STUDENT DEMOGRAPHICS AND FINANCIAL HEALTH IN PRIVATE HIGHER EDUCATION INSTITUTIONS

by

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(Under the Direction of Robert K. Toutkoushian)

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ABSTRACT

The long-term financial viability of private higher education has been a topic of concern for some time, with experts predicting their decline. This concern has been exacerbated by declining enrollment, mounting deficits, and a wave of closures among small private institutions. Demographic changes, including declining high school graduate populations and the growth of minority students, are set to create a highly competitive and saturated college market. Moreover, the growing gap in income and wealth distribution, coupled with the rising number of non-traditional learners, adds further pressure on colleges to modernize their academic offerings and support services.

This study investigated the relationship between student demographic characteristics and the financial health of 769 private non-profit colleges and universities. By analyzing 2021 data from the U.S. Department of Education's Integrated Postsecondary Education Data System (IPEDS), the study sought to determine the relationship between student body demographic characteristics and institutional financial health. The independent variables for this study

included the percentage of enrolled students by race, percentage of non-resident alien students, Pell eligibility, percentage of students receiving aid, age, and gender. The dependent variables were represented by the CFI and its four ratios: primary reserve ratio, viability ratio, return on net assets ratio, and the net operating revenues ratio.

Multiple regression analysis results indicated that student demographics have a modest role in predicting institutional financial health. Notably, only three of the student demographic characteristics variables were associated with CFI performance. An increase in the percentage of Black students was positively associated with CFI performance. However, growth in the proportion of Pell-eligible and adult students had a negative relationship with CFI performance. These findings underscore the complex relationship between student demographics and institutional financial health, with indirect association through variables like overall discount rates, retention, and graduation rates. Overall, the study provides valuable insights into the multifaceted factors related to private institutions' financial viability.

INDEX WORDS: Student demographics, composite financial index, financial ratios, financial health, private colleges and universities, multiple regression

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DEDICATION

This dissertation is dedicated to the remarkable women leaders who tirelessly strive to transform higher education by ascending to influential leadership roles. Their unwavering commitment and resilience inspire positive change, and this dedication honors their invaluable contributions.

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To my dear husband, whose unwavering belief in my dreams sustained me during the long nights and weekends of study and research. Your sacrifices, patience, and encouragement made this degree possible. I am profoundly grateful for your love and steadfast support. Thank you for believing in me, Neel! My heartfelt appreciation to my in-laws, whose caring love comforted me through this time. Special thanks to my mother, she not only instilled in me a profound love for education but also emphasized the importance of resilience and determination. Her love, support, and encouragement have shaped me into the confident woman I am today, ready to contribute meaningfully to society. I also want to recognize my sister. She has been such a source of inspiration, teaching me to fight for myself and prioritize my well-being. Her unconditional love was a constant source of strength throughout this journey.

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CHAPTER 1

INTRODUCTION

Over the years, the financial viability of private colleges and universities has been questioned, and industry experts and observers have predicted their demise. In 2018, *Education Next* released a special report, "Private Colleges in Peril." In the report, Eide stated, “enrollment is dwindling. Deficits are mounting. And more closures are looming: that's the prediction of many higher education experts, who are concerned about the future of small private colleges in America" (p. 1). Before the pandemic, 36 private, non-profit colleges failed the Department of Education’s Financial Responsibility Test, and since Eide's statement in 2018, over 40 colleges have closed their doors (Federal et al., 2019; Higher Ed Dive, 2022). According to the authors of The College Stress Test, a book that analyses market stresses that threaten the viability of American colleges and universities, 10% of the nation’s colleges will face substantial market risk, and 30% will be bound to struggle. Moreover, Moody’s Investors’ outlook for higher education has been negative since the pandemic's beginning, as reduced enrollments have led to declining revenue. Industry experts confirm the above statements with a study of federal government data, which concluded that the financial resilience of colleges and universities to withstand another shock to the system has substantially eroded (Krafft, et al., 2023). These results are substantiated by the 2023 Forbes College Financial Grade ranking report, which suggests that the federal assistance provided by the American Rescue Plan due to COVID has created a misleading perception of improvement for financially challenged institutions (Whitford & Schifrin, 2023).

With no shortage of dire predictions, are private institutions doomed to irrelevance in the face of the upcoming demographic changes and an unsustainable business model? Without a

doubt, the upcoming demographic changes, such as the declining high school graduate population, the rise of adult students, and minority population growth, will challenge many private colleges' mission, enrollment, current business model, and, consequently, their financial viability. Due to enrollment declines and upcoming changes, college and university governing boards and leaders have become hyper-focused on assessing enrollment challenges, risk, management practices, and financial viability (Tahey et al., 2010). They have responded to the environment in many ways by adopting more business-like operations and management practices. In such, they have adopted the use of financial ratios to measure their financial performance and guide strategic decision making.

Given the posed threats to institutions' financial health, this research examined the relationship between student body demographic characteristics and institutional financial performance at four-year, non-profit private colleges and universities. Student demographics characteristics were represented by variables such as socioeconomic status, race, age, proportion of international students, and gender. The Composite Financial Index (CFI) and the four ratios that comprise it served as the proxy for institutional financial health. The CFI is the financial performance measure recommended by the Strategic Financial Analysis of Higher Education Handbook, a widely used framework by senior colleges and university leaders to assess their institution's financial health. To understand the context of private institutions' financial health and enrollment, this chapter provides an overview of the upcoming demographic changes, the current environment, and the role of financial ratios in assessing financial health at colleges and universities; it concludes by stating the research questions and the significance of the study.

Upcoming Demographic Changes and Private Institutions' Financial Health

Declines in traditional high school graduate population, growth of minority students, significant equity gaps in wealth and college retention and attainment, and growth of non-traditional student populations mean a highly saturated competitive market and higher cost to educate students putting significant financial pressure on tuition-dependent institutions. Due to lower birth rates during the Great Recession, the high school graduate population is expected to peak at 3.93M graduates in 2025 and then decline to 3.52 M by 2037 (Bransberger et al., 2020). Termed the "enrollment cliff", this decline in the number of 18 years-olds will not impact all colleges equally. Grawe's (2021) projections suggest that colleges in the Northeast and the Midwest regions will be hit the hardest with a 15% decline from 2025 to 2029 due to migration patterns. This represents sobering news for tuition-dependent colleges in those regions that are already teetering on unstable financial footing. This means students will become a scarce resource resulting in a highly saturated market in which colleges will compete fiercely to secure their market share.

Furthermore, the high school students of color represent the only growth we will see in years. Students of color will grow by 8.9% in the next 15 years, while White students will decrease by 9.7% (Bransberger et al., 2020). Such statistics signal that we are becoming a minority-majority society. According to the National Center for Education Statistics (NCES), in 1976, only 16% of students were non-white; fast forward to 2019, and 46% of students were non-white. Furthermore, projections from the 2014 U.S. Census Bureau suggest that more than half of our population will belong to a minority group by 2044 (Colby & Ortman, 2015). Moreover, there are significant gaps in retention rates between White and Asian students compared to Latinx, Black, and Native Americans. According to the NSC Research Center, Asian

students have the largest retention rates at private, non-profit institutions, with 86.6% compared to Whites at 77.5%, Latinx at 68.5%, Blacks at 61.1%, and Native Americans at 59.1%. Let us consider that most of the population growth for the next ten years will be in the Latinx population. Senior college and university administrators must understand the implications of such growth and its impact on enrollment, revenue, and consequently their financial health.

Other considerations regarding demographic changes are stagnant income growth and unequal wealth distribution (Seltzer, 2019). From 2000 to 2020, the median household income went from $58,609 to $67,521 (in 2020 U.S. dollars), a 15.2% increase (Statista, 2022). While household income has grown only modestly in the last 20 years, the wealth gaps in income continue to widen, and there are noticeable differences by race or ethnic groups (Horowitz et al., 2020; Statista, 2020). For example, according to the Statista research department, Asians and Whites have relatively high median incomes of $94,903 and $74,912, respectively. In contrast, Hispanic and Black household incomes are lower than the national average median income of $55,321 and $45,870, respectively. Another statistic that illustrates racial inequality in the U.S. is the unemployment rate. Currently, Caucasians have unemployment rates of 4.7%, which is below the national average of 5.3%, while Hispanics and blacks are above that average at 6.8% and 8.6% (Statista, 2022). Given the statistics, enrollment of these populations means that additional resources are needed from colleges and universities to close the gap. This will become increasingly difficult, with unfunded discount rates at an all-time high among private institutions and the rising costs of educating students. Supporting these students means colleges will have to provide additional aid, which increases their discount and reduces their revenue per student. For non-highly selective institutions, this is not an easy task as they do not count on large endowment to fund student aid.

Another phenomenon in higher education is the growth of the non-traditional student population. Denoted as adult learners over the age of 24, non-traditional students differ from the typical 18-year-old as they are financially independent, have a dependent and are a caregiver, have delayed matriculation into college, in many instances do not hold a traditional high school diploma, and tend to be employed full-time while attending school part-time (NCES, 2015). While representing over 40% of undergraduate students, this rapidly growing population reports that only 58% of institutions offer support services to non-traditional students (CLASP, 2015). Non-traditional students represent a viable market for private colleges and universities, but to serve these students, they need to modernize their curriculum by offering a career-focused approach to their educational offerings and creating seamless student experiences by adopting technology and streamlining processes. Additionally, these students do not contribute to auxiliary revenue such as room and board fees. This means that as the student composition changes, enrollment managers need to account for the revenue that is relinquished when enrolling a larger proportion of adult students. Not accounting for this can have a negative impact on the financial health of the institution.

