, by utilizing tuition discounting, higher enrollments can be achieved. Figure 1 also portrays the effect of higher tuition prices and its negative effect on enrollments if unfunded aid is also not increased.

Figure 1

Enrollment Demand and Unfunded Student Aid.



Note. Adapted from Figure 3-2 of “Liberal Arts Colleges: Thriving, Surviving, or Endangered?” by David W. Breneman, 1994. Copyright 1994 by The Brookings Institution. P represents the tuition rate, DD represents the demand curve, X_N represents total enrollment, X_{FP} represents the number of full-paying students, $\beta_1 P X_N$ (area abc) represents unfunded student aid.

Breneman (1994) asserted that unfunded institutional aid plays a significant role in determining an institution’s enrollment. Referencing Breneman, Behaunek (2015) noted that “institutions are unable to cap or restrict the amount of funds allocated to tuition discounting without potentially affecting enrollment levels” (p. 23). Through his analysis, Breneman (1994) determined that to maximize net tuition revenue, colleges should set their tuition prices at “the level where the demand curve intersects the vertical axis, enrolling just one full-pay student and discounting down the demand curve until the desired enrollment is reached” (p. 44). However, Breneman (1994) noted that this is simply not feasible unless all institutions simultaneously raise tuition prices, as such a dramatic shift could cause *sticker shock* and turn prospective students away from any one institution that decided to set tuition prices using this methodology.

Acknowledging this, Breneman (1994) argued that net tuition revenue can be maximized through

three different avenues: by attracting more full-paying students and affectively shifting the demand curve up and to the right, by increasing tuition prices (if enrollments do not fall), and by altering admissions standards to capture enrollment growth. Lastly, Breneman (1994) concluded that trying to control the percentage of the expense budget that is directed towards unfunded aid can be harmful to the downward sloping demand curve depicted in Figure 1, and can lead to a loss of enrollment, and in turn, net tuition revenue. Although Breneman's (1994) idea of not limiting unfunded aid to a specific dollar amount or percentage of an institution's expense budget could be deemed beneficial, institutions must budget for unfunded aid expense prior to the end of enrollment cycles, and any negative effect on enrollment or substantial increase in unfunded aid without a simultaneous growth in enrollment can be detrimental to the financial health of an institution. More recent research following Breneman's (1994) study on private colleges has shown that of the 212 liberal arts institutions from Breneman's initial study, only 137 of them still exist as liberal arts institutions (Baldwin & Baker, 2009). Many of these institutions have evolved into more academically complex institutions and therefore no longer fit the true liberal arts mold manifesting the need for institutions to expand to attract students to meet necessary enrollment goals.

Although dated, Breneman's (1994) microeconomic theory on private colleges provided a strong synthesis of the relationship between tuition discounting and its effect on net tuition revenue. Breneman's research will provide a structure upon which the results of this study can be compared.

History of Tuition and the Introduction of the High Price/High Aid Model

To better understand tuition discounting and its impact on enrollment and net tuition revenue in American higher education, we must first have a general understanding of what

tuition is and its context within the American higher education system. Put simply, tuition is the published price that institutions charge their students for instruction. Often referred to as the sticker price, tuition can often be misleading as it does not account for any discounts in the form of aid to offset the sticker price. As tuition prices have grown over the years, sticker shock, or the dismay felt by consumers when tuition prices are much more expensive than anticipated, looms large over those shopping amongst possible colleges to attend (Henley, 2014). As a result, critics argue the usefulness and longevity of the current practice of continuing to raise tuition prices to levels that might appear to be unaffordable (Baum, Lapovsky, & Ma, 2010; Lapovsky, 2016). Currently, tuition prices in the United States are higher than that of just about any other country (Farooq, 2023; Sandoval, 2022). Annually, students spend about twice as much on college in the U.S. than in the average developed country (Ripley, 2018). Moreover, in numerous other countries, obtaining a college degree is effectively cost-free for a significant number of students (Johnstone & Marcucci, 2010). It needs to be noted that the valuation of higher education and the extent of governmental investment in higher education is frequently contingent upon the idiosyncrasies of specific national cultures. Ultimately, the difference in the cost expected of a student to pay for their higher education in differing countries stems from the philosophical stance that each country has on whether higher education is or should be a public or private good (Gayardon de Fenoyl, 2017). With tuition prices soaring, and the investment from federal and state governments towards higher education remaining mostly stagnant in comparison to the cost of tuition, the argument can be made that higher education in the United States cannot be deemed a public good.

Since the inception of our very first colonial colleges in the United States, tuition has been a necessary means for colleges to provide vitally needed revenue (McAnear, 1955; Thelin,

2019). However, prices for tuition and room and board were modest in comparison to existing levels and were more than likely not enough to cover an institution's total operating expenses (Thelin, 2019). Thelin (2019) noted that, from the very beginning, our American colonial colleges perpetually depended on tuition payments along with donations and other subsidies to survive. Although imperative to the stability of the institution, tuition was not the only means to financially support the university. Many of these institutions' operations would be subsidized by colonial governments, churches, towns, societies, and various individuals (Harmon, 1931). Since the founding of America's earliest colleges, there has been a significant movement in tuition prices. Most of this can more than likely be attributed to the shift in the perception of higher education as a public or private good. At the genesis of American higher education, most of those students who were pursuing a postsecondary education were studying disciplines that were considered to be beneficial to society as a whole (Adam, 2017). You could make the argument that during the earliest years of American higher education, that higher education was considered a public good, with many costs being subsidized by those other than the students themselves.

John D. Rockefeller Jr. once explained that,

there was once a time when it made sense for society not to expect students to pay much for college: most of the students were going into the ministry, or into some other low-paying but society-benefiting career, so it behooved the nation to keep costs low by supplementing funds with endowments and gifts. (Rothman, 2016, para. 3)

However, when most American public higher education institutions were founded through the passing of the first *Morrill Act of 1862*, the landscape of higher education changed drastically. The signing of the *Morrill Act of 1862* led to a proliferation of newly created educational institutions, offering a substantial increase in opportunities for students to pursue post-secondary

education (Thelin, 2019). Furthermore, in 1944, the United States passed legislation that would further advance educational opportunity through the *Serviceman's Readjustment Act of 1944*, otherwise known as the GI Bill. Prior to the introduction of the *Serviceman's Readjustment Act of 1944*, higher education was widely perceived as prohibitively expensive, primarily accessible only to the privileged elite. However, the GI Bill opened tremendous doors for those who otherwise would have more than likely not have pursued postsecondary education. In fact, with the introduction of the GI Bill, roughly 8 million veterans enrolled at some institution of higher education in the United States. In tandem with the passing of the GI Bill, new programs such as the National Defense Student Loan Program and the Higher Education Act of 1965 introduced additional opportunities to higher education for more civilians, women, and those from various minority groups. While these programs were necessary mechanisms to boost educational opportunities for many Americans, the introduction of increased opportunity may have inadvertently contributed to the long-term erosion of the affordability of American higher education. Upon the arrival of these new educational programs, "from 1965 to 1972, colleges and universities dug very deep into their own pockets to provide grants and other forms of student financial aid in alignment with the new federal programs" (Thelin, as cited in Sanchez, 2014, para. 3). With so much federal aid readily available, many Americans assumed that the government would subsidize most of their educational costs. During this period, institutions began providing additional forms of institutional grants, scholarships, and other aid to students in lieu of the aid fostered by the government. However, with institutional aid becoming more readily available for students, in the 1970's, tuition prices began to soar alongside inflation, a faltering United States economy, and declining family income. It was also during this time that there also seemed to be a strong disinvestment of state aid to public institutions and a decrease in federal loan opportunities (Alexander, 2019). All of this coupled together set the tone for the

beginning of the high price/high aid tuition pricing structure that is so prevalent in the American higher education system today. Many scholars have noted that the goal of the high price/high aid strategy is to generate necessary net tuition revenue while also shaping enrollment outcomes (Martin, 2004; Heller, 2006). However, while many argue its effectiveness and each institution's true intent behind this practice, it seems as if the high price/high aid model is here to stay.

The journey from higher education being predominantly a privilege of the elite to the current era of broader accessibility has been marked by significant shifts in societal perceptions, government policies, and shifting economic dynamics. The initial American colleges, characterized by exclusivity and limited educational opportunities, stand in stark contrast to the current landscape where a much more diverse student body is empowered to pursue knowledge. As tuition levels have grown since the inception of American higher education, they have not only reflected but also shaped the aspirations and demographics of the higher education landscape. Understanding this historical trajectory of tuition prices is essential to comprehend the unique interplay between tuition discounting, enrollment, and net tuition revenue.

The Rising Costs Facing Higher Education

As tuition prices continue to rise and face increasing scrutiny, it's important to recognize that these prices are closely linked to the escalating costs of providing higher education. According to Martin (2012), as institutional expenses grow, tuition prices often increase correspondingly to meet these financial demands. As with any good or service, it is reasonable to expect modest increases in the cost of that good or service (Behaunek, 2015), specifically due to inflationary pressures or a scarcity problem. However, tuition price increases have steadily outpaced the rate of inflation, specifically from 1980 to the early 2000's with more recent years growing at a clip closer to the rate of inflation. (Bundick & Pollard, 2019). However, inflation

measured by the Consumer Price Index (CPI) is not necessarily the most effective index to depict the true reality between tuition prices and the cost of delivering higher education. Luckily, the Higher Education Price Index (HEPI), produced by Commonfund, provides an annual index designed to track the movement of prices for things that are most applicable to higher education (Commonfund, n.d.). The HEPI is an effective tool that can be used by higher education budget officers and administrators to help project and plan for their institution’s future finances.

According to the 2022 HEPI data, costs for higher education institutions increased by 5.2 percent in 2022, the highest since a 6.0 rise in 2001 (Commonfund, 2022). Table 1 (below) displays the CPI and HEPI factors as well as their respective percentage increases from 1981 to 2023. As Table 1 below shows, the HEPI depicts that in most years, the price of goods and services most applicable to higher education grow at a steeper pace than that of the CPI. Interestingly, 2022 was the first year in which growth in the HEPI was less than that of the CPI.

Table 1

CPI and HEPI Factors, 1981 – 2023

| Year | CPI Index Value | % Change | HEPI Index Value | % Change |
|------|-----------------|----------|------------------|----------|
| 1981 | 88.2 | 11.6% | 85.8 | 10.7% |
| 1982 | 95.8 | 8.7% | 93.9 | 9.4% |
| 1983 | 100.0 | 4.3% | 100.0 | 6.5% |
| 1984 | 103.7 | 3.7% | 104.8 | 4.8% |
| 1985 | 107.7 | 3.9% | 110.8 | 5.8% |

| | | | | |
|------|-------|------|-------|------|
| 1986 | 110.8 | 2.9% | 116.3 | 5.0% |
| 1987 | 113.3 | 2.2% | 120.9 | 4.0% |
| 1988 | 118.0 | 4.1% | 126.2 | 4.4% |
| 1989 | 123.5 | 4.7% | 132.8 | 5.3% |
| 1990 | 129.4 | 4.8% | 140.8 | 6.0% |
| 1991 | 136.4 | 5.4% | 148.2 | 5.2% |
| 1992 | 140.8 | 3.2% | 153.5 | 3.6% |
| 1993 | 145.2 | 3.1% | 157.9 | 2.9% |
| 1994 | 148.8 | 2.5% | 163.3 | 3.4% |
| 1995 | 153.2 | 3.0% | 168.1 | 2.9% |
| 1996 | 157.4 | 2.7% | 173.0 | 2.9% |
| 1997 | 161.9 | 2.9% | 178.4 | 3.2% |
| 1998 | 164.8 | 1.8% | 184.7 | 3.5% |
| 1999 | 167.6 | 1.7% | 189.1 | 2.4% |
| 2000 | 172.5 | 2.9% | 196.9 | 4.1% |
| 2001 | 178.4 | 3.4% | 208.7 | 6.0% |
| 2002 | 181.6 | 1.8% | 212.7 | 1.9% |
| 2003 | 185.5 | 2.2% | 223.5 | 5.1% |
| 2004 | 189.6 | 2.2% | 231.7 | 3.7% |
| 2005 | 195.3 | 3.0% | 240.8 | 3.9% |
| 2006 | 202.7 | 3.8% | 253.1 | 5.1% |
| 2007 | 208.0 | 2.6% | 260.3 | 2.8% |
| 2008 | 215.7 | 3.7% | 273.2 | 5.0% |

| | | | | |
|------|-------|------|-------|------|
| 2009 | 218.7 | 1.4% | 279.3 | 2.3% |
| 2010 | 220.8 | 1.0% | 281.8 | 0.9% |
| 2011 | 225.3 | 2.0% | 288.4 | 2.3% |
| 2012 | 231.9 | 2.9% | 293.2 | 1.7% |
| 2013 | 235.7 | 1.7% | 297.8 | 1.6% |
| 2014 | 239.4 | 1.6% | 306.7 | 3.0% |
| 2015 | 241.1 | 0.7% | 312.9 | 2.0% |
| 2016 | 242.8 | 0.7% | 317.7 | 1.5% |
| 2017 | 247.2 | 1.8% | 327.4 | 3.0% |
| 2018 | 252.8 | 2.3% | 336.1 | 2.6% |
| 2019 | 258.0 | 2.1% | 346.0 | 3.0% |
| 2020 | 262.2 | 1.6% | 352.7 | 1.9% |
| 2021 | 268.1 | 2.3% | 362.3 | 2.7% |
| 2022 | 287.3 | 7.2% | 381.1 | 5.2% |
| 2023 | 305.3 | 6.3% | 396.2 | 4.0% |

Inflation undeniably plays a pivotal role in driving the surging costs of higher education, and data from the Higher Education Price Index (HEPI) suggests that the operational costs for institutions may surpass the levels depicted by traditional inflation metrics. Although inflation pushes the price of higher education up, other theories and work exist that aim to explain the increase in costs.

Cost disease theory.

The cost disease theory, also known as the Baumol effect, can be traced back to the work of William Baumol and William Bowen (1966) originally focused on the arts. The cost disease theory is based on the notion that technological progress that increases labor productivity is not randomly distributed across all industries (Archibald & Feldman, 2008). The theory seeks to explain the phenomenon behind why the costs of services tend to rise over time, even when productivity improvements occur across the overall economy. The cost disease theory is relevant to higher education because the theory helps to explain why productivity growth in labor intensive sectors, such as higher education, tend to be slower than that of other sectors specifically that are goods producing like the manufacturing sector. The cost disease theory suggests that as wages rise in the overall economy due to productivity gains in other sectors, industries with slower productivity growth like higher education, experience a cost increase. This results in a cost gap between labor-intensive services and more productive sectors. As a result, the prices of services in these industries, like tuition, rise over time to compensate for increasing labor costs, leading to the perception of a *cost disease* of which higher education is certainly not immune. In response to this phenomenon, Archibald and Feldman (2008) posited that higher education institutions could, in theory, increase labor productivity and reduce their labor costs through increasing class sizes and/or relying more heavily on adjunct faculty members to teach courses; however, these moves are often perceived as mechanisms that reduce the quality of instruction and ultimately harm the institution.

The implications of the cost disease theory are significant for higher education as it suggests that institutions may face perpetual cost pressures and that efforts to contain costs in these areas may be challenging due to the nature of the services provided. However, as institutions continue to face increasingly more competition, the reliance on distance education,

larger class sizes, and large pools of adjunct faculty are being utilized to fight against the pressures highlighted in the cost disease theory.

Why does college cost so much?

One of the most notable scholarly works addressing the escalating costs of higher education in the United States was performed by Robert B. Archibald and David H. Feldman in *Why Does College Cost So Much* (2010). Reinforcing the cost-disease theory, in their book, Archibald and Feldman identified three different economic forces which explained the evolution and increase in costs facing higher education institutions. They further state that each of these forces are rooted in technological progress that have occurred in the United States since the end of World War II. As noted in the aforementioned section, the first of these technological challenges that is introduced is the *cost disease* phenomenon. Higher education institutions have difficulty in increasing the productivity of their workforce, which drives costs up over time. Cost savings that are afforded to most industries due to technological advances such as in manufacturing are lagging in most service industries, including higher education, and as a result, the cost of these services must rise as well. The second force in driving costs up in higher education posed by Archibald and Feldman lies in the fact that, in comparison to other industries, higher education utilizes a very highly educated workforce. The wages paid to highly educated employees increase higher education costs in comparison to the wages of employees who are not highly educated in other industries. Finally, it is highlighted by Archibald and Feldman that the skills required to use new technologies compel institutions to engage in training and recruiting new personnel to manage these new technological advancements. This can include, but is not limited to, the introduction of many new student and support services, computing capabilities,

and information technology infrastructure. With the addition of these services, there comes an inflation of costs that is absorbed by each institution (Archibald & Feldman, 2010).

Revenue theory of costs.

The revenue theory of costs, also known as Bowen's law, is a similar theory relative to the cost-disease theory which attempts to explain the trend of increasing tuition prices among American higher education institutions. The theory was formulated by American economist Howard Bowen (1980) as is contra to that of the cost disease theory in the argument that unit cost is not determined by any change in production or technology, but rather by the revenue that can be raised per student unit (Archibald & Feldman, 2008). Bowen's theory posits that institutions seek to maximize their revenues and will spend all the resources they can raise, thus producing the value of unit cost (Behaunek, 2015). Bowen (1980) grounds his theory by characterizing universities in the four statements below:

1. The dominant goals of institutions are educational excellence, prestige, and influence.
2. There is virtually no limit to the amount of money an institution could spend for seemingly fruitful educational ends.
3. Each institution raises all the money it can.
4. Each institution spends all it raises.

Bowen's theory was grounded in the thought that institutions spend all that they raise and, as a result, the intention is that the goal is to always increase their revenues. However, Bowen's first statement slightly contradicted his theory as if the intent is to maximize revenue at whatever cost, institutions could admit every paying student. However, in doing so, there could

be a loss in institutional reputation, prestige, and influence. Regardless, Bowen's theory gave some teeth to the trend of rising tuition prices.

Understanding Enrollment Decline

It is no secret that higher education institutional enrollments have been trending downwards in the United States for some time now. The COVID-19 pandemic certainly exasperated this problem, but the diminishing of enrollments was undeniably occurring prior to the start of the pandemic (Knox, 2023). Enrollment declines in the United States were most significantly steeped after the Great Recession. Interestingly, college enrollments increased during the years 2007 through 2009 in response to what some economists term the counter-cyclical response to an economic downturn (Murphy, 2020). However, following the Great Recession, “between 2009 and 2020, total undergraduate enrollment decreased by 9 percent (from 17.5 million to 15.9 million students)” (National Center for Educational Statistics, 2022, p. 1). Out of all higher education institutional types in America outside of the community college, private, not-for-profit, four-year institutions have been the most susceptible to these inauspicious trends, yet they are also the institution type in which are most reliant on tuition revenues from student enrollments to sustain operations, creating a unique and potentially detrimental scenario (Martin, 2012; Merea, 2010). Crown (2023) presumed that many small private institutional enrollments have been affected the greatest due to the institution's lack of prestige in comparison to the elite institutions, and shortage of resources in contrast to those of many public institutions. Since most private institutions do not receive state appropriations like publics do, any slight decrease in enrollment figures can devastate these institutions' operational ability. This emerging enrollment drift can and has forecasted gloomy futures for many institutions, specifically private higher education institutions. As such, there has been increasingly growing concern for the

closure of many higher education institutions across the United States, with some observers even predicting the closure of as many as half of America's colleges and universities because of enrollment declines (Pavlov & Katsamakos, 2020). Small private institutions with enrollments under 2,000 students are among those most at risk of closure due to limited financial reserves and heightened sensitivity to enrollment declines (Higher Ed Dive, 2023). Unfortunately, since 2000 there have been more than 300 college closures in the United States among the various institutional types (Gardner, 2023). Simultaneously adding institutional pressure along with enrollment declines, another significant burden for our American higher education institutions involves the weaning from emergency federal grants coming out of the pandemic. During the height of the COVID-19 Pandemic, Congress passed three bills of emergency legislation through the Higher Education Emergency Relief Fund (HEERF) I, II, and III. HEERF funds were to be utilized by institutions to distribute emergency aid to students in the form of grants and to use at their discretion to fund institutional priorities during the pandemic. HEERF funds were instrumental in the preservation of higher education during the pandemic; however, most institutions have fully consumed their allocated HEERF funds, creating operating pressures for these institutions now that the federal support has been fully exhausted (Moody, 2023). Although federal support certainly abetted these institutions in weathering the difficulties of the pandemic, it has now put immense pressure on them to promptly operate at pre-pandemic levels (Pierce, 2021). The factors that contribute to the decline in student enrollment at private institutions are numerous; however, there are a few that seem to be most prevalent, such as the rising cost of tuition, demographic changes and the enrollment cliff, and the economic impact of the pandemic on private institutions and their students.

Increase in Tuition Prices

There has been much written on the continuous outpacing of tuition prices compared to inflation and the Consumer Price Index (CPI) in the United States (Archibald & Feldman, 2010; Baum, 2017). For the most part, all segments of higher education have experienced tuition hikes regardless of their size and stature. Specifically, since the 1980's higher education institutions have steadily increased their tuition prices (Cheslock & Riggs, 2023). While there are critics who are vocal about the effects of the increasing price of tuition ("Anger as US tuition", 2015) and immense amounts of outstanding student debt as a result of tuition hikes (Hahn, 2023), institutions are not all to blame for these cost pressures as they have increasingly greater pressures mounting against them to remain in compliance and competitive with their peer institutions (Archibald & Feldman, 2010). For example, there are growing levels of federal and state regulations that universities must abide by such as the Clery Act, new Title IX requirements, the Family Educational Rights and Privacy Act (FERPA), along with many others (Simon, 2017). In alignment with growing regulatory requirements, institutions often must hire staff and create and develop departments to manage the administrative duties assigned with ensuring compliance. The growth in the number of administrative units at higher education institutions is a trend that is becoming well known in higher education and has been termed *administrative bloat*, or the increase in non-instructional staff at a college or university (Simon, 2017). While there is a common complaint among those on the outside looking in at the increasing price of higher education, it is important to acknowledge that a lot of this increase in non-instructional expense trickles down from the federal level. Aside from administrative bloat from a regulatory standpoint, institutions are growing increasingly more competitive amongst their peers to attract the necessary students to remain financially stable. To remain competitive, institutions are competing in what seems to be an arms race to provide the best facilities and services to better attract students. Varga and Lingrell (2018) effectively illustrated that "it has

become a competition between institutions to see who can outdo the other, by providing the better college experience, and building the fanciest residence halls, the grandest university unions, or the most expensive recreation centers” (p. 377). Varga and Lingrell (2018) observed that in order to increase their enrollments, institutions are willing to spend endless amounts of money to increase their applications, prestige, and national rankings. In *Why Does College Cost So Much*, authors Robert B. Archibald and David H. Feldman offered an unordinary yet fascinating perspective as to why higher education costs are so drastically outpacing the rate of inflation. Archibald and Feldman (2010) suggested, where you sit affects what you see and argued that a college president will view the increase in higher education costs much differently than a congressional representative. They determine that the average standard of living is much higher today than it was in the 1960’s, which affects what services amenities, and facilities universities provide, ultimately uplifting costs. They also noted that the distribution of income is quite different in the United States today from what it used to be, so college affordability varies significantly based on consumers income distribution. This change in the standard of living and in income distribution enables the perception of cost variation amongst where different people stand in social stature. Regardless of what the literature says on the increasing cost of higher education, there seems to be a progressive shift in the idea of what is most attractive to students, formerly the dissemination of knowledge, to the current emphasis on the student experience. Between administrative bloat and the arms race to attract students, there is greater expense to the institutions, which effectively demands that institutions increase tuition prices. In turn, with the increase in tuition prices, enrollments very well might suffer. Quite a bit of prior research has been conducted to determine the demand for higher education and price elasticities between increases in tuition pricing and enrollment levels. Most of which indicate a decrease in enrollments along with material increases in tuition prices. (Leslie & Brinkman, 1987; Heller,

1997). With that in mind, institutions must delicately balance the extent to which they increase tuition prices to offset the increased expense to support the very projects that might be needed to provide student services to help the institution remain competitive. Beyond additional student services, perhaps the greatest investment that an institution can make in its students is scholarship support. As tuition prices have grown steadily in the past forty years, so has the use of student institutional scholarships. Institutions have begun more heavily relying on tuition discounting or the practice of awarding institutional dollars to students in the form of grants and scholarships to help reduce the “sticker price” of tuition (Hillman, 2012). More precisely, tuition discounting is a means for institutions to attract students who are either unable to pay the sticker price, unwilling to pay the sticker price, or to strategically attract students with specific characteristics the institution finds attractive (Behaunek & Gansemer-Topf, 2019). Furthermore, tuition discounting has now become a tool for institutions to use to drive enrollment, craft a unique cohort of students, and to achieve specific financial objectives, among other motivators (Breneman 1994; Cheslock 2006). However, the growing use of tuition discounting has driven up the price of tuition at many institutions and often creates barriers for entry to students who do not wish to pay the steep price to enroll or are unaware of the scholarships or grants that are available to offset high tuition prices. In conclusion, the complex interplay between heightened regulatory pressures, administrative bloat among higher education institutions, and the proliferation of the tuition discounting model continue to prompt the rising of tuition prices and put pressure on enrollment growth.

Demographic Change

Along with increasing tuition prices, demographic change also has had substantial influence on the descending enrollment trends. The single most detrimental element that has

played into diminishing enrollments is the incessant decline in birth rates in the United States. Following the Great Recession there has been a notable decrease in birth rates, with many attributing this phenomenon to the economic downturn and its impact on earnings, the housing and labor markets, and various other implications of economic decline (Dettling & Kearney, 2014; Kearney, Levine, & Pardue, 2022; Lindo, 2010). Since the Great Recession, the United States still does not have a birthrate that exceeds pre-recession levels (Kline, 2019). What colleges and universities are facing because of the birthrate decline is a dwindling in the number of college-aged students available to enroll. This phenomenon of having fewer college-aged students because of birth declines has been widely referred to as the looming *enrollment cliff* and should prompt the fears of many institutions of higher education in the United States specifically because the problem is beyond the scope of control of the institutions (Copley & Douthett, 2020). While the presumed enrollment cliff is certainly alarming to all institutional types, smaller private institutions are perhaps the most at risk considering they are generally very dependent on tuition revenue and have smaller endowments to draw from and fewer alumni to appeal to in comparison to public and elite or larger private institutions (Eide, 2018). In contrast to smaller private institutions, elite private institutions typically have deep applicant pools to choose from and strong endowments to offset any decline in applicants, and public institutions typically receive fiscal support from the state (Eide, 2018; Kline, 2019). Furthermore, smaller private institutions that are highly tuition dependent are the most at risk to succumb to closure as the enrollment cliff comes crashing down on American higher education. To further invigorate declining enrollments since the Great Recession, the COVID-19 Pandemic exacerbated the decline. In fact, according to the National Student Clearinghouse Research Center (NSCRC), between 2020 and 2022 colleges and universities lost roughly one million students to the pandemic (Weissman, 2023). Luckily, with a wide variation among sectors and institutions, since

the height of the pandemic institutions are now seeing enrollments trending upwards. While the enrollment cliff and the pandemic certainly led to enrollment difficulties for our American institutions, college and university leaders need to focus on strategies that will help bridge the enrollment gap. International student enrollment might just be one answer to help offset waning domestic student enrollment. Unfortunately, the pandemic placed major stress on international students' ability to study in the United States as the U.S. closed the border to international travelers (Buckner, Zhang, & Blanco, 2022) effectively reducing international student enrollment in the U.S. by 15 percent from 2020 to 2021 (Knox, 2022). However, with the current loosening of travel and visa restrictions (Knox, 2022), interest in applying to U.S. schools is resurging. Understanding the progression of immigration policies in the U.S. since the pandemic, institutions should invest heavily in international recruitment to help offset the exodus in numbers of enrolled domestic students. In addition to the decline in birth rates and the impact of the pandemic on international student enrollment, changing racial demographics in the U.S. will more than likely influence enrollment patterns. Racial population distributions among college-aged students are growing in diversity across the United States, specifically with the percentage of white and black school-aged children decreasing and other racial/ethnic groups increasing (Zalaznick, 2022). The specific composition of college-aged students will certainly be different than that of past cohorts, which could have an adverse effect on college enrollments. For instance, with shifts in population distributions, institutions must adjust their enrollment strategies to accommodate these changes. If institutions do not make a conscious effort to reach populations of students who are of demographics growing in percentage of the total population in the U.S., then they will continue to have enrollment woes. Recently, the ban on affirmative action or using race as a factor in admissions decisions could hinder the college aged students of these growing demographics. Hill (2023) suggested that with the ban on affirmative action, the

rate of applications for black students will increase at historically black colleges and universities (HBCU's), yet it will be important for predominantly white institutions to seek to creative avenues to draw black students to their campus. American institutions could witness an even larger gap in diversity with the ban on making race conscious decision of admission. Before the federal ban on affirmative action, *The Chronicle of Higher Education* conducted an analysis to estimate the potential impact on minority enrollment across the United States. Examining data from 30 selective public institutions in states that already prohibited race-conscious admissions, *The Chronicle* found that “the vast majority of flagship campuses with state bans on race-conscious admissions did not see their underrepresented-minority enrollment increase at the same rate as their state’s underrepresented-minority population of college age” (The Chronicle of Higher Education, 2023, July 7, para. 6). Furthermore, Chen and Wolfe (2023) demonstrated that bans on affirmative action benefited White and Asian students but negatively affected other groups. Despite these findings, it is still too early, following the Supreme Court’s recent ruling, to draw definitive conclusions about the long-term effects on minority enrollment.

However, as U.S. population distributions shift, it will be critical for colleges and universities to adapt their admissions practices to serve and recruit emerging demographic groups. Beyond the impact of the affirmative-action ban on enrollments, the population of college-aged White students is expected to decline in the foreseeable future. Additionally, according to the U.S. Census Bureau, over the next 30 years, the number of children living in poverty is projected to rise, the number of those not living with both parents will increase, and the number living with mothers who have not completed significant education will also grow (Hemez & Washington, 2022). If these patterns continue, a growing proportion of these children

may never reach college. Changing racial demographics, combined with these socioeconomic shifts, could therefore become a major contributor to enrollment declines in higher education.

The Economic Impact of the Pandemic

The COVID-19 pandemic had a profound impact on all sectors of the United States, and higher education was no exception. The challenges posed by the pandemic exacerbated an already difficult climate for institutions, which were struggling to remain financially stable while heavily competing with one another. As institutional enrollments plummeted, the federal government intervened by providing financial support to both colleges and students through institutional support and increased student aid that was passed on to students through the institutions (Pierce, 2021). This assistance was critical during such a tumultuous period, yet institutions have exhausted those allotted funds (The United States Government, 2023). Colleges and universities are therefore expected to operate at pre-pandemic levels without continuous federal support, despite continued enrollment and financial pressures. Although enrollments have partially rebounded since the pandemic's onset, trends from the National Student Clearinghouse Research Center (2024) indicate that overall college enrollment remains below pre-pandemic levels. Private institutions, in particular, face heightened financial pressures due to their reliance on tuition revenue and the challenges of declining enrollment (NACUBO, 2024).

Moreover, the pandemic created significant financial hardships for students and their families, further compounding a pre-existing debt crisis. Even before COVID-19, substantial debt burdens were common among those taking out both federal and private loans, with total student debt in the United States standing at approximately \$1.75 trillion (Hahn, 2023). As the country continues to emerge from the pandemic, soaring inflation has further pushed borrowing costs upward (Federal Reserve Board, 2022). When combined with rising tuition, these higher

borrowing costs deter many prospective students from pursuing higher education, contributing to the ongoing cyclical enrollment decline. In this post-pandemic environment, institutions, especially smaller private colleges, must adapt their financial models and recruitment strategies to remain viable, as the temporary relief once provided by the federal government has largely been depleted.

Short and Long-Term Effects of Enrollment Decline

The short and long-term consequences of enrollment decline at private institutions are many, with the most devastating being eventual closure. A few of the common short-term consequences that are associated with enrollment declines include, but are not limited to: budget cuts, reduced faculty and staff, academic program cuts, increased reliance on adjunct faculty, lesser admissions standards, and the diminishing of certain student services (Leachman, Mitchell & Saenz, 2019). Most often, an enrollment deficit will equate to budget cuts for specific areas within an institution. Understandably, as revenues are diminished, institutions must adjust their expenses against their newly anticipated revenues. However, budget cuts can look very different on an institution-to-institution basis depending on the priorities of the institution. Typically, institutions will cut where the greatest net effect on the bottom line will be, and often this equates to payroll cuts. During the pandemic, many institutions engaged in hiring freezes, encouraged early retirement, and furloughed and/or laid off employees to account for budget deficits (Hubler, 2020). Along with reductions in the workforce, institutions are also leaning more heavily on adjunct faculty and employing fewer full-time faculty (Jaschik, 2017). The increase in reliance on adjunct faculty has received tremendous criticism; however, institutions are able to increase cost efficiency through the employment of adjunct faculty to help keep costs down (Jaschik, 2017). However, the ramifications for institutions disinvesting in full-time faculty

means fewer faculty to advise, tutor, and support students on campus. It can also equate to less faculty engagement in the campus community, which can significantly alter the campus environment (Pros, 2021). One of the swiftest ways for a college or university to alter its campus community is by lowering admissions standards. During periods of financial strain, often influenced by fluctuating enrollment and declining net tuition revenue, institutions may feel pressured to implement strategies aimed at increasing enrollment and revenue, such as enhancing recruitment efforts and adjusting financial aid offerings (NACUBO, 2022). This strategy really goes together with tuition discounting, where colleges offer higher institutional aid or scholarships to attract applicants, attempting to boost enrollment (Lapovsky, 2020). While these approaches can temporarily increase overall headcount, research has suggested that excessive discounting can diminish NTR, especially if the enrolled students require significantly more institutional aid (NACUBO, 2024). Admitting students who are less academically prepared can present challenges for institutions, as these students may require additional academic support to succeed, potentially impacting retention and graduation rates over time (Winter, 2021).

Furthermore, as operating costs continue to rise and reliance on tuition revenue grows, many institutions face financial pressures that may lead to difficult budgetary decisions, potentially impacting areas such as student support services. These cutbacks may include academic advising, tutoring centers, or mental health services, areas that have become increasingly important for student success and retention. In the long term, these types of actions can become counterproductive. While lowering admissions standards and aggressively discounting tuition may yield short-term enrollment spikes, this may risk undermining the academic quality, reputation, and financial stability of an institution. This is one of the many reasons why striking an optimal balance between accessible admissions policies, prudent

discounting, and sustainable net tuition revenue remains a central challenge in contemporary enrollment management.

Considering all of this, the interplay between increased tuition costs, the enrollment cliff phenomenon and changing demographics, and the economic turmoil that has been exacerbated by the global pandemic has all significantly impacted student enrollment rates at institutions in the United States. All these factors accentuate the importance of addressing the challenges faced by students and their families in having access to affordable higher education, as well as institutions in having the discernment to determine the most fitting formula to attract and enroll students yet remain financially stable enough to continue to keep their doors open. Unfortunately, if higher education as a whole continues on the trend of increasing tuition prices, the consequences could be dire for the institutions themselves and for our students.

The Effects of Current Tuition Prices

The effects of the current tuition pricing model place considerable stress on students, as the average student loan debt at graduation has risen substantially over the past decades. According to Melanie Hanson (2024), the average student loan debt at graduation is approximately \$37,850. Before adjusting for inflation, this represents a 108% increase since 2007; after adjusting for inflation, the average debt increased by 39%. In previous decades, state allocations to public institutions comprised nearly three quarters of their total revenues, but that figure has since dropped to around half, shifting more of the burden onto students and their families. Meanwhile, tuition prices have continued to climb, but wages have not kept pace. Because only a small fraction of families can cover the gap between rising tuition and declining financial support, many are forced to rely on private loans or other means to pay their tuition. In contrast to the GI Bill, where education costs were largely covered, government support today

does not cover the full cost of attending college. Significantly, much of this assistance comes in the form of loans rather than grants, which further supports the evidence that students are taking on substantial debt to pursue higher education (Dwyer, McCloud, & Hodson, 2012, p. 2).

According to studies by the National Education Association (2020) and Velez et al. (2018), students who accumulate significant debt during college are more likely to experience financial stress that influences their employment choices, leading them to work additional hours, accept jobs outside their degree fields, or prioritize higher immediate wages over long-term career satisfaction. Students from less privileged families must borrow more often, and in greater amounts, than those from wealthier backgrounds, ultimately widening the gap in educational attainment. Additionally, the debt that is accumulated by earning a degree is taking longer and longer to pay off once graduates enter the workforce. As a result of continuous increases in tuition prices and decreased state and federal aid, college access is starting to resemble the pre-World War II era, when higher education was largely a privilege of the wealthy. Those from less advantaged backgrounds can still pursue a college education, but often only through taking on substantial debt.

Tuition Discounting and Its Purpose

As stated throughout, tuition discounting can simply be defined as gross tuition and fee revenue less all institutional aid. Tuition discounting has been a widely used practice among higher education institutions that began in the 1970's to utilize institutional funds to add to federal, state, and private aid that was becoming available to students (Duggan & Mathews, 2005). Both private and public institutions employ the tuition discounting model, initially used as a method to attract various students who normally would not have access to higher education. Currently, tuition discounting serves as much more than just a means of attracting a more diverse

group of students to an institution. Institutions now utilize tuition discounting to maximize their desired enrollment and composition of their student body and increase net tuition revenue. However, the concept of tuition discounting can be perceived differently by various groups of people depending on their respective seat within or outside of higher education. Some people may not be aware of what tuition discounting even is, while others are keen on the subject and understand the model in which it operates within. Depending on the institution, tuition discounting can be perceived as a means of educational opportunity or the opposite, as a lack of access. For example, Martin (2004) determined that most institutions discount students who hail from a family with higher income more than students who come from families with less resources, further increasing the gap in access and equity. This is dependent on the specific institution, as most institutions use tuition discounting to attract a diverse student body; however, institutions attempt to attract students from families who can afford to pursue multiple years of the typical educational journey. Jalal and Khaksari (2019) made an interesting point that, while sticker tuition and fee prices of universities tend to go up each year, total revenues for these universities are barely budging due in large part to the significant discounts the universities offer to attract students. Institutions are finding it harder and harder to keep up with the high price/high aid model of higher education. It is also important to understand what the total institutional discount rate of an institution is. This can be determined by dividing the sum of all institutional aid, unfunded and funded, by the total tuition revenue generated for a specific fiscal year (Baum & Lakovsky, 2006). Although state funding for higher education has continued to decrease, specifically since the Great Recession, public institutions do receive some state aid and are able to offset some loss in tuition revenue through these appropriations. Private institutions on the other hand do not typically receive any state funding and are at the mercy of tuition paying students to balance the budget each year. As a result, private institutions are much more

tuition and fee dependent and typically are more reliant on high tuition prices and utilizing discounting to maintain enrollment and revenue streams. As tuition prices have gone up over the years, discounts for students have gone up almost simultaneously with it. A real issue within the practice is that, as prices grow steeper, more and more students who may be naïve to scholarships, grants, or other aid that are available might be turned off to higher education as it is perceived to be completely unaffordable. It is helpful to know that there are different ways an institution can discount a student's tuition costs. Unfunded institutional aid is essentially the amount of revenue that is forgone from the tuition sticker price of an institution. Unfunded aid is an expense to the general funds of an institution. On the other hand, there is funded aid which exists as revenue from gifts or endowment income that can be used to provide scholarships to students. Allan (1999) suggested that for every dollar of funded aid raised by an institution, the amount of unfunded aid could be reduced by one dollar. However, this may not universally apply, as institutions vary in how they utilize funded scholarships. Since many funded scholarships have restrictions tied to their usage, they cannot be viewed as a supplement to unfunded scholarships. Institutions with large endowments typically have more endowed funds that are available to use for general scholarships, while smaller institutions with much smaller endowments, do not have the capacity to supplement many scholarships they are offering as a discount to students through funded scholarships. There is also evidence that shows that the elite and prestigious institutions within the United States do not discount their tuition sticker price nearly at the rate of those institutions which might be smaller of stature, as the allure of attending these institutions alone draws them to these institutions more than any amount of scholarship could. A particularly insightful observation on college pricing comes from Schifrin (2013), who noted that "college pricing is perversely inefficient—blue chips and penny stocks tend to be priced in the same narrow range," and that aside from a few elite institutions, "listed tuition rates

rarely represent actual fair values or real transaction prices” (para. 5). Whether used for enrollment management, to craft a specific class of students, to increase net tuition revenue, or create access to students, tuition discounting seems as if it around to stay.

Types of Institutional Aid

Aforementioned, tuition discounting has grown more in significance, specifically since the 1980s’s, as institutions increasingly attempt to drive enrollment, craft a unique cohort of students that fit the mold of their institution and achieve desired financial objectives. Tuition discounting is prevalent at institutions of all types; however, it is most pervasive and necessary among small, private liberal arts institutions. Small, private, liberal arts institutions are typically very reliant on tuition dollars to supply needed revenues to cover continually inflating operating expenses. Most private institutions do not receive state funding like those of publics which receive welcomed appropriations to help manage revenues. Private institutions only have a few sources of revenue streams through tuition and fees, room and board revenue, and that of fundraising efforts. However, not all privates are the same. Elite private institutions find themselves reading from a much different script, as although enrollments across the United States are diminishing, these institutions are expected to increase demand for students (Kline, 2019). Interestingly, in contrast to the greater higher education landscape, “elite colleges are less affected by the birth dearth because they’re a small, niche market of fewer than 200,000 students” (Kline, 2019, para. 5). Prestige certainly plays a role in admissions rates and enrollment figures, and the institutions that have perceived prestige will come out ahead when fighting the enrollment cliff. With all of this in mind, small, private, liberal arts institutions are those which rely most heavily on tuition discounting to create desired net tuition revenue as this is most often their largest revenue source (Breneman, 1994). Different institutions obviously

have different approaches and frameworks in how they implore tuition discounting strategies. As mentioned earlier, there are three main elements that play into tuition discounting practices: crafting a specific student type or cohort of students, setting desired enrollment figures, and achieving specific financial goals. Each of these three elements are mutually inclusive of one another and work in tandem together. It is important that institutions do their best to manage all three of these elements to best capture their desired outcomes. Breneman (1994) developed an economic theory on tuition discounting practices at four-year baccalaureate institutions in his book *Liberal Arts Colleges: Thriving, Surviving, or Endangered* that effectively affirmed how these institutions set tuition discounting approaches. Breneman (1994) posits that there are essentially two stages in which optimally, institutions formulate their desired discounting methodology. Breneman presumes that the first stage of the process is “setting the desired enrollment, as well as creating the inputs (e.g., faculty, staff, facilities,) needed to serve that enrollment at a financially sustainable quality” (Breneman, 1994, p. 37). The second stage involves focusing on the quality of the students, faculty, staff, and facilities acknowledging certain confinements due to budgetary constraints (Behaunek & Gansemer-Topf, 2019). Breneman (1994) specifically highlights the importance of tuition discounting in the second stage as revenues from enrollment is often the most significant source of revenue for these institutions. While I think that Breneman’s framework on tuition discounting practices clarifies key coveted outcomes for institutions, i.e., desired enrollment rates, high achieving students, accomplished faculty, exceptional facilities, financial stability etc., it fails to address the fluidity of each of these singular elements in the holistic process of enrollment management. Setting desired tuition discount practices is extremely difficult, and I would argue that most small, private, liberal arts institutions have little mastery over the delicate balance of achieving specific enrollments with high quality students and recognizing financial success. The truth of the matter

is that all the elements that play into successful tuition discounting practices and effectively lead to adequate enrollment and financial management are always at play simultaneously. For instance, the process of awarding financial aid to students is dynamic as institutions package aid to a multitude of could-be students of various backgrounds. Their aid packages differ and depending on whether each student enrolls or not will affect the balancing of the financial aid budget for the institution. As you can imagine, the constant attempt to balance enrollment growth with budgetary constraints can be tedious. All of this is noted to say that the balance between enrolling a cohort of students in which total financial aid expense matches the institutional financial aid budget is extremely difficult and is a continuous and fluid process through the entire enrollment season. Playing into this, projecting enrollment and, in turn, total tuition and fees revenues can be difficult as well. As enrollment cycles near closer and closer to the end of the enrollment periods, institutions will have a better understanding of what revenues will look like. This is difficult from a budgeting standpoint because it is relatively unknown what enrollment figures and revenues will look like until way after institutional budgets are created. Institutions should amply market academic programs to students all year round, but specifically during the peak of fall and spring enrollment cycles in attempt to capture student enrollment. When creating a university budget, tuition revenues are often projected using prior year enrollment figures, new approved tuition rates, and global and local enrollment trends. Since institutional fiscal years often end and begin in the summer months, it is difficult to project tuition revenues with the fall enrollment cycle being so distant from budget creation. With that said, institutions certainly have an enrollment figure they are trying to reach each year. Most institutions are seeking growth in enrollment each year, which can trigger an increase in unfunded aid awarded to students, There are also institutions that try to remain a consistent enrollment as they feel the need to keep the student body of relatively similar stature year over year. No matter the institution's enrollment

goals, each institution will have a unique plan to attempt to achieve a specific enrollment size and balance their institutional aid budget. Institutional tuition discounting strategies are further complicated when trying to discern which types of financial aid institutions decide to award to their students. There are various types of financial aid available to students at small, private, liberal arts institutions, each playing a specific role depending on the institution's desires. Financial aid appears in various forms, but for the purposes of this study on tuition discounting, the focus will be on institutional aid and nothing that students receive or could receive external of the institutions themselves. This is to maintain consistency with most of the literature written on tuition discounting which typically follow the NACUBO definition as the total institutional grant aid awarded to undergraduates as a percentage of the gross tuition and fee revenue that institutions would collect if the students paid the full tuition and fee sticker price. The largest distinction in types of institutional aid is that of funded and unfunded aid. The literature on tuition discounting will often reference funded and unfunded aid; however, often there is a failure to distinguish the difference between the two. The difference between funded and unfunded aid is critical to understanding the tuition discounting phenomenon and the perceived financial stability of colleges and universities. Simply stated, funded institutional discounts are usually linked to gifts or endowment income restricted to financial aid (Martin, 2012). In other words, funded aid is real tangible money which can be used to help students better afford the pursuit of their education. For instance, many donors will establish restricted funds or endowments at institutions in which they give money to the institutions to be given away as scholarships. This would be an example of a funded scholarship. Unfunded scholarships on the other hand do not come from tangible funds, but rather simply represent foregone tuition revenue. Unfunded scholarships are utilized as a method by which institutions forego tuition revenue in order to incentivize enrollment and capture students who, if not awarded a

scholarship, might not enroll in college at all. Breneman (1994) attested that unfunded aid comes from an institution's general funds, or operating budget, and not from a specified endowment fund or gift like that of funded aid. The notion behind having unfunded aid is that, through increased enrollments with increased aid, institutions can capture enough tuition and fee revenue to justify the additional unfunded aid expense. Matthews (2022) put it best that "unfunded institutional grants and scholarships act more like a price reduction, while scholarships and grants funded by endowment income are real money directed to student accounts and act as revenue to the operating budget (para. 7)." While understanding the difference between funded and unfunded institutional aid is important, it is even more important to understand that discount rates are not always an effective metric to compare institutions financial health. Since different institutions charge different tuition rates, attempting to simply compare discount rates for an accurate depiction of financial health is not always helpful. Net tuition revenue, or total tuition and fee revenue less institutional aid, is the metric that should be utilized to distinguish financially stable institutions. With a specific focus on small, private, liberal arts institutions, analyzing net tuition revenue is important because tuition and fee revenue typically supply most of all revenue for these institutions. However, one of the gaps in the literature, and specifically on the tuition discounting study that is supplied annually by NACUBO, is that the literature does not segregate how much of an institution's awarded institutional aid is from that of funded and unfunded sources (Matthews, 2022). Delineating between funded and unfunded sources of institutional aid paints a very clear picture of the financial health of an institution because those institutions that have large endowments that supply funded scholarships in perpetuity offset the amount of foregone revenue the institutions supply through unfunded aid. For example, if College A and College B have the same sticker price of \$50,000 and identical discount rates of 50% it might seem as if both have the same net tuition revenue. However, if College As

percentage of total institutional aid comes from 90% unfunded sources and College Bs from 75%, college B has the significant advantage as a larger portion of discount is funded by endowment income. However, elite private institutions, specifically the Ivy League schools, are typically the institutions with the most significant endowments. Many of the small, private, liberal arts institutions have small endowments and are unable to leverage much of their endowments for significant portions of their overall institutional financial aid expense. As a result, this places tremendous pressure on these institutions to utilize unfunded sources for most, if not all, of their institutional aid. Further exacerbating the problem is that as tuition prices continue to rise, institutions are having to either increase their total institutional aid awarded along with tuition hikes or realize a decline in enrollments as affordability becomes an issue for students.

Further breaking down the different types of institutional aid, the two most common types of aid are need-based and merit-based aid. Need-based aid is just as it sounds, aid that is supplied to students who show a financial need of some sort. Merit-based aid, on the other hand, is aid that is awarded to students who illustrate some type of achievement, whether through academics, athletics, or some other form of talent or criteria they excel at. In making the connection between funded versus unfunded scholarship and need-based versus merit-based aid, the delineation between funded and unfunded aid is simply by how the aid was *funded*, whereas need-based versus merit-based determines how the funds were *spent*. In other words, the terms funded and unfunded determine the source of where the aid comes from, whereas the terms merit and need-based determine how the aid was awarded to students. Need-based and merit-based aid can come from either funded or unfunded sources. When studying the financial health of an institution it is going to be much more appropriate to focus on the percentages of funded versus

unfunded aid that institutions spend on institutional aid. However, when analyzing the enrollment strategies and priorities on an institution, focusing on the percentages of need-based vs. merit-based aid is going to be most insightful. For instance, institutions that supply large percentages of their institutional aid through need-based aid might shed light on the fact that that specific institution prioritizes reaching students who have greater financial need. When it comes to award strategies and how institutions structure their financial aid award packages, there is no one-size fits all approach. Each institution has their own unique and specific strategy of awarding aid to try and attract a specific cohort of students to their institution. Specifically focusing on small, private, liberal arts institutions, I would imagine that since these institutions typically have steeper tuition prices, they really need to balance their merit and need-based aid to attract students. Along with the hike in tuition prices since the 1980's, private institutions have increasingly awarded more merit-based aid as opposed to aid based on need (Cheslock & Riggs, 2023). Prior to this trend, need-based aid was the primary component of financial aid programs amongst these institutions (Griffith, 2011). There are certainly advantages to increasing merit-based aid pools, such as attracting specific students that fit the mission of the institution, finding discipline specific students, attracting talented athletes, and of course growing institutional enrollments. However, there is growing concern related to the continued increase in merit-based aid, most pertaining to access to higher education. The primary disadvantage of merit-based programs is that this type of aid typically goes to those who would have attended the institution without any additional aid (Doyle, 2010). This is an issue, specifically in consequence of college becoming more and more unaffordable, and with additional merit-based aid there is an equal decrease in available need-based aid. Brown (2007) confirmed this in stating that merit-based awards diminish the pool of money required to fund need-based aid. Perhaps the most ludicrous form of merit-based aid, "vanity scholarships" often are most common at small, private, liberal

arts institutions. Vanity scholarships, as Brown (2007) noted, “are those nominal awards students receive, in some cases, simply for being admitted to a college” (p. 41). Although there are drawbacks to increasing percentages of merit-based aid, the shift away from need-based aid is likely here to stay. It should come as no surprise that prestige plays a significant role in American higher education and looms large in the minds of students making their way into the college ranks. Scholarships are typically associated with prestige and often students will choose to attend an institution based on, not necessarily how affordable the institution is, but rather how much scholarship they receive. For example, if a college seeking student was being courted by two institutions, College A with a tuition price of \$50,000 annually, and College B with a tuition price of \$40,000 annually, and the student received \$25,000 in scholarship from College A, and \$20,000 from college B (both 50 percent discount rates), often the student will choose the more lucrative scholarship offer (College A) even if the cost of attendance is actually higher (\$5,000).

Denominational Groups and Religious Institutions

One of the less broadcasted pieces of institutional revenue sources for many small, private, liberal arts institutions are yielded in the form of appropriations from external religious entities. Although there is very little literature on the relationship between denominational bodies and their religiously affiliated institutions, it is a relationship that looms large specifically in private higher education. Many religious affiliated institutions, specifically Baptist, Lutheran, and Methodist, often have ties to a specific denomination and a convention for that denomination. Also called denominational funding, many religiously affiliated small, private, liberal arts universities in the United States receive funding from their denominational bodies. Typically, denominational funding is derived from the state convention in which the institutions reside. The genesis of this type of partnership started with various denominational groups either

founding institutions or creating cooperations with various institutions in their respective states to construct a unique partnership that benefitted both the denominational body and the institution. As part of these cooperations, the denominational body would typically have either full or partial control of the institution's governance. As a result of full or partial control of the institution's governance, the denominational body would often send appropriations to support the operations of these institutions, resulting in a mutually beneficial partnership between the two entities. Unfortunately, in more recent years, many of these denominational bodies have faced declining income sources, thus shrinking the pool of resources available to be dispersed to their respective institutions. In turn, there has grown controversy over the denominational body having control over the governance of the institutions if their annual appropriations continue to shrink as a percentage of the institution's total operating revenue. Interestingly, "in many cases today, denominational groups that control electing university trustees provide 1% or less of a university's revenue" (Wingfield, 2020, para. 3). Unfortunately, what used to be a unique and favorable partnership is frequently becoming a tension point between denominational bodies and the institutions within their realm. When many of these partnerships were first established, there was a dependence on the institutions part on the appropriations derived from the denominational body, in fact, many times the denominational body would bail the institutions out of financial woes (Wingfield, 2020). However, as denominational revenues have diminished, institutions rely less and less on appropriations from their convention. With respect to the continued rising of tuition prices, many people don't realize that there are various streams of institutional revenue that might have once been prevalent to an institution that are now either nonexistent or are quickly depleting. The relationship between denominational bodies and religious institutions provides tremendous insight into the enrollment cliff and the rising cost of private higher education. Due to decreasing appropriations sent to institutions, students are less likely to be able

to afford the higher sticker price that is demanded of them by the institution. Unfortunately, there is little available to determine the lengths of collaboration and communication between denominational groups and their respective institutions pertaining to funding for each year. While there is little written on the communication between denominational groups and institutions pertaining to funding, most conventions operate similarly and have elected personnel who work together to approve annual budgets which contain the figure of appropriations for each institution. These members are typically all connected to the convention, often through church membership, and serve voluntarily as elected officials. The operating budgets for these denominational groups are usually prepared by the staff of the organization, reviewed by some sort of executive board, and then voted on and approved by the organization. Institutions will receive notice of the specific amount in appropriations from the convention in various ways, either by e-mail correspondence, via an annual meeting, by a written report, or some other form of communication. However, depending on the duration of the institution's fiscal year and when internal budgets are prepared, the communication from a denominational group might not be timely enough to be useful for accurate budgeting processes. Regardless of the type and effectiveness of communication between denominational groups and their institutions, reliance on these types of revenue streams from an institutional perspective is basically foregone. Just like that of higher education institutions, denominational groups were not immune to the effects of the devastating pandemic. Since appropriations to higher education institutions from these groups depends on giving from members to the group, the difficult economic realities of the pandemic placed significant stress on these denominational groups operating budgets. The trickle-down effect of the pandemic on higher education institutions more than likely meant that appropriations were further reduced. If appropriations resume on this pattern of reduction, I believe there will be increasingly more conversations pertaining to control by these

denominational groups over the governance of the institutions in their scope. What once was a seemingly quid pro quo exchange of benefits for the betterment of both parties, the relationship between many denominational groups and the institutions they serve seems to have shifted to highly favor that of the denominational groups with governing control. Denomination groups are just one example of the many external funding agencies in which institutions have historically relied upon that may find difficulty in supporting external institutions in the future.

Endowments

As funding for institutions from denominational groups declines, institutions must leverage alternate mechanisms to bridge the gap in any shortfalls in revenue. Of course, increased tuition prices have become the most common method, but institutions need to try to find alternative methods to make up for this deficit outside of merely increasing tuition. One of the most salient ways in which institutions can reduce a shortfall of revenues is through growing their endowments. In fact, endowments can be used to directly offset any operating expenses for an institution, depending on the restriction. “Endowments are the result of private gifts to universities whose proceeds donors can direct for specific uses. In the USA, the three largest uses are student aid 43%, faculty compensation 15%, and research 6%” (Meyer & Zhou, 2017, p. 836). An institution’s endowment size plays a significant role in determining how an institution operates. For instance, those with significant endowments for student aid have a unique advantage over those that don’t which allow those with large endowments to offer more significant financial aid packages to attract students. Endowments are directly correlated to institutional funded and unfunded aid. Funded aid, as noted earlier, comes from that of endowments, or is funding that is tangible and was at some point given to the institution. The institutions that have significant endowments can use funded dollars to award financial aid as

opposed to institutions who will have to more often “forego” tuition revenue through offering unfunded aid to attract students. It is not out of the norm for elite private institutions to have endowments valued in the billions of dollars. In fact, Harvard’s endowment was valued at over 50 billion dollars in fiscal year 2022. Depending on how endowments are invested, the market returns alone can conservatively earn five percent in earnings each year, not to mention any additions made to the endowment. However, the gap between elite private institutions endowment values and that of small private institutions can be significant. In fact, fewer than the top one percentile of institutions hold 54.5 percent of the combined wealth in American higher education (Meyer & Zhou, 2017). Acknowledging the significance of endowments in ensuring long-term financial success, the small, private institutions that invest heavily in their fundraising efforts to grow their endowments will have the greatest chance at survival as the enrollment cliff places tremendous pressure on these institutions operating budgets. In general, institutions are going to have to lean on fundraising efforts to manage their operating budgets, even outside of endowments. Many institutions are currently having to fundraise a specific portion of their annual budgets just to end the year in the black. Specifically, as tuition prices are being driven up, institutions are feeling a heightened need to provide more financial aid, and many are turning to alumni and donors for help (Supiano, 2008). In short, whether through creating endowment funds in which the interest earned in perpetuity offsets operating expense, or through specific pools of donor dollars being used to fund annual operations, institutions are going to have to get creative in finding avenues to overcome revenue shortfalls.

Tuition Discounting and Its Impact on Net Tuition Revenue

Tuition discounting, commonly defined as the practice of providing institutional aid in the form of grants or scholarships to lower the actual price that students pay, has become a prominent

enrollment strategy in higher education (National Association of College and University Business Officers [NACUBO], 2022). Although widely adopted, many scholars argue that this model is not sustainable considering the shifting student demographics, growing institutional expenses, and heightened competition for a smaller pool of college-bound students (Grawe, 2018; Redd, 2000). Breneman et al. (2001) suggested two decades ago that many institutions had begun using discounting more strategically, coupling rising tuition prices and financial aid awards with sufficient enrollment growth to generate higher net tuition revenue. However, more recent evidence, particularly from the annual NACUBO Tuition Discounting Studies, shows that higher discount rates do not typically guarantee overall tuition revenue increases, in fact, in many cases, they have contributed to unstable operating budgets and constrained resources (NACUBO, 2022). Scholars such as McPherson and Schapiro (1998) and Ehrenberg (2000) have underscored these concerns, arguing that when institutions engage in what has been called a *tuition discounting arms race*, the outcome can be a net loss if too many institutions pursue similar tactics in a contracting market for students.

As American higher education has evolved, institutional budgets have expanded significantly to account for needs in academic advising, counseling, career development, and wellness programs, among many other student services. These services reflect broader conceptions of student success and require additional staffing and infrastructure, raising overall operating costs (Desrochers & Hurlburt, 2016). Meanwhile, rising expectations for amenities, spacious residence halls, modern fitness centers, varied dining options, also drive up expenses. Many universities allocate considerable resources to athletic programs, sometimes exceeding \$100 million annually, exerting further pressure on institutional budgets (Knight-Newhouse College Athletics Database, n.d.). In response, institutions often rely more heavily on tuition

revenue, a practice complicated by growing public concern about high tuition prices and the related issue of student debt (Baum & Ma, 2016). Although a high sticker price paired with extensive discounting might initially appear to address these cost pressures, Hemelt and Marcotte (2011) showed that such strategies can deter price-sensitive student populations, resulting in enrollment shortfalls that reduce net tuition revenue. This creates a unique financial paradox where institutions must discount tuition prices more aggressively to maintain their enrollment levels, potentially decreasing their overall tuition revenue.

Demographic shifts further compound these challenges. In many regions, the number of traditional-aged college students is declining, a phenomenon often referred to as the “demographic cliff” (Grawe, 2018). Beyond shrinking high school graduating classes, the COVID-19 pandemic disrupted K–12 education and led numerous families to question the value or timing of a college education (Schaeffer Center, 2020). Such factors contributed to consecutive enrollment declines at hundreds of institutions (National Student Clearinghouse Research Center, 2022). Between 2019 - 2020 and 2020 - 2021, first-time undergraduate enrollments fell by an average of 5.1%, while total undergraduate enrollments decreased by 2.7% (National Student Clearinghouse Research Center, 2022). Although the pandemic played a role, these trends also reflect more enduring demographic and economic forces. In this environment, simply increasing tuition discounts to lure students away from competing institutions may not be sufficient to offset the drop in applicants, ultimately casting doubt on the effectiveness of discounting as a sustainable revenue-generation strategy (Redd, 2000).

In addition to large-scale national studies on tuition discounting, several doctoral dissertations have examined tuition discounting. Johnson (2015), for instance, investigated a cohort of small liberal arts colleges in the Northeast and found that tuition discount rates

consistently above 50% were associated with diminishing returns in net tuition revenue. While these colleges saw modest enrollment upticks when initially offering deeper discounts, the strategy ultimately reduced per-student revenue and created budget imbalances as institutions struggled to maintain comparable levels of student services. Similarly, Seltzer (2017) reported that while aggressive tuition discounting can increase short-term enrollment, it often leads to declines in net tuition revenue, requiring institutions to either limit program expansion or turn to external fundraising to address operational shortfalls. These findings mirror broader concerns that discounting must be carefully evaluated to avoid long-term financial instability.