In light of all upcoming demographic changes, colleges will need to adjust by modernizing their curriculum, building support services and scholarships programs to close minority population gaps, and streamlining experiences to attract adult students- all in function of maintaining or growing enrollment to ensure their viability. This will require an influx of resources and strategic decisions regarding enrollment composition and resource allocation. Moreover, they need to do all of that while actively responding to the challenges of today's environment.

The Current Environment's Challenges

U.S. higher education is experiencing the longest and largest college enrollment contraction in modern history, with over two million undergraduate students lost between 2010-2020, representing a 12.8% enrollment decline (National Center for Education Statistics [NCES], 2022). Among the possible factors for the loss of enrollment over the past decade are the high rate of tuition increases over the years, discriminatory pricing strategies, shifting market demands, and stagnant retention rates.

This enrollment contraction period and the negative outlook of a college education have forced institutions to reevaluate their recruitment and tuition discounting practices to appeal to a highly competitive, shrinking market (National Association of Independent Colleges and Universities [NACUBO], 2018). Because of their high sticker price and dependency on tuition revenue, the pressure to discount tuition has always been higher on private institutions, which makes them vulnerable to economic and demographic changes. However, the public does not realize that as sticker prices have gone up, so have the amount of dollars colleges and universities provide back to families through scholarships and grants. This is what we know as the high-tuition, high-aid model.

Historically, the high-tuition, high-aid model depends on a healthy supply of middle and upper-income families willing to pay the full costs. However, given the wealth gap in the U.S. and the growth of minority populations, the pipeline of those middle and upper-income families is declining. Furthermore, due to colleges providing merit aid regardless of the student's ability to pay to attract more academically qualified students, families have gotten very savvy and no longer expect to pay the total cost of a private education (Marcy, 2020; Thelin, 2019). They shop around by applying to several institutions and wait for financial aid packages before making a

final decision, which explains the decrease in student yield (number of accepted students that enroll at the institution) from 26% average yield at non-profit privates in 2017 compared to 20.3% in 2021 (RNL, 2022). This high-tuition, high-aid model has resulted in the loss of revenue over the last decade as colleges experienced enrollment declines (Behaunek, 2019; Browning, 2013; Jalal & Khaksari, 2019). Today, 82.8% of all undergraduate students receive institutional grant aid at private institutions, and tuition discounting is at an all-time high, with first-time undergraduates' average tuition discount rate rising to 53.9% in the 2020-21 academic year from 44.3% in 2011-12 (NACUBO, 2021). Meanwhile, the average net tuition revenue in that period has only increased by 14% (NACUBO, 2021). Moreover, according to NACUBO (2021), 71.7% of all institutional grants and scholarships came from unfunded or undedicated revenue sources, which means that operating revenues were sacrificed to enroll students, putting the institution's financial health at risk.

Another factor impacting financial health at private colleges is the shifts in academic program market demand and the need for additional services to meet students' expectations due to the high cost of providing such programs and services, which puts tremendous pressure on the colleges as they try to keep their education affordable to students and families. According to data from the National Center for Education Statistics (NCES), there has been a significant shift in demand for majors that are aligned with post-graduation careers. STEM majors such as health professions, computer science, and engineering are leading the degree charts (NCES, 2021). Between 2009-10 and 2019-20, degrees granted in health professions and related fields have increased by 98%, from 129,600 to 257,300 degrees, while degrees conferred in social science and history have decreased by 7%, from 172,800 to 161,200 degrees (NCES, 2022). This means

a move away from the programs typically offered in the liberal arts curriculum, fundamentally challenging the mission and financial outlook of small liberal arts institutions (Marcy, 2020).

Along with the academic shifts, the increasing number of first-generation students, the growth of minority populations, the rising number of adult students, students diagnosed with moderate to severe mental health conditions, and the rise of technology, the market expects colleges to provide services to attend to their student's increasing needs and demands (Lieber, 2021). As the expectations of a college education expand from being seen as a social good and individual asset to providing a full-service experience, private colleges are being forced to expand existing programs to offer high-in-demand degrees and expected student services. These expansions can be pricey because of the need to acquire talent and, in many cases, physical assets to house the new programs (Marcy, 2020). Developing new programs and implementing supporting services requires extensive planning and up-front investment; when not executed successfully, it can weaken the institution's financial health. With the current realities and the upcoming demographic changes, how can institutions assess their financial viability to make strategic decisions that enable them to navigate these challenges successfully?

Using Financial Ratios to Assess Financial Health and Guide Strategic Decisions

Financial ratio analysis has been used to assess the financial risk of colleges and universities since the mid-1970s. The ratios helped identify how and in what ways the financial condition of institutions was changing (Collier & Patrick, 1978). Furthermore, the strongest proponents of applying ratio analysis in higher education predicted that the practice would achieve several goals: to improve institutional effectiveness, increase accountability, improve resource allocation decisions, and help inform current or proposed higher education public policy

(Brand, 1993; Jackson & Hammonds, 1997; Lewis & Wasescha, 1987; Murphy & Eddy, 1998; Updegrove, 1982).

Over the years, most of the focus of ratio analysis in higher education has aimed at setting terms for borrowing funds and making judgments on financial distress to predict college closures. For example, the Department of Education's Financial Responsibility Composite Score (FRCS) formula aims to measure the overall financial health of the institution and identify institutions at risk of closure due to financial distress (Sherman, 2016). Over the years, failing the composite score test not only jeopardizes the institution's participation in Title IV programs but has also been seen as an indicator of the institution's overall financial fragility and a signal to investors that a college could be ripe for a for-profit takeover (Blumenstyk, 2013; Federal Student Aid, 2016). However, Chabotar (1989) asserted that financial ratios could also be used to identify what is unique about a higher education institution and provide the ability to control for the effects of size over time and across institutions.

In the late 1980s, KMPG introduced the first edition of ratio analysis in higher education. Now in its seventh edition, they provide a framework for private and public institutions to understand their overall financial condition so senior administrators can align financial resources to the institution's mission and strategic plan. To simplify communication of the institution's financial health, they created the Composite Financial Index (CFI). The CFI combines four ratios that help measure resource sufficiency and flexibility, debt management, asset performance, and operating results. Over the years, the CFI has become the commonly used tool by college administrators as well as a benchmark instrument used by higher education organizations.

Purpose of the Study

Given the implications of demographic changes on the colleges' ability to sustain enrollment volumes and how enrollment is closely linked to financial viability at four-year, non-profit private institutions as it accounts for a large share of their revenue, this study seeks to understand the relationship between student body demographic characteristics and the financial health of the institution. Although much research exists on financial ratios (Buddy, 1999; Collier, 1979; Dickmeyer & Hughes, 1982; DiSalvio, 1989; Chabotar, 1989; Everett, 1995; Lee, 2009; Lupton et al., 1976; Sherman, 2016) determining the financial viability of institutions, how non-financial indicators ought to complement the ratios to paint the whole picture, and how certain enrollment key performance indicators are linked to financial performance (Lee, 2009; Martin & Samels, 2009; Tahey et al., 2010; Lyken-Segosebe & Shepherd, 2013; Hanover Research, 2014; Tandberg, 2018), limited research exists on how student body demographic characteristics impact ratio performance and consequently institutional financial viability. Therefore, this quantitative research study contributes to the existing literature by providing empirical evidence about the relationship between student demographics and institutions' financial health at private, four-year non-profit colleges. Its purpose is to determine whether student characteristics are related to the Composite Financial Index performance and, if so, which student characteristic is most predictive of institutional financial health. The goal is to help enrollment managers and campus administrators make strategic enrollment management decisions that positively impact the institution's financial health while also informing policymakers, researchers, and leaders in higher education organizations who are invested in the sustainability of private higher education in the U.S.

Research Question

This research aimed to study the relationship between student body demographic characteristics and the financial health of four-year, non-profit private colleges as measured by the CFI framework. To study this relationship, 2021 data from the U.S. Department of Education's Integrated Postsecondary Education Data System (IPEDS) was analyzed using a multiple regression statistical technique. The study examined several independent variables, including the percentage of students enrolled by race, non-resident alien students, Pell eligibility, percentage of students receiving aid, age, and gender. The dependent variables were the CFI and its four ratios: primary reserve ratio, viability ratio, return on net assets ratio, and net operating revenues ratio.

Utilizing the Extended Resource-based Theory (ERBT) as the underlying conceptual framework, this study posited a hypothesis wherein a discernible linkage exists between student demographic characteristics and the financial well-being of four-year private, non-profit educational institutions. The implications of the study's findings are poised to aid institutional leaders in making strategic enrollment decisions, thereby ensuring the financial sustainability of their institutions.

In the empirical examination of this hypothesis, the study endeavors to address the following research question:

> How are student body demographic characteristics related to the financial health of four-year, non-profit private institutions, and which characteristic is most predictive of financial health?

Significance of the Study

With higher graduation rates, smaller classes, and greater faculty-student interaction than public institutions, small private colleges are an alternative preferred by many prospective students. Four-year, non-profit colleges account for 32.9% of higher education institutions in the U.S., serving a little over four million students (Hanson, 2022). Additionally, as we strive to expand access to higher education and bring about innovative practices to serve the market's ever-changing needs, many argue that private institutions are nimbler and more efficient than their public counterparts (Kwiek, 2008; Robertson & Komljenovic, 2016). Per the National Association of Independent Colleges and Universities (NAICU, 2019), these colleges and universities provided a substantial share of degrees: 29% of undergraduate and 45% of Master's degrees versus 26% and 43% at public institutions; student borrowers from these institutions had the lowest default rates within the higher education sector at 6.6% compared to 7.1% at public institutions; in FY16, approximately half of the undergraduate students at non-profit privates came from households with less than $50,000 a year income (NAICU, 2019). Moreover, NAICU (2007) asserted that underrepresented minority groups are more likely to graduate from private colleges in four years than in six years at a public institution which can have significant implications in correcting income inequalities, especially as minority populations are expected to grow.