NACUBO's annual surveys provide insight into how discounting practices have evolved across the nation. Its 2020 Tuition Discounting Study, encompassing 361 private, nonprofit colleges and universities, showed that the average tuition discount rate for first-time undergraduates rose from around 44.3% in 2011 - 2012 to 51.2% in 2019 - 2020 (NACUBO, 2021). Over the same span of time, the average discount rate for all undergraduates increased from 38.6% to 45.9%, implying that many students now effectively pay only about half of the published price. The proportion of first-time undergraduates receiving institutional grants or scholarships climbed from 86.7% in 2011 - 2012 to 89.7% in 2020 - 2021, while the share of all undergraduates on institutional aid rose from 76.2% to 82.8% (NACUBO, 2021). Institutions often prioritize more generous aid packages for incoming first-year students, expecting them to stay enrolled for multiple years and contribute additional revenue through housing, dining, and other fees (Desrochers & Hurlburt, 2016). Nevertheless, NACUBO (2021) reported a 6.2% inflation-adjusted decline in net tuition revenue per undergraduate across 351 institutions between 2016 - 2017 and 2020 - 2021, which included a 2.5% decline from 2019 - 2020 to 2020

- 2021. These patterns reinforce Redd's (2000) earlier conclusions that significant aid increases relative to tuition price does not reliably expand enrollment or bolster net tuition revenue.

The mechanics behind how institutions fund these discounts further complicate matters. NACUBO (2021) reported that approximately 71.7% of undergraduate institutional aid expenditures in 2019–2020 came from undedicated revenue sources, often referred to as unfunded aid or “forgone tuition dollars.” Because these funds depend on enrollment targets being met, an institution risks a shortfall if student numbers fail to materialize (Davis & Redd, 2013). Some colleges or universities draw on restricted or unrestricted endowment earnings and philanthropic contributions to cover scholarship costs, providing a more stable and effective funding option. However, significant variation in endowment sizes and donor support means that wealthier institutions can better absorb the cost of high discount rates, while less-resourced colleges face greater financial distraught in a discounting arms race (Davis & Redd, 2013; Ehrenberg, 2000). Complicating comparisons across campuses, NACUBO discount rates typically exclude tuition remission and inter-institutional tuition exchange programs, which can also reduce an institution's realized revenue (Baum & Ma, 2016).

Heightened skepticism about the high-price/high-aid model follows naturally from these concerns. Continuously raising the posted sticker price while simultaneously offering ever growing institutional aid can become uncontrollable if it does not produce growth in net tuition revenue. Some institutions have responded by resetting tuition to lower levels and tapering their discounts, hoping to simplify costs for students and eliminate “sticker shock” (Baum & Ma, 2016). Others have instituted tuition freezes to signal cost containment, though these measures may require significant internal budget cuts or external fundraising to compensate for any lost revenue should the institution not reach needed enrollment goals. Even at schools that embark

upon these reforms, meeting or exceeding net tuition revenue goals can be challenging, especially when demographic and economic factors limit enrollment growth (Desrochers & Hurlburt, 2016). Additionally, while discounting can serve as an enrollment management tool to attract talented or specific applicants, critics caution that merit-based discounting may reduce need-based awards, potentially exacerbating access and equity gaps among underrepresented or first-generation students (Hillman & Orians, 2013).

Finally, the question remains as to how these practices affect affordability at a systemic level. High tuition prices, even when offset by large discounts, may deter many prospective students, particularly those with limited knowledge of institutional factors or financial literacy (Desrochers & Hurlburt, 2016). Also, as concerns about student loan debt intensify, the credibility of high tuition strategies may further erode in the public's perception, prompting new regulatory or policy interventions (Grawe, 2018; NACUBO, 2021). Proposed solutions include broader cost containment, more transparent pricing, and comprehensive reforms in both federal and state student aid programs, yet implementing these strategies often requires significant political prowess and resources. Consequently, many experts anticipate substantial shifts in higher education pricing within the next decade, driven by convergent factors such as the demographic cliff, growing skepticism about tuition costs, and pressures for increased accountability (Grawe, 2018; Hemelt & Marcotte, 2011). As institutions grapple with the financial strain of balancing operating costs, student demand, and equity considerations, data from NACUBO and other organizations remain vital. These benchmarks help colleges and universities determine feasible discount rates, align aid strategies with institutional missions, and sustain critical commitments to access and affordability. In this complex landscape, tuition

discounting is only one piece of the puzzle, but it is a pivotal component that may well define the future of how American higher education is priced and funded.

CHAPTER 3: METHODOLOGY

Introduction

This chapter addresses the research methodology and design applied in investigating the effects of tuition discounting and its impact on enrollment and net tuition revenue for private, not-for-profit, four-year institutions in the United States. More specifically, this chapter includes an overview of the problem statement and purpose of the study, an overview of the inquiry paradigm, an elucidation of the research questions, an examination of the research population with the criteria used for their selection, and an outline of the data collection and analysis procedures undertaken in the study. Lastly, this chapter acknowledged the inherent limitations of the study.

Tuition discounting has become a standardized practice for all higher education institution types, but it is most prevalent and necessary among private, not-for-profit institutions (Baum & Lapovsky, 2006; Merea, 2010). Beginning in the 1970's, the original intent of tuition discounting was to extend financial aid as a means to reduce the burden for needy students who required help to cover the cost of their tuition (Baum & Lapovsky, 2006). Since its inception, tuition discounting has become a customary institutional practice. However, tuition discounting is now exploited by institutions to design and cultivate a specific cohort of students, particularly crafting a student body to fit the vision and mission adapted by the specific institution. It is also used as a function of enrollment management as an attempt to meet desired enrollment figures and increase net tuition revenue. Despite the intent by each institution, there is little evidence that supports the need for tuition discounting as an institutional practice to reach these institutional desires.

Although there is certainly literature regarding tuition discounting, most of the scholarly research is devoted simply to the reasons that institutions extend institutional aid to reduce sticker prices and the percentages at which they do so; however, there is a great need for institutions to understand the true relationships between key variables such as tuition prices, discount rates, enrollment trends, and the utilization of certain proportions of funded and unfunded aid (Harter, 2016). Research that analyzes the relationship of these specific variables could help enrollment and finance officers work collaboratively to best determine to what extent tuition prices and institutional aid should grow (or decline) in the attempt to reach institutional goals. Since there is little scholarly research currently devoted to the relationship between these variables, institutional administrators are left to essentially maintain the status quo and continue increasing tuition prices and institutional aid alongside competition in the attempt to recruit the necessary students to generate needed net tuition revenue. However, the high price/high aid pricing model in higher education is receiving greater criticism and with the looming demographic cliff and consumer sentiment for higher education seemingly at an all-time low, institutions that are unwilling to change their tuition discounting methodology could be headed towards greater institutional distress (Martin, 2004 & Duggan & Matthews, 2005). Understanding the relationship between these variables could pay dividends for the future financial wellbeing of higher education institutions.

Problem and Purpose of the Study

As tuition sticker prices have grown rapidly over the years, some question whether the current high price/high aid tuition pricing model and the tuition discounting practice is a sustainable method of attracting students, building a diverse student body, supporting educational access, and growing an institution's net tuition revenue. However, history would

suggest that the high price/high aid pricing model will not be challenged anytime soon as the growth in tuition prices and institutional aid has continued to rise in higher education, specifically among private higher education institutions. Even though this problem persists, there has been little research dedicated to the relationship between tuition pricing, tuition discount rates, net tuition revenue, and enrollment. Further, there is practically no literature dedicated to studying the impact of utilizing funded versus unfunded institutional aid on an institution's enrollment and net tuition revenue. For those institutions which have significant endowments, there should, in theory, be a greater leaning on funded sources to extend institutional aid. This could inherently implore these institutions to have a lesser reliance on unfunded sources and should have greater autonomy to increase overall institutional aid, which would, in theory, increase enrollment and net tuition revenue. Understanding the relationship between these variables is essential as American higher education receives scrutiny about the value of higher education and as the demographic makeup of our country changes. With that, the purpose of this study was to analyze the trends in tuition pricing and tuition discount rates, to analyze the relationship between tuition discounting, enrollment, and net tuition revenue and to analyze the effects of utilizing funded versus unfunded institutional aid at private, not-for-profit, four-year institutions of higher education in the United States.

Inquiry Paradigm

Creswell (2018) defined inquiry paradigms as frameworks that guide researchers in their understanding of the world and influence their research questions, methodologies, and interpretations of data. Creswell (2018) acknowledged four different primary inquiry paradigms, post-positivism, constructivism, pragmatism, and transformative inquiry. The inquiry paradigm guiding this study was rooted in post-positivism, which acknowledges that knowledge is fallible

and may change as new evidence arises (Creswell, 2018). While this study employed a quantitative methodology, it should be noted that it was informed by post-positivist principles that emphasize the importance of understanding the context in which educational decisions are made (Creswell & Poth, 2018), as well as larger social contexts that are at play. Post-positivism recognizes that knowledge is not absolute but rather constructed through social processes and experiences. This paradigm allows for the consideration of multiple perspectives and the acknowledgment of potential biases in the data collection and analysis processes (Guba & Lincoln, 1994). With this inquiry paradigm, the research acknowledges that the relationships between tuition discounting, enrollment, and net tuition revenue may be influenced by various contextual factors.

Research Questions

The core of this study revolves around three specific research questions designed to interpret the interplay of tuition discounting, enrollment, and net tuition revenue within private, not-for-profit, four-year institutions in the United States. These questions aim to fill existing gaps in the literature and contribute to a greater understanding of the implications of tuition discounting practices on enrollment and net tuition revenue.

RQ1: What are the trends in tuition prices and tuition discount rates for private, not-for-profit, four-year institutions?

This research question seeks to identify and analyze longitudinal trends in tuition pricing and tuition discount rates across private, not-for-profit, four-year institutions in the United States. Understanding these patterns is essential to establishing the contextual foundation for subsequent analyses of how institutional pricing strategies relate to enrollment and net tuition revenue outcomes. By first examining historical trajectories of published tuition, this analysis provides

insight into whether the traditional high-price, high-aid model has remained viable or has weakened under changing demographic and economic conditions. To reflect the real purchasing power of tuition over time, published tuition and required fees were restated in constant 2023 dollars using both the Consumer Price Index (CPI) and the Higher Education Price Index (HEPI). The CPI adjustment provides a measure of the broader inflationary impact on consumers, while the HEPI more directly captures the cost pressures experienced by colleges and universities. Examining tuition growth under both indices offers a more complete perspective on the economic realities influencing institutional pricing. When analyzed alongside longitudinal changes in average tuition discount rates, these inflation-adjusted price trends highlight how institutional margins have evolved over the decade and frame the context for understanding the financial sustainability of tuition discounting practices.

RQ2: What is the relationship between tuition discounting, enrollment, and net tuition revenue?

This question addresses the central hypothesis of the study: that tuition discounting directly influences both enrollment figures and net tuition revenue. By exploring this relationship, the research aims to uncover whether higher discount rates lead to increased enrollment and whether this, in turn, affects net tuition revenue positively or negatively. Insights from this analysis can guide institutional leaders in their financial aid strategies and overall enrollment management.

RQ3: What is the effect of utilizing funded versus unfunded institutional aid on enrollment and net tuition revenue?

This question aims to investigate the differing impacts of funded (i.e., aid drawn from funded sources, i.e., endowments) versus unfunded aid (i.e., aid based on current institutional revenues) on enrollment and net tuition revenue. By comparing the proportions of these two

forms of financial assistance, the study seeks to determine whether institutions with significant sources of funded dollars and endowments can and do leverage their resources more effectively than those reliant on unfunded institutional aid. This analysis is crucial for institutions, specifically private institutions analyzed in this study, aiming to optimize their financial aid strategies and enhance their competitive positioning in a challenging and increasingly competitive enrollment landscape.

The purpose of this study, and ultimately with these research questions, is to provide a comprehensive analysis of the variables affecting tuition discounting practices and the broader implications for private higher education institutions. By answering these questions, the study aims to equip institutional leaders and policymakers with evidence-based insights that can inform strategic decision-making regarding tuition pricing and discounting practices as well as help inform institutional finance leaders of the relationship and interplay between these factors. Ultimately, this research aspires to contribute to the question over the sustainability and effectiveness of tuition discounting in higher education.

Research Methods and Design

This quantitative study employed a quantitative, non-experimental, correlational methodology, meaning that there was no manipulation of any independent variables. Utilizing a longitudinal correlation research design with existing data, the study aimed to investigate the relationships between tuition discounting, enrollment, and net tuition revenue at private, not-for-profit, four-year institutions in the United States (Creswell & Creswell, 2018; Hossler et al., 2013). The non-experimental nature of this study indicates that variables were observed without manipulation, distinguishing it from experimental research where independent variables are deliberately altered to assess their impact on dependent variables. Instead, the intent was to

observe and assess any potential relationships among the variables. By employing a correlational design, this study sought to identify patterns and associations between tuition discount rates, enrollment figures, and net tuition revenue, providing valuable insight into how these factors interplay and interact over time (Levin & Van Dender, 2011). This approach allowed for a comprehensive analysis of the data, facilitating a deeper understanding of how tuition discounting practices might influence institutional outcomes. Ultimately, this methodology was well suited to address the research questions, as it provided the framework for exploring the intricate interlay of these key variables within the context of private higher education (Harter, 2016).

Data Collection

The data for this study was obtained from the National Center for Education Statistics (NCES) through the Integrated Postsecondary Education Data System (IPEDS). This database provides comprehensive and standardized datasets on a multitude of institutional data including tuition pricing, institutional aid, enrollment, and overall financial indicators for U.S. higher education institutions (Hossler et al., 2013). Data were collected for a ten-year period spanning years 2014 through 2023 to capture a full decade of institutional behavior related to tuition discounting. This timeframe was selected to reflect contemporary trends in higher education finance, particularly the growing reliance on institutional aid and changes in enrollment dynamics following the Great Recession and through the COVID-19 recovery period. This time period was also chosen based on the availability of complete and consistent data for all variables required in the analysis. The data collection process involved extracting relevant variables across all private, not-for-profit, four-year institutions within the United States that reported complete data for each year of the study. Conducting this longitudinal analysis enabled a detailed

understanding of how tuition discounting practices evolved over the decade and how these strategies influenced both enrollment and net tuition revenue. By utilizing comprehensive data from IPEDS, the study aimed to provide robust insights into the research questions.

Timeframe and Contextual Relevance

This study analyzed tuition discounting trends over a 10-year period (2014 - 2023) to capture significant changes in pricing strategies and enrollment patterns. This timeframe is particularly important because it encompasses the impact of the COVID-19 pandemic (2020-2023) on higher education. The pandemic led to significant disruptions in enrollment patterns, financial aid strategies, and institutional revenue models. Many private institutions implemented aggressive tuition discounting strategies to maintain enrollment and stabilize finances during this period. Analyzing this timeframe allowed for an evaluation of whether these strategies had a lasting impact on institutional financial health and student enrollment behavior. Understanding these trends is crucial for institutional leaders seeking to navigate post-pandemic financial realities in higher education.

Data Analysis

The data analysis strategy for this study was designed to examine the relationships among tuition discounting, enrollment, and net tuition revenue within private, not-for-profit, four-year institutions in the United States. Because the study spanned a 10-year period (2014 - 2023), it also considered the potential effects of the COVID-19 pandemic (2020 - 2023). The following sections describe how the datasets were prepared, which variables were included, and the analytical techniques employed to investigate the research questions mentioned above.

Data Cleaning and Handling Missing Data

Data for this study was obtained from the Integrated Postsecondary Education Data System (IPEDS), which is maintained by the National Center for Education Statistics (NCES). Using the “Compare Institutions” tool in IPEDS, institutional data was retrieved for all private, not-for-profit, four-year institutions in the United States for the 2014 - 2023 years. The initial dataset extracted from IPEDS included 1,590 institutions. To ensure that analyses were based on complete, reliable, and consistent data, institutions that contained either blank cells (missing values) or values of zero in any of the study variables across the ten-year period were excluded. This procedure reduced the dataset to a final sample size of 624 institutions, or 6,240 institution-year cases. The decision to remove institutions with blank or zero values in any of these variables was made to preserve the integrity of the longitudinal dataset and to ensure comparability across institutions. Blanks represented missing or unavailable data, while zeros in variables such as tuition discount rate, net tuition revenue, or endowment were considered implausible for private, not-for-profit, four-year institutions. Even in cases where a zero value may have reflected an actual figure (for example, institutions without graduate enrollment or without an endowment), such institutions likely represented atypical institutional profiles that differed meaningfully from the majority of the sample. Including these cases would have introduced inconsistency into the dataset and made meaningful comparisons across institutions more difficult. By excluding institutions with blanks or zero values, the study ensured that every institution in the final dataset reported complete and credible data for all study variables and operated from a broadly comparable financial and operational baseline. Although this process reduced the number of institutions available for analysis, it strengthened the validity of the findings by producing a balanced panel dataset in which each institution contributed consistent and comparable information across all ten years under study. This consistency was particularly important for longitudinal analyses, including regression models, where missing or implausible

values could otherwise compromise the robustness of results. Moreover, the final sample of 624 institutions, or 6,240 institution-year cases remained sufficiently large to provide strong statistical generalizability for the analyses conducted. A complete listing of the institutions included in the final dataset is provided in Appendix A. It is important to note that some institutions in the dataset share the same institutional name but represent distinct universities. For example, multiple institutions appear under the names Bethel University, Anderson University, Marian University, St. John's College, and University of St. Thomas. These institutions were treated as separate entities in the analysis and are therefore listed individually in Appendix A.

Data Normalization and Variable Categorization

To ensure meaningful year-over-year comparisons in the descriptive analyses, tuition and fee prices were converted to constant 2023 dollars using the Consumer Price Index (CPI) and Higher Education Price Index (HEPI) to account for the effects of inflation. This adjustment allowed for a more accurate interpretation of tuition price trends over time while maintaining other variables in nominal terms to preserve their original reporting context. Key study variables included tuition discount rate, enrollment, net tuition revenue, and percent of institutional aid that was funded versus unfunded. To control for institutional differences, two control groups were created. Institutions were grouped by total enrollment size, defined as small (fewer than 2,500 students), medium (2,500–9,999 students), and large (10,000 or more students). Institutions were also categorized into tertiles based on endowment assets per full-time equivalent (FTE) student to capture differences in endowment capacity. These classifications and controls provided a framework for examining how tuition discounting, enrollment, and institutional resources interacted to influence net tuition revenue over time by different enrollment and endowment statuses.

Descriptive Analysis

Descriptive analyses provided an overview of the dataset's central tendencies and dispersion before more rigorous inferential techniques were employed. Specifically, mean, median, and mode values were examined for tuition prices, discount rates, net tuition revenue, and enrollment levels, while measures such as standard deviation, ranges, as well as minimum and maximum values offered insights into the variability in these metrics across institutions. Histograms were also generated to assess the distribution of key variables and to detect potential outliers that might unduly influence subsequent analyses. In addition, charts with descriptive data documented changes in tuition discounting, net tuition revenue, and enrollment patterns over the study's 10-year window. This step helped establish the context in which variations in pricing or discounting practices might be observed.

Correlation Analysis

After descriptive analyses were performed, statistical assumptions were tested to ensure that the data met the necessary conditions for correlational and regression analyses. Normality, linearity, and homoscedasticity were assessed using visual inspections of histograms, scatterplots, and standardized residual plots, while multicollinearity was examined through tolerance and variance inflation factor (VIF) statistics. Following the confirmation that assumptions were sufficiently met, Pearson correlation coefficients were calculated to determine the strength and direction of relationships among the primary variables of interest. These analyses examined the associations between tuition discount rate and enrollment, tuition discount rate and net tuition revenue, and the extent to which varying proportions of funded versus unfunded institutional aid influenced net tuition revenue outcomes.

Regression Models

Prior to conducting regression analyses, statistical assumptions were evaluated to ensure the appropriateness of the models. Linearity, normality, and homoscedasticity were examined through visual inspection of scatterplots and standardized residuals, while multicollinearity was assessed using tolerance and variance inflation factor (VIF) statistics. No violations were detected that materially affected the interpretation of results, indicating that the data met the assumptions required for simple and multiple regression analysis. Building on the findings from the descriptive and correlation analyses, simple and multiple regression models were subsequently constructed to examine how tuition discounting and institutional aid composition predicted both enrollment and net tuition revenue. Three primary models guided this phase of the analysis. The first model assessed the impact of tuition discount rate on enrollment, while the second model examined whether tuition discounting predicted changes in net tuition revenue. In both models, institutional size (small, medium, or large) and endowment assets per FTE student (categorized into tertiles) were included as control variables to isolate the unique effects of tuition discounting. A third regression model evaluated the influence of the proportion of funded versus unfunded institutional aid on net tuition revenue, providing a deeper understanding of how differing funding sources affect institutional financial outcomes. This model also incorporated institution size and endowment per FTE category as control variables. In addition to these standard regression models, a series of piecewise regression analyses were conducted to further explore potential nonlinear relationships between tuition discount rate and net tuition revenue. Breakpoints were tested at 35%, 40%, 45%, and 50% to determine whether the relationship between discounting and net tuition revenue changed in strength or direction beyond specific threshold levels. These thresholds were selected based on both theoretical and empirical considerations in the tuition discounting literature, which frequently identifies the mid-30% to mid-40% range as a critical zone where institutional revenue pressures begin to intensify. Testing

breakpoints at 35%, 40%, 45%, and 50% allowed the analysis to capture potential inflection points across the discount spectrum and to determine whether the relationship between discounting and net tuition revenue shifts as institutions move into increasingly high-discount environments. These analyses provided a more nuanced understanding of the extent to which increases in tuition discount rate beyond certain points were associated with diminishing or stabilizing effects on net tuition revenue outcomes.

Limitations

This study acknowledged several inherent limitations. First, the reliance on existing data might have introduced challenges related to data accuracy, completeness, and potential reporting biases. Variations in institutional reporting practices could affect the consistency of data across the sample, potentially leading to misleading conclusions (Creswell & Creswell, 2018). Additionally, the focus on private, not-for-profit institutions may limit the generalizability of findings to public or for-profit institutions, which often operate under different financial models and regulatory frameworks (Duggan & Matthews, 2005). Consequently, the insights drawn might not fully capture the complexities of the broader higher education landscape as a whole. Furthermore, while the longitudinal approach offers insights into trends over time, it does not account for external factors such as economic conditions, changes in federal or state policy, global instability, or shifts in consumer sentiment toward higher education. These factors, and many others, could significantly impact enrollments and the impact on net tuition revenue but were not explicitly measured in this study (Martin, 2004). Lastly, future research could benefit from qualitative methodologies that explore institutional decision-making processes and various stakeholder perspectives. Incorporating interviews or case studies could provide a richer

understanding of the motivations behind tuition discounting practices and their perceived effectiveness from the viewpoints of institutional leaders and students.

Summary

The study was structured to deliver a comprehensive and robust examination of how tuition discounting, utilizing both funded and unfunded aid, shaped enrollment patterns and net tuition revenue across private, not-for-profit, four-year institutions. Employing a blend of descriptive, correlational, and simple and multiple regression techniques, this design aligns with a post-positivist paradigm that recognizes the inherent complexity and context-dependent nature of educational research (Guba & Lincoln, 1994). By evaluating a wide array of variables spanning a 10-year period, the analysis not only illuminated the direct effects of tuition discounting but also highlighted how institutional characteristics and external factors, such as the COVID-19 pandemic, might have altered the trajectory of these financial strategies in higher education.

CHAPTER 4: RESULTS

Introduction

This chapter presents the results of the quantitative, longitudinal, correlational analysis designed to investigate the relationship between tuition discounting, enrollment, and net tuition revenue at private, not-for-profit, four-year institutions in the United States. Guided by the methodological approach described in chapter three, this chapter provides a comprehensive presentation of findings derived from descriptive statistics, correlational analyses, and multiple regression models. The data analyzed spans a ten-year period (2014 - 2023) and was obtained from the Integrated Postsecondary Education Data System (IPEDS), which is maintained by the National Center for Education Statistics (NCES). IPEDS serves as the primary federal source of comprehensive data on U.S. postsecondary institutions.

The results are organized around the study's three research questions. First, the chapter examines longitudinal trends in tuition pricing and institutional discount rates, establishing a contextual foundation for understanding how tuition prices and tuition discounting strategies have evolved over the ten-year period. Second, it investigates the relationship between tuition discounting, institutional enrollment, and net tuition revenue, with particular attention to how shifts in institutional discounting may influence enrollment and financial outcomes. Third, it assesses the impact of utilizing funded versus unfunded institutional aid on both enrollment and net tuition revenue. Across each form of analysis, institutional characteristics such as enrollment size and endowment per full-time equivalent student are accounted for as control variables.

This chapter begins with a summary of descriptive statistics regarding the central tendencies and variability of the dataset's primary variables. Next, statistical assumption testing is presented to validate the application of inferential statistics. Following that, correlational and

multiple regression analyses were conducted in alignment with the research questions. Where appropriate, tables and figures are provided to support the presentation and interpretation of results. All statistical significance was assessed using a threshold of $p < .05$ (Lochmiller & Lester, 2015). Consistent with the post-positivist paradigm framing this research, the aim of this chapter is to report findings in an objective and empirical manner. The interpretation and implications of these results will be addressed in chapter five.

Descriptive Statistics

This section presents descriptive statistics to provide a foundational understanding of the institutions included in the study and the key variables under analysis. The descriptives also served as the basis to answer the first research question. The analysis considered institutional characteristics such as enrollment size and endowment per FTE, along with the primary variables under investigation such as tuition prices, tuition discount rates, institutional enrollments, net tuition revenue, and the proportions of funded versus unfunded institutional aid utilized. The descriptive analysis was based on data collected annually by IPEDS from 2014 to 2023 for private, not-for-profit, four-year institutions in the United States. The purpose of this section is threefold. First, descriptive statistics are presented to provide an overview of the central tendencies, variability, and distribution of the key variables. Second, these statistics help to identify any observable patterns or anomalies within the data before proceeding to inferential testing. Finally, the descriptive results establish important context for the correlation and regression analyses that follow. This section begins by summarizing institutional characteristics among the sample, including enrollment size and endowment per full-time equivalent (FTE) student, to provide context for the institutions included in the sample. It then examines the primary variables under analysis: tuition prices, tuition discount rates, institutional enrollments,

net tuition revenue, and funded vs unfunded institutional aid allocations. Together, these descriptive statistics establish a comprehensive baseline for the inferential procedures and regression analyses that follow.

Institutional Sample Characteristics

Data for this study was obtained from the Integrated Postsecondary Education Data System (IPEDS), which is maintained by the National Center for Education Statistics (NCES). Using the “Compare Institutions” tool in IPEDS, institutional data was retrieved for private, not-for-profit, four-year and above institutions in the U.S. for the 2014 - 2023 academic years. The initial dataset out of IPEDS included 1,590 institutions. However, to ensure that analyses were based on complete, reliable, and consistent data, institutions that contained either blank cells (missing values) or values of zero in any of the study variables across the ten-year period were excluded. This procedure reduced the dataset to a final sample size of 624 institutions, or 6,240 institution-year cases based on the ten-year dataset. The following variables were used as the basis for inclusion or exclusion: Undergraduate Enrollment, Graduate Enrollment, Total Enrollment, Published In-State Tuition and Fees, Institutional Grants (Unfunded), Institutional Grants (Funded), Institutional Grants (Total), Percent Funded Aid, Tuition and Fees – Total, Gross Tuition Revenue, Tuition Discount Rate, Total Change in Net Assets, Value of Endowment Assets at the End of the Fiscal Year, and Endowment Assets (Year End) per FTE Enrollment (FASB). The decision to remove institutions with blank or zero values in any of these variables was made both to preserve the integrity of the longitudinal dataset and to ensure comparability across institutions. Blanks represent missing or no data, while zeros in variables such as tuition discount rate, net tuition revenue, or endowment are implausible for private, not-for-profit, four-year institutions. Even in cases where a zero value may have been a true figure

(e.g., institutions without graduate enrollment or without an endowment), those institutions might represent a different institutional profile from the majority of the sample. Including such cases would have introduced inconsistency into the dataset, making meaningful comparisons across institutions more difficult. By excluding institutions with blanks or zeros, the study ensured that every institution in the final dataset reported complete and credible data for all study variables and operated from a broadly comparable financial and operational baseline. Although this process reduced the number of institutions available for analysis, it strengthened the validity of the findings by producing a balanced panel dataset in which every case contributed consistent and comparable information across all ten years being studied. This consistency is particularly important for longitudinal analyses, including regression models, where missing or implausible values could otherwise compromise the robustness of results. Moreover, the final sample of 624 institutions or 6,240 institution-year cases remains sufficiently large to provide strong statistical generalizability for the analyses conducted. A complete listing of the institutions included in the final dataset is provided in Appendix A. It is important to note that some institutions in the dataset share the same institutional name but represent distinct universities. For example, multiple institutions appear under the names Bethel University, Anderson University, Marian University, St. John's College, and University of St. Thomas. These institutions were treated as separate entities in the analysis and are therefore listed individually in Appendix A.

Institutions in the final dataset were classified into size categories based on their total enrollment for each year of the study period. While the Carnegie Classifications of Institutions of Higher Education define institutional size using broader thresholds; small (fewer than 4,000 students), medium (4,000–19,999 students), and large (20,000 or more students) for the purposes of this study, more restrictive thresholds were applied to provide clearer differentiation across the

sample, especially since most private institutions are smaller than their public counterparts, which might skew the analysis by each category. Institutions with fewer than 2,500 students were classified as small, those with 2,500 to 9,999 students as medium, and those with 10,000 or more students as large. This classification was used because the Carnegie system would have placed most institutions in the sample within the small category, so adjusted thresholds were chosen to create a more balanced distribution across size groups for analysis. Because institutional enrollment is not static, institutions were categorized on a year-by-year basis rather than being fixed to a single category across the ten-year span. As a result, the classification reflects institution-year observations rather than permanent institutional assignments. Across the 6,240 institution-year cases in the dataset (624 institutions \times 10 years), 48.7% (3,040) were classified as small (<2,500 students), 41.3% (2,577) were classified as medium (2,500–9,999 students), and 10.0% (623) were classified as large (\geq 10,000 students). This distribution indicated that the majority of observations reflected smaller and mid-sized institutions, which aligned with the overall profile of private, not-for-profit, four-year institutions in the United States. It also reinforced the rationale for utilizing the small, medium, large thresholds used in this study, rather than the broader, more widely used, Carnegie size classifications, in order to capture institutional distinctions more clearly within this sector of higher education. It is important to note that some institutions shifted between categories during the ten-year period as their enrollments either grew or declined. For example, an institution might have been categorized as small in the early years of the dataset but moved into the medium category in later years as enrollment increased. This dynamic categorization captured the longitudinal character of the dataset and provided a more nuanced understanding of institutional change over time. By classifying institutions in this manner, the study ensures that descriptive and inferential analyses account for differences in institutional stature, which is a critical contextual factor in examining

tuition pricing, discounting practices, and net tuition revenue. Institutional size often shapes financial capacity and enrollment strategies and therefore serves as an important control variable in statistical models. The size categories reported here provided a foundation for interpreting patterns in the descriptive statistics that follow and for understanding how institutional characteristics may moderate the relationships under investigation.

As shown below in Table 2 below, enrollment sizes across the full sample varied widely, ranging from just 145 students to a massive 164,091 students. The average enrollment across the entire sample was 4,611 students ($SD = 7,517$), with a median of 2,571, indicating that while the overall mean was influenced by a small number of very large institutions, the typical institution in the sample was much smaller. These statistics reflected the diverse landscape of private higher education in the United States, where the majority of institutions fall into the small-to mid-sized categories, but a handful of large universities enroll tens of thousands of students.

Table 2

Descriptive Statistics for Institutional Enrollment, 2014–2023 (N = 6,240)

| Statistic | Enrollment Size |
|--------------------|-----------------|
| Mean | 4,611 |
| Median | 2,571 |
| Mode | 2,064 |
| Standard Deviation | 7,517 |
| Minimum | 145 |
| Maximum | 164,091 |

Note. Enrollment values represent institution-year observations across the sample period.

When institutions were grouped by enrollment size (see Table 3 below) distinct patterns emerged. Small institutions (defined as fewer than 2,500 students) represented the largest share of the sample ($n = 3,040$). Their enrollments ranged from 145 to 2,498 students, with an average of 1,468 students ($SD = 612$) and a median of 1,472, reflecting strong relative consistency within this group. Medium-sized institutions (2,500–9,999 students) comprised 2,577 observations and demonstrated greater variability, with enrollments ranging from 2,501 to 9,991 students. This group’s average enrollment was 4,587 students ($SD = 1,880$), with a median of 3,928. Large institutions (10,000 students or more) accounted for 623 observations. This group exhibited the greatest variability, with enrollments ranging from 10,002 to 164,091 students. The average enrollment among large institutions was 20,050 students ($SD = 16,228$), though the median was 15,002, again reflecting the presence of several outliers among the largest private universities. For the small enrollment institutional class, the mean and median enrollment were nearly identical, suggesting a strong balanced distribution among this group. This alignment indicated that the average small institution was also highly representative of the “typical” institution in the sample. Because of this stability and the fact that small institutions comprised the majority of observations, the small class served as the most central point of comparison in the subsequent analyses, functioning as a control against which the dynamics of medium and large institutions can be evaluated.

Table 3

Descriptive Statistics for Institutional Enrollment by Class, 2014–2023

| Institutional Class | N | Mean | Median | Mode | SD | Min | Max |
|------------------------|-------|--------|--------|--------|--------|--------|---------|
| Small (<2,500) | 3,040 | 1,468 | 1,472 | 2,064 | 612 | 145 | 2,498 |
| Medium (2,500–9,999) | 2,577 | 4,587 | 3,928 | 3,764 | 1,880 | 2,501 | 9,991 |
| Large (\geq 10,000) | 623 | 20,050 | 15,002 | 10,095 | 16,228 | 10,002 | 164,091 |
| Total | 6,240 | 4,611 | 2,571 | 2,064 | 7,517 | 145 | 164,091 |

Note. Values are based on institution-year observations. Multiple modes exist; the smallest value is shown.

These results showed that the institutional sample is heavily weighted toward smaller colleges and universities, with almost half of the observations falling into the small-enrollment category. At the same time, the inclusion of medium and large institutions ensured that the sample captures the full range of institutional sizes across the private, not-for-profit sector in the United States. This distribution underscored the importance of controlling for institutional size in the subsequent analyses, as size was likely to shape both enrollment patterns and financial strategies, including tuition discounting.

Endowment resources per full-time equivalent (FTE) student represented the second institutional control variable included in the study. Endowment per FTE represented the total value of an institution's endowment assets divided by its full-time equivalent student enrollment. This measure adjusted institutional endowment strength for enrollment size, providing a standardized indicator of financial capacity on a per-student basis. Unlike raw endowment totals, which can be misleading when comparing institutions of very different enrollment and endowment sizes, endowment per FTE reflected the relative resources available to support each student. Endowment per FTE is an important control because it is a good indicator of an

institution’s long-term financial capacity and its ability to subsidize operations, offer institutional aid, and withstand fluctuations in tuition revenue over spans of time. Institutions with larger endowments per student often have greater flexibility in setting tuition prices and their discounting strategies, while those with limited endowment support may be more tuition dependent and have to resort to greater lengths of tuition discounting with sources of unfunded aid to attract students. Controlling for endowment per FTE therefore helps isolate the effects of tuition discounting and enrollment behavior from underlying differences in institutional wealth. Across the 6,240 institution-year observations, endowment assets per FTE varied widely, reflecting significant disparities in financial capacity across private, not-for-profit, four-year institutions. As shown in Table 4 below, the mean endowment per FTE across the whole sample was \$85,669 (SD = \$238,588), while the median was substantially lower at \$27,007, indicating that the distribution was positively skewed by a small number of highly endowed institutions. The minimum reported endowment value was \$182 per FTE, while the maximum exceeded \$4.7 million per FTE. These results underscored the extreme range of institutional endowment wealth within the sector, justifying the inclusion of endowment per FTE as a control variable in subsequent analyses.

Table 4

Descriptive Statistics for Endowment per FTE, 2014–2023 (N = 6,240)

| Statistic | Endowment per FTE (\$) |
|-----------|------------------------|
| Mean | 85,669 |
| Median | 27,007 |
| Mode | 4,648 |

| | |
|--------------------|-----------|
| Standard Deviation | 238,588 |
| Minimum | 182 |
| Maximum | 4,701,173 |

Note. Values represent institution-year observations.

Institutions with higher endowment per FTE values generally have greater flexibility in tuition pricing and financial aid and tuition discounting strategies, while those with lower values tend to be more tuition dependent. Unlike enrollment size, which was classified using a modified Carnegie threshold to capture institutional stature mostly applicable to the private, not-for-profit, four-year institution sector, endowment per FTE was divided into tertiles. This approach was chosen because the distribution of endowment resources was highly skewed, with a small number of institutions reporting extraordinarily high values. Grouping institutions into low, medium, and high endowment categories provided a more balanced representation of the sample while preserving the ability to examine financial capacity as a continuous control in inferential analyses. Endowment per FTE displayed substantial variation across the institutional sample. When grouped into tertiles (low, medium, and high), differences emerged (see Table 5). Institutions in the lowest tertile reported an average endowment per FTE of \$9,248 (SD = \$4,299), with a median of \$9,486, a minimum of \$182, and a maximum of \$16,495, indicating that the majority of these institutions operated with relatively modest endowment resources per student. The middle tertile demonstrated higher values, with a mean of \$28,281 (SD = \$7,979), a median of \$27,007, a minimum of \$16,497, and a maximum of \$44,696 reflecting more moderate but still fairly consistent levels of endowment strength. In contrast, the highest tertile exhibited extreme variability, with a mean of \$219,478 (SD = \$379,071) a median of \$85,715, a

minimum of \$44,719 but with maximum exceeding \$4.7 million per FTE. This disparity highlighted the presence of a small group of highly resourced institutions that skewed the overall distribution of endowment wealth. The tertile grouping therefore underscored the sector’s financial stratification, with the majority of institutions clustered in the lower two groups and only a minority possessing the exceptionally large endowments characteristic of the top tertile. Considering the similarity between the mean and median values for institutions in the first tertile of endowment per FTE, this study focused particular attention on this group to provide the most realistic understanding of the effects of tuition discounting on enrollment and net tuition revenue, as it reflected the most representative and consistent results among the tertiles. Similar to the smallest enrollment size group utilized as a control variable, this tertile serves as a control group to most accurately capture the effects of tuition discounting on these institutions.

Table 5

Descriptive Statistics for Endowment per FTE by Tertile, 2014–2023 (N = 6,240)

| Endowment per FTE Group | N | Mean (\$) | Median (\$) | SD (\$) | Min (\$) | Max (\$) |
|----------------------------|-------|-----------|-------------|---------|----------|-----------|
| Low (Tertile 1) | 2,080 | 9,248 | 9,486 | 4,299 | 182 | 16,495 |
| Medium (Tertile 2) | 2,080 | 28,281 | 27,007 | 7,979 | 16,497 | 44,696 |
| High (Tertile 3) | 2,080 | 219,478 | 85,715 | 379,071 | 44,719 | 4,701,173 |
| Total | 6,240 | 85,669 | 27,007 | 238,588 | 182 | 4,701,173 |

Note. Values represent institution-year observations. Endowment per FTE was grouped into tertiles (low, medium, high) for descriptive purposes.

Together, the analysis of enrollment size and endowment per FTE underscored the importance of controlling for institutional characteristics in this study, especially considering the large sample size. Both control variables revealed substantial disparities across institutions in the sample, with enrollment distributions skewed by a small number of very large universities and endowment values heavily influenced by a small set of highly resourced institutions. These imbalances highlighted the diversity of the private, not-for-profit sector and the potential for institutional stature and financial capacity to confound the relationships under investigation. Accordingly, both enrollment size and endowment per FTE were retained as control variables in the subsequent analyses to ensure that the effects of tuition discounting, enrollment, and net tuition revenue were interpreted independently of these structural differences.

Primary Variables of Interest

With institutional characteristics of the study sample established through enrollment size and endowment per FTE student, the analysis now turns to the primary variables under investigation. These variables, tuition prices, tuition discount rates, enrollment, net tuition revenue, and the proportions of funded versus unfunded aid utilized, form the basis for addressing the study's research questions. Descriptive statistics for each variable are presented to provide context for subsequent inferential analyses, highlight distributional patterns, and identify any potential anomalies within the data. This section also presents the result of the first research question.

Tuition and fee prices.

Published tuition and fees provide the most readily available data point and most direct measure of institutional tuition pricing. They also serve as the foundation for understanding both tuition discounting practices and net tuition revenue. As the published, or "sticker," price, tuition

and fees represent the gross revenue institutions would generate in the absence of institutional aid or other forms of tuition discounts. Because these published prices anchor the calculation of tuition discount rates and strongly influence perceptions of affordability, examining their distribution is a necessary starting point for the descriptive analysis. In the context of this study, descriptive statistics for tuition and fees highlighted the range, central tendencies, and variability of institutional tuition pricing strategies across private, not-for-profit, four-year institutions in the United States from 2014 to 2023. These figures provided the baseline against which tuition discounting patterns, enrollment outcomes, net tuition revenue, and the effects of utilizing greater percentages of unfunded institutional aid can be more precisely interpreted.

Across all institutions and years in the dataset ($N = 6,240$), published tuition and fees averaged \$33,849 with a standard deviation of approximately \$11,145. Tuition and fees ranged from a low of \$2,425 at smaller, regionally focused institutions to a high of \$68,365 at the most selective, highly priced institutions. The widespread and large standard deviation indicated substantial diversity in tuition pricing strategies across private, not-for-profit, four-year institutions in the United States during the study period. This variation underscored the importance of examining tuition pricing in relation to institutional characteristics, as student affordability and net tuition revenue outcomes are shaped within very different pricing contexts.

As shown in Table 6 below, the average published tuition and fees among private, not-for-profit, four-year institutions increased steadily between 2014 and 2023. Mean tuition prices rose from \$29,327 in 2014 to \$38,222 in 2023, representing a 30% increase over the ten-year period. The trajectory of growth was consistent, with tuition climbing by approximately \$800 - \$1,200 annually on average. The range of tuition prices also widened over time, with the standard deviation increasing from \$8,968 in 2014 to \$12,565 in 2023. This suggested that while

most institutions raised tuition incrementally, the range between the lowest and highest priced institutions became more pronounced over the decade.

Table 6

Descriptive Statistics for Published In-State Tuition and Fees, Private Not-for-Profit Four-Year Institutions, 2014–2023

| Year | Mean (\$) | SD (\$) | Min (\$) | Max (\$) |
|------|-----------|---------|----------|----------|
| 2014 | 29,327 | 8,968 | 2,425 | 49,138 |
| 2015 | 30,255 | 9,392 | 2,475 | 51,008 |
| 2016 | 31,323 | 9,737 | 2,525 | 53,000 |
| 2017 | 32,461 | 10,084 | 2,525 | 55,056 |
| 2018 | 33,527 | 10,441 | 2,675 | 57,208 |
| 2019 | 34,483 | 10,915 | 2,900 | 59,430 |
| 2020 | 35,485 | 11,343 | 2,900 | 61,788 |
| 2021 | 36,361 | 11,711 | 3,015 | 61,671 |
| 2022 | 37,042 | 12,094 | 5,015 | 66,064 |
| 2023 | 38,222 | 12,565 | 5,930 | 68,365 |

Note. Values represent published in-state tuition and fees in nominal dollars as reported to IPEDS. SD = standard deviation.

The descriptive analysis of published tuition and fees in nominal dollars demonstrated a consistent upward trajectory across the ten-year period from 2014 to 2023. These nominal values reflected the sticker prices charged by institutions without accounting for broader economic

conditions, and they served as the baseline against which discounting and revenue outcomes were measured. However, because nominal figures did not capture changes in purchasing power or the inflationary environment faced by consumers and institutions themselves, the next step in the analysis adjusted tuition and fee prices for inflation using both the Consumer Price Index (CPI) and the Higher Education Price Index (HEPI). This dual adjustment provided a more comprehensive understanding of tuition and fee pricing trends, allowing comparisons of affordability from the consumer or student perspective (CPI) and cost sustainability and pressures from the institutional perspective (HEPI). To ensure consistent comparability of tuition prices over time, both the Consumer Price Index (CPI) and the Higher Education Price Index (HEPI) were rebased to constant 2023 dollars. This process involved dividing each year's published index value by the 2023 index value and multiplying by 100, so that the base year (2023) equaled 100. For example, the CPI value in 2014 was 239.40, while the 2023 value was 305.30. Dividing 239.40 by 305.30 and multiplying by 100 yielded a rebased index of 78.4 for 2014. The same procedure was applied to the HEPI, with its 2014 value of 306.70 divided by the 2023 value of 396.20, producing a rebased index of 77.4. This rebasing allowed tuition figures to be adjusted consistently into constant 2023 dollars, enabling meaningful interpretation of trends in real terms from both the student affordability perspective (CPI) and the institutional cost perspective (HEPI). When adjusted for inflation, (see Table 7) the decade-long increases in published tuition appeared much more modest. CPI-adjusted tuition rose only 2 percent from 2014 to 2023, while HEPI-adjusted tuition increased less than 1 percent over the same period. These results suggested that while nominal sticker prices grew by nearly 30 percent, real tuition growth relative to household purchasing power (CPI) and institutional costs (HEPI) were effectively flat. In other words, the apparent rise in tuition was largely a reflection of broader inflationary pressures rather than substantial increases in the real cost of attendance. This is

important to note especially considering the narrative surround price sensitivities in higher education.

Table 7

Average Published Tuition and Fees in Nominal and Constant 2023 Dollars (Private, Not-for-Profit, Four-Year Institutions, 2014–2023)

| Year | Nominal Mean Tuition | CPI Adjusted (2023) | HEPI Adjusted (2023) |
|------|-------------------------|------------------------|-------------------------|
| 2014 | 29,327 | 37,407 | 37,890 |
| 2015 | 30,255 | 38,297 | 38,297 |
| 2016 | 31,323 | 39,400 | 39,056 |
| 2017 | 32,461 | 40,075 | 39,252 |
| 2018 | 33,527 | 40,492 | 39,537 |
| 2019 | 34,483 | 40,808 | 39,499 |
| 2020 | 35,485 | 41,310 | 39,826 |
| 2021 | 36,361 | 41,413 | 39,739 |
| 2022 | 37,042 | 39,365 | 38,505 |
| 2023 | 38,222 | 38,222 | 38,222 |

Note. Nominal mean tuition values represent published sticker prices as reported to IPEDS. CPI-adjusted and HEPI-adjusted figures express tuition in constant 2023 dollars, with indices rebased so that 2023 = 100. CPI reflects the consumer price index (All Items, CPI-U) and represents household purchasing power. HEPI reflects the Higher Education Price Index and represents institutional cost pressures.

Since institutional scale influences tuition pricing strategies, published tuition and fees were analyzed across three enrollment size categories: small (<2,500), medium (2,500–9,999), and large (\geq 10,000). As shown in Table 8, average published tuition and fees generally increased with enrollment size. Small institutions reported the lowest mean tuition and fee prices (M = \$30,810, SD = \$9,997), with values ranging from \$2,425 to \$68,365. Medium institutions reported higher tuition levels (M = \$34,992, SD = \$9,836), with a similar range (\$6,300 to \$64,322). Large institutions reported the highest mean tuition (M = \$43,947, SD = \$14,290), though variability was also greater, with tuition ranging from \$4,850 to \$66,139. These results indicated a positive association between institutional size and tuition levels, with larger institutions tending to charge higher sticker prices. However, the spread within each group, particularly among the largest institutions, highlighted the diversity of pricing strategies across the private, not-for-profit sector. Because these results were reported in nominal dollars, they provided a straightforward comparison of published sticker prices across institutions of different enrollment sizes.

Table 8

Published In-State Tuition and Required Fees by Institutional Enrollment Size Category

| Enrollment Size Category | N | Mean (\$) | Median (\$) | SD (\$) | Min (\$) | Max (\$) |
|--------------------------|-------|-----------|-------------|---------|----------|----------|
| Small (< 2,500) | 3,040 | 30,810 | 30,110 | 9,997 | 2,425 | 68,365 |
| Medium (2,500–9,999) | 2,577 | 34,992 | 34,504 | 9,836 | 6,300 | 64,322 |
| Large (10,000+) | 623 | 43,947 | 47,436 | 14,290 | 4,850 | 66,139 |

Institutional financial capacity, as represented by endowment assets per FTE, also displayed a strong relationship with tuition pricing. Institutions were grouped into tertiles, based on endowment assets per FTE. As shown in Table 9, average tuition increased consistently across these groups. Institutions in the lowest endowment group reported the lowest mean tuition (M = \$27,418, SD = \$8,588), with values ranging from \$5,150 to \$58,965. The middle group reported higher tuition levels (M = \$33,154, SD = \$9,307), with a comparable range (\$4,850 to \$63,142). Institutions in the highest endowment group reported the highest mean tuition (M = \$40,971, SD = \$10,944), spanning from \$2,425 to \$68,365. These results indicated a clear positive association between institutional wealth and tuition pricing. Wealthier institutions tended to charge higher sticker prices, reflecting both market positioning and their ability to leverage financial resources. However, the wide spread of tuition values within each group demonstrated that endowment strength alone did not fully determine pricing strategy, as mission, selectivity, and competition also shaped tuition levels. Because these results are reported in nominal dollars, they provided a straightforward comparison of tuition levels across institutions with varying financial resources.

Table 9

Published In-State Tuition and Required Fees by Endowment per FTE Category

| Endowment per FTE Category | N | Mean (\$) | Median (\$) | SD (\$) | Min (\$) | Max (\$) |
|-------------------------------|-------|-----------|-------------|---------|----------|----------|
| Low (Tertile 1) | 2,079 | 27,418 | 27,660 | 8,588 | 5,150 | 58,965 |
| Medium (Tertile 2) | 2,081 | 33,154 | 32,420 | 9,307 | 4,850 | 63,142 |
| High (Tertile 3) | 2,080 | 40,971 | 41,453 | 10,944 | 2,425 | 68,365 |

The descriptive analyses of published tuition and fees demonstrated both the steady increase in sticker prices over the past decade and the ways in which pricing varied across institutional characteristics such as enrollment size and endowment stature. While larger and wealthier institutions generally had higher tuition levels, substantial variability within each category underscored the heterogeneity of pricing strategies across the private, not-for-profit sector. Interestingly, when adjusted for inflation, the overall increase in tuition and required fees was much smaller than anticipated, especially considering the narrative surround pricing in higher education, suggesting that the real growth in college costs has been more moderate than nominal figures alone would indicate. These findings provided the necessary baseline for interpreting subsequent analyses of tuition discounting, enrollment, and net tuition revenue.

Tuition discount rates.

Following the examination of published tuition and fee prices, the analysis then turned to tuition discount rates, which represented the proportion of institutional aid relative to tuition and fee revenue. Tuition discounting was central to understanding the financial dynamics of private, not-for-profit, four-year institutions, as it directly influenced both student affordability and institutional revenue. By reducing the effective price paid by students, discount rates shaped enrollment decisions and, in turn, determined the extent to which increases in published tuition translated into realized net tuition revenue. Descriptive statistics for tuition discount rates highlighted the distribution of discounting practices across institutions and the changes observed between 2014 and 2023. Across all institutions and years ($N = 6,240$), the average tuition discount rate was 0.392 (39.2%) with a standard deviation of 0.131 (13.1 percentage points). Discount rates ranged from a low of 0.012 (1.2%) to a high of 0.924 (92.4%), reflecting the wide variation in institutional discounting practices. This range indicated that while some institutions

offered minimal institutional aid relative to sticker price, others heavily discounted tuition, up to nearly the full published amount. The sizable standard deviation further highlighted the diversity of discounting strategies across the private, not-for-profit sector. As shown in Table 10, tuition discount rates increased steadily over the 2014 - 2023 period. The average institutional discount rate rose from 34.98 percent in 2014 to 43.59 percent in 2023, reflecting a nearly nine percent increase across the decade. Standard deviations also grew modestly, from 11.9 percent in 2014 to 13.6 percent in 2023, suggesting greater variability in discounting practices among institutions. While some institutions offered minimal institutional aid relative to published tuition, others discounted aggressively, in some cases exceeding 80 percent. The consistent upward trajectory highlighted the growing reliance of private, not-for-profit, four-year institutions on tuition discounting as a central enrollment and pricing strategy.

Table 10

Average Tuition Discount Rates, Private Not-for-Profit Four-Year Institutions, 2014–2023

| Year | Mean Discount Rate (%) | Std. Deviation (%) | Minimum (%) | Maximum (%) |
|------|------------------------|--------------------|-------------|-------------|
| 2014 | 34.98 | 11.95 | 1.20 | 92.40 |
| 2015 | 35.78 | 12.11 | 2.00 | 84.90 |
| 2016 | 36.73 | 12.24 | 2.10 | 79.20 |
| 2017 | 37.63 | 12.43 | 2.50 | 74.20 |
| 2018 | 38.73 | 12.70 | 2.80 | 74.00 |
| 2019 | 39.72 | 12.94 | 3.00 | 76.10 |
| 2020 | 40.66 | 12.98 | 2.60 | 76.90 |

| | | | | |
|------|-------|-------|------|-------|
| 2021 | 41.79 | 13.24 | 3.20 | 77.60 |
| 2022 | 42.72 | 13.50 | 1.50 | 82.10 |
| 2023 | 43.59 | 13.62 | 1.20 | 81.50 |

When analyzed by institutional enrollment size, see Table 11, notable differences in tuition discounting practices emerged. Small institutions (2,499 or fewer students) reported the highest average discount rates, with a mean of 42.7 percent (SD = 14.1), and exhibited the greatest variability, ranging from 1.2 percent to more than 92 percent. Medium-sized institutions (2,500 to 9,999 students) had a lower mean discount rate of 36.9 percent (SD = 10.8), while large institutions (10,000 students and greater) reported the lowest discounting on average at 32.1 percent (SD = 11.5). These results suggested that smaller institutions were more likely to rely heavily on tuition discounting as a competitive enrollment strategy, whereas larger institutions tended to maintain lower discount rates, reflecting their ability to sustain enrollment demand with less institutional aid. The wider range observed among small institutions also indicated more diverse pricing and aid strategies within that group.

Table 11

Average Tuition Discount Rates by Institutional Enrollment Size, Private Not-for-Profit Four-Year Institutions, 2014–2023

| Enrollment Size Category | Mean Discount Rate (%) | Std. Deviation (%) | Minimum (%) | Maximum (%) |
|-----------------------------|------------------------------|-----------------------|-------------|-------------|
| Small (< 2,500) | 42.70 | 14.10 | 1.20 | 92.40 |

| | | | | |
|----------------------|-------|-------|------|-------|
| Medium (2,500–9,999) | 36.90 | 10.80 | 3.50 | 76.10 |
| Large (10,000+) | 32.10 | 11.50 | 2.70 | 62.00 |

When examined by endowment per FTE, tuition discounting patterns revealed a clear gradient across institutional resource levels. As expected, institutions with smaller endowments reported the lowest average discount rates ($M = 33.2\%$, $SD = 12.8$), with rates ranging from 1.2% to 73.9%. Medium sized endowment institutions averaged 39.6% ($SD = 11.3$), while large endowment institutions reported the highest discount rates on average at 44.9% ($SD = 12.4$). These findings suggested that institutions with greater financial resources were able to employ more aggressive discounting strategies, likely through the use of funded scholarships supported by endowment income. By contrast, resource-constrained institutions appeared more limited in their ability to extend aid, which may constrain enrollment management options and reduce the capability to increase net tuition revenue.

Table 12

Average Tuition Discount Rates by Endowment per FTE Category, Private Not-for-Profit Four-Year Institutions, 2014–2023

| Endowment per FTE Category | Mean Discount Rate (%) | Std. Deviation (%) | Minimum (%) | Maximum (%) |
|----------------------------|------------------------|--------------------|-------------|-------------|
| Low (Tertile 1) | 33.20 | 12.80 | 1.20 | 73.90 |
| Medium (Tertile 2) | 39.60 | 11.30 | 2.30 | 81.50 |
| High (Tertile 3) | 44.90 | 12.40 | 1.20 | 92.40 |

The descriptive analysis of tuition discount rates revealed a steady and substantial upward trend across the 2014 - 2023 period, with the average rate rising from approximately 35 percent to nearly 44 percent. Smaller institutions consistently reported the highest discount rates, while larger institutions maintained lower averages, underscoring the role of institutional size in shaping pricing strategies. Similarly, discounting patterns varied by endowment resources, with well-resourced institutions able to extend the deepest discounts, often through funded aid supported by endowment income. The combination of rising discount rates over time, higher averages among smaller and better endowed institutions, and wide variation across the sector highlighted both the increasing reliance on tuition discounting and the diverse approaches institutions employed to balance enrollment management with financial sustainability.

Addressing research question one.

The first research question asked: What are the trends in tuition prices and tuition discount rates for private, not-for-profit, four-year institutions? Results from the descriptive analyses demonstrated that tuition prices rose consistently in nominal terms across the 2014 - 2023 period, with mean published tuition increasing by nearly 30 percent, from \$29,327 to \$38,222. However, once adjusted for inflation using both the Consumer Price Index (CPI) and the Higher Education Price Index (HEPI), the apparent growth largely disappeared. CPI-adjusted tuition rose by only 2 percent, while HEPI-adjusted tuition increased by less than 1 percent over the decade. These results suggested that, although sticker prices rose steadily, real tuition costs relative to household purchasing power and institutional costs remained essentially flat. In contrast, tuition discount rates exhibited a substantial upward trajectory. The average discount rate increased from 34.98 percent in 2014 to 43.59 percent in 2023, reflecting a nearly nine-percentage-point increase. Moreover, variability among institutions also widened, with some

institutions discounting minimally and others providing discounts exceeding 80 percent or more of published tuition and fees. Control group analyses revealed that smaller institutions and institutions with greater endowment resources reported the highest discount rates, underscoring the importance of institutional characteristics in shaping pricing strategies. The results indicated that private, not-for-profit, four-year institutions relied increasingly on tuition discounting to manage enrollment, attempt to generate necessary net tuition revenue, and manage affordability during a period when real tuition prices remained relatively stable. These findings will be discussed in greater detail in the following chapter, but they provide important context for the subsequent research questions and inferential analysis, which examine how discounting strategies affect enrollment and net tuition revenue outcomes.

Enrollment.

While some enrollment descriptives were previously reported in the institutional classification section to illustrate differences by enrollment size categories, this section examined longitudinal trends in enrollment across the 2014 - 2023 period. Tracking enrollment over time provided critical context for understanding the dynamics of tuition pricing and the effects of tuition discounting, as shifts in student demand directly affect institutional revenue and financial sustainability. By presenting year-by-year enrollment descriptives, this analysis highlighted overall sector trends and sets the stage for subsequent inferential tests of the relationship between discounting strategies, enrollment outcomes, and net tuition revenue.

Table 13

Descriptive Statistics for Institutional Enrollment by Year, 2014–2023

| Year | Mean | Median | Std. Deviation | Min | Max |
|------|-------|--------|----------------|-----|---------|
| 2014 | 4,468 | 2,651 | 5,986 | 168 | 77,338 |
| 2015 | 4,501 | 3,071 | 6,433 | 174 | 81,493 |
| 2016 | 4,586 | 3,690 | 6,554 | 174 | 80,404 |
| 2017 | 4,590 | 3,651 | 6,660 | 173 | 75,583 |
| 2018 | 4,618 | 3,694 | 7,017 | 171 | 90,705 |
| 2019 | 4,651 | 3,802 | 7,426 | 171 | 104,608 |
| 2020 | 4,666 | 3,554 | 7,787 | 173 | 113,341 |
| 2021 | 4,638 | 3,239 | 8,381 | 173 | 134,427 |
| 2022 | 4,700 | 3,461 | 8,904 | 175 | 145,523 |
| 2023 | 4,694 | 3,411 | 9,451 | 163 | 164,091 |

Note. Values represent institution-year observations ($N \approx 624$ per year).

Across the 2014 - 2023 period, average institutional enrollments remained relatively stable, increasing slightly from 4,468 students in 2014 to 4,694 students in 2023 (see Table 13). The mean enrollment fluctuated only modestly from year to year, reflecting the overall sector's slow-moving enrollment dynamics. Median enrollment followed a similar pattern, rising from 2,651 students in 2014 to 3,411 in 2023, which suggested incremental growth among typical institutions. However, standard deviations widened over time, growing from approximately 5,986 in 2014 to more than 9,451 by 2023. This pattern indicated that while the average institution experienced only modest change, the gap between the smallest and largest institutions increased considerably, with maximum enrollments expanding from 77,338 students in 2014 to more than 164,000 students in 2023. These results underscored the heterogeneity of the private,

not-for-profit, four-year sector, where a small number of very large universities skewed overall averages upward while the majority of institutions remained far smaller. As reported in the institutional classification section, enrollment distributions also varied substantially by institutional size and endowment per FTE. Smaller institutions consistently enrolled fewer than 2,500 students on average, while larger institutions enrolled more than 20,000 students, with endowment resources similarly stratifying institutional capacity. These structural differences, reported earlier, provided essential context for interpreting the overall trends observed here and were incorporated as control variables in the inferential analyses that follow. Taken together, these longitudinal descriptives showed that while average enrollment among private, not-for-profit, four-year institutions remained relatively stable from 2014 to 2023, the sector experienced growing variability, with a widening gap between small institutions and a handful of very large universities. These dynamics underscored the importance of accounting for institutional size and endowment capacity in subsequent analyses of tuition discounting, enrollment, and net tuition revenue.