Without a doubt, private institutions are an integral part of our higher education ecosystem. However, a declining enrollment environment threatens their financial viability. As put by Gardner and Williams June, "If there's a primary vital sign for colleges, a crude point of reference for outside observers, like the pulse of an emergency-room patient, it's student enrollment" (2022, p. 1). Unfortunately, their high dependency on tuition, paired with shifts in

the market demand and upcoming demographic changes, jeopardizes these institutions' livelihood, negatively impacting the campus' local community economy and identity (Sapiro, 2019). Understanding the relationship between student demographic characteristics and the institution's financial health can help enrollment and university leaders make strategic enrollment decisions and adopt business models that enable them to avoid the dire college closure experts' predictions and successfully navigate the current and upcoming challenges. The study's findings have implications not only for institutional leaders and administrators but also for policymakers, researchers, and stakeholders invested in the sustainability of higher education. The implications extend beyond the immediate financial health metrics; they provide insights into how institutions navigate the intricacies of student diversity to secure resources, enhance the educational experience, and contribute positively to society.

Conclusion

As higher education undergoes the most prolonged period of enrollment contraction in modern history, many private colleges and universities face financial risks. Moreover, upcoming demographic changes such as the decrease in high school graduates and the growth of minority populations and non-traditional students combined with the increasing cost of higher education, shifting academic program trends, and the negative outlook of the value of a college degree have forced senior leadership at these institutions to respond to the environment by adopting more business-like practices. To that end, college and university governing boards and leaders have become hyper-focused on assessing financial viability. In the 1970s ratios were adopted in higher education to assess financial risk, and the strongest proponents predicted that the practice would achieve several goals: to improve institutional effectiveness, increase accountability, improve resource allocation decisions, and help inform current or proposed higher education public policy

(Brand, 1993; Jackson & Hammonds, 1997; Lewis & Wasescha, 1987; Murphy & Eddy, 1998; Updegrove, 1982).

Given the fact that tuition and revenue account for a large share of operating revenues at private institutions, this quantitative study will seek to understand if there is a relationship between student body demographic characteristics and institutions' financial health at private, four-year non-profit colleges. Its purpose is to determine whether specific student demographic characteristics are related to the CFI performance and, if so, which indicators are most predictive of institutional financial health. The goal is to help enrollment managers and campus administrators make strategic enrollment management decisions that positively impact the institution's financial viability.

CHAPTER 2

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

How do we define a college or university's financial viability? What are the best ways to measure financial viability or financial health? Financial viability is commonly known as the generation of sufficient revenue to meet operating expenses and debt commitments and allow growth while maintaining quality services. Over the years, researchers, governing boards, campus administrators, and state, federal, and private organizations have conducted a plethora of studies to help us identify the best indicators of higher education institutions' financial health. However, little research exists directly tying student demographic characteristics to financial ratio performance to help enrollment leaders and senior administrators make strategic and financially sound enrollment decisions, especially during periods of enrollment contraction and large demographic shifts. The following literature provided a starting point to forge these distinct topics into a new body of knowledge. This chapter is organized into four sections. In the first section, I provide an overview of the financial goals of colleges and universities, the motivations behind their actions, and how they have responded to complex changes in the environment. The second section reviews financial ratios' history and their role as tools to measure institutional financial performance. In the third section, I expose the seminal research on financial and non-financial indicators impacting financial health at private, non-profit institutions. Finally, I conclude with the theoretical framework that guided the analysis of the study.

Higher Education Institutions' Financial Goals and Responses to the Environment

Before diving into measuring financial health at private colleges and universities, it is essential to understand how these institutions operate financially along with their goals, motivations, and objectives. As with any other business, colleges provide goods and services. To

survive, they depend on the demand for those goods and services, which means they need to generate enough revenue to pay for the cost of providing such services (Smith, 2019). Consequently, if we compare colleges to any other business, we can presume their goal is to maximize profits, and that cost, and revenue decisions determine their long-term viability. However, contrary to most businesses, the objective of colleges and universities is not to maximize profits for shareholders but rather maximize the production and distribution of knowledge subject to their limitations, and so revenue generation represents only a means to an end (Toutkoushian & Paulsen, 2016). Although most would agree with that statement, how colleges and universities operate and choose to reach those goals is heavily disputed. Some researchers argue that colleges model the behavior of profit maximization, while others believe that profit maximization does not accurately describe the incentive behind colleges' behavior.

Paulsen and Smart (2001) and many other economists, such as Rothschild and White, have used the profit maximization model to explain colleges' behavior arguing that institutions seek to maximize profit for producing services plus other expenses for marketing and fundraising. They argue that colleges can direct excess annual revenues into endowments to make future longer-term service improvements and weather market stress (Paulsen & Smart, 2001). Arguments against the profit maximization model state that institutions that practice selective admissions intentionally forgo profit in exchange for controlling the subset of students they will serve (Toutkoushian & Paulsen, 2016)

In contrast to Paulsen and Smart (2001), Bowen (1980) observed that colleges operate under what he called the "revenue theory of cost," in which colleges seek to maximize revenue to pursue excellence, prestige, and influence in the marketplace. Because there is no cap on what could be spent in such pursuit, institutions raise as much revenue as possible and then spend all

that revenue. Bowen's theory, widely cited and accepted in the industry, suggests that institutions put all their revenues into their operation and drive-up expenditures, which helps explain the rise of college costs (Winston, 1999). However, we know that colleges use some of that revenue to provide it back to students in the form of subsidies, so one could argue that where colleges seek to maximize revenue, that is not their ultimate goal.

Another school of thought asserts that the goal of higher education institutions is not to maximize profit or revenue; instead, they seek to maximize utility or prestige. Garvin (1980) applied industrial organization theory to develop a model of the university as a prestige-maximizing organization. James (1990) suggested that if higher education institutions have a single-valued objective function, it is "prestige maximization." Winston (1999) also refers to the maximization of prestige as the goal of colleges and universities as they seek to control the quality of their students' input to the production process by using their resources/revenues to subsidize students that attract more students with desirable characteristics and hence increasing their market positioning. Epple et al. (2006) posed that colleges seek to maximize the educational quality provided to their students. Based on their model, post-secondary institutions are ranked and differ by the quality of the experience provided to students.

Toutkoushian and Paulsen (2016) argue that all the above models offer insights into the actions of colleges and universities, but they do not fully explain institutional behavior. They argue that colleges operate differently based on the market in which they compete and assert that there are two extreme groups of institutions: prestige maximizers and revenue maximizers. For the prestige maximizer group, reputation is driven by the quality of the students enrolled at the institution. To do so, they improve the quality of education and/or subsidize the price for students with high academic credentials, creating excess demand; as demand rises, colleges can be more

selective with the students they admit increasing the average academic qualifications of enrolled students, and in turn, the college's reputation and prestige goes up (Toutkoushian & Paulsen, 2016). This group of institutions believes that by maximizing prestige, they can better achieve their goal of knowledge production and dissemination. This model aligns well with the prestige maximization model that Garvin (1980), James (1990), and Winston (1999) proposed. On the other hand, according to Toutkoushian and Paulsen (2016), revenue maximizers are colleges that do not use selective admission to increase prestige or invest significantly in research and tend to be heavily dependent on tuition revenue. Examples of these institutions are less selective four-year institutions and two-year colleges. For these institutions, Toutkoushian and Paulsen (2016) argue that although these colleges use part of their revenue to provide subsidies to reduce prices and drive-up costs, Bowen's revenue theory of cost better describes their behavior.

Understanding the motivation behind colleges' actions and behaviors is critical when assessing their financial health. As stated above, recruitment of certain types of students can help colleges increase prestige and improve market positioning. Given the upcoming demographic changes, colleges are finding themselves in a highly saturated market where the only growing populations may not be historically associated with top academic quality or high income levels. Even for revenue maximizers, the market is shrinking, and the subsidy model could threaten their financial viability.

Navigating the Complex Environment

The financial resilience of private colleges and universities has been questioned for decades with many experts predicting a substantial number of closures due to competitive pressures and an antiquated business model. This along with upcoming demographic changes, misperceptions about the price and value of higher education, and the level of student debt has

built public skepticism over the financial viability of these institutions. However, data reveals that the majority of independent colleges have maintained their financial stability, health, and viability. In 2017, the Council of Independent Colleges published a report stating that between 2000 and 2014, 67% of private non-doctoral colleges and universities in their sample were above the threshold for financial viability. The following details literature that describes approaches implemented by private colleges and universities to ensure their financial sustainability.

Hearn and Warshaw (2015), provided the following findings in their CIC report regarding private colleges response to environmental shifts:

1. All presidents of independent colleges are actively engaging in efforts to contain costs and enhance or diversify revenue sources, with most pursuing both strategies at the same time.
2. Market forces, economic pressures, and the expectations of prospective students and their families are major factors driving these efforts.
3. Common cost-containment measures include not filling vacant faculty positions, freezing salaries, reducing staff, restructuring or closing academic programs, and outsourcing operations.
4. To boost revenue, popular strategies are developing new academic programs, expanding online course offerings, and modifying fundraising approaches.
5. Additionally, presidents are implementing a variety of other initiatives such as revising admissions and financial aid practices, expanding athletic programs and facilities, and reforming resource allocation systems.

Furthermore, Hearn and Warshaw (2015) asserted that the innovations private colleges

have implemented in both cost savings and revenue enhancement have been consistent with longstanding institutional missions. They stated that "not only do these institutions intentionally adapt to new challenges, but they do so by embracing—not abandoning their historic missions" (p. 1).