Net tuition revenue (NTR).

Net tuition revenue (NTR) represented the realized tuition and fee income after accounting for institutional grants and discounts. As such, it served as a central indicator of institutional financial sustainability and the effectiveness of tuition discounting strategies. This section presents descriptive statistics for NTR across the 2014 - 2023 period. These descriptives provided essential context for subsequent inferential analyses of the relationship between tuition discounting, enrollment, and NTR.

Table 14

Descriptive Statistics for Net Tuition Revenue, Private Not-for-Profit Four-Year Institutions, 2014–2023

| Year | Mean NTR (\$) | Median (\$) | Std. Deviation (\$) | Minimum (\$) | Maximum (\$) |
|------|---------------|-------------|---------------------|--------------|---------------|
| 2014 | 81,442,783 | 37,070,601 | 138,460,022 | 687,015 | 1,550,000,000 |
| 2015 | 84,294,284 | 38,261,046 | 145,229,421 | 741,078 | 1,600,000,000 |
| 2016 | 86,855,935 | 39,591,802 | 152,127,237 | 731,870 | 1,660,000,000 |
| 2017 | 89,329,219 | 39,757,044 | 159,718,819 | 725,905 | 1,750,000,000 |
| 2018 | 92,073,820 | 40,492,169 | 169,032,388 | 741,674 | 1,850,000,000 |
| 2019 | 95,466,886 | 40,039,217 | 180,046,876 | 748,054 | 2,020,000,000 |
| 2020 | 97,442,941 | 39,789,865 | 186,080,579 | 745,421 | 2,110,000,000 |
| 2021 | 95,122,486 | 38,171,404 | 183,671,965 | 607,987 | 2,110,000,000 |
| 2022 | 100,713,226 | 37,334,507 | 208,803,776 | 998,712 | 2,450,000,000 |
| 2023 | 102,798,264 | 36,200,550 | 216,319,960 | 649,323 | 2,510,000,000 |

Descriptive statistics for net tuition revenue (NTR) are presented in Table 14. Mean NTR increased steadily from approximately \$81.4 million in 2014 to \$102.8 million in 2023.

However, median values were consistently far lower, ranging from \$37.1 million in 2014 to \$36.2 million in 2023, indicating substantial positive skew caused by a relatively small number of very large institutions. This skewness was further reflected in the large standard deviations, which expanded from \$138 million in 2014 to more than \$216 million in 2023, as well as in the maximum values reported, which rose from \$1.55 billion in 2014 to \$2.51 billion in 2023.

Meanwhile, minimum reported values remained under \$1 million throughout the study period,

illustrating the vast disparities in tuition revenue among private, not-for-profit four-year institutions. These findings highlighted both the sector’s growth in aggregate revenue and the extreme heterogeneity across institutions, reinforcing the importance of controlling for institutional size and endowment capacity in subsequent analyses.

Table 15

Descriptive Statistics for Net Tuition Revenue by Institutional Enrollment Size, 2014–2023

| Enrollment Size Category | Mean NTR (\$) | Median (\$) | Std. Deviation (\$) | Minimum (\$) | Maximum (\$) |
|-----------------------------|------------------|-------------|------------------------|-----------------|---------------|
| Small (< 2,500) | 21,150,151 | 17,576,787 | 14,241,355 | 607,987 | 111,000,000 |
| Medium (2,500–9,999) | 83,546,091 | 61,563,524 | 58,072,989 | 10,100,000 | 353,000,000 |
| Large (10,000+) | 478,237,765 | 380,212,000 | 346,984,206 | 43,500,000 | 2,510,000,000 |

Descriptive statistics for net tuition revenue (NTR) by enrollment size are presented in Table 15. Institutions classified as small (fewer than 2,500 students) reported an average NTR of approximately \$21.2 million, with a median of \$17.6 million. Medium-sized institutions (2,500–9,999 students) reported a substantially higher average of \$83.5 million, though the median was lower at \$61.6 million, reflecting skewness within the group. Large institutions (10,000 students or more) demonstrated the highest NTR values by far, with a mean of \$478.2 million and a median of \$380.2 million. The range of values within this category was also the widest, from \$43.5 million to over \$2.5 billion. Across all three categories, the disparity between mean and

median values, combined with large standard deviations, indicates highly skewed distributions driven by a small number of institutions with exceptionally high net tuition revenue.

Table 16

Descriptive Statistics for Net Tuition Revenue by Endowment per FTE Tertile, 2014–2023

| Endowment per FTE Category | Mean NTR (\$) | Median (\$) | Std. Deviation (\$) | Min (\$) | Max (\$) |
|----------------------------------|---------------|-------------|---------------------|-----------|---------------|
| Low (Tertile 1) | 68,404,274 | 31,574,051 | 122,772,654 | 1,460,000 | 1,230,000,000 |
| Medium (Tertile 2) | 96,721,915 | 38,749,940 | 208,381,159 | 1,500,000 | 2,510,000,000 |
| High (Tertile 3) | 112,522,150 | 48,459,757 | 181,984,804 | 607,987 | 1,740,000,000 |

Descriptive statistics for net tuition revenue (NTR) by endowment per FTE tertile are reported in Table 16. Institutions in the lowest tertile reported an average NTR of \$68.4 million, with a median of \$31.6 million. The middle tertile demonstrated higher averages (\$96.7 million) and a median of \$38.7 million, though the wide standard deviation (\$208.4 million) highlighted the presence of extreme cases. Institutions in the highest tertile reported the greatest mean NTR (\$112.5 million) and median (\$48.5 million), reflecting their larger financial capacity. Across all tertiles, substantial variability and positive skewness were observed, indicating that a relatively small number of highly resourced institutions disproportionately drive group means. These

results underscored the significant influence of financial capacity from endowments on net tuition revenue.

Funded vs. unfunded institutional aid.

In addition to tuition pricing, discount rates, enrollment trends, and net tuition revenue, the study examined the distribution of institutional aid between funded and unfunded sources. This distinction was critical for understanding institutional financial sustainability. Funded aid referred to awards supported by permanent sources such as endowment income or designated restricted gifts, while unfunded aid represented grants drawn from an institution’s operating budget. Whereas funded aid leverages long-term assets, unfunded aid directly reduces gross tuition revenue and places ongoing pressure on operating revenues.

Table 17

Average Institutional Grants (Funded vs. Unfunded), 2014–2023 (Nominal \$)

| Year | Funded Aid Mean (\$) | Unfunded Aid Mean (\$) |
|------|----------------------|------------------------|
| 2014 | 5,851,018 | 34,327,415 |
| 2015 | 6,182,324 | 36,385,256 |
| 2016 | 6,534,826 | 38,622,364 |
| 2017 | 6,874,471 | 41,121,407 |
| 2018 | 7,474,916 | 43,768,195 |
| 2019 | 7,466,501 | 47,018,983 |
| 2020 | 7,753,663 | 49,527,558 |
| 2021 | 8,218,996 | 50,574,542 |

| | | |
|------|-----------|------------|
| 2022 | 8,771,565 | 53,827,088 |
| 2023 | 9,585,780 | 55,796,140 |

Note. Values represent mean annual institutional aid reported to IPEDS by private, not-for-profit four-year institutions. Funded aid refers to grants supported by restricted or endowed sources; unfunded aid refers to grants drawn from institutional operating budgets.

Across the 2014 - 2023 period, private, not-for-profit institutions consistently awarded far more in unfunded aid than in funded aid (see Table 17). On average, unfunded grants exceeded funded grants by more than fivefold each year, highlighting the extent to which institutions relied on discounting via their operating budgets rather than from endowed or restricted sources to support tuition discounting. In 2014, institutions awarded an average of \$34.3 million in unfunded aid compared to just \$5.9 million in funded aid. Both categories increased over the decade, though unfunded aid grew more rapidly in absolute terms. By 2023, average unfunded aid had risen to \$55.8 million, a gain of more than \$21 million over the period, while funded aid increased to \$9.6 million, reflecting a growth of less than \$4 million. This widening underscored the sector's increasing dependence on unfunded aid to remain competitive in the student market. The steady rise in unfunded aid indicated that institutions continue to absorb significant tuition revenue losses in order to sustain enrollment. Meanwhile, the comparatively modest growth of funded aid demonstrated that most institutions lack the endowed resources needed to shift a larger portion of their discounting strategies to more permanent funding streams. Although some institutions with robust endowments were able to fund larger proportions of their institutional grants, the typical private, not-for-profit institution remained heavily reliant primarily on unfunded aid. These findings highlighted a structural imbalance: while both funded and

unfunded aid increased over the decade, unfunded aid remained the dominant form of institutional grantmaking. This reliance places continued strain on operating budgets and underscores the financial vulnerability of institutions that must use tuition revenue itself to finance large proportions of their tuition discounting strategies.

When institutional aid was examined by enrollment size (see Table 18), clear differences emerged in both the dollar amounts awarded and the proportions funded versus unfunded. Small institutions awarded an average of \$14.9 million in unfunded aid and \$2.2 million in funded aid annually, with funded aid comprising about 14 percent of their total institutional grants. Medium-sized institutions awarded higher overall aid, averaging \$44.2 million in unfunded aid and \$5.4 million in funded aid, yet their funded share was lower at just over 9 percent. Large institutions reported the greatest averages by a wide margin, with \$196.2 million in unfunded aid and \$41.9 million in funded aid annually. Despite their scale, large institutions also showed a higher funded share (nearly 15 percent), suggesting greater capacity to leverage endowed or restricted sources relative to smaller peers.

Table 18

Average Institutional Aid by Enrollment Size (2014–2023)

| Enrollment Size Category | Unfunded Aid Mean (\$) | Funded Aid Mean (\$) | Percent Funded Aid (%) |
|-----------------------------|------------------------|----------------------|------------------------|
| Small (< 2,500) | 14,938,958 | 2,161,916 | 14.3 |
| Medium (2,500–9,999) | 44,151,595 | 5,422,826 | 9.3 |
| Large (10,000+) | 196,166,181 | 41,853,494 | 14.9 |

Note. Values represent institutional averages across 2014–2023. Percentages reflect the mean share of institutional aid reported as funded versus unfunded in IPEDS.

When institutions were examined by endowment per FTE (see Table 19), clear gradients emerged in both the scale of aid awarded and the proportion supported by funded sources. Institutions in the lowest tertile averaged \$27.8 million in unfunded aid and just \$1.7 million in funded aid annually, with funded aid representing only about 9 percent of the total. Medium-tertile institutions awarded larger sums overall, averaging \$46.5 million unfunded and \$4.4 million funded, though the proportion of funded aid rose only modestly to just over 10 percent. In contrast, institutions in the highest endowment tertile demonstrated both the largest absolute aid amounts and the greatest relative share of funded aid. These institutions awarded an average of \$60.9 million in unfunded aid and \$16.3 million in funded aid, with funded aid comprising more than 17 percent of the total. This suggested that institutions with stronger resource bases not only provided larger overall levels of aid but also allocated a significantly higher share from endowed or restricted sources, reducing reliance on operating budgets. Together, these results underscored the role of institutional wealth in shaping tuition discounting strategies. While all institutions remained heavily reliant on utilizing unfunded aid, those with significant endowment resources were better positioned to leverage permanent funding streams, thereby easing pressure on operating revenues.

Table 19

Average Institutional Aid by Endowment Category (2014–2023)

| Endowment per FTE Category | Unfunded Aid Mean (\$) | Funded Aid Mean (\$) | Percent Funded Aid |
|----------------------------|------------------------|----------------------|--------------------|
| Low (Tertile 1) | 27,832,909 | 1,714,882 | 9.1 |
| Medium (Tertile 2) | 46,511,450 | 4,412,718 | 10.3 |
| High (Tertile 3) | 60,937,345 | 16,285,320 | 17.5 |

Note. Values represent institutional averages across 2014–2023. Endowment categories reflect tertiles of endowment per full-time equivalent student. Percentages reflect the mean share of institutional aid reported as funded versus unfunded in IPEDS.

Altogether, the descriptive results portrayed a sector that was heterogeneous in both institutional size and financial capacity. The sample consisted of 624 private, not-for-profit, four-year institutions observed annually from 2014 to 2023 (6,240 institution-year cases). The distribution was weighted toward smaller institutions, and endowment resources per FTE were highly skewed, with a small number of outliers at the upper end. Published tuition and fees increased steadily in nominal terms across the decade; however, after adjusting to constant 2023 dollars using CPI and HEPI, the apparent growth largely dissipated, indicating that most sticker-price increases tracked general inflation rather than substantive real gains. In contrast, tuition discount rates rose meaningfully over the period, with averages increasing from roughly 35 percent to nearly 44 percent and variability widening across institutions. Consistent control group patterns emerged: smaller institutions and those with higher endowment resources reported the deepest discounts. Enrollment levels were relatively stable on average, but dispersion increased over time, means remained above medians and maxima expanded, suggesting that a small number of very large institutions continue to pull distributions upward. Net tuition revenue rose in nominal

dollars, yet distributions remained strongly right-skewed, with large gaps between means and medians and growing standard deviations, reinforcing the presence of substantial institution differences. Finally, institutions consistently awarded far more unfunded than funded institutional aid throughout the study period, with funded shares comparatively higher only among the most well-resourced institutions. Collectively, these patterns underscored the necessity of retaining institutional size and endowment per FTE as control variables in the subsequent analyses and provided the empirical context for the inferential procedures that follow. The next section turns to assumption testing prior to examining the relationships among tuition discounting, enrollment, and net tuition revenue.

Assumptions Testing

Prior to conducting the correlational and regression analyses for this study, statistical assumptions were examined to ensure the accuracy and validity of the findings. For Pearson's correlation, assumptions included linearity of relationships, approximate normality of distributions, and homoscedasticity of variance. Multiple regression builds upon these same assumptions and further requires normally distributed residuals, linearity between predictors and the dependent variable, independence of errors, and the absence of multicollinearity among predictors. Although the large sample size ($N = 6,240$) mitigated concerns about minor deviations from normality, it also increased the likelihood that formal normality tests would show statistically significant departures from the assumption, even when such deviations were not practically meaningful. Accordingly, the evaluation of assumptions in this study emphasized both statistical indicators and visual inspection to ensure that any violations did not substantively affect the validity of the analyses.

The variables selected for assumption testing corresponded directly to those used in the inferential analyses addressing Research Questions 2 and 3. Because Research Question 1 was descriptive in nature, focusing on longitudinal trends in tuition prices and discount rates, no assumption testing was required. For Research Question 2, which examined the relationship between tuition discounting, enrollment, and net tuition revenue, the variables included tuition discount rate, total enrollment, percent funded aid, and net tuition revenue (dependent variable). For Research Question 3, which investigated the effects of utilizing funded versus unfunded institutional aid on enrollment and net tuition revenue, the dependent variables were total enrollment and net tuition revenue, while the independent variable represented the proportions of funded and unfunded aid. Limiting the assumption testing to these variables ensured consistency between the statistical models and the research questions.

Assumptions for correlation were evaluated using scatterplots, histograms, Q–Q plots, and the Kolmogorov–Smirnov test. Regression assumption testing included assessments of residual normality, linearity, homoscedasticity, independence of errors, and multicollinearity.

The following section presents the results of these assumption tests prior to reporting the correlation and regression analyses.

Correlation assumptions.

Prior to conducting Pearson’s correlation analysis, the underlying statistical assumptions were examined to ensure the validity of the results. Pearson’s correlation assumes that variables are measured on a continuous scale, that the relationships among variables are approximately linear, that the distributions of variables are reasonably normal, and that the variance of one variable remains relatively constant across the values of the other (homoscedasticity). Because the variables in this study, net tuition revenue, tuition discount rate, total enrollment, and percent

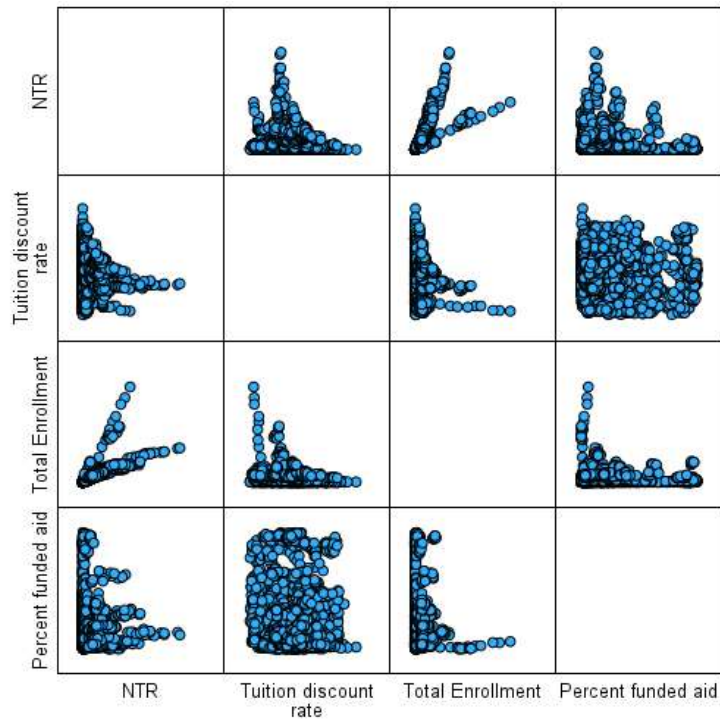
funded aid, were all continuous measures, no further action was required to confirm their scale of measurement. Linearity was assessed through scatterplots of each independent variable against the dependent variable, while approximate normality was evaluated using histograms, Q–Q plots, and the Kolmogorov–Smirnov test. Homoscedasticity was assessed through visual inspection of scatterplots to confirm a consistent spread of residuals across the range of predicted values. These diagnostic checks provided confirmation that the data met the conditions necessary to support the use of Pearson’s correlation in addressing Research Questions 2 and 3.

Linearity.

Pearson’s correlation assumes that the relationships between variables are approximately linear. A matrix of scatterplots was generated to examine the association between net tuition revenue (NTR) and each independent variable. Linearity was examined through a matrix of scatterplots among all continuous variables, including net tuition revenue, tuition discount rate, total enrollment, and percent funded aid. Visual inspection of the scatterplots indicated that the relationships among variables were generally monotonic and approximately linear. The relationship between tuition discount rate and net tuition revenue demonstrated a negative association with a slight curvilinear pattern, reflecting that higher discount rates were associated with lower levels of net tuition revenue. A positive linear trend was observed between total enrollment and net tuition revenue, while the relationships involving percent funded aid appeared weaker and less definite. While a few relationships showed minor curvature, the overall patterns were consistent with the assumption of approximate linearity and were therefore deemed suitable for Pearson’s correlation analysis. A matrix of scatterplots illustrating these relationships is presented in Figure 2.

Figure 2

Scatterplot Matrix of Continuous Variables Assessing the Assumption of Linearity for Pearson's Correlation.



Normality.

Pearson's correlation assumes that the variables included in the analysis are approximately normally distributed. Normality was assessed for each continuous variable, net tuition revenue, tuition discount rate, total enrollment, and percent funded aid, using descriptive statistics, histograms, and the Kolmogorov–Smirnov test. Descriptive statistics for each variable are presented in Table 20, and results of the Kolmogorov–Smirnov tests are summarized in Table 21.

Table 20*Descriptive Statistics for Continuous Variables Used in Pearson's Correlation*

| Variable | Skewness | Kurtosis |
|-----------------------|----------|----------|
| Net Tuition Revenue | 5.298 | 40.182 |
| Tuition Discount Rate | -.106 | 0.278 |
| Total Enrollment | 8.082 | 107.545 |
| Percent Funded Aid | 3.216 | 11.702 |

Table 21*Kolmogorov-Smirnov Test of Normality for Continuous Variables*

| Variable | Statistic | df | Sig. |
|-----------------------|-----------|-------|--------|
| Net Tuition Revenue | 0.3 | 6,240 | < .001 |
| Tuition Discount Rate | 0.017 | 6,240 | < .001 |
| Total Enrollment | 0.276 | 6,240 | < .001 |
| Percent Funded Aid | 0.225 | 6,240 | < .001 |

Visual inspection of the histograms indicated that NTR and total enrollment were both positively skewed, with a small number of institutions reporting substantially higher values than the majority of the sample. These results were consistent with institutional size differences across higher education, where larger universities generated disproportionately higher levels of tuition

revenue and had higher levels of enrollment. Tuition discount rate appeared approximately normally distributed, displaying a bell-shaped curve centered near 40 percent. In contrast, percent funded aid exhibited positive skewness, reflecting that most institutions reported relatively low levels of funded aid while a smaller number reported much higher proportions.

As shown in Table 21, the Kolmogorov–Smirnov test was significant for all variables ($p < .001$). However, given the large sample size ($N = 6,240$), such results were expected, as even minor deviations from normality tend to produce statistically significant findings in large datasets. Because Pearson’s correlation was robust to moderate deviations from normality, the assumption of approximate normality was considered adequately met.

Histograms for each continuous variable are presented in Figures 3 through 6.

Figure 3

Histogram Illustrating the Distribution of Net Tuition Revenue (NTR).

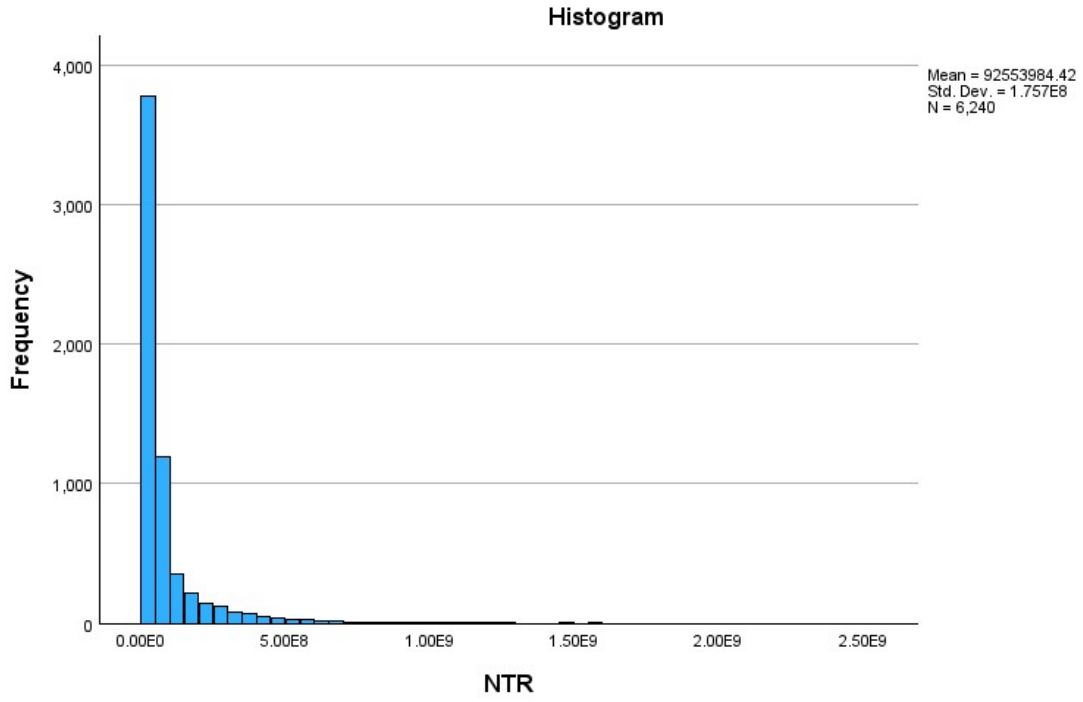


Figure 4

Histogram Illustrating the Distribution of Tuition Discount Rate.

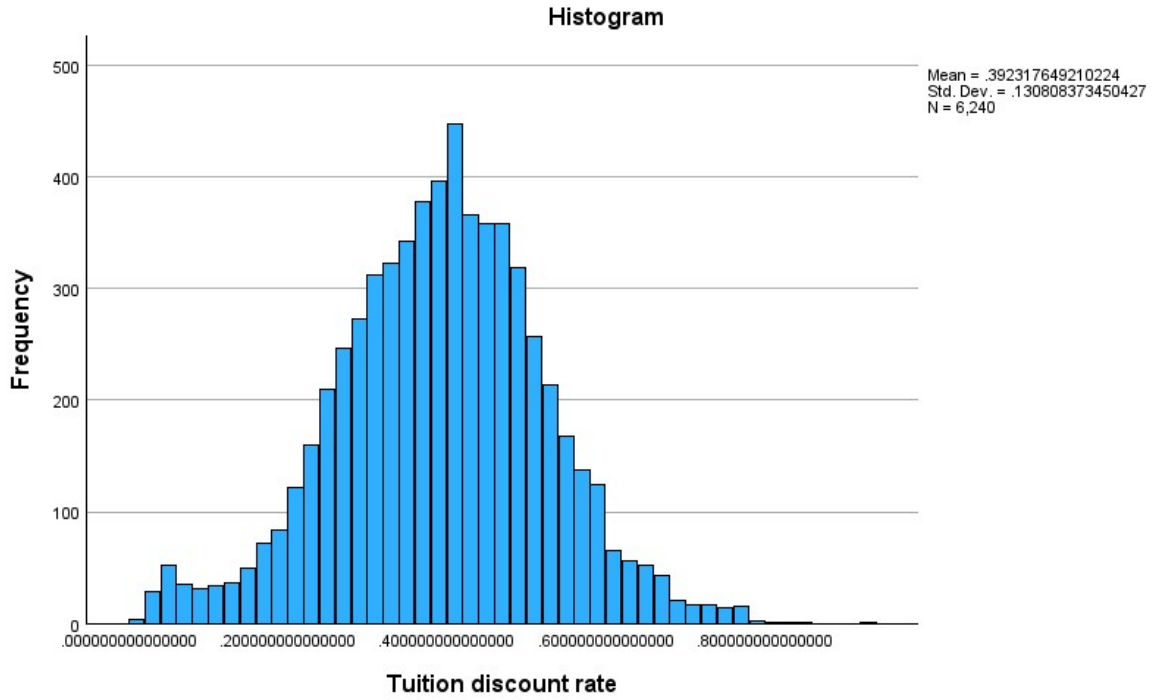


Figure 5

Histogram Illustrating the Distribution of Total Enrollment.

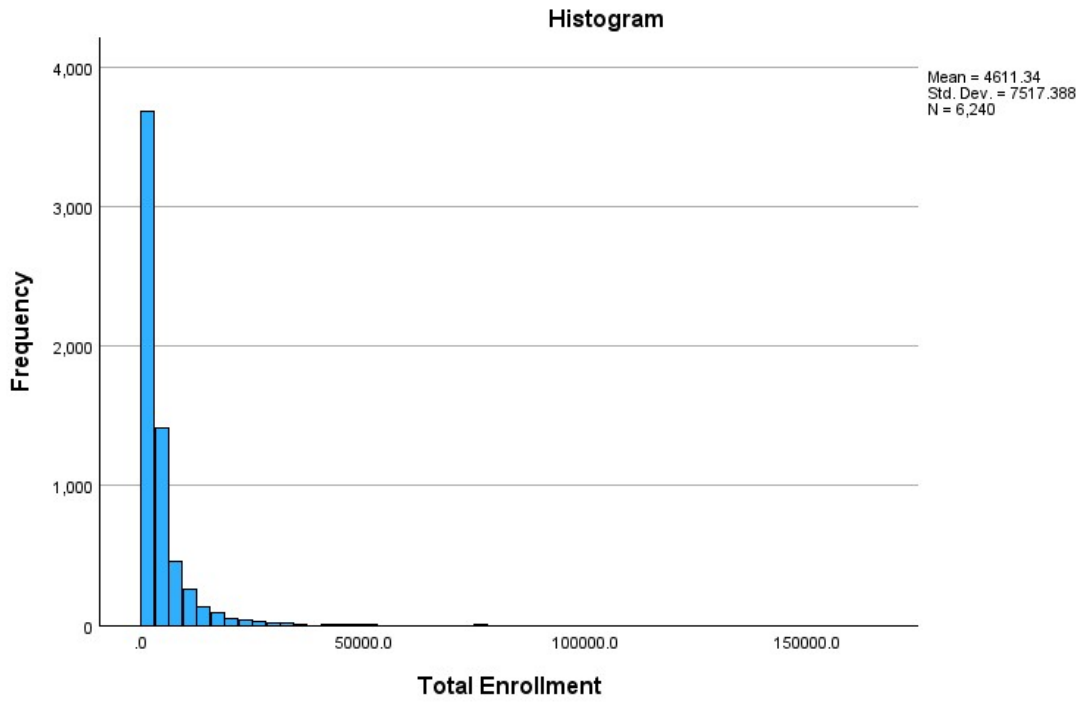
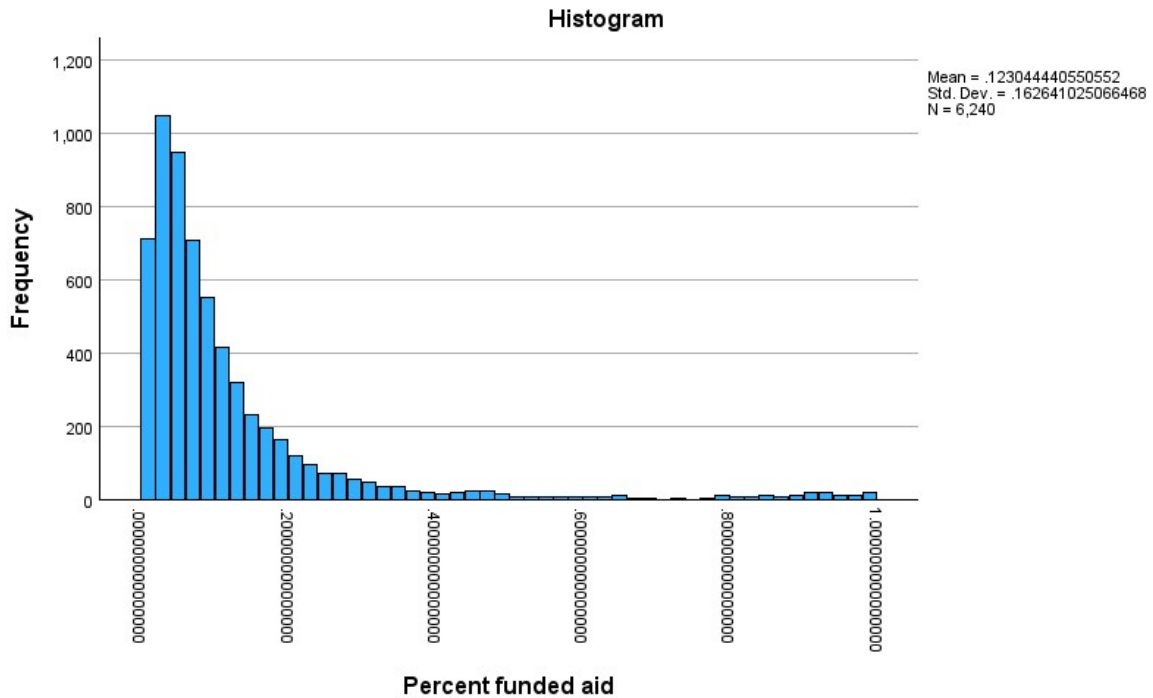


Figure 6

Histogram Illustrating the Distribution of Percent Funded Aid.