In their seminal work, Morphew and Braxton (2017) delve into the nuanced ways in which small independent colleges are navigating the complex terrain of modern higher education. The book reveals that these institutions, often nimbler and more adaptable due to their size, are uniquely positioned to swiftly implement innovative strategies and respond to emerging educational trends. Emphasizing the synergy between academic research and practical application, the authors demonstrate how data-driven insights can guide strategic decision-making, leading to effective and sustainable adaptations in curricular offerings, pedagogical approaches, and institutional policies (Morphew & Braxton, 2017). This analytical approach is particularly crucial as these colleges confront an array of challenges, ranging from demographic shifts and technological advancements to evolving student needs and financial pressures. The work of Morphew and Braxton stands as a testament to the resilience and potential of small colleges to not only weather the storms of change but to emerge as frontrunners in redefining the educational landscape.

Marcy (2020) also addresses the pressing challenges facing small colleges in the current higher education climate and ways they can respond to these challenges. She emphasizes the need for these institutions to move beyond traditional operational approaches to sustain themselves amidst rising costs, shrinking traditional student populations, and predictions of widespread college closures. Marcy proposes five emerging models as pathways for small colleges to not only survive but thrive: the Traditional, Integrative, Distinctive Program,

Expansion, and Distributed models (Marcy, 2020). These models are designed to guide colleges in selecting strategies aligned with their unique contexts and needs. Moreover, Marcy highlights the role of consortia and partnerships in offering innovative cost management solutions and in developing new opportunities and programs, all while staying true to the institutions' missions and strategic visions (Marcy, 2020). This comprehensive guide serves as a crucial resource for small colleges seeking sustainable futures in a rapidly evolving educational landscape.

While post-secondary institutions' goal is to produce and disseminate knowledge rather than maximize profits, the administration of its financial resources is vital in reaching their goals. In simpler terms, colleges must stay in business if they want to carry out their mission. Hence, it is crucial to measure financial performance and understand the factors that influence it. This knowledge can guide strategic decisions to ensure financial sustainability and the fulfillment of their mission. To this end, financial ratios were adopted to provide a more encompassing indicator of institutional financial health. The following section provides the history of ratios in higher education and the most used ratios to assess colleges and universities' financial viability.

Measuring Institutional Financial Performance Through Financial Ratios

The Development of Financial Ratios in Higher Education

The adoption of financial ratios in higher education dates to the early 1970s, when several researchers inaccurately estimated that up to 70% of higher education institutions were headed or were already in financial distress (Dickmeyer, 1983). It was then that the National Commission on the Financing of Postsecondary Education (1973) asserted that indicators should be developed to determine the fiscal viability of different types of postsecondary institutions. In addition to assessing financial risk and gauging the effects of public policies, adopting comparative indicators enabled the measurement of institutional effectiveness in competing for

the same students, faculty, and resources (Updegrove, 1982). As a result, between 1970 and the 1980s, over 300 possible ratios were produced by different researchers to assess the financial viability of colleges (Brubaker, 1979; Dickmeyer, 1983; Lupton et al., 1976).

Among the earlier studies conducted during the 1970s, most were subjective and relied on a panel of experts to rate colleges as financially strong or weak. According to Taylor (1984), under these subjective studies, money was considered necessary only to meet the institution's purpose, which implies that many intangible factors were subjective and varied among institutions. One of the earliest and most significant subjective studies was conducted by Lupton et al. in 1976. Researchers used the Higher Education General Information Survey (HEGIS) data to rate 2200 institutions as healthy, neutral, relatively healthy, or unhealthy. Using discriminant analysis as the statistical validation technique and as many HEGIS indicators as possible, sixteen indicators were used to distinguish the different groups among 2200 institutions. The indicators included institutional control, enrollment trends, education and general expenditures trends, current fund revenues to expenditures, academic expenditures to education and general expenditures, full-time freshman equivalents to total undergraduate FTEs, and tuition and fees to student aid revenues.

Another noteworthy subjective study focused on private institutions was developed by Bowen and Minter in 1976. The researchers developed their first annual report on the financial and educational conditions of the private higher education sector across the country. They applied a subjective analysis to trend lines in revenues and expenditures, and their results focused on resources per student. Their report considered qualitative and quantitative measures in the following areas: enrollment and admissions, faculty and staff, program content and quality of educational programs, operating revenues and expenditures, assets, liabilities and net worth,

and federal financial aid programs. Based on their findings, they grouped institutions into weak, medium-strength, and strong categories.

In 1978, Collier and Patrick conducted theory-based research and developed a set of dimensions to describe an institution's financial condition. Their dimensions included financial independence, revenue drawing power, financial risk, revenue stability, and reserve strength. As with other subjective studies, they used discriminant analysis and expert panels to determine indicators that differentiated strong versus weak private and public institutions. Although these subjective studies significantly contributed to the development of ratio analysis, they were criticized due to the lack of standards regarding the expert panel and how the researchers selected discriminating factors (Collier, 1979). From then on, researchers (Gallagher, 1998; Lomax, 1984; Peters, 1995; Roden, 1991;) started using a combination of expert opinions, surveys, and descriptive analysis to develop predictor ratios. Below are a couple of the most important studies focused on the private higher education sector that significantly contributed to ratio analysis as we know it today.

In 1980, the American Council on Education and the National Association of College and University Business Officers published a simplified but comprehensive workbook approach to assist campus administrators and governing boards with examining the financial condition of their institutions. The workbook contained detailed computational steps on median values, which allowed for comparison among institutions and provided guidance on interpreting the data, its limitations, and suggestions on strategies based on results. The workbook used 19 indicators divided into four classes: financial resources, flexibility, non-financial resources, and changes affecting financial resources (Dickmeyer, 1979, 1980, 1983; Dickmeyer & Hughes 1979a, 1979b). Through the development of the workbook, they found the following: 1. Indicators can

be developed using data from Higher Education General Information Survey (HEGIS) data, 2. Ratio analysis has powerful analytics capabilities, 3. Analysis of financial conditions can help guide policy decisions, 4. No single measure captures the financial health of an institution, and 5. It is possible to monitor institutional financial conditions.

A few years later, Bolda and Mack (1983) studied a sample of 284 private, coeducational colleges from 1976-77 to 1980-81 to assess the financial viability of private colleges by looking at the relationship of expenditures to endowments to voluntary support. They used a sample of 284 private, coeducational colleges and studied three variables: expenditures, endowment, and voluntary support. They then divided the sample into six categories: Carnegie classification, founding date, enrollment, number of alums solicited for fundraising, geographic region, and religious affiliation. They found that of the six characteristics, two factors were critical in determining the college's financial viability: the size of the alum base and enrollment at the institution.

In 1989, Chabotar published his work on cost analysis in non-profits. As a result, he played a critical role in applying financial metrics from for-profit organizations to non-profit organizations such as colleges and universities. Throughout his research from 1989 to 2010, he identified several reliable ratios from corporate finance that could serve as a warning system for financial stress in at-risk colleges. He focused his research on three areas: liquidity, debt, capacity, and net operating results. Liquidity was measured by three distinct ratios: current ratio, quick ratio, and available funds ratio. Debt capacity was measured by the debt-equity ratio and the debt service ratio, and the net operating ratio measured net operating results. Chabotar (1989) concluded that financial ratio analysis could be used as an early warning system for financial distress in higher education institutions.

Although these early studies significantly contributed to the development of ratio analysis, they lacked consensus as an accurate and comprehensive tool for higher education due to the absence of generally accepted accounting standards. Such absence resulted in non-standardized recording techniques, inflation of institutional resources that distort ratios over time, and quantitative disposition to judge ratios over time (DiSalvio, 1989). It was not until the 1990s when the Generally Accepted Accounting Principles (GAAP) for the non-profit organization were adopted that ratios were formalized in higher education. The GAAP standards allowed for meaningful comparisons among institutions, so the U.S. Department of Education adopted ratios to assess institutional financial viability and risk (Kieso et al., 2008).

Although financial ratio analysis has become a commonly used management tool in higher education institutions and they were used as the financial measure for this study, it is important to note the following limitations: inflation can distort financial ratios if appropriate adjustments are not made, the quantitative nature of the ratios ignores the nature of changes, and ratios are lagging indicators (Bailey & Miller, 1993; Davis & Sonnenbert, 1993; DiSalvio, 1989). Given some of the limitations of financial ratios, researchers have identified additional non-financial indicators to assess the institution's financial viability. Such factors include shifts in revenue streams, enrollment, spending patterns, tuition discounting, net education expense by student, fundraising expenses, net tuition, student selectivity, endowment levels, student default rate, tuition increases, yield, retention, and student diversity (Hanover Research, 2014; Lee, 2019; Lyken-Segosebe & Shepherd, 2013; Martin & Samels, 2009; Tahey et al., 2010; Tandberg, 2018). Therefore, it is suggested that these factors should be used in conjunction to provide more context and a greater understanding of the institution's financial health.

Most Used Financial Tools for Assessing Financial Viability

The wide adoption of financial ratios, made possible by the introduction of GAAP standards, provides “arguably” a quick and simple way to assess financial health. Higher education institutions are financially complex, and adopting ratios made it possible for all constituencies to understand, assess, and compare institutional health without necessarily having an accounting background (Chabotar, 1989; Goldstein, 2018). The following section describes the introduction of the widely used Composite Financial Index (CFI), how the Department of Education implemented financial ratios to measure financial responsibility, and the role of credit agencies in assessing financial health.