Homoscedasticity.

Pearson's correlation assumes that the variance of one variable is approximately constant across the range of the other variable, a condition known as homoscedasticity. This assumption was evaluated through visual inspection of the scatterplot matrix presented in Figure 2, which displays the bivariate relationships among the continuous variables: net tuition revenue (NTR), tuition discount rate, total enrollment, and percent funded aid. Visual examination of the plots indicated that the data points were generally and evenly dispersed across the range of values without clear patterns of funneling or heteroscedasticity. While some uneven clustering was noted in the relationship between tuition discount rate and NTR, particularly at lower discount

levels, the overall spread of data remained fairly consistent across the range of values. The relationships between NTR and total enrollment and between NTR and percent funded aid demonstrated relatively uniform scatter, suggesting no meaningful differences in variability across the range of values. These observations supported the assumption of approximate homoscedasticity, indicating that the variance of one variable remained reasonably constant across the values of the others. The data therefore satisfied the equal variance assumption required for Pearson's correlation analysis.

Regression assumptions.

Prior to conducting the multiple regression analysis, the underlying statistical assumptions were evaluated to ensure the accuracy and validity of the findings. Multiple regression assumes linear relationships between predictors and the dependent variable, independence of errors, normally distributed residuals, homoscedasticity of variance, and absence of multicollinearity among predictors. As with the correlation analyses, these diagnostic checks were conducted to verify that the data met acceptable thresholds for inferential testing.

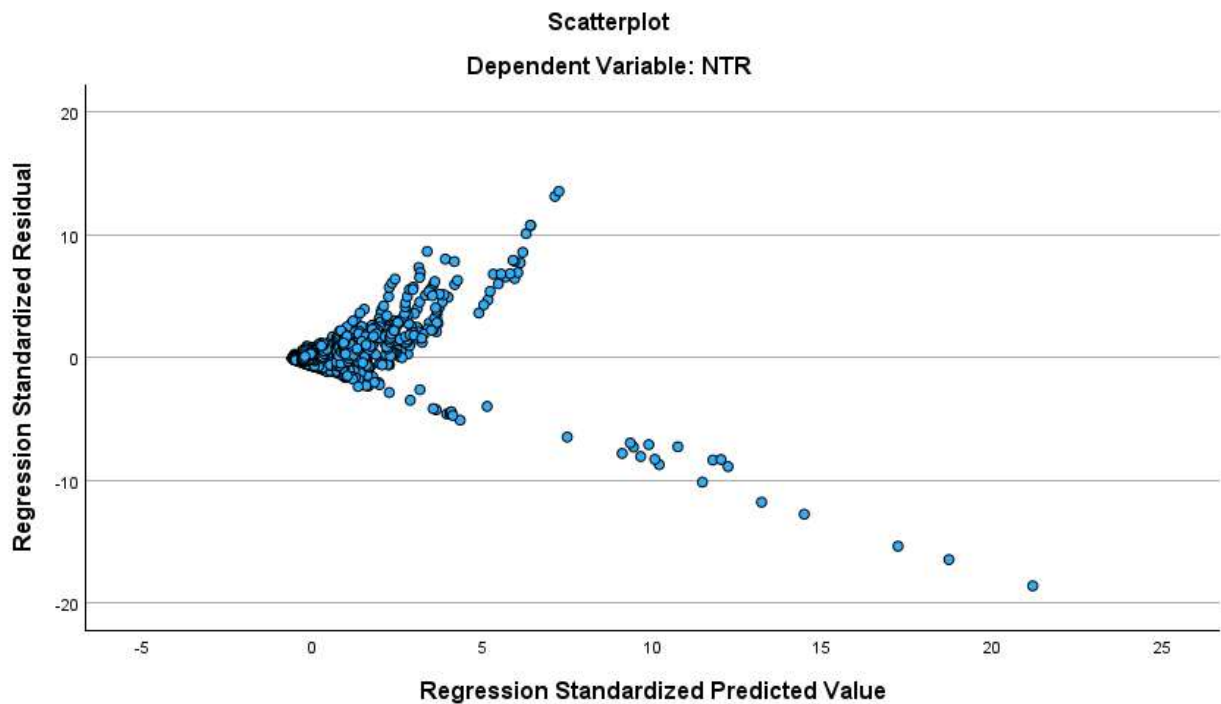
Linearity and homoscedasticity.

The assumptions of linearity and homoscedasticity were examined through a scatterplot of standardized residuals versus standardized predicted values. As shown in Figure 7, the residuals were generally and evenly dispersed around zero without a pronounced curve or systematic pattern, indicating that the relationships between predictors and the dependent variable were approximately linear. While slight funneling was evident, reflecting somewhat greater variability in residuals at higher predicted values, the overall spread remained acceptable. Although mild heteroscedasticity was observed, the large sample size ($N = 6,240$) helped minimize its impact on the validity of the regression results. Therefore, the assumptions of

approximate linearity and homoscedasticity were considered reasonably satisfied for the analysis.

Figure 7

Scatterplot of Standardized Residuals Versus Standardized Predicted Values for the Regression Model Predicting Net Tuition Revenue (NTR).



Normality of residuals.

The normality assumption was assessed using both a histogram and a normal P–P plot of standardized residuals. The histogram (Figure 8) displayed a strong central peak with thin tails, while the P–P plot (Figure 9) showed mild deviation from the diagonal line at both extremes. These patterns suggested slight departures from perfect normality; however, such deviations are not uncommon in large samples and are unlikely to meaningfully affect the validity of regression estimates. The residual statistics further supported these findings, with standardized residuals

ranging from -18.61 to 13.55 ($M = 0.00$, $SD = 1.00$) and residuals centered near zero ($M = 0.00$, $SD = 101,975,737.63$). The residuals were therefore considered to meet the assumption of approximate normality.

Figure 8

Histogram of Standardized Residuals for the Regression Model Predicting Net Tuition Revenue (NTR).

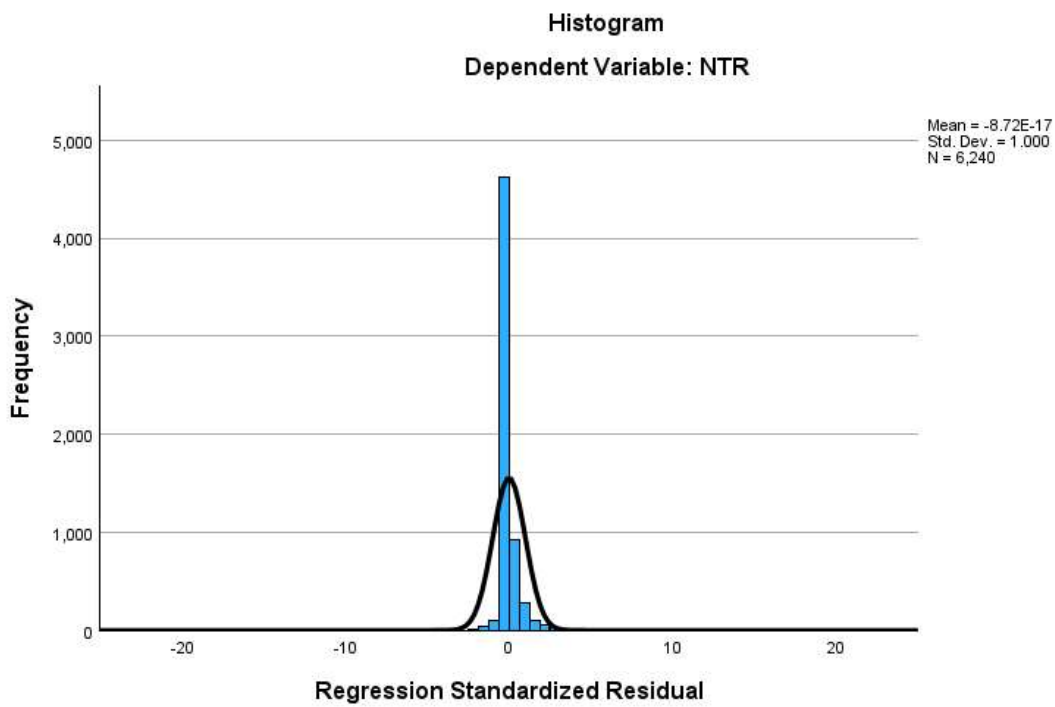
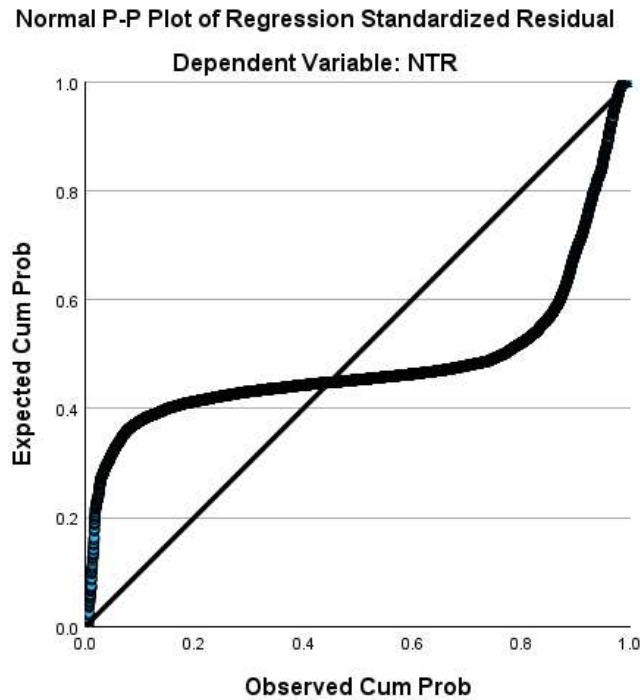


Figure 9

Normal P–P Plot of Standardized Residuals for the Regression Model Predicting Net Tuition Revenue (NTR).



Independence of errors.

The independence of residuals was evaluated using the Durbin–Watson statistic, which yielded a value of 1.14, indicating a mild degree of positive autocorrelation among residuals. This finding was not unexpected given the longitudinal nature of the dataset, which included repeated annual observations for multiple institutions over time. Because the model demonstrated strong explanatory power ($R = .814$, $R^2 = .663$) and consistent parameter estimates, the minor autocorrelation observed was not considered substantial enough to violate the independence assumption or affect the overall validity of the regression results.

Multicollinearity.

Multicollinearity was assessed using Variance Inflation Factor (VIF) and tolerance statistics. All predictors, tuition discount rate, total enrollment, and percent funded aid, demonstrated VIF values below 10 and tolerance values above .10, indicating that the independent variables contributed unique variance to the model. These results confirmed that multicollinearity was not a concern in this analysis.

The diagnostic tests confirmed that the data met the assumptions necessary for multiple regression analysis. Minor deviations from normality, independence, and homoscedasticity were not considered severe enough to compromise the validity of the findings, particularly given the large sample size and robustness of the regression procedure.

Inferential Results

Following the completion of descriptive analyses and assumption testing, inferential procedures were conducted to address research questions 2 and 3. These analyses examined the statistical relationships among tuition discounting, enrollment, and net tuition revenue, and further evaluated the impact of utilizing funded versus unfunded institutional aid on enrollment and net tuition revenue. Pearson's correlation and multiple regression analyses were employed to assess the direction and strength of associations among variables. The following sections present the results of these analyses and their relevance to the study's guiding research questions.

Correlation Results

To address the study's inferential research questions, correlation analyses were conducted to examine the linear relationships among tuition discount rate, total enrollment, net tuition

revenue, and percentage of funded institutional aid utilized across 6,240 institutional-year observations.

Research Question 2: What is the relationship between tuition discounting, enrollment, and net tuition revenue?

Results indicated that tuition discount rate was significantly and negatively correlated with both enrollment ($r = -.238, p < .001$) and net tuition revenue ($r = -.199, p < .001$). These findings suggested that as institutions increased their tuition discount rate, both enrollment and net tuition revenue tended to decline. Although discounting was often implemented to stimulate demand and enhance affordability, these results implied that aggressive discounting may, in practice, reduce the financial return on enrollment and erode net tuition revenue. In contrast, a strong and statistically significant positive correlation was observed between total enrollment and net tuition revenue ($r = .814, p < .001$), indicating that institutions with higher enrollment levels generate substantially greater net tuition revenue. These results reinforced that while discounting may offer short-term enrollment incentives, sustained financial health in private higher education remained most closely tied to maintaining strong enrollment volume and minimizing excessive tuition discounting.

To further examine whether the relationships among tuition discount rate, enrollment, and net tuition revenue differed by institutional size, correlations were computed separately for each enrollment category. For institutions with the smallest enrollments ($<2,500$), tuition discount rate demonstrated a weak and negative correlation with net tuition revenue ($r = -.081, p < .001$) but was not significantly related to total enrollment ($r = -.012, p = .494$). In contrast, total enrollment showed a strong positive correlation with net tuition revenue ($r = .723, p < .001$). These results suggested that, among smaller institutions, increased discounting was

slightly associated with lower net tuition revenue but did not appear to influence enrollment size directly. However, enrollment remained a primary driver of net tuition revenue within this group. For institutions within the mid-sized enrollment classification (2,500-9,999), tuition discount rate was significantly and negatively correlated with both total enrollment ($r = -.281, p < .001$) and net tuition revenue ($r = -.189, p < .001$). Total enrollment again displayed a strong positive association with net tuition revenue ($r = .809, p < .001$). This pattern indicated that, within moderately sized institutions, higher discount rates corresponded with both lower enrollment and reduced tuition revenue, whereas maintaining higher enrollment was strongly linked to greater tuition revenue. Among institutions with the largest enrollments (10,000+), tuition discount rate exhibited a moderate negative correlation with total enrollment ($r = -.254, p < .001$) but was not significantly associated with net tuition revenue ($r = -.037, p = .352$). Total enrollment, however, remained positively and significantly correlated with net tuition revenue ($r = .591, p < .001$). These findings suggested that for larger institutions, tuition discounting exerted less direct influence on net tuition revenue, likely due to the scale of their enrollment and greater capacity to absorb the effects of discounting. These results indicated that total enrollment consistently showed a strong positive relationship with net tuition revenue across all institutional sizes, highlighting the critical role of enrollment volume in sustaining net tuition revenue. The negative associations between tuition discount rate and both enrollment and net tuition revenue were most pronounced among institutions of moderate size, suggesting that these institutions may be particularly sensitive to discounting strategies. In contrast, smaller and larger institutions appeared somewhat insulated from these effects, either due to limited enrollment elasticity or the stabilizing benefits of scale.

To determine whether the relationships among tuition discount rate, total enrollment, and net tuition revenue differed by institutional endowment strength, correlations were calculated separately for institutions grouped by endowment assets per full-time equivalent (FTE). For institutions with the lowest endowment per FTE, tuition discount rate was negatively correlated with both total enrollment ($r = -.230, p < .001$) and net tuition revenue ($r = -.207, p < .001$). Total enrollment showed a strong and positive correlation with net tuition revenue ($r = .831, p < .001$). These findings suggested that institutions with limited endowment resources experienced small but meaningful declines in both enrollment and tuition revenue as discount rates increased, while enrollment continued to play a substantial role in driving overall tuition revenue. Among institutions with moderate endowment levels, tuition discount rate was again negatively associated with total enrollment ($r = -.242, p < .001$) and net tuition revenue ($r = -.235, p < .001$). The relationship between total enrollment and net tuition revenue remained strong and positive ($r = .933, p < .001$). This pattern indicated that for institutions of moderate endowment capacity, higher discounting was linked with both lower enrollment and decreased net tuition revenue, with net tuition revenue remaining highly dependent on enrollment performance. For institutions possessing the highest endowment per FTE, tuition discount rate exhibited moderate negative correlations with both total enrollment ($r = -.333, p < .001$) and net tuition revenue ($r = -.356, p < .001$). The association between total enrollment and net tuition revenue was exceptionally strong and positive ($r = .972, p < .001$). These results indicated that even among the wealthiest institutions, increasing tuition discounting corresponded with declines in both enrollment and tuition revenue, though these institutions demonstrated near-perfect alignment between enrollment and net tuition revenue due to their scale and financial stability. This near-perfect relationship likely reflected the reality that net tuition revenue was largely a function of enrollment volume. Among wealthier institutions, tuition pricing and discounting practices

tended to be more stable from year to year, supported by substantial endowment resources that cushioned fluctuations in institutional aid and operating revenue. As a result, variations in total enrollment directly and almost proportionally influenced tuition revenue. In essence, these institutions' scale minimized volatility in net revenue per student, leading to the exceptionally strong alignment between enrollment and net tuition revenue. These results revealed a consistent negative relationship between tuition discounting and both enrollment and net tuition revenue across all endowment per FTE categories, with the magnitude of the relationship intensifying among institutions with greater endowment resources. Regardless of endowment strength, total enrollment remained the most powerful determinant of net tuition revenue, underscoring the centrality of maintaining enrollment volume to ensure institutional financial sustainability.

Overall, the correlation analyses for RQ1 revealed consistent and statistically significant relationships among tuition discount rate, enrollment, and net tuition revenue. Across all analysis, higher discounting was associated with lower enrollment and diminished net tuition revenue, while enrollment consistently demonstrated a strong positive association with revenue outcomes. Although the strength of these relationships varied among control groups by institutional size and endowment capacity, the directionality remained stable, emphasizing that enrollment volume remained the most influential driver of net tuition revenue. Collectively, these findings highlighted the delicate balance institutions must maintain between offering competitive tuition discounts to attract students and safeguarding the financial sustainability of their net tuition revenue.

Research Question 3: What is the effect of utilizing funded versus unfunded institutional aid on enrollment and net tuition revenue?

The percentage of funded aid, which represented the share of institutional aid sourced from endowed or restricted funds rather than unrestricted operating dollars, was not significantly correlated with enrollment ($r = .002$, $p = .868$) or net tuition revenue ($r = .019$, $p = .130$). This finding suggested that the source of aid, whether funded or unfunded, did not exert a measurable direct influence on enrollment or net tuition revenue. While funded aid may support institutional sustainability by reducing pressure on operating budgets, its immediate relationship with enrollment and net tuition revenue appeared negligible when assessed across the full sample. Finally, as noted above addressing correlation for RQ2, a strong positive correlation was observed between total enrollment and net tuition revenue ($r = .814$, $p < .001$), affirming the link between enrollment and net tuition revenue generation. Institutions enrolling more students consistently generated higher levels of net tuition revenue, underscoring the central importance of enrollment management in institutional financial performance.

To explore whether the relationships among funded aid percentage, total enrollment, and net tuition revenue varied according to institutional enrollment size, correlations were computed separately for each enrollment category. For institutions with the smallest enrollments ($>2,500$), percent funded aid was negatively correlated with both total enrollment ($r = -.208$, $p < .001$) and net tuition revenue ($r = -.083$, $p < .001$). Again, total enrollment was strongly and positively correlated with net tuition revenue ($r = .723$, $p < .001$). These findings indicated that smaller institutions with a higher proportion of funded aid tended to have slightly lower enrollment and net tuition revenue, although enrollment remained the dominant driver of revenue outcomes. Among institutions with moderate enrollment levels (2,500-9,999), percent funded aid demonstrated no significant correlation with either total enrollment ($r = .006$, $p = .769$) or net tuition revenue ($r = .016$, $p = .404$). The relationship between total enrollment and net tuition

revenue remained strong and positive ($r = .809, p < .001$). This pattern suggested that for moderately sized institutions, the proportion of funded aid did not appear to be associated with either enrollment or net tuition revenue, while tuition revenue continued to be most influenced by enrollment volume. For institutions with the largest enrollments (10,000+), percent funded aid was again not significantly correlated with either total enrollment ($r = .012, p = .764$) or net tuition revenue ($r = .031, p = .439$). Total enrollment maintained a positive and statistically significant relationship with net tuition revenue ($r = .591, p < .001$). These results implied that for large institutions, funded aid composition played little direct role in determining enrollment or tuition revenue outcomes. These results suggested that the proportion of funded institutional aid showed minimal or inconsistent relationships with enrollment and tuition revenue when examined by institutional size. Smaller institutions exhibited weak negative associations, whereas moderate and large institutions showed no significant relationships. Across all size categories, enrollment consistently remained the strongest predictor of tuition revenue, underscoring its central role in shaping institutional financial performance.

To determine whether the relationships among percent funded aid, total enrollment, and net tuition revenue differed according to institutional endowment strength, correlations were conducted separately for institutions grouped by endowment assets per full-time equivalent (FTE) enrollment. For institutions with the lowest endowment per FTE, percent funded aid was weakly and negatively correlated with both total enrollment ($r = -.064, p = .004$) and net tuition revenue ($r = -.095, p < .001$). Total enrollment, however, was strongly and positively correlated with net tuition revenue ($r = .831, p < .001$). These findings suggested that among smaller endowed institutions, a higher proportion of funded aid was modestly associated with lower enrollment and slightly reduced tuition revenue, though enrollment continues to serve as the

primary driver of revenue performance. Among institutions with moderate endowment levels, percent funded aid demonstrated a very weak positive correlation with total enrollment ($r = .051$, $p = .020$) and a nonsignificant correlation with net tuition revenue ($r = -.040$, $p = .071$). As in other groups, the relationship between total enrollment and tuition revenue was strong and positive ($r = .933$, $p < .001$). This pattern indicated that for moderately resourced institutions, the proportion of funded aid was only marginally associated with enrollment and unrelated to net tuition revenue. For institutions with the highest endowment per FTE, percent funded aid was positively correlated with both total enrollment ($r = .077$, $p < .001$) and net tuition revenue ($r = .088$, $p < .001$). Total enrollment and tuition revenue again exhibited an exceptionally strong positive correlation ($r = .972$, $p < .001$). These results implied that among the wealthiest institutions, increases in funded aid were modestly associated with both higher enrollment and greater tuition revenue, though enrollment remained the dominant factor explaining revenue variation. These results suggested that the relationships among funded aid, enrollment, and net tuition revenue varied slightly according to institutional endowment strength. Less wealthy institutions exhibited weak negative correlations between funded aid and both enrollment and revenue, while moderate institutions showed little to no association. In contrast, wealthier institutions displayed weak positive correlations, implying that increased reliance on funded aid may offer a small but favorable influence on enrollment and tuition revenue among the most financially secure institutions. Across all levels of institution by endowment stature, enrollment consistently demonstrated the strongest relationship with tuition revenue, underscoring its central importance to institutional financial outcomes.

Conclusion of Correlation Results

Overall, the correlation analyses revealed consistent and statistically significant relationships among the key variables of tuition discounting, institutional aid composition, enrollment, and net tuition revenue. Across all models, enrollment consistently demonstrated a strong positive correlation with tuition revenue, confirming its central role in institutional financial performance. Tuition discount rate was negatively associated with both enrollment and net tuition revenue, suggesting that increased discounting may undermine net tuition revenue. In contrast, the proportion of funded institutional aid showed little to no significant relationship with enrollment or tuition revenue in the aggregate, though weak directional trends emerged when examined by institutional size and financial capacity. These results collectively indicated that while the structure and source of institutional aid may influence revenue outcomes in limited contexts, enrollment remained the dominant factor explaining variation in net tuition revenue. The subsequent regression analyses further examined these relationships by testing the predictive influence of discounting and aid composition on enrollment and net tuition revenue while controlling for institutional enrolment and endowment capacity.

Multiple Regression Results

Following the correlation analyses, multiple regression analyses were conducted to further examine the predictive relationships among study variables and to determine the extent to which tuition discount rate, enrollment, and institutional aid composition explained variations in enrollment and net tuition revenue. Whereas the correlation results identified the strength and direction of bivariate relationships, the regression models provided a more comprehensive understanding by assessing the combined and unique contributions of each predictor variable while controlling for institutional characteristics such as enrollment size and endowment per FTE. This approach allowed for a deeper evaluation of how tuition discounting and discounting

strategies collectively influence enrollment behavior and net tuition revenue across private, not-for-profit, four-year institutions.

Research Question 2: What is the relationship between tuition discounting, enrollment, and net tuition revenue for private, not-for-profit, four-year institutions?

To address this research question, a series of regression models were conducted to examine the predictive relationships among tuition discount rate, enrollment, and net tuition revenue. The first model evaluated whether tuition discount rate significantly predicted enrollment, thereby assessing the extent to which institutional pricing and discounting strategies were associated with student enrollment levels.

Model 1: Predicting enrollment from tuition discount rate.

A simple linear regression was conducted with enrollment as the dependent variable and tuition discount rate as the independent variable. The model was statistically significant, $F(1, 6,238) = 375.30, p < .001$, explaining approximately 5.7% of the variance in total enrollment ($R^2 = .057$). The correlation between predicted and observed enrollment values was modest ($R = .238$), indicating a small to moderate association between discount rate and institutional enrollment. Tuition discount rate was a significant negative predictor of enrollment ($B = -13,690.30, SE = 706.68, \beta = -.238, t = -19.37, p < .001$). Specifically, for every one-percentage-point increase in tuition discount rate, institutional enrollment decreased by an estimated 13,690 students, holding other factors constant. Although this figure represented an aggregate effect across the sample rather than a literal per-institutional change, it demonstrated a consistent inverse relationship between discounting levels and enrollment outcomes.

These results indicated that institutions with higher tuition discount rates tended to enroll fewer students, suggesting that aggressive discounting strategies may not always achieve their intended goal of stimulating demand. Instead, higher discount rates may reflect reactive efforts by institutions to offset declining enrollment through institutional aid incentives, a pattern consistent with prior research on tuition discounting. While discounting may improve affordability for some students, results suggested that its widespread use was associated with diminishing enrollment returns. Although the model explained only a modest proportion of enrollment variability ($R^2 = .057$), the statistical significance and consistency of the negative effect underscored the importance of tuition pricing strategy as a determinant of institutional enrollment outcomes. Other contextual factors, such as institutional reputation, location, programmatic offerings, etc., likely contributed additional explanations not captured by this model.

To examine whether the relationship between tuition discount rate and enrollment varied according to institutional enrollment size, separate simple linear regressions were conducted for each of the three enrollment categories. For institutions with the smallest enrollments, the regression model was not statistically significant, $F(1, 3,038) = 0.47$, $p = .494$, and explained virtually none of the variance in total enrollment ($R^2 = .000$). Tuition discount rate was not a significant predictor of enrollment ($B = -53.95$, $SE = 78.88$, $\beta = -.012$, $t = -0.68$, $p = .494$). These results suggest that discounting practices among small institutions do not meaningfully affect overall enrollment levels. For institutions with moderate enrollment sizes, the regression model was statistically significant, $F(1, 2,575) = 221.13$, $p < .001$, explaining approximately 7.9% of the variance in total enrollment ($R^2 = .079$). Tuition discount rate was a significant negative predictor of total enrollment ($B = -4,903.01$, $SE = 329.71$, $\beta = -.281$, $t = -14.87$, $p <$

.001), indicating that for every one-percentage-point increase in discount rate, enrollment decreased by an estimated 4,903 students on average. This figure reflected the aggregate effect across the sample rather than an institutional-level change, illustrating the overall sector wide relationship between tuition discounting and enrollment. This finding suggested that institutions in the midrange of enrollment among private, not-for-profit institutions, were most sensitive to discounting strategies, with higher discount rates corresponding to lower overall enrollment levels. For institutions with the largest enrollments, the model was also statistically significant, $F(1, 621) = 42.96, p < .001$, accounting for 6.5% of the variance in enrollment ($R^2 = .065$). Tuition discount rate was again a significant negative predictor ($B = -35,749.09, SE = 5,454.38, \beta = -.254, t = -6.55, p < .001$), indicating that even among the largest institutions, higher discount rates were associated with lower enrollment outcomes. Collectively, these findings suggested that the negative relationship between tuition discount rate and enrollment was strongest among mid-sized institutions and remained significant among large institutions, while smaller institutions exhibited no meaningful association.

To determine whether the relationship between tuition discount rate and enrollment varied according to institutional endowment strength, separate simple linear regressions were conducted for institutions grouped by tertile by endowment assets per full-time equivalent (FTE). For institutions in the lowest endowment group, the model was statistically significant, $F(1, 2,077) = 115.50, p < .001$, explaining approximately 5.3% of the variance in total enrollment ($R^2 = .053$). Tuition discount rate was a significant negative predictor of enrollment ($B = -17,872.89, SE = 1,663.03, \beta = -.230, t = -10.75, p < .001$). These findings indicated that among lesser endowed institutions, higher discount rates were associated with lower enrollment levels, suggesting that discounting strategies may be less effective for institutions with limited

endowment resources. For institutions with moderate endowment levels, the model was also statistically significant, $F(1, 2,079) = 129.51, p < .001$, accounting for approximately 5.9% of the variance in total enrollment ($R^2 = .059$). Tuition discount rate remained a significant negative predictor ($B = -13,980.86, SE = 1,228.51, \beta = -.242, t = -11.38, p < .001$), indicating that for every one-percentage-point increase in discount rate, institutional enrollment decreased by an estimated 13,981 students on average. This figure represented an aggregate effect across the sample rather than an institutional level change, illustrating the broader negative relationship between discounting levels and enrollment outcomes within this group. For institutions with the highest endowment per FTE, the regression model was again statistically significant, $F(1, 2,078) = 259.91, p < .001$, and explained 11.1% of the variance in total enrollment ($R^2 = .111$). Tuition discount rate was a significant negative predictor ($B = -15,100.37, SE = 936.65, \beta = -.333, t = -16.12, p < .001$), indicating that wealthier institutions experienced the strongest negative association between discount rate and enrollment. Collectively, these results revealed a consistent negative relationship between tuition discount rate and total enrollment across all endowment levels. However, the strength of this relationship increased among institutions with greater endowment resources, suggesting that even financially secure institutions were not immune to the enrollment consequences of increased discounting. This pattern implied that while endowment may shield short term financial impacts, higher discount rates remained associated with declines in enrollment performance across the sector.

Model 1 provided the first component in addressing research question 2, demonstrating a significant and negative association between tuition discount rate and enrollment among private, non-for-profit, four-year institutions from 2013 to 2024. These results suggested that increases in institutional discounting were consistently linked to reductions in enrollment, regardless of

institutional size or endowment strength, highlighting the inherent tension between affordability and enrollment management outcomes. The findings underscored that tuition discounting, while often employed to attract students, may instead coincide with or contribute to declining enrollment trends when applied aggressively. Building upon these results, the next model extended the analysis by examining the combined effects of tuition discount rate and enrollment on net tuition revenue.

Model 2: Predicting net tuition revenue from tuition discount rate and enrollment.

A multiple linear regression was conducted to examine whether tuition discount rate and enrollment significantly predicted net tuition revenue among private, not-for-profit, four-year institutions from 2013 to 2024. The overall regression model was statistically significant, $F(2, 6,237) = 6,129.51, p < .001$, and accounted for approximately 66.3% of the variance in NTR ($R^2 = .663$). Total enrollment emerged as a strong, statistically significant positive predictor of NTR ($B = 18,995.15, SE = 176.94, \beta = .813, t = 107.36, p < .001$), indicating that institutions with higher enrollment levels generated substantially greater net tuition revenue. In contrast, tuition discount rate was not a significant predictor of NTR ($B = -7,487,748.97, SE = 10,168,373.22, \beta = -.006, t = -0.74, p = .462$). These findings suggested that institutional scale, rather than discounting strategy, served as the dominant driver of net tuition revenue. While discount rate exhibited a small, nonsignificant negative effect, enrollment size alone accounted for most of the explained variance in NTR. This outcome aligned with existing research indicating that increases in enrollment directly increase net tuition revenue, whereas aggressive discounting primarily affects student yield rather than overall revenue generation.

To further evaluate whether the relationship between tuition discounting, enrollment, and net tuition revenue varied by institutional size, separate multiple regression analyses were

conducted for each enrollment size category. In each model, tuition discount rate and total enrollment were entered as predictors of NTR. For institutions with the smallest enrollments, the overall model was statistically significant, $F(2, 3,037) = 1,700.28, p < .001$, and explained approximately 52.8% of the variance in NTR ($R^2 = .528$). Total enrollment was a strong positive predictor of NTR ($B = 16,802.22, SE = 289.92, \beta = .722, t = 57.95, p < .001$), while tuition discount rate was a modest but significant negative predictor ($B = -7,248,070.86, SE = 1,260,559.99, \beta = -.072, t = -5.75, p < .001$). These results suggested that while enrollment primarily drove tuition revenue among smaller institutions, higher discount rates were associated with modest reductions in NTR among smaller sized institutions. For medium sized enrolled institutions, the model was also statistically significant, $F(2, 2,574) = 2,451.98, p < .001$, accounting for approximately 65.6% of the variance in NTR ($R^2 = .656$). Total enrollment remained a strong positive predictor of NTR ($B = 25,354.30, SE = 372.31, \beta = .821, t = 68.10, p < .001$), whereas tuition discount rate showed a small but statistically significant positive effect ($B = 22,648,017.91, SE = 6,491,139.42, \beta = .042, t = 3.49, p < .001$). This result may suggest that among mid-sized institutions, moderate discounting strategies may be correlated with stronger enrollment yields and therefore higher overall net tuition revenue. For the largest enrollment sized institutions, the model remained significant, $F(2, 620) = 176.38, p < .001$, explaining approximately 36.3% of the variance in NTR ($R^2 = .363$). Enrollment again served as the dominant positive predictor ($B = 13,287.83, SE = 708.86, \beta = .621, t = 18.75, p < .001$), while tuition discount rate also demonstrated a positive but smaller significant relationship ($B = 362,734,770.54, SE = 99,626,076.50, \beta = .121, t = 3.64, p < .001$). Given the scale of these institutions, this finding likely reflected that large universities may be able to increase discounting without negatively affecting their net tuition revenue due to higher overall pricing power and enrollment stability. Collectively, these results indicated that while enrollment

remains the strongest determinant of net tuition revenue across institutional enrollment sizes, the role of discounting differed by enrollment scale, serving as a modest constraint for smaller institutions but functioning as a neutral or even positive lever for medium and large institutions.

To further explore whether the relationship between tuition discounting, enrollment, and net tuition revenue varied by institutional endowment strength, a series of multiple regression analyses were conducted for each endowment-per-FTE tertile group. In each model, tuition discount rate and total enrollment were entered as predictors of net tuition revenue. For the first tertile (lowest endowment per FTE), the overall model was significant, $F(2, 2076) = 2317.17$, $p < .001$, explaining approximately 69.1% of the variance in NTR ($R^2 = .691$). Total enrollment was a strong, positive predictor of NTR ($B = 10,262.88$, $SE = 155.66$, $\beta = .827$, $t = 65.93$, $p < .001$), whereas tuition discount rate was not a significant predictor ($B = -16,569,223.48$, $SE = 12,121,233.25$, $\beta = -.017$, $t = -1.37$, $p = .172$). These results indicated that among the least endowed institutions, enrollment almost entirely drove net tuition revenue, with discounting having little measurable effect once enrollment is accounted for. For the second tertile (mid-range endowment per FTE), the model was again significant, $F(2, 2078) = 7017.85$, $p < .001$, explaining 87.1% of the variance in NTR ($R^2 = .871$). Total enrollment remained a dominant positive predictor ($B = 30,027.77$, $SE = 261.86$, $\beta = .931$, $t = 114.67$, $p < .001$), while tuition discount rate was again nonsignificant ($B = -16,857,083.74$, $SE = 15,118,113.40$, $\beta = -.009$, $t = -1.12$, $p = .265$). This pattern suggested that for moderately endowed institutions, endowment capacity did not appear to meaningfully alter the relationship between discounting and net tuition revenue once enrollment levels were considered. For the third tertile (highest endowment per FTE), the model was also significant, $F(2, 2077) = 17,933.87$, $p < .001$, explaining 94.5% of the variance in NTR ($R^2 = .945$). Total enrollment again served as a very strong predictor ($B =$

31,909.34, SE = 181.05, $\beta = .960$, $t = 176.25$, $p < .001$), while tuition discount rate exhibited a small but statistically significant negative relationship ($B = -54,045,351.06$, SE = 8,199,608.21, $\beta = -.036$, $t = -6.59$, $p < .001$). This finding implied that even the most well-endowed institutions, while able to maintain net tuition revenue stability at higher discount levels, may still experience a slight reduction in net tuition yield as discounting increases. The results across all three endowment groups reinforced that total enrollment was the most powerful determinant of net tuition revenue. However, discounting appeared to have limited or inconsistent effects once enrollment was accounted for, neutral among less-resourced institutions and slightly negative among those with greater endowment capacity.

Overall, Model 2 demonstrated that while tuition discount rate and total enrollment were both included as predictors of net tuition revenue, enrollment consistently emerged as the overwhelmingly dominant factor across the sample and all institutional control groups. The relationship between tuition discounting and net tuition revenue was either negligible or weakly negative once enrollment was controlled for, suggesting that the financial impact of tuition discounting operated primarily through its influence on enrollment rather than directly on net tuition revenue. Institutions with larger enrollments and stronger endowment resources exhibited the most stable and predictable net tuition revenue patterns, reflecting their capacity to absorb the financial effects of discounting. These findings highlighted that sustained enrollment growth remained the most significant driver of net tuition revenue, while the direct returns on increased discounting remain limited and context dependent.

Identifying the threshold effect of tuition discounting on net tuition revenue.

Although tuition discount rate was not a significant independent predictor of net tuition revenue in the multiple regression model once enrollment was considered, a supplemental

analysis was conducted to explore whether a nonlinear or threshold effect existed, specifically, whether there was a discount rate level beyond which net tuition revenue began to decline more sharply. This additional analysis was motivated by the results indicating that tuition discounting was a significant negative predictor of enrollment (Model 1) and that enrollment, in turn, was the dominant driver of net tuition revenue (Model 2). Together, those findings suggested that discounting primarily affected revenue indirectly through enrollment behavior; however, it remained possible that excessive discounting could also exert a direct negative effect on institutional net tuition revenue once it surpassed a certain percentage or level.

To examine this potential inflection point, a series of piecewise linear regressions were estimated using discount rate breakpoints at 35%, 40%, 45%, and 50%. This approach allowed for separate slope estimates below and above each threshold, thereby identifying the point at which discounting exerted the greatest negative impact on net tuition revenue. Results of the piecewise analyses are presented in Table 22. The models with breakpoints at 35% and 40% produced the strongest fit ($R^2 = .048$) and revealed a statistically significant negative slope in the post-breakpoint range ($b = -398,481,451$, $p < .001$), while the pre-breakpoint slope remained nonsignificant ($b = -25,203,744$, $p = .502$). These results indicated that NTR remained relatively stable as discount rates increased up to approximately 35–40% but declined sharply beyond that level. In contrast, models with higher thresholds (45% and 50%) exhibited weaker fit ($R^2 = .041$ and $.040$, respectively) and nonsignificant post-breakpoint slopes, suggesting that most of the negative net tuition revenue effect had already occurred prior to those levels of discounting.

Taken together, these findings build upon the earlier regression results by revealing the specific range in which tuition discounting became financially counterproductive. While moderate discounting below 35% appeared sustainable, discount rates above approximately 40%

were associated with rapid declines in net tuition revenue. In essence, the piecewise models demonstrated that once institutions exceeded this threshold in discounting, the amount of net tuition revenue forfeited through unfunded aid surpassed any potential enrollment gains achieved. Table 22 presents a summary of the results from the four piecewise regression models, illustrating the changes in slope and model fit at each tested breakpoint.

Table 22

Piecewise Regression Models of Discount Rate on NTR, by Breakpoint

| Breakpoint | R ² | Seg1 (B) | p | Seg2 (B) | p | Interpretation |
|------------|----------------|--------------|--------|--------------|--------|---|
| 35% | 0.048 | -25,203,744 | 0.502 | -398,481,451 | < .001 | NTR stable below 35%; sharp, significant decline after 35%. |
| 40% | 0.048 | -25,203,744 | 0.502 | -398,481,451 | < .001 | Similar fit; decline begins after 40%. |
| 45% | 0.041 | -222,072,354 | < .001 | -143,666,632 | 0.014 | Decline already present; smaller change beyond 45%. |
| 50% | 0.040 | -257,832,230 | < .001 | -49,358,712 | 0.479 | Effect nonsignificant beyond 50%; |

relationship levels
off.

Overall, the piecewise regression analyses clarified the nonlinear relationship between tuition discounting and net tuition revenue, revealing that the negative financial effects of tuition discounting intensified beyond a distinct threshold. Specifically, institutional net tuition revenue remained relatively stable at discount rates below approximately 35–40%, suggesting that moderate discounting levels can be absorbed without major net tuition revenue loss. However, once discount rates exceeded this range, net tuition revenue declined sharply, indicating a tipping point at which additional unfunded aid yields diminishing and ultimately harmful net tuition revenue. These findings emphasized that while discounting can serve as an enrollment management tool when applied strategically, excessive discounting beyond sustainable limits erodes net tuition revenue and compromises long-term financial viability.

Research Question 3: What is the effect of utilizing funded versus unfunded institutional aid on enrollment and net tuition revenue?

Model 3 addressed Research Question 3, which examined the effect of utilizing funded versus unfunded institutional aid on both enrollment and net tuition revenue among private, not-for-profit, four-year institutions from 2013 to 2024. Because the goal was to determine whether the proportion of aid derived from funded sources (such as endowments or restricted gifts) influenced institutional performance, two separate regression models were estimated: one predicting enrollment (Model 3A) and one predicting net tuition revenue (Model 3B). This structure allowed for independent evaluation of whether the percentage of funded aid utilized serves as a meaningful predictor of enrollment behavior and net tuition revenue.

Model 3A: Predicting enrollment from percent funded aid.

A simple linear regression was performed with total enrollment as the dependent variable and percent funded aid as the independent variable. The overall model was not statistically significant, $F(1, 6,238) = 0.027$, $p = .868$, indicating that the proportion of institutional aid that was funded versus unfunded did not significantly predict institutional enrollment levels. The model explained less than 0.1% of the variance in enrollment ($R^2 = .000$). Percent funded aid was not a significant predictor of enrollment ($B = 96.94$, $SE = 585.21$, $\beta = .002$, $t = 0.17$, $p = .868$). This suggested that, across private nonprofit institutions from 2013 - 2024, the extent to which institutional aid was funded had no measurable effect on student enrollment. Institutions that utilized higher proportions of funded aid did not enroll significantly more, or fewer, students than those relying more heavily on unfunded institutional aid. The lack of statistical significance indicated that the funding source of aid appeared largely unrelated to overall enrollment outcomes.

A series of simple linear regressions were performed to examine whether the proportion of institutional aid that was funded predicted enrollment across the three institutional enrollment control groups. For small institutions, the model was statistically significant, $F(1, 3,038) = 137.48$, $p < .001$, explaining 4.3% of the variance in enrollment ($R^2 = .043$). Percent funded aid was a significant negative predictor of enrollment ($B = -728.62$, $SE = 62.14$, $\beta = -.208$, $t = -11.73$, $p < .001$), indicating that institutions with a higher proportion of funded aid actually tended to enroll fewer students. In contrast, for medium sized institutions, the model was not significant, $F(1, 2,575) = 0.09$, $p = .769$, and percent funded aid did not predict enrollment ($B = 78.57$, $SE = 267.28$, $\beta = .006$, $t = 0.29$, $p = .769$). Similarly, for large institutions, the model was also nonsignificant, $F(1, 621) = 0.09$, $p = .764$, with percent funded aid showing no relationship

with enrollment ($B = 1,128.48$, $SE = 3,750.93$, $\beta = .012$, $t = 0.30$, $p = .764$). Overall, these results suggested that the relationship between funded aid and enrollment differed by institutional size. The negative relationship observed among small institutions implied that increasing the share of funded aid, often tied to more restricted, donor-supported sources, may coincide with smaller enrollment levels, possibly reflecting more selective or resource-constrained enrollment strategies. Conversely, medium and large institutions appeared unaffected by the funding source of institutional aid, suggesting that scale and reputation may buffer enrollment from fluctuations in aid composition.

To assess whether this relationship differed based on institutional endowment capacity, the analysis was repeated across endowment per FTE control groups. Among institutions in the lowest endowment tertile, percent funded aid was a small but significant negative predictor of NTR ($b = -3,944$, $p = .004$), suggesting that institutions with lower endowment resources may experience reduced tuition revenue as their proportion of funded aid increases. This could indicate that such institutions rely more heavily on externally funded aid sources that do not generate additional revenue and may crowd out tuition-paying students. In contrast, for institutions in the middle and upper endowment tertiles, the relationship between funded aid and NTR was positive and significant ($b = 2,442$, $p = .020$; $b = 2,358$, $p < .001$, respectively). These findings suggested that institutions with greater financial resources and more robust endowments may benefit from higher levels of funded aid, likely due to endowed scholarships or donor-supported programs that supplement rather than replace tuition revenue. Overall, the results indicated that the impact of funded institutional aid on net tuition revenue depended somewhat on institutional endowment wealth. While smaller and less endowed institutions may experience diminishing returns from funded aid, wealthier institutions appeared better able to leverage

externally funded support to enhance financial outcomes. The findings reinforced the broader conclusion that not all institutional aid functions equally in sustaining tuition revenue, funded aid tended to stabilize or improve revenue primarily when supported by strong endowment capacity and donor investment.

Model 3B: Predicting net tuition revenue from percent funded aid.

A simple linear regression was conducted to determine whether the proportion of funded institutional aid significantly predicted net tuition revenue among private, not-for-profit four-year institutions from 2013 to 2024. The overall model was not statistically significant, $F(1, 6,238) = 2.30, p = .130$, explaining less than 0.1% of the variance in NTR ($R = .019, R^2 = .000$). Percent funded aid was not a significant predictor of NTR ($B = 20,731,651.86, SE = 13,674,354.24, \beta = .019, t = 1.52, p = .130$). This result suggested that the proportion of funded institutional aid, regardless of funding source, did not have a meaningful direct impact on institutional net tuition revenue. These findings aligned with the broader results of research question 3, indicating that the relationship between funded versus unfunded aid and net tuition revenue was indirect. While funded aid may serve to offset the cost of institutional grants or enhance affordability for students, it did not independently predict tuition revenue outcomes.

When analyzed by institutional enrollment size, results were largely consistent with the overall model, showing minimal predictive power for percent funded aid on net tuition revenue. Among the smallest institutions, the model reached statistical significance, $F(1, 3,038) = 20.90, p < .001$, though it explained less than 1% of the variance in NTR ($R = .083, R^2 = .007$). The regression coefficient was negative and significant ($B = -6,732,857, SE = 1,472,701, \beta = -.083, t = -4.57, p < .001$), indicating that higher levels of funded aid corresponded to slightly lower tuition revenue among smaller institutions. For medium-sized institutions, the model was not statistically

significant, $F(1, 2,575) = 0.70$, $p = .404$, explaining virtually no variance in NTR ($R = .016$, $R^2 < .001$). Similarly, for the largest institutions (Category 3), results were nonsignificant, $F(1, 621) = 0.60$, $p = .439$, with a negligible coefficient ($B = 62,085,125$, $\beta = .031$, $p = .439$). These findings indicated that the proportion of funded aid did not meaningfully predict net tuition revenue.

While smaller institutions exhibited a weak inverse relationship, suggesting potential trade-offs between funding sources and net revenue, the relationship dissipated among larger, more financially stable institutions. This pattern suggested that the composition of institutional aid played a limited role in shaping overall net tuition revenue, particularly for institutions with greater scale and endowment capacity.

When institutions were grouped by endowment per FTE, the relationship between the proportion of funded institutional aid utilized and net tuition revenue varied in both direction and strength. For institutions in the lowest endowment tier, the regression model was statistically significant, $F(1, 2077) = 18.78$, $p < .001$, explaining less than 1% of the variance in NTR ($R = .095$, $R^2 = .009$). Percent funded aid emerged as a small but significant negative predictor ($B = -72,929,082$, $SE = 16,828,915$, $\beta = -.095$, $t = -4.33$, $p < .001$), indicating that as a greater share of institutional aid became funded rather than unfunded, net tuition revenue tended to decline slightly among less-resourced institutions. Among mid-sized endowment institutions, the model was not statistically significant, $F(1, 2079) = 3.26$, $p = .071$, and the slope of the relationship was nonsignificant ($B = -61,329,389$, $\beta = -.040$, $p = .071$). This suggests that for institutions with moderate endowment resources, the funding source composition of institutional aid had minimal impact on net tuition revenue. In contrast, for institutions in the highest endowment tier, the model was statistically significant, $F(1, 2078) = 16.34$, $p < .001$, explaining approximately 0.8% of the variance in NTR ($R = .088$, $R^2 = .008$). Here, the relationship between percent funded aid

and NTR was positive ($B = 90,267,858$, $SE = 22,330,343$, $\beta = .088$, $t = 4.04$, $p < .001$), indicating that wealthier institutions with higher proportions of funded aid achieved slightly greater net tuition revenue. These findings suggested that institutional wealth moderated the relationship between aid composition and tuition revenue. Less-resourced institutions appeared to experience modest revenue losses when shifting a greater proportion of aid to funded sources, while wealthier institutions, likely benefiting from endowment earnings and donor-supported scholarships, exhibited modest revenue gains under similar conditions. Although the explanatory power of these models was limited, the directionality of the effects highlighted a meaningful divide in how aid structure interacted with institutional financial capacity.

Inferential Results Summary

Overall, the inferential analyses conducted across the two research questions revealed a clear and consistent pattern regarding the relationships among tuition discount rate, enrollment, net tuition revenue, and the composition of institutional aid. The first model demonstrated that tuition discount rate was a significant negative predictor of total enrollment, indicating that as institutions increased their average discount rates, overall enrollment levels tended to decline. The second model, which examined the predictors of net tuition revenue, showed that enrollment was the dominant factor influencing net tuition revenue outcomes. Although tuition discount rate initially appeared negatively correlated with net tuition revenue, it did not remain a significant predictor once enrollment was accounted for, suggesting that discounting primarily affects net tuition revenue indirectly through its impact on enrollment. Supplementary piecewise analyses identified a critical threshold around a 35 to 40% discount rate, beyond which net tuition revenue began to decline more sharply, highlighting the potential financial risks associated with excessive discounting practices. Finally, the third set of regression models examined the

relationship between the percentage of funded aid utilized and enrollment and net tuition revenue. Results indicated that the proportion of funded versus unfunded aid was only weakly related to either enrollment or net tuition revenue. However, when controlling for institutional characteristics such as enrollment size and endowment per FTE, some patterns emerged. Among smaller or less endowed institutions, higher proportions of funded aid were modestly associated with lower enrollment and revenue, while among stronger endowed institutions, a greater share of funded aid corresponded to slight net tuition revenue gains.

Overall, these findings suggested that tuition discounting exerted its primary influence through enrollment rather than through direct net tuition revenue influence, and that endowment strength and scale may moderate the financial implications of institutional aid structure. The overall results reinforced the complexity of tuition pricing strategies and underscored the importance of balancing discounting practices to sustain both access and institutional financial stability.

CHAPTER 5: DISCUSSION/CONCLUSION

Introduction

The purpose of this quantitative, longitudinal study was to examine the relationship between tuition discounting, enrollment, and net tuition revenue (NTR) at private, not-for-profit, four-year institutions in the United States over a ten-year period from 2014 to 2023. The study also evaluated whether the composition of institutional aid, specifically, the use of funded versus unfunded aid, bore a measurable relationship to institutional enrollment levels and net tuition revenue. The analysis relied on Integrated Postsecondary Education Data System (IPEDS) data for 624 institutions that reported complete data for each of the ten years studied, resulting in 6,240 institution-year observations. Three research questions guided the study: (1) What are the trends in tuition prices and tuition discount rates for private, not-for-profit, four-year institutions? (2) What is the relationship between tuition discounting, enrollment, and net tuition revenue? and (3) What is the effect of utilizing funded versus unfunded institutional aid on enrollment and net tuition revenue? Descriptive statistics were used to establish longitudinal trends of the variables and contextualize the study. Institutional characteristics such as enrollment size and endowment per FTE were utilized as control variables to isolate the effects of specific variables. Pearson's correlation analyses and multiple regression analyses were used to assess the statistical relationships among tuition discounting, enrollment, net tuition revenue, and the composition of funded and unfunded institutional aid utilized by institutions. Piecewise regression analysis was used to identify whether a tipping point exists at which tuition discounting levels begin to erode net tuition revenue more sharply. This chapter interprets the findings of the study in relation to the research questions, situates the findings within the existing literature and theoretical

framework, and discusses their implications for institutional practice and policy. The chapter concludes with a listing of limitations of the study and recommendations for future research.

Interpretation of Findings

Research question one.

The first research question asked: What are the trends in tuition prices and tuition discount rates for private, not-for-profit, four-year institutions? Two central patterns emerged from the descriptive analyses. First, as one would expect, tuition and fee prices increased substantially in nominal terms across the study period. Average sticker prices rose from \$29,327 in 2014 to \$38,222 in 2023, representing an increase of nearly 30% over the decade. Larger institutions and institutions with greater endowment resources per FTE tended to report higher published tuition and fee levels, indicating that institutions with greater market leverage or perceived prestige charged higher sticker prices. However, when controlling for inflation, the apparent growth in tuition and fees prices largely disappeared. When tuition and fee prices were converted to constant 2023 dollars using both the Consumer Price Index (CPI), which reflect household purchasing power, and the Higher Education Price Index (HEPI), which more accurately reflected institutional cost pressures, the decade long increases in tuition and fees were minimal. CPI adjusted tuition and fees rose by only about 2% between 2014 and 2023, and HEPI adjusted tuition and fees rose by less than 1% across the same period. In other words, although nominal sticker prices increased each year, much of that increase reflected broader inflation and rising operating costs rather than a meaningful increase in the real economic price paid by students or born by institutions (Archibald & Feldman, 2010). This finding complicated the dominant public narrative that private higher education is becoming dramatically more expensive each year. In real terms, the price of tuition and fees did not escalate nearly as sharply

as nominal figures alone would have suggested. At the same time, and perhaps more importantly, tuition discount rates increased substantially and meaningfully throughout the study period. The mean institutional tuition discount rate rose from 34.98% in 2014 to 43.59% in 2023. This nearly nine percentage point increase represented a significant structural shift in institutional aid practices. The range and variability of tuition discount rates also widened over this time period, with some institutions reporting discount rates above 80% and, in extreme cases, above 90% by the end of the period. These results indicated a broad and intensifying reliance on institutional aid as a means to reduce net price for students to be able to compete for enrolling students in a continuously more competitive environment. Patterns in tuition discounting behavior differed notably across types of institutions. Smaller institutions (fewer than 2,500 students) reported the highest average discount rates (approximately 42.7%) and the widest variability, suggesting intense competition for enrollment among tuition dependent institutions with limited scale. Large institutions (10,000 or more students) reported lower average discount rates (approximately 32.1%), implying that these institutions were able to sustain enrollment with comparatively less aid per student, likely due to stronger brand recognition, program offerings, or geographic reach. Institutions with the highest endowment per FTE reported the deepest discounting on average (approximately 44.9%), indicating that institutions with greater financial capacity were more able to extend high levels of institutional aid, often supported by funded sources. (Harter, 2016; Lapovsky, 2020). Institutions were simultaneously maintaining or increasing published prices while also increasing the rate at which they discounted that price. The implication of these findings was that much of the apparent rise in sticker prices was driven by inflation rather than substantial increases in the real cost of attendance. Institutional tuition discount rates grew by nearly nine percentage points, reflecting a widespread shift toward greater use of institutional aid to attract and retain students. While this expansion in discounting improved affordability and

competitiveness, it simultaneously reduced the proportion of gross tuition revenue retained as net tuition revenue. As a result, institutions effectively charged higher nominal prices but realized little to no real financial growth, underscoring the growing tension between affordability for students and fiscal sustainability for institutions.

Research question two.

The second research question asked: What is the relationship between tuition discounting, enrollment, and net tuition revenue? This question spoke directly to institutional financial sustainability. It asked, in effect, whether increasing tuition discounting helped institutions enroll more students and maintain tuition revenue, or whether it ultimately harmed net tuition revenue. The study addressed this question through correlation analyses, regression models predicting enrollment and net tuition revenue, and piecewise regression models designed to test for threshold effects. Across the full sample, tuition discount rate was significantly and negatively correlated with both enrollment ($r = -.238, p < .001$) and net tuition revenue ($r = -.199, p < .001$). This means that institutions with higher discount rates tended to have lower enrollment and generated less net tuition revenue. These findings complicated the widespread assumption in enrollment management practice that deeper discounting necessarily stimulates demand and protects net tuition revenue through increased headcount (Lapovsky, 2020; Martin, 2018). Instead, the pattern observed in this study suggested an alternative dynamic: institutions experiencing enrollment stress tended to raise their average discount rates in an effort to attract and retain greater numbers of students, but those higher discount rates did not consistently correspond with larger enrollment yield or stronger net tuition revenue. In this way, discounting appeared less as a proactive growth strategy and more as a reactive strategy deployed in response to enrollment pressure. When these same relationships were disaggregated by institutional size,

the results revealed some differences. Among smaller institutions (fewer than 2,500 students), tuition discount rate was not significantly related to total enrollment ($r = -.012$, $p = .494$), and its correlation with net tuition revenue, although statistically significant, was weak ($r = -.081$, $p < .001$). These results indicated that for small institutions, discounting did not appear to be strongly associated with attracting or retaining more students. Enrollment among small institutions may instead be influenced by a myriad of factors rather than solely by price. Among mid-sized institutions (2,500–9,999 students), tuition discount rate was more clearly and consistently associated with the outcomes. In this group, discount rate was negatively associated with both enrollment ($r = -.281$, $p < .001$) and net tuition revenue ($r = -.189$, $p < .001$). This pattern suggested that mid-sized institutions may be particularly exposed to the risks of aggressive discounting practices. For these institutions, increases in the discount rate coincided with lower overall enrollment and net tuition revenue. These institutions were often tuition dependent and did not have the brand recognition or endowment stature of the largest institutions. For large institutions (10,000 or more students), tuition discount rate remained negatively associated with enrollment ($r = -.254$, $p < .001$); however, it was not significantly correlated with net tuition revenue ($r = -.037$, $p = .352$). This indicated that while larger institutions did show a pattern in which higher discounting was associated with somewhat lower enrollment, this did not necessarily translate into proportionate declines in net tuition revenue. Large institutions may insulate themselves from this by virtue of their scale, breadth of program offerings, and pricing power. When the same analyses were conducted by endowment capacity, similar themes emerged. For institutions in the lowest endowment tertile, tuition discount rate was negatively correlated with both enrollment ($r = -.230$, $p < .001$) and net tuition revenue ($r = -.207$, $p < .001$). For institutions with the highest endowment per FTE, the negative relationships were even stronger (enrollment $r = -.333$, $p < .001$; net tuition revenue $r = -.356$, $p < .001$). These findings

indicated that even among well-endowed institutions, higher rates of discounting tended to coincide with lower total enrollment and lower net tuition revenue, suggesting that endowment strength alone did not insulate institutions from the negative trade-offs of tuition discounting. A simple linear regression model predicting enrollment from tuition discount rate found that tuition discount rate was a significant and negative predictor of enrollment, $F(1, 6,238) = 375.30, p < .001$, with tuition discount rate explaining approximately 5.7% of the variance in enrollment ($R^2 = .057$). The regression coefficient for tuition discount rate was negative and statistically significant ($B = -13,690.30, \beta = -.238, p < .001$), indicating that higher discount rates were associated with lower levels of enrollment. While the magnitude of the coefficient reflects aggregated results and should not be interpreted literally as an institution-level change of 13,690 students for each percentage point increase in discount rate, the direction and consistency of the finding is meaningful. They suggested that higher discounting tended to be observed in environments where institutions were already experiencing enrollment challenges, and that higher discounting was not, on average, reversing those trends. This pattern was especially pronounced for mid-sized institutions, for which tuition discount rate significantly and negatively predicted enrollment, $F(1, 2,575) = 221.13, p < .001, R^2 = .079$ ($B = -4,903.01, \beta = -.281, p < .001$), and for institutions with the highest endowment per FTE, for which tuition discount rate significantly and negatively predicted enrollment, $F(1, 2,078) = 259.91, p < .001, R^2 = .111$ ($B = -15,100.37, \beta = -.333, p < .001$). These findings indicated that tuition discounting was not operating as a reliable enrollment growth strategy. Rather, institutions that were discounting more heavily tended to be those experiencing lower enrollment, and the relationship strengthens as institutions became larger or more resourced, implying that discounting growth may reflect intensifying market competition even among financially stronger institutions (Breneman, 1994; Lapovsky, 2020). The study then examined net tuition revenue directly. A multiple regression

model predicting net tuition revenue from both total enrollment and tuition discount rate found that the model was statistically significant, $F(2, 6,237) = 6,129.51, p < .001$, and explained approximately 66.3% of the variance in net tuition revenue ($R^2 = .663$). Within this model, enrollment emerged as a strong and statistically significant positive predictor of net tuition revenue ($B = 18,995.15, \beta = .813, p < .001$). In contrast, tuition discount rate did not significantly predict net tuition revenue once enrollment was considered ($B = -7,487,748.97, \beta = -.006, p = .462$). These results indicated that institutions with higher enrollment yielded consistently more netted tuition revenue and that this relationship was far more powerful than the direct effect of discount rate. This pattern held true across institutional size categories. For smaller institutions, enrollment was a strong positive predictor of net tuition revenue ($\beta = .722, p < .001$), while tuition discount rate was a modest but significant negative predictor ($\beta = -.072, p < .001$). For mid-sized and large institutions, enrollment again strongly predicted net tuition revenue ($\beta = .821$ and $\beta = .621$, respectively; both $p < .001$). Interestingly, in these groups tuition discount rate became a small but statistically significant positive predictor of net tuition revenue ($\beta = .042, p < .001$ for mid-sized institutions; $\beta = .121, p < .001$ for large institutions). This suggested that for institutions with greater enrollment scale, particularly those that can maintain volume even while discounting, institutional aid can in some cases function as a strategic tool that stabilizes or even enhances revenue, likely by improving yield among desired students or preserving enrollment in critical programs (Lapovsky, 2020). When the same regression model was repeated by endowment tertile, total enrollment remained the dominant predictor of net tuition revenue in all cases ($\beta = .827, \beta = .931, \text{ and } \beta = .960$; all $p < .001$), explaining large proportions of the variance in net tuition revenue ($R^2 = .691, R^2 = .871, \text{ and } R^2 = .945$, respectively). For institutions in the highest endowment tertile, tuition discount rate was a small but statistically significant negative predictor of net tuition revenue ($\beta = -.036, p < .001$), indicating that even highly endowed

institutions can experience erosion in net tuition revenue as discounting becomes more aggressive. The results of research question two suggested three key conclusions. First, tuition discounting was not consistently associated with stronger enrollment. Instead, institutions that discounted more tended to be those experiencing lower levels of enrollment, particularly among mid-sized and highly endowed institutions. Second, across the private, not-for-profit sector, net tuition revenue was primarily a function of enrollment volume rather than discount rate. Institutions that enrolled more students generated more net tuition revenue. Third, the primary mechanism by which discounting affected net tuition revenue was indirect, through its relationship with enrollment. Discounting was associated with lower enrollment, and lower enrollment, in turn, was strongly associated with lower net tuition revenue. To further investigate whether tuition discounting exerted a nonlinear effect on net tuition revenue, specifically, whether there is a point beyond which discounting became financially destructive, the study applied piecewise regression models using discount rate breakpoints at 35%, 40%, 45%, and 50%. These models revealed a threshold effect. At breakpoints of 35% and 40%, net tuition revenue remained relatively stable below the breakpoint: the slope for the below breakpoint segment was not statistically significant ($B = -25,203,744$, $p = .502$). However, above the breakpoint, the slope became sharply negative and statistically significant ($B = -398,481,451$, $p < .001$), and the model fit improved ($R^2 = .048$). The implication of this finding was that net tuition revenue began to decline more steeply and predictably once an institution's average tuition discount rate exceeded approximately 35% to 40%. At higher breakpoints (45% and 50%), the post breakpoint slopes weakened and, in some cases, was no longer statistically significant, suggesting that the most substantial erosion to net tuition revenue occurred as institutions crossed into and moved through the 35% to 40% range. By the time institutions reached average tuition discount rates above 45% or 50%, much of the damage to net tuition

revenue had already occurred. This finding was especially important for institutional leaders. It provided empirical support for the commonly expressed but rarely quantified belief that there is a “danger zone” in institutional discounting beyond which tuition revenue begins to decline in a structurally unsustainable way (Lapovsky, 2020). This study showed that zone at approximately 35% to 40%. Below that range, institutions appeared able to use discounting in a way that did not significantly erode net tuition revenue. Above that range, additional discounting corresponds to rapid declines in net tuition revenue. This finding also lended contemporary support to Breneman’s (1994) depiction of tuition discounting as a practice that can quickly become detrimental when overused.