The Composite Financial Index

In 1980, the first edition of the Strategic Financial Analysis of Higher Education (SFAHE) series by predecessor firms of KPMG was published (Tahey et al., 2010). Since then, subsequent editions have been published by a collaboration of three firms -- KPMG, Prager & Sealy, and Attain-- to reflect changes in financial matters in the higher education landscape. The SFAHE framework, although arguably a good measure of financial health, is the most widely used model by senior college and university leaders to understand their financial statements and measure their institution's financial health. Initially created for institutional analysis to help in the strategic financial planning process, state and system-level analysts have also used it to assess institutions' financial health and risks (Tandberg, 2018). Over the years, SFAHE has settled on five financial measures: liquidity, resource sufficiency and flexibility, debt management, asset performance and management, and operating results. The last four are combined into a consolidated score known as the Composite Financial Index (CFI). The index has been widely used in higher education to assess an institution's financial condition, conduct peer comparisons,

and in strategic decision-making by institutional boards and leadership (Lee, 2008; Tahey et al., 2010). The CFI's four ratios are the primary reserve ratio (resource sufficiency), the viability ratio (debt management), the return on net assets ratio (asset performance), and the net operating revenues ratio (operating results) (Tahey et al., 2010).

The primary reserve ratio measures whether the institution has sufficient resources and is flexible enough to support the mission of the institution (Tahey et al., 2010). In other words, it compares accumulated reserves to annual operating demands to measure a school's viability and liquidity. The ratio determines how long the institution can conduct regular operations without generating new revenue. The ratio is calculated by dividing expandable net assets by the total operating expenses (Tandberg, 2018). Expandable net assets represent the institution's financial equity, and the operating expenses represent the annual instruction costs, student services, institutional support, etc. (Correti, 2021; Federal Student Aid, 2016).

The viability ratio measures whether debt resources are managed strategically to advance the institution's mission (Tahey et al., 2010). It compares the long-term obligations to its expandable resources and, according to the SFAHE, is calculated by dividing expandable net assets by plant-related debt.

The return on net asset ratio measures asset performance to support the institution’s strategic direction. It is calculated by dividing the change in net assets by the total net assets (Tahey et al., 2010). According to Tandberg (2018), this ratio helps determine if the college is financially better off from previous years by examining changes in economic return.

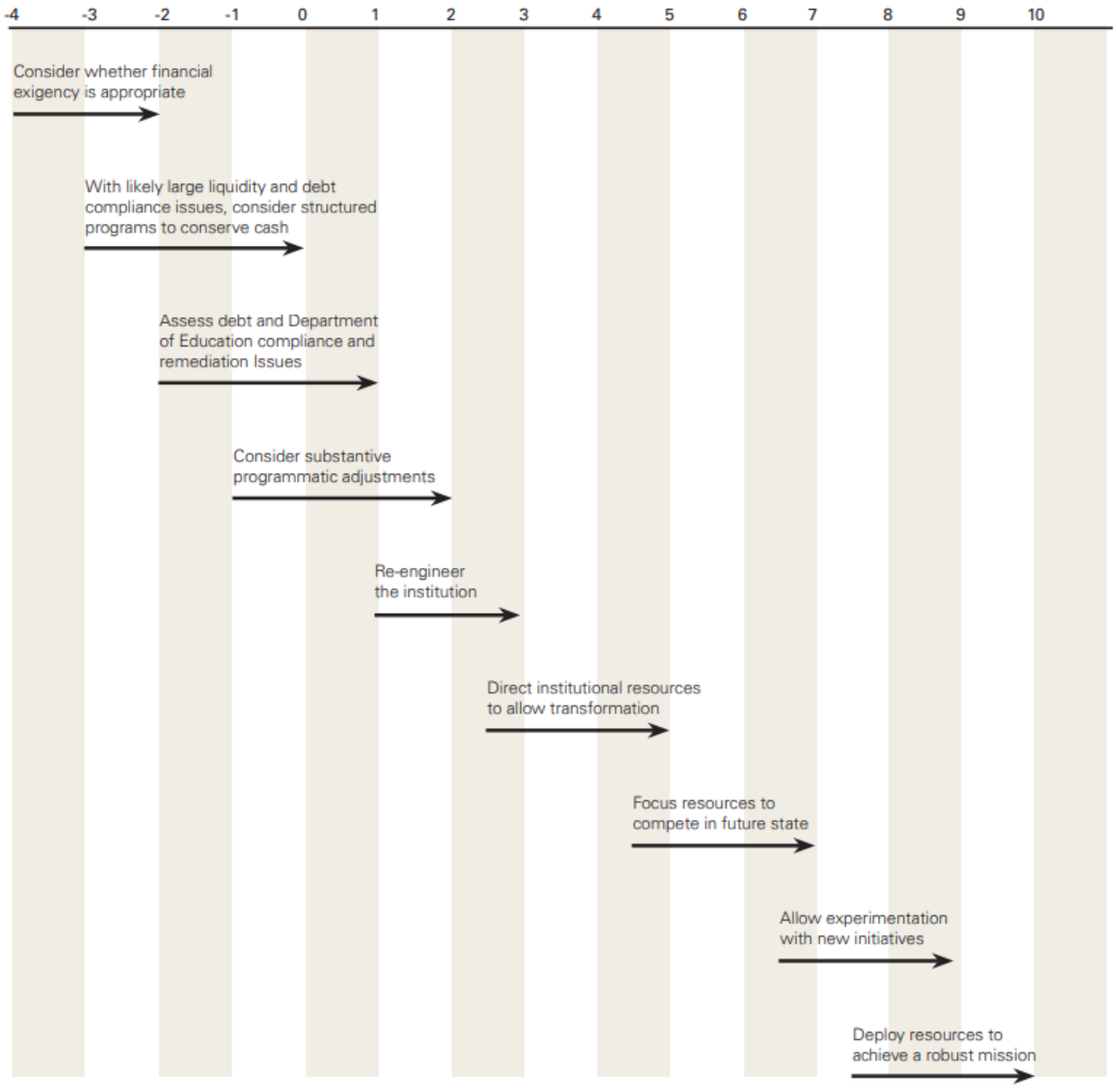
Finally, the net operating revenue ratio measures whether the institution lives within available resources (Tahey et al., 2010). It compares revenues to expenditures, and the SFAHE calculates it by dividing the change in unrestricted assets by total unrestricted revenues. This

ratio aims to show whether the results of the college's general operations are positive or negative. In other words, is the institution losing or making money?

Once the four ratios are calculated, the CFI is computed by adding them after they are rescaled and weighted based on the perceived importance of each (Tahey et al., 2010). The index can run from -4 to 10. The chart below illustrates the scale for charting financial performance levels as established by the SFAHE framework. The scale ranges from -4 to 10. According to SFAHE, a score of 3 represents minimal financial health. Higher scores such as those above 5 indicate strong financial health enabling the institution to invest in new initiatives and weather economic difficulties. In contrast, scores below 3 indicate financial stress and high risk. It is important to note that the scores are indicators of a range of financial well-being, but they do not have absolute precision. It is recommended to combine the CFI with nonfinancial indicators performance to better inform comprehensive financial performance.

Figure 1

Scale for Charting CFI Performance



Note. Source: Strategic Financial Analysis for Higher Education (Tahey et al., 2010).

While the CFI measures the financial component of an institution's viability, The SFAHE authors note that other factors, such as shifts in revenue streams, trends in enrollment, and spending patterns, must be considered to assess the overall well-being of the college. Generally,

a low CFI indicates challenges, but a high CFI may not necessarily mean the institution is fulfilling its mission (Tahey et al., 2010). It is also important to note that ratings are lagging indicators, which may not represent the current situation of the institution. Overall, one should exercise caution when using the CFI or ratios as a single measure of financial health as research shows that nonfinancial indicators can impact institutional financial viability.

The Department of Education's Test of Financial Responsibility

After the unannounced closures of several for-profit institutions in the late 1980s, the Higher Education Act section 498 (c)(1) was enacted (Federal Student Aid, 2016). The section authorized the U.S. Department of Education (ED) to measure whether an institution met sufficient financial responsibility standards to participate in Federal Title IV financial aid programs (Federal Student Aid, 2016). It aimed to protect students and the public's investment in federal financial aid from un financially viable institutions. The criteria for financial responsibility include a composite score (combination of three ratios) of at least 1.5, sufficient cash reserves to cover required refunds, returning funds on time, and being current in debt payments (Federal Student Aid, 2016). The Financial Responsibility Composite Score (FRCS) formula was developed in 1996 to measure the overall financial health of the institution and identify institutions at risk of closure due to financial distress (Sherman, 2016). Over the years, failing the composite score test not only jeopardizes the institution's participation in Title IV programs but has also been seen as an indicator of the institution's overall financial fragility and a signal to investors that a college could be ripe for a for-profit takeover (Blumenstyk, 2013; Federal Student Aid, 2016).

The financial responsibility score is a composite of three ratios derived from an institution's audited financial statements: the primary reserve, equity, and net income ratios

(Correnti, 2021; Federal Student Aid, 2016). After calculating the three ratios, a strength factor score is applied to each score per the ED's established formulas. Subsequently, a weighting percentage is applied to each strength factor score. Thirty percent weight is applied to the primary reserve strength factor score, 30% to the net income strength factor score, and 40% to the equity strength factor score. The three weighted scores comprise the composite score (Federal Student Aid, 2016). The composite scores can range from -1 to 3.0. According to the US Dept. of Education, scores between 1.5-3.0 mean that the institution is financially responsible. A score between 1.0 and 1.4 means the institution is financially responsible but requires oversight. Lastly, a score of -1-.90 means the institution is not considered financially responsible. Consequently, it is placed on heightened cash monitoring, receiving provisional certification for up to three years, and is required to provide a surety to ED, all of which results in material and reputational damage to the institution (Correti, 2021; Sherman, 2016). As with the CFI, it is important to note that these scores are subjective values that do not account for non-quantifiable institutional characteristics.

Although the primary reserve, equity, and net income ratios are recognized as key performance indicators in measuring institutional financial health, industry experts criticized the Composite Score due to assigning equal fiscal health scores to extremely wealthy schools such as Yale and obscure institutions like the Hypnosis Motivation Institute (Eide, 2018). In 2012, the National Association of Independent Colleges and Universities (NAICU) published a report recommending changes to the E.D.'s financial responsibility test after more than 100 non-profit private colleges failed the composite score test in 2010 (National Association of Independent Colleges, 2012). The report stated that the ratio calculation contradicted current regulations by mistakenly classifying income statement losses as expenses. Additionally, it identified the need

for an appeals process so that institutions can correct errors before the scores are published, given the lack of consistency in the calculation among E.D.'s regional offices. The report found that several institutions with failing scores were financially viable and continued to provide a quality education for years afterward (National Association of Independent Colleges, 2012).

Fast forward to 2021, the NAICU, NACUBO, and ACE wrote a letter to the E.D., stating that the current system has proven to be a poor tool in protecting students and taxpayers while penalizing many institutions that are healthy and failing to identify those that are not (Mistick, Johnston, et al., 2021). In the letter, they urge the E.D. to review the composite score calculation to consider the following: the changing nature of higher education finances, a school's total financial circumstance before assessing penalties, and implementation of a draft/review process so institutions can correct mistakes by the department prior to the release to the public. In general, the literature suggests that E.D. ratios have fallen short of providing an accurate and comprehensive financial picture due to being a lagging indicator and too focused on liquidity measures (NAICU, 2012; Sherman, 2016; Seltzer, 2020).

The Role of Credit Agencies in Assessing Financial Health

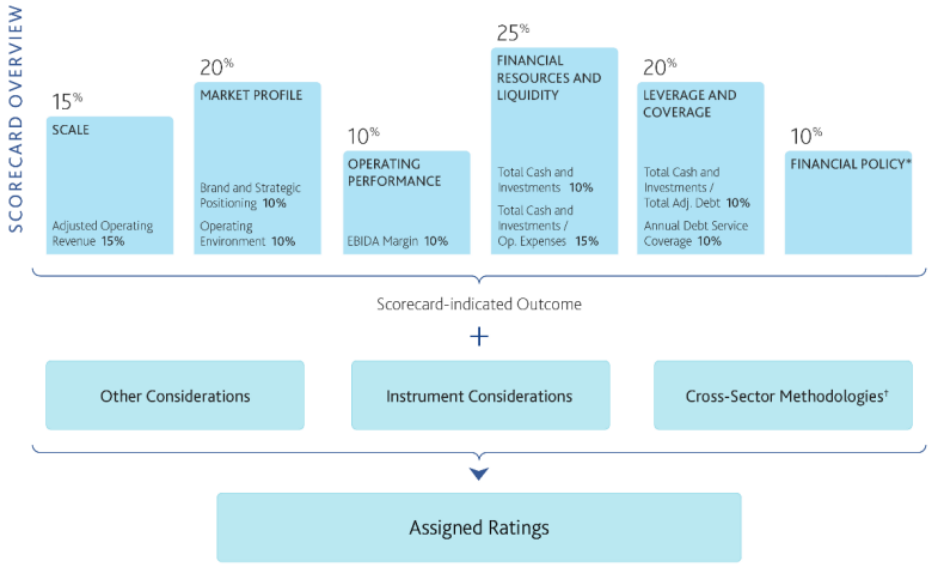
External stakeholders such as credit agencies have also become a tool to analyze the financial viability of higher education institutions. Focused on the institutions' creditworthiness and ability to repay debt, they identify institutions with financial risk (Moody’s Investor Service, 2021).

A decline in the college's rating negatively impacts an institution's ability to borrow, the interest rate level, planning effectiveness, and the public's perception of their financial viability, as the ratings are often published (Moody, 2008; Serna, 2013; Tandberg, 2018). To better understand the role that credit ratings play as an indicator of financial performance, it is

necessary to get familiar with the symbols and criteria used by the agencies. Since the methodologies are similar for the credit agencies, I have selected Moody's framework as it is the most well-known and largest provider of credit ratings for higher education institutions serving 468 four-year colleges and universities (Moody's Investor Service, 2021). Shown in Figure 2 is Moody's higher education methodology framework. The framework considers six criteria as part of their scorecard outcome and other relevant considerations (Moody's Investor Service, 2021).

Figure 2

Moody's Higher Education Methodology Framework



Note: Source: Moody's Investor Service (2021)

Per Moody's Investor Service (2021) published framework, below is a summary of the six indicators on the scorecard:

1. The Scale accounts for 15% of the scorecard's weight and measures adjusted

operating revenue. Moody's framework suggests that institutions with larger adjusted operating revenues represent colleges with higher brand recognition; hence, they have more success in attracting students and donors.

2. The Market Profile is measured by brand and strategic positioning and operating environment, accounting for 20% of the weight in the scorecard. It measures the strength and predictability of financial support paired with the college's autonomy to manage programs, expenses, and revenue drivers.
3. The Operating Performance accounts for 10% of the scorecard weight. The margin indicates the institution's ability to use its operating revenue to pay debt and invest in the college to advance its strategic position.
4. Financial Resources and Liquidity account for 25% of the scorecard weight and indicate the institution's flexibility and resilience, which can help it overcome periods of market volatility.
5. Leverage and coverage represent 20% of the scorecard weight and indicate the institution's ability to cover its annual costs and debt obligations while fulfilling its mission.
6. Financial Policy and Strategy account for 10% of the scorecard. A sound financial strategy indicates the institution's ability to execute its strategic plan and risk management capabilities.

In addition to the six different criteria above, Moody's ratings also take into consideration other factors such as "financial controls and the quality of financial reporting; legal structure; the quality and experience of management; assessments of governance as well as environmental and social considerations; exposure to uncertain licensing regimes; and possible interference from

one or more layers of government. Regulatory, litigation, liquidity, technology and reputational risk, as well as changes to consumer and business spending patterns, competitor strategies and macroeconomic trends, also affect ratings" (Moody's Investor Service, 2021, p. 12).

Once all criteria have been evaluated, the credit agencies issue a rating for the institution. Figure 3 below outlines the meaning of each rating as well as indicators that serve as qualifiers to signify an institution's relative standing within each category.

Figure 3

S&P and Moody's Credit Rating Criteria

	S&P	Moody's	
Highest Rating	AAA	Aaa	**Highest Rating**
	AA	Aa	
	A	A	
	BBB	Baa	
Speculative	BB	Ba	**Speculative**
	B	B	
	CCC	Caa	
	CC	Ca	
In Default/Lowest Rating*	C	C	**In Default/Lowest Rating**
	D	N/A	
Qualifiers	Plus and minus indicate a relatively stronger/weaker position in the category	1 indicates a higher, 2 a median, and 3 a lower position in the category	**Qualifiers**

Without a doubt, credit agency ratings provide a comprehensive look at the college's financial health and help us understand its ability to generate revenue and compete effectively over the long run. However, the ratings tend to reflect their expectations of the institution's future performance. Therefore, a limitation of this approach is that the assumptions made could be proven wrong due to unexpected changes in the market, competition, technology disruptions, pandemics, regulatory or legal action, etc. (Moody's Investor Service, 2021). Additionally,

contrary to the financial ratios such as the CFI or the FRCS, the credit ratings include qualitative analysis, and agencies do not provide an exhausting description of all factors that may be included in their assessments.

Seminal Work in Financial and Non-Financial Viability Indicators

Since the Department of Education adopted financial ratios to assess financial viability in the 1990s, several researchers and industry experts have focused on identifying indicators that signal an institution's financial risk and understanding the impact of financial and non-financial indicators. The following section describes the most significant literature that has helped advance the identification of financial and non-financial measures to assess financial health and sustainability at private institutions.

Townsley (2009) published "The Small College Guide to Financial Health: Beating the Odds," which suggested ways small colleges could position themselves to avoid economic disaster by understanding the markets in which they operate. Townsley offered a full description of the financial structure of small colleges and exposed the many challenges they face, such as economic environment, moribund enrollment, spiking tuition, uncontrollable expenses, the high cost of technology, and tough competition. He also stated, "Existing financial resources may impose the greatest constraint on a college, with wealthy colleges thriving and penurious colleges sinking in a sea of rapidly changing market demands" (p. 72). Townsley indicated that to measure the institution's financial structure, one could measure the relative weights of revenue, expense, assets, liability, and net assets accounts. The author's guide suggested using the CFI to identify small colleges in financial distress. According to the study, leaders indicated achieving balanced budgets by using financial ratio analysis and strategic planning in non-financial areas like student services and academic program development. The author pointed out

the limitations of financial ratios as stand-alone indicators of financial health. Townsley's work provided a comprehensive guide for college administrators at the time. Despite its age, the guide remains relevant to college administrators today as they seek to understand the intricacies of a college's financial framework.