Research question three.

The third research question asked: What is the effect of utilizing funded versus unfunded institutional aid on enrollment and net tuition revenue? This question shifted focus from the magnitude of institutional aid being utilized to the funding mechanism behind that aid. Funded aid refers to awards supported by restricted or endowed sources, such as donor-restricted scholarships or endowment spending. Unfunded aid refers to awards granted from an institution’s operating budget, which directly reduce the institution’s realized net tuition revenue. Descriptively, the study found that institutions consistently awarded far more unfunded aid than funded aid throughout the period from 2014 to 2023. In 2023, for example, institutions awarded an average of \$55.8 million in unfunded aid compared to \$9.6 million in funded aid. This pattern indicated that most tuition discounting in the private, not-for-profit sector was still being financed out of foregone tuition revenue rather than out of permanent or externally supported scholarship funds. Correlational and regression analyses showed that, overall, the proportion of funded aid utilized was not significantly associated with enrollment or net tuition revenue.

Across the full sample, percent funded aid was not significantly correlated with enrollment ($r = .002$, $p = .868$) or with net tuition revenue ($r = .019$, $p = .130$). Likewise, in regression models, percent funded aid did not significantly predict enrollment, $F(1, 6,238) = 0.027$, $p = .868$, and did not significantly predict net tuition revenue, $F(1, 6,238) = 2.30$, $p = .130$. These results suggested that simply shifting the source of aid from unfunded institutional dollars to funded sources did not reliably correspond to higher enrollment or higher net tuition revenue. However, this test was designed to explore whether institutions with higher proportions of funded aid at their disposal might possess greater capacity to attract and yield students without increasing reliance on unfunded institutional aid. Because unfunded aid represented institutional discounts that directly reduced tuition revenue, institutions with more externally supported or endowed funds could theoretically preserve net tuition revenue while remaining competitive in student recruitment. The findings, however, indicated that the availability and utilization of funded aid alone were not sufficient to produce measurable gains in enrollment or net tuition revenue. However, when institutions were disaggregated by enrollment size and endowment per FTE, some patterns emerged that pointed to underlying stratification in the sector. Among smaller institutions, percent funded aid emerged as a weak but statistically significant negative predictor of both enrollment ($\beta = -.208$, $p < .001$) and net tuition revenue ($\beta = -.083$, $p < .001$). In practical terms, smaller institutions that relied more heavily on funded aid tended to have slightly lower enrollment and slightly lower net tuition revenue. This may reflect the fact that smaller institutions often have more targeted or restricted funded aid, frequently associated with donor stipulations or specific merit criteria, which may not be designed to drive overall enrollment growth. In such cases, funded aid may support institutional mission or donor expectations but does not necessarily expand overall enrollment or increase net tuition revenue. Among institutions with the lowest endowment per FTE, similar patterns were observed. For these less-

resourced institutions, a higher percentage of funded aid was weakly but significantly associated with lower net tuition revenue ($\beta = -.095, p < .001$). This finding suggested that for institutions with limited endowment resources, the substitution of funded aid for unfunded aid did not necessarily represent net tuition revenue gain. In contrast, among institutions with the highest endowment per FTE, percent funded aid was weakly but positively associated with both enrollment ($r = .077, p < .001$) and net tuition revenue ($r = .088, p < .001$), and it significantly and positively predicted net tuition revenue in regression ($\beta = .088, p < .001$). Although the explanatory power of this model was small ($R^2 \approx .008$), the directionality was meaningful. It suggested that well-endowed institutions are able to leverage funded aid in a way that supported both enrollment and net tuition revenue. In such institutions, funded aid may not simply replace unfunded aid but rather expand institutional capacity to offer competitive net prices to students without proportionately reducing net tuition revenue. These findings indicated that the financial benefits of funded aid were not evenly distributed across the sample. Institutions with strong endowments and higher financial capacity appeared to use funded aid as a strategic tool that could both support access and preserve net tuition revenue. By contrast, less endowed and smaller institutions did not appear to translate higher proportions of funded aid into stronger enrollment or higher net tuition revenue. In some cases, a higher proportion of funded aid was actually associated with weaker enrollment and lower net tuition revenue. These results aligned with concerns in the literature that endowment rich institutions possess competitive advantages that allowed them to deploy institutional aid in ways that not only addressed affordability but also sustained or enhanced long-term financial stability (Harter, 2016; Lapovsky, 2020).

Comparison to the Literature

The findings of this study both confirm and extend prior work on tuition discounting, pricing behavior, and financial sustainability in private, not-for-profit higher education. First, the steady rise in tuition discount rates across the period from 2014 to 2023 supported longstanding concerns that private institutions are locked in an “aid escalation” cycle in which they feel compelled to increase institutional aid in order to remain competitive in enrolling students (Breneman, 1994; Redd, 2000). The magnitude of discounting reported in this study, averaged in excess of 40% and institutional cases exceeding 80% or even 90%, illustrated how aggressively this escalation has advanced in the last decade. Second, the findings challenged the common assumption that tuition discounting reliably stimulated demand and protected net tuition revenue through scale by increasing enrollment. While prior literature often framed discounting as a lever to increase student yield, particularly among cost-sensitive students (Lapovsky, 2020; Martin, 2018), this study found that higher discount rates were associated with lower, not higher, enrollment levels ($r = -.238, p < .001$), and tuition discount rate significantly and negatively predicted enrollment in regression models. This suggested that discounting was frequently deployed in reactive contexts, after demand softens, rather than as an effective growth tool. Third, this study reinforced the conclusion that net tuition revenue in private higher education remained overwhelmingly driven by enrollment volume rather than by aid strategy alone. Enrollment predicted net tuition revenue strongly and consistently ($\beta = .813, p < .001$ overall, and the model containing enrollment and discount rate explained approximately two-thirds of the variance in net tuition revenue ($R^2 = .663$). This supported Breneman’s (1994) argument that private institutions’ financial positions are fundamentally enrollment dependent, even as their aid strategies become increasingly sophisticated. This study extended this argument by demonstrating that this enrollment dependence persisted even as institutions escalated their use of tuition discounting. Fourth, this study offered an updated, empirically derived estimate of the

tuition discount “danger zone.” The piecewise regression models revealed that net tuition revenue remained relatively stable as institutions increased discount rates up to roughly the mid-30s to 40%. Beyond that approximate range, net tuition revenue began to decline sharply and significantly, with a strong negative slope in the post breakpoint segment ($B = -398,481,451$, $p < .001$ at breakpoints of 35% and 40%). This analysis provided quantitative support for a widely held but previously informal claim that there is a tipping point beyond which additional discounting ceases to be financially sustainable (Lapovsky, 2020). This study identified that point, on average, between approximately 35% and 40%.

Implications

The findings of this study carry several implications for institutional practice in private, not-for-profit higher education. First, the results underscored that enrollment volume remains the central determinant of net tuition revenue. Across all models, enrollment was the strongest predictor of net tuition revenue, while tuition discount rate generally did not predict net tuition revenue once enrollment was included. This indicated that institutional financial health in tuition-dependent private institutions continues to depend primarily on sustaining and growing enrollment. Efforts to stabilize net tuition revenue should therefore prioritize strategies that protect headcount over time. Second, the findings called into question the assumption that tuition discounting alone can be relied upon to reverse enrollment decline. The study found that higher discount rates were associated with lower enrollment and, indirectly, lower net tuition revenue. For mid-sized institutions in particular, higher discounting coincided with both reduced headcount and reduced net tuition revenue. This suggested that institutional leaders should be cautious in interpreting escalating discount rates as evidence of an effective enrollment strategy. Instead, rapidly increasing discount rates may indicate that an institution is under competitive

pressure and is sacrificing net tuition revenue in an attempt to maintain enrollment levels that may not yield positive results in net tuition revenue. Third, the study identified an approximate threshold between 35% and 40% discount rate beyond which net tuition revenue began to decline sharply. Institutions whose average discount rates approached or exceeded this range should treat that level as a financial risk indicator. This threshold can serve as an internal monitoring metric alongside other traditional financial indicators. Presidents, chief financial officers, and governing boards should understand that crossing into the low 40% range in overall discount rate could be a structural financial decision that may materially erode net tuition revenue. Fourth, the results highlighted the particular vulnerability of smaller institutions. For smaller institutions, tuition discount rate did not show a significant association with enrollment, but it was associated with a modest direct reduction in net tuition revenue. This finding suggested that for small institutions, increasing institutional aid may directly erode net tuition revenue without generating an increase in enrollment. For institutions that lack substantial auxiliary revenue streams or endowment support, this pattern poses a long-term sustainability concern. Boards and senior leaders at smaller institutions should recognize that perpetually increasing discount rates may delay but not prevent structural revenue decline. Fifth, the analysis of funded versus unfunded aid indicated that the benefits of funded aid were not evenly available across the sector. For institutions with substantial endowment capacity, increasing the share of funded aid was modestly associated with improved enrollment and net tuition revenue, suggesting that these institutions can use funded aid as a strategic tool to both expand affordability and preserve net tuition revenue. For less-endowed institutions, however, a higher proportion of funded aid was not associated with higher enrollment or net tuition revenue and, in some cases, corresponded with very small but measurable declines. This implied that “moving aid to funded sources” alone was not a universal path to sustainability. Instead, the capacity to leverage funded aid as a revenue-stabilizing tool

appeared to be, itself, a function of institutional wealth. Finally, the findings suggested that institutional aid strategy should be understood as a financial instrument rather than solely as an enrollment tactic. Tuition discounting is often managed primarily through enrollment offices and framed in terms of yield. This study indicated that discounting has direct implications for long-term net tuition revenue stability. As such, tuition discounting policy should be co-owned by enrollment leadership and financial leadership.

Limitations and Recommendations for Future Research

Several limitations should be considered when interpreting the findings of this study. First, the analysis relied on secondary IPEDS data. While IPEDS provides comprehensive and standardized financial and enrollment data for U.S. postsecondary institutions, institutional reporting practices may vary, and definitions of funded versus unfunded aid may not be applied uniformly across institutions or across time. Second, because the study employed correlational and regression methods using observational data, causal inferences cannot be drawn. Although tuition discount rate was negatively associated with enrollment, and enrollment strongly predicted net tuition revenue, these results do not prove that increasing discount rates causes enrollment to fall or that declining enrollment causes institutions to increase discount rates. It is possible, and even likely, that institutions increase discounting in response to declining demand, and that both phenomena reinforce one another over time. Third, the analysis was conducted at the institution-year level and did not include student-level data. As a result, the study cannot directly assess how tuition discounting affects specific student populations, such as Pell-eligible students, first-generation students, transfer students, adult students, graduate students, or doctoral students. Prior research indicated that price sensitivity and financial aid responsiveness vary across student types (Martin, 2018; Redd, 2000). Future work incorporating student level or

segment level data would provide a more precise understanding of how institutional aid functions within recruitment and retention strategies. Fourth, the models did not include certain institutional characteristics that may influence both pricing capacity and enrollment behavior, such as selectivity, program mix, regional competition, mode of delivery, and mission or religious identity. Institutions with nationally recognized brands or highly specialized academic programs may be able to sustain higher published prices and lower discount rates without experiencing the same enrollment consequences faced by less visible institutions. Fifth, the study period spans pre-pandemic, pandemic, and post-pandemic years. Although the longitudinal design captures how institutions behaved across these periods, the study does not isolate the unique effects of the COVID-19 pandemic on tuition discounting, enrollment behavior, or net tuition revenue. These limitations suggested several directions for future research. First, future studies should examine institutional behavior at and above the identified 35% to 40% discount rate threshold. Second, future studies should incorporate student level data to evaluate how tuition discounting affects enrollment and net tuition revenue among distinct student populations. Institutions may find that discounting is still effective in populations even if it is less effective in others. Third, future work should expand the piecewise regression approach into forward-looking solvency modeling. The present study identified a threshold beyond which net tuition revenue declined sharply as discounting rose. Future research could estimate how long an institution can remain above that threshold, given its enrollment trajectory and endowment capacity, before new revenue sources, program changes, budget cuts, or debt restructuring become necessary. Finally, future research should also examine how varying proportions of funded and unfunded institutional aid affect broader financial outcomes beyond net tuition revenue, including changes in unrestricted net assets. Modeling the relationship between institutional aid composition and indicators of financial strength, specifically for private institutions, the change in unrestricted net

assets, could provide valuable insights into how institutions strategically allocate aid while sustaining long-term fiscal health. Such analyses may help institutional leaders better understand how different funding strategies influence not only short-term revenue outcomes but also overall financial resilience and growth.

Conclusion

This study examined a decade of tuition pricing behavior, institutional aid strategies, enrollment patterns, and net tuition revenue outcomes among private, not-for-profit, four-year institutions in the United States. Three conclusions emerged from the results. First, although published tuition and required fees rose substantially in nominal terms between 2014 and 2023, those increases were far more modest when restated in constant 2023 dollars using CPI and HEPI. At the same time, tuition discount rates increased by nearly nine percentage points over the decade, reaching an average of 43.59% in 2023 and, in many institutions, far higher. These findings indicated that private institutions were increasingly relying on institutional aid to attract students but with less margins in net tuition revenue. Second, the study found that enrollment volume, not tuition discount rate, was the dominant driver of net tuition revenue. Enrollment consistently and strongly predicted net tuition revenue across all models, while tuition discount rate generally did not remain significant once enrollment was included in the model. Institutions that enrolled more students generated more net tuition revenue, regardless of their average discount rate. At the same time, higher tuition discount rates were associated with lower enrollment levels and, indirectly, with lower net tuition revenue. These results suggested that the principal financial vulnerability faced by tuition-dependent private institutions was not simply high discount rates in isolation, but the combination of high discount rates and weakening enrollment. Third, the study identified an approximate threshold in the relationship between

tuition discount rate and net tuition revenue. Piecewise regression models indicated that net tuition revenue remained relatively stable as institutional discount rates rose into the mid 30% range but began to decline sharply as discount rates exceeded approximately 35% to 40%. Beyond that range, each additional increase in discounting corresponded to a rapid deterioration in net tuition revenue. This suggested that institutions operating with average tuition discount rates above 40% were assuming significant and measurable financial risk. This threshold offered a practical planning benchmark for institutional leaders and provided empirical support for widely voiced concerns regarding the sustainability of ever-increasing discount rates (Lapovsky, 2020). Finally, the differentiated effects of funded versus unfunded aid underscore the growing stratification of private higher education. Institutions with substantial endowment resources appeared able to deploy funded aid in ways that modestly supported both enrollment and net tuition revenue. Less resourced institutions, by contrast, did not consistently explain the same benefits and in some cases exhibited weak, negative associations between funded aid share and net tuition revenue. These findings suggest that wealthier institutions can afford to “buy down” net price strategically without proportionately eroding tuition revenue, while less wealthy institutions often cannot (Harter, 2016; Lapovsky, 2020).

The results of this study indicated that tuition discounting has moved from being an effective enrollment tool to being a defining dimension of institutional financial identity. Going forward, private, not-for-profit institutions will likely need to treat tuition discounting not only as an enrollment decision but as a financial decision that demands active cooperation between enrollment leadership, finance leadership, and the rest of an institution’s administrative body.

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APPENDIX A

Institutions Included in the Study

| | |
|--------------------------------|-------------------------------|
| Abilene Christian University | Assumption University |
| Adelphi University | Augsburg University |
| Adrian College | Augustana University |
| AdventHealth University | Aurora University |
| Alaska Pacific University | Austin College |
| Albright College | Ave Maria University |
| Alfred University | Avila University |
| Alvernia University | Azusa Pacific University |
| Alverno College | Babson College |
| American International College | Baker College |
| American University | Baldwin Wallace University |
| Anderson University | Baptist University of Florida |
| Anderson University | Barclay College |
| Andrews University | Bard College |
| Anna Maria College | Barton College |
| Aquinas College | Bay Path University |
| Arcadia University | Baylor University |
| Art Center College of Design | Belhaven University |
| Asbury University | Bellarmino University |
| Ashland University | Bellevue University |

Bellin College
Belmont University
Benedictine College
Bentley University
Berklee College of Music
Berry College
Bethany College
Bethel University
Bethel University
Bethel University
Biola University
Blue Mountain Christian University
Bluefield University
Bluffton University
Boston Architectural College
Boston College
Boston University
Brandeis University
Brenau University
Brescia University
Briar Cliff University
Brigham Young University
Brown University
Bryan College-Dayton
Bryant University
Bryn Mawr College
Buena Vista University
Bushnell University
Butler University
Cabrini University
Cairn University-Langhorne
Caldwell University
California Baptist University
California College of the Arts
California Institute of Technology
California Institute of the Arts
California Lutheran University
Calvary University
Calvin University
Cambridge College
Campbell University
Campbellsville University
Canisius University
Capital University
Carlow University
Carnegie Mellon University

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|----------------------------------|---|
| Carroll University | Colgate University |
| Carson-Newman University | College for Creative Studies |
| Carthage College | College of Our Lady of the Elms |
| Case Western Reserve University | College of Saint Mary |
| Cedar Crest College | College of the Atlantic |
| Cedarville University | Colorado Christian University |
| Centenary College of Louisiana | Columbia College |
| Chaminade University of Honolulu | Columbia College Chicago |
| Champlain College | Columbia International University |
| Chapman University | Columbia University in the City of New York |
| Charleston Southern University | Concordia College at Moorhead |
| Chatham University | Concordia University Texas |
| Chestnut Hill College | Concordia University-Chicago |
| Christian Brothers University | Concordia University-Irvine |
| Claflin University | Concordia University-Nebraska |
| Clark Atlanta University | Concordia University-Saint Paul |
| Clark University | Concordia University-Wisconsin |
| Clarke University | Converse University |
| Clarks Summit University | Corban University |
| Clarkson College | Cornell University |
| Clarkson University | Cornerstone University |
| Cleveland Institute of Music | Covenant College |
| Coker University | |

Creighton University
Crown College
Culver-Stockton College
Cumberland University
Curry College
Curtis Institute of Music
Daemen University
Dakota Wesleyan University
Dallas Baptist University
Dartmouth College
Davenport University
Defiance College
Delaware Valley University
DePaul University
DeSales University
Dominican University
Dominican University of California
Dordt University
Drake University
Drew University
Drexel University
Drury University
Duke University
Duquesne University
D'Youville University
Earlham College
East Texas Baptist University
Eastern Mennonite University
Eastern Nazarene College
Eastern University
Edgewood College
Elizabethtown College
Elmhurst University
Elon University
Embry-Riddle Aeronautical University-
Daytona Beach
Emerson College
Emmanuel College
Emory & Henry University
Emory University
Endicott College
Erskine College
Evangel University
Fairleigh Dickinson University-
Metropolitan Campus

Faith Baptist Bible College and
Theological Seminary
Faulkner University
Felician University
Fisk University
Florida Institute of Technology
Florida Southern College
Fontbonne University
Fordham University
Franciscan Missionaries of Our Lady
University
Franciscan University of Steubenville
Franklin Pierce University
Freed-Hardeman University
Fresno Pacific University
Friends University
Furman University
Gallaudet University
Gannon University
Gardner-Webb University
Geneva College
George Fox University
George Washington University

Georgetown College
Georgetown University
Georgian Court University
Goddard College
Gonzaga University
Gordon College
Goshen College
Goucher College
Grace College and Theological Seminary
Graceland University-Lamoni
Grand View University
Greensboro College
Greenville University
Gwynedd Mercy University
Hamline University
Hannibal-LaGrange University
Harding University
Hardin-Simmons University
Harvard University
Hastings College
Heidelberg University
Hendrix College
Heritage University

High Point University
Hilbert College
Hiram College
Hobart William Smith Colleges
Hofstra University
Hollins University
Holy Family University
Hood College
Hope International University
Houghton University
Houston Christian University
Howard Payne University
Howard University
Huntington University
Illinois Institute of Technology
Immaculata University
Indiana Institute of Technology
Indiana Wesleyan University-Marion
Iona University
Ithaca College
Jacksonville University
Jewish Theological Seminary of America
John Brown University
John Carroll University
Johns Hopkins University
Johnson University
Judson University
Juniata College
Kansas Wesleyan University
Kentucky Christian University
Kettering University
Keuka College
King University
King's College
La Roche University
La Salle University
La Sierra University
LaGrange College
Laguna College of Art and Design
Lake Erie College
Lake Forest College
Lakeland University
Lancaster Bible College
Lasell University
Lawrence Technological University
Le Moyne College

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|------------------------------------|---------------------------------------|
| Lebanon Valley College | Maine College of Art & Design |
| Lee University | Malone University |
| Lehigh University | Manchester University |
| Lenoir-Rhyne University | Manhattan College |
| LeTourneau University | Manhattanville College |
| Lewis & Clark College | Marian University |
| Liberty University | Marian University |
| Life Pacific University | Marietta College |
| Limestone University | Marist College |
| Lincoln Christian University | Marquette University |
| Lindsey Wilson College | Mars Hill University |
| Lipscomb University | Martin Luther College |
| Loras College | Mary Baldwin University |
| Louisiana Christian University | Maryland Institute College of Art |
| Lourdes University | Marymount University |
| Loyola Marymount University | Maryville University of Saint Louis |
| Loyola University Chicago | Marywood University |
| Loyola University Maryland | Massachusetts Institute of Technology |
| Loyola University New Orleans | McDaniel College |
| Lubbock Christian University | McKendree University |
| Lynn University | McMurry University |
| Madonna University | McPherson College |
| Maharishi International University | MCPHS University |

Mercer University
Mercy University
Mercyhurst University
Meredith College
Merrimack College
Messiah University
Methodist University
Mid-America Christian University
MidAmerica Nazarene University
Midland University
Midwestern Baptist Theological Seminary
Millikin University
Millsaps College
Milwaukee School of Engineering
Minneapolis College of Art and Design
Misericordia University
Mission University
Mississippi College
Missouri Baptist University
Missouri Valley College
Molloy College
Monmouth University
Montreat College
Moody Bible Institute
Moore College of Art and Design
Moravian University
Morningside University
Mount Aloysius College
Mount Holyoke College
Mount Mary University
Mount Mercy University
Mount Saint Mary College
Mount Saint Mary's University
Mount St. Joseph University
Mount St. Mary's University
Mount Vernon Nazarene University
Multnomah University
Muskingum University
Naropa University
National Louis University
Nazareth University
Nebraska Methodist College of Nursing &
Allied Health
Nebraska Wesleyan University
Neumann University
New York Institute of Technology

New York School of Interior Design
New York University
Newman University
Niagara University
Nichols College
North Central University
North Park University
Northeastern University
Northwest Nazarene University
Northwest University
Northwestern University
Northwood University
Norwich University
Nova Southeastern University
Oakwood University
Oberlin College
Ohio Christian University
Ohio Dominican University
Ohio Northern University
Oklahoma Baptist University
Oklahoma City University
Oklahoma Wesleyan University
Olivet Nazarene University
Oral Roberts University
Otis College of Art and Design
Ottawa University-Ottawa
Otterbein University
Our Lady of the Lake University
Pace University
Pacific Lutheran University
Pacific Union College
Pacific University
Palm Beach Atlantic University
Park University
Peirce College
Pennsylvania Academy of the Fine Arts
Pepperdine University
Pfeiffer University
Piedmont University
Point Loma Nazarene University
Point Park University
Pratt Institute-Main
Presbyterian College
Prescott College
Princeton University
Providence College

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|-------------------------------------|--------------------------------------|
| Queens University of Charlotte | Rosemont College |
| Quincy University | Russell Sage College |
| Quinnipiac University | Sacred Heart University |
| Randall University | Saint Ambrose University |
| Randolph College | Saint Edward's University |
| Regis College | Saint Elizabeth University |
| Regis University | Saint Francis University |
| Reinhardt University | Saint John's University |
| Rensselaer Polytechnic Institute | Saint Joseph's College of Maine |
| Rhode Island School of Design | Saint Joseph's University |
| Rhodes College | Saint Louis University |
| Rice University | Saint Martin's University |
| Rider University | Saint Mary-of-the-Woods College |
| Rivier University | Saint Mary's College of California |
| Robert Morris University | Saint Mary's University of Minnesota |
| Rochester Institute of Technology | Saint Michael's College |
| Rockford University | Saint Norbert College |
| Rockhurst University | Saint Peter's University |
| Rocky Mountain College | Saint Vincent College |
| Roger Williams University | Saint Xavier University |
| Rollins College | Salem College |
| Roosevelt University | Salve Regina University |
| Rose-Hulman Institute of Technology | Samford University |

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|--|--|
| San Francisco Conservatory of Music | Southwest Baptist University |
| Sarah Lawrence College | Southwestern Assemblies of God University |
| Savannah College of Art and Design | Southwestern Christian University |
| Scripps College | Southwestern College |
| Seattle Pacific University | Spalding University |
| Seattle University | Spring Arbor University |
| Seton Hall University | Spring Hill College |
| Seton Hill University | Springfield College |
| Shenandoah University | St. Bonaventure University |
| Shorter University | St. Catherine University |
| Siena College | St. Lawrence University |
| Simmons University | St. Francis College |
| Simpson College | St. John Fisher University |
| Simpson University | St. John's College |
| Smith College | St. John's College |
| Southeastern Baptist Theological Seminary | St. John's University-New York |
| Southern Adventist University | St. Mary's University |
| Southern California Seminary | St. Thomas Aquinas College |
| Southern Methodist University | St. Thomas University |
| Southern Nazarene University | Stanford University |
| Southern New Hampshire University | Stephens College |
| Southern Wesleyan University | Stetson University |

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| Stevens Institute of Technology | The University of the South |
| Stevenson University | Thomas College |
| Suffolk University | Thomas More University |
| Sweet Briar College | Tiffin University |
| Syracuse University | Touro University |
| Tabor College | Trevecca Nazarene University |
| Taylor University | Trine University |
| Texas Christian University | Trinity Christian College |
| Texas Lutheran University | Trinity College |
| Texas Wesleyan University | Trinity International University-Illinois |
| The Catholic University of America | Trinity University |
| The College of Idaho | Trinity Washington University |
| The College of Saint Rose | Tufts University |
| The College of Saint Scholastica | Tulane University of Louisiana |
| The Cooper Union for the Advancement of Science and Art | Tusculum University |
| The Juilliard School | Tuskegee University |
| The King's University | Union Adventist University |
| The Master's University and Seminary | Union College |
| The New England Conservatory of Music | Union University |
| The New School | University of Charleston |
| The University of Findlay | University of Chicago |
| The University of Tampa | University of Dallas |
| | University of Denver |

University of Detroit Mercy
University of Dubuque
University of Evansville
University of Holy Cross
University of Indianapolis
University of Jamestown
University of La Verne
University of Lynchburg
University of Mary
University of Mary Hardin-Baylor
University of Miami
University of Mobile
University of Mount Union
University of New England
University of New Haven
University of Notre Dame
University of Pennsylvania
University of Portland
University of Providence
University of Puget Sound
University of Redlands
University of Richmond
University of Rio Grande
University of Rochester
University of Saint Francis-Fort Wayne
University of Saint Joseph
University of Saint Mary
University of San Diego
University of San Francisco
University of Scranton
University of Sioux Falls
University of Southern California
University of St. Francis
University of St. Thomas
University of St. Thomas
University of the Arts
University of the Cumberland
University of the Incarnate Word
University of the Pacific
University of the Southwest
University of the West
University of Tulsa
University of Valley Forge
Upper Iowa University
Ursuline College
Utica University

Valparaiso University
Vanderbilt University
Villanova University
Viterbo University
Wagner College
Wake Forest University
Walsh University
Warren Wilson College
Washington and Lee University
Washington University in St. Louis
Wayland Baptist University
Waynesburg University
Webster University
Wentworth Institute of Technology
Wesleyan College
Wesleyan University
West Virginia Wesleyan College
Western New England University
Westminster College
Westminster University
Wheaton College
Whitworth University
Widener University
Wilkes University
Willamette University
William Carey University
William Jessup University
William Penn University
William Woods University
Williams College
Wilmington University
Wilson College
Wingate University
Wisconsin Lutheran College
Wittenberg University
Worcester Polytechnic Institute
Xavier University
Xavier University of Louisiana
Yale University
Yeshiva University
York College of Pennsylvania
York University