In 2009, Martin and Samels presented a checklist of indicators of financial stress at colleges and universities in their book "Turnaround: Leading Stressed Colleges and Universities to Excellence." Their list focused comprehensively on institutional budget and resource challenges. Although they acknowledge that a fragile college may not demonstrate all twenty, "a preponderance of these twenty indicators clearly means that an institution has slipped, possibly far, from its founding vision and strength, and that some form of surgery will most likely be required to bring it back to health" (Martin & Samels, 2009, p. 9). After analyzing the financial risk factors of several hundred campuses over two decades, they came up with the following checklist indicators: 1. Tuition Discounting of more than 35%; 2. Tuition dependency of more than 85%; 3. Student default rate above five percent; 4. Debt service more than 10% of the annual operating budget; 5. Less than the one-to-three ratio between endowment and operating budget; 6. Average tuition increases greater than eight percent for five years; 7. Deferred maintenance at least 40% unfunded; 8. Short-term bridge financing is required in the final quarter of each fiscal year; 9.—less than 10% of the operating budget dedicated to technology; 10. Average alumni gift is less than $75, and fewer than 20% of alumni give annually; 11. Institutional enrollment of 1,000 students or fewer; 12. Conversion yield is 20% behind that of primary competitors; 13. Student retention is 10 percent behind that of primary competitors; 14. The institution is on probation, warning, or financial watch with a regional accreditor or a specialty degree licensor; 15. The majority of faculty do not hold terminal degrees; 16. The

average age of faculty is 58 or higher; 17. The leadership team averages more than 12 years or fewer than three years in service at the institution; 18. No complete online program has been developed; 19. No new degree or certificate program has been developed for at least two years, and 20. Academic governance and curriculum development systems require more than one year to approve new degree programs. While the book provides a comprehensive list of indicators, the author tended to generalize strategies, emphasized a top-down leadership approach, and focused on fixes and short-term results which raises concerns about the practicality and meaningfulness of the guide.

A few years later, Lyken-Segosebe and Shepherd (2013) asserted that while Martin and Samels offered a comprehensive and valuable set of indicators, it is critical that institutions use institutional history as a benchmark and understand that certain indicators will take precedence at one institution while another set of indicators may be most important at a different institution. They studied IPEDS data for 57 four-year private institutions that closed between 2004-2013. They identified the following ten risk factors statistically significant in predicting college closures: 1. Small enrollment; 2. Religious and non-degree granting; 3. Reliance on part-time enrollment; 4. The rapid expansion of graduate and certificate programs; 5. Tuition per student; 6. Large tuition dependency; 7. Large expenses on interest payments; 8. Large capital expenses without long-term financial stability; 9. Operating with expenses that exceed total revenues; 10. Feeble support from private donations.

The work by Martin and Samels and research by Lyken-Segobese and Shepherd offered important contributions to the study of non-financial risk indicators for small private non-profit colleges. However, it is critical to note that such indicators must be evaluated within the context of individual institutions and the environmental pressure at a particular time.

Prior to the study by Lyken-Segobese and Shepherd (2013), Denneen and Dretler (2012) from Bain & Company studied financial and non-financial issues impacting colleges and universities. They conclude that the liquidity crisis facing higher education is the result of the "Law of More" (p. 3), which states that institutions that operate under the assumption that the more they build, spend, diversify, and expand, the more they will persist and prosper (Denneen & Dretler, 2012). They identified the following criteria associated with an at-risk institution:

1. The institution is not top ranked, which means decreased yield rates and increased costs, flat median salaries for graduates over several years, and endowment in the millions (not billions) with a large percentage of restricted funds.
2. Weakening financial statement performance demonstrated by debt expenses increasing far more rapidly than instruction expenses, capital assets increasing faster than revenue, decreased bond ratings, and trouble accessing past levels of government funding.
3. A need for drastic measures such as consistent tuition hikes, lowered admissions standards, reductions in offered financial aid, and reductions in faculty headcounts.

To reverse the Law of More, Denneen and Dretler (2012) noted that innovative institutions are developing a clear strategy, reducing support and administrative costs, freeing up capital in non-core assets, and strategically investing in innovative models. One of the issues with this study is that most institutions are not top-ranked and don't have billion-dollar endowments. If that is the criteria, then over 90% of private institutions would be considered at risk.

Another noteworthy study in assessing institutional financial health that helps us extend the knowledge of financial ratios and non-financial indicators is the quantitative-predictive

research published in the Journal of Academic Administration in Higher Education by Lee (2009). Utilizing data from Moody's Investor Services Database, National Center for Education Statistics, and GuideStar, he studied 766 four-year non-profit, private baccalaureate institutions from the years of 2001 to 2004 (Lee, 2009). Through the logistic regression statistical technique, he sought to find predictable differences between financially viable and non-viable institutions, as indicated by the Composite Financial Index, based on demographics, student demand, endowment, and capital ratios. His findings showed that college affordability and the percentage of minority students were insignificant in predicting financially viable from non-viable institutions. SAT scores, however, did show to be significant in separating viable from non-viable institutions. Furthermore, he found that the tuition discount ratio provided modest predicting capabilities for separating viable from non-viable institutions. Finally, he also found that the endowment to total operating expenses and capital ratios were significant predictors of financial viability (Lee, 2009). A limitation of Lee's study is that he divided the institutions by financially viable or non-viable based on the SFAHE framework suggestion of a CFI score. Institutions with scores < 3 were considered non-financially viable, and those >3 were viable. It is important to recognize that these thresholds are subjective, and the difference between a school that scores 2.8 vs. 3 is somewhat insignificant. Additionally, understanding how each non-financial indicator related to each of the CFI ratios could have led to a more comprehensive understanding of specific financial areas impacted by the non-financial factors.

The predictive tool created by Zemsky et al. (2020) represents some of the most recent seminal work in assessing financial viability. Using data from IPEDS, they built a stress test to estimate the market viability of more than 2,800 undergraduate institutions from 2008 to 2016. The test uses four variables: new student enrollment percentage changes, student retention, net

cash price, and major external funding to gauge the potential risk of closure or merger. The authors asserted that 60% of institutions face no market risk, ten percent of all colleges and universities face substantial risk, and 30% are most likely to struggle unless they reconsider their price, curriculum, and alternate modalities (Zemsky et al., 2020).

They found that the best predictor of financial stress was a combination of declining first-year enrollment and increasing market prices over the last ten years (Zemsky et al., 2020). Basically, if the institutions' first-year classes continue to decrease while they increase the discount rate, it means financial trouble. They also assessed student body demographics to see which students are commonly served by institutions in financial distress. They found that smaller institutions are at more risk than larger ones, and Black and Pell-eligible students are more likely to attend an institution at market risk. Moreover, they found that institutions with status and prestige are less likely to experience market stress (Zemsky et al., 2020).

Tuition Discounting and Impact on Financial Sustainability

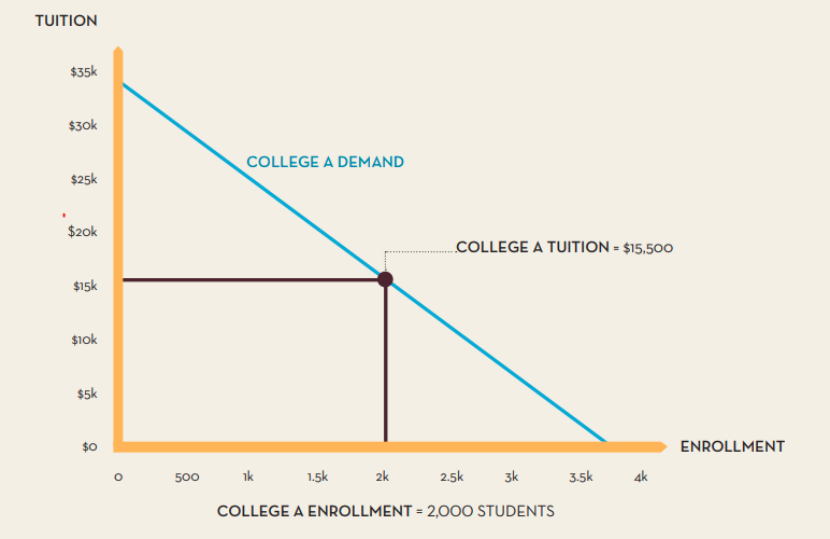
Among all enrollment performance indicators, the discount rate has been the most highly linked to private institutions' financial sustainability. Although tuition discounting has many known benefits, higher education experts have expressed concerns over the years, questioning, "How long can sticker price and discount rate keep climbing before the model reaches its breaking point?" (Seltzer, 2019, p. 3). The high price, high aid model strategy that served some institutions well during enrollment growth has proven not to work as intended during the last 11-year period of enrollment contraction. While tuition discounting has resulted in increased enrollment, short-term revenue, and student diversity, this practice has had negative financial implications (Behaunek & Gansemer-Topf's, 2019; Hillman, 2012; Jalal & Khaksari, 2019; Redd, 2000; Rine, 2016). A survey of financial officers conducted by Inside Higher Ed in 2018

stated that 68% of financial officers at four-year private colleges believe their tuition discount rate was unsustainable. This sentiment has gained momentum as the pandemic forced colleges to offer higher discount rates which led to significant declines in net tuition revenue (NTR) as their enrollments declined (NACUBO, 2021). Due to the negative implications of tuition discounting, many studies have been published regarding the impact tuition discounting has on the institution's financial health. The following reflects some of the literature surrounding this key performance enrollment indicator.

In 1994, in his economic theory of private colleges, David Breneman developed the most widely used tuition discounting model. According to Breneman's theory, when it comes to market demand and price, colleges face a downward-sloping demand curve which illustrates the inverse relationship between the college's tuition and the number of students willing to pay for it. In other words, as college tuition rises, the number of students willing to pay for it decreases. Figure 4 illustrates this relationship: at $15,500 in tuition, enrollment would be 2,000 students. In contrast, at "0" charges, this particular college would enroll 4,000 students (Rine, 2016).

Figure 4

Relationship between tuition price and enrollment



Note: Source: A shell game by any other name: The economics and rationale behind tuition discounting (Rine, 2016)

Breneman's theory also helped explain the need for differential pricing or price discrimination. He noted that this strategy is necessary to capture the consumer surplus of students willing to pay more to attend. He argued that each college can exercise power over supply and price because they are the sole provider of a particular student experience (Breneman, 1994).

At the beginning of the 21st century, a study conducted by Redd (2000), compared data from the annual Institutional Student Aid Survey or private institutions to enrollment and Pell Grant data from the U.S. Department of Education for 275 four-year, private colleges between 1990-91 and 1998-99 and found the following regarding the financial implications of the discount rate: out of the 275 institutions, at least one-quarter of the college's discounting strategy resulted in large losses of tuition revenue; institutions that had the greatest increases in discount rate saw minimal increases in tuition and fee revenue. Furthermore, the study found that increases in the discount rate did not significantly improve academic profile; however, it did help recruit low-income students (Redd, 2000).

Browning (2013) studied the relationship between a college's overall financial position and its tuition discount rate utilizing data from NCES, IPEDS, and TICAS from 2003-2007. She utilized the Financial Vulnerability Index (FVI), composed of five ratios: debt, revenue concentration index, surplus margin, administrative cost, and size ratio, as her proxy for financial position. After conducting a regression analysis, Browning found a relationship between the institution's financial position and tuition discount rates for stable and unstable institutions. As the FVI decreased at stable institutions, the discount rate increased (Browning, 2013). This

indicated that institutions with substantial financial resources used them to recruit students that would help them further their mission and prestige. Conversely, Browning found that as the FVI increased for unstable institutions, tuition discount rates increased, suggesting that the institutions utilized their financial resources to attract students. However, they compromised their long-term financial position (Browning, 2013).

Later in 2019, Jalal and Khasari (2019) confirmed Browning's findings as they found a positive and statistically significant relationship between tuition discounting and the level of debt at institutions. Utilizing a large panel of data from U.S. private and public four-year institutions, they found that institutions providing higher tuition discounting had more financial leverage, less equity, and experienced lower liquidity and asset turnover, indicating financial risk. Such findings were stronger for private institutions, given their reliance on tuition revenue. Although they found a positive relationship between discounting practices and revenue, the institutions' profitability decreased as an institution provided a higher discount than its competitors (Jalal & Khasari, 2019).

During the same year, Behaunek and Gansemer-Topf's 2019 research studied trends in student characteristics, enrollment, institutional grants, net tuition revenue, and the relationship between tuition discounting and net tuition revenue. After analyzing panel data of four-year private institutions from 2003-2012, they found a point at which tuition discounting practices do not generate additional revenue. They noted that "although institutions have increased pricing levels and made small gains in enrolling more students, the net tuition revenue gains have been minimized by increases in institutional grant aid awarded through unfunded sources" (p.11). This study highlighted the importance of institutional leaders examining the effectiveness of their

current high-price, high-aid model, the institution's demand, and the need to improve enrollment and retention strategies (Behaunek & Gansemer-Topf, 2019).

Conclusion

The assessment of financial health at colleges and universities, as we know it today, originated back in the early 1970s when pundits were predicting 70% of higher education institutions were headed or were already in financial distress. While post-secondary institutions' ultimate goal is to produce and disseminate knowledge rather than maximize profits, the administration of its financial resources is vital to them reaching their goal. Hence, the importance of assessing their fiscal health. Over the years, over 300 ratios have been generated to assess financial viability (Brubaker, 1979; Dickmeyer, 1983; Lupton et al., 1976), and a plethora of non-financial indicators have been put to the test to help administrators and governing bodies measure institutional financial health (Bahaunek & Gansemer-Topf, 2019; Breneman, 1994; Browning, 2013; Denneen & Dretler, 2012; Jalal & Khasari, 2019; Lee, 2009; Lyken-Segobese & Shepherd, 2013; Martin & Samels, 2009; Redd, 2000; Rine, 2016; Townsley, 2009; Zemsky et al., 2020).

Serving as the inception of financial viability assessment, financial ratios provide a solid ground for measuring fiscal health. While some of the initial work (Bowen & Minter, 1976; Collier & Patrick, 1978; Dickmeyer, 1983; Chabotar, 1989; Lupton et al., 1976) was highly subjective and lacked consensus as an accurate and comprehensive tool for higher education, the adoption of GAAP standards in the 1990s has allowed for more meaningful measures of financial health. Ratio-based tools for assessing financial viability such as the Strategic Financial Analysis of Higher Education framework (SFAHE), the E.D. Test of Financial Responsibility, and credit agency ratings have become the most widely used tools to measure and compare

colleges and universities' financial performance. However, such tools have limitations. The SFAHE framework, while the gold standard for senior administrators and higher education experts, does not account for shifts in revenue streams and trends in enrollment. The E.D. Test of Financial Responsibility has received tremendous criticism over the fact that it does not account for the changing nature of higher education finances and its overreliance on liquidity measures. Finally, credit agencies tend to be future-focused, which can be proven wrong due to unexpected changes in the market.

More comprehensive approaches to measuring higher education financial performance were developed in the early 2000s (Browning, 2013; Denneen & Dretler, 2012; Jalal & Kashari, 2019; Lee, 2009; Lyken-Segobese & Shepherd, 2013; Martin & Samels, 2009; Redd, 2000; Rine, 2016; Townsley, 2009; Zemsky et al. 2020). Such studies consider a mix of ratios and non-financial indicators, such as enrollment, academic profile, endowment levels, yield, retention and graduation rates, bond ratings, tuition discounting, percentage of minority students, etc. While providing a more comprehensive outlook of financial health, there are several approaches, leaving it to college senior administrators to decide which approach is the best fit for their institution based on their situation. Given such diversity in the approach to measuring financial health, this study utilized the CFI and its comprising ratios as the proxy for institutional financial health.

Worth noting and of special interest to this study is the divergent literature on the impact of minority and Pell-eligible students on the financial health of the institution. Lee (2009) found that the percentage of minority students was insignificant in predicting financially viable from non-viable institutions. However, contradictory to Lee (2009), Zemsky (2020) observed that Black and Pell-eligible students were more likely to attend institutions with financial risk.

Although much research exists on private institutions' financial health to include financial and non-financial indicators, the literature review did not produce a comprehensive and clear understanding of the relationship between student demographic characteristics and financial performance, especially as it relates to race diversity, socioeconomic status, adult students, gender, and international students.

The stakes are higher than ever with the current enrollment contraction and the upcoming demographic changes to ensure that higher education leaders can make sound, financially conscious enrollment decisions that enable them to fulfill the institution's mission. By studying the relationship between student demographics and the CFI, the study contributed to the existing literature to help college administrators in making strategic enrollment decisions that support the college's financial sustainability.

Theoretical Framework

In the current landscape of higher education, the dynamic interplay between demographic changes and the financial health of non-profit, four-year private colleges is a critical and popular concern. This study adopted the Extended Resource-based Theory (ERBT) as the theoretical framework to analyze how enrollment managers and senior college administrators make strategic decisions regarding the composition of their student body to maximize revenue and ensure financial sustainability.

The theory of the firm is a microeconomic concept that states that a firm exists and makes decisions to maximize profit and financial sustainability (Murphy & Kelly, 2020). Such decisions entail a variety of areas, such as resource allocation, production techniques, pricing adjustments, and production volume (Murphy & Kelly, 2020). The theory of the firm originated in the late 1930s by neoclassical economist Ronald Coase, who developed the transactional cost theory to

define the firm theoretically in relation to the market. After Coase, many other takes on the theory of the firm emerged, such as managerial and behavioral views by Richard Cyert and James March in 1960, asset specificity theory, and boundaries of the firm theory by Oliver Williamson (Kantarelis, 2007).

The Resource-based view of the micro-economic theory of the firm became the dominant paradigm in the 1990s, arguing that sustainable competitive advantage derives from developing superior capabilities and resources (Priem & Butler, 2001). Barney's seminal work about strategic resources (1991) became the fundamental contribution to Resource-Based Theory (RBT). In general, RBT states that the firm's resources are financial, legal, human, organizational, informational, and relational; such resources are heterogenous, and that management's key responsibility is to identify and select strategies that best utilize these internal resources relative to external opportunities to ensure sustainable competitive advantage (Hunt & Derozier, 2004; Makadok, 2001). Furthermore, RBT is interdisciplinary and suggests that organizations must develop unique, firm-specific core competencies that will enable them to outperform competitors by doing things differently (Mahoney & Pandian, 1992). Per RBT, a firm's long-term success and competitive advantage can be achieved by ensuring resources are valuable, rare, difficult to imitate, and not substitutable (Barney, 1991). Therefore, firms can achieve an advantage by continually reconfiguring diverse types of resources and by creating new applications to meet market demands (Adner & Helfat, 2003).

With the years, the classic RBT evolved into extended RBT (ERBT). ERBT originated through a study done by Lewis et al. (2010) on operation and supply change management. It established an interplay between the firm's capabilities, internal resources, and external environment (Utami & Alamanos, 2022). Basically, to gain a long-term sustainable advantage,

firms must strategically synchronize and integrate internal resources with environmental factors. Although the study was concerned with non-profit institutions, ERBT was used to explain how private colleges and universities strategically conduct their student search, set admissions criteria, and discount to recruit a student body that enables them to maximize tuition revenue and improve market positioning. One of the ways colleges seek to maximize revenue is reflected in how they deploy price discrimination practices which come in the form of tuition discounting based on students' demographics and abilities (Baum et al., 2010; Doyle, 2010; Gansemer-Topf et al., 2021). According to Gansemer-Topf (2021), colleges use these profits to invest in future capital investments or expand services to students to attract more or better-qualified students.

Furthermore, each institution brings to the market its unique educational experience: its mission, a mix of curricular and co-curricular programs, faculty, traditions, housing options, etc. Given the upcoming demographic changes, institutions are recognizing the need to cater to the unique demands of diverse student groups. This may involve tailored student support services, specialized programs, and targeted financial aid. In alignment with ERBT, those institutions that offer a differentiated and relevant experience to their students can develop a competitive advantage in the market and, consequently, achieve long-term financial sustainability. For example, in the book, The Small College Imperative by Marcy (2020), she describes how private education has evolved from the traditional model to new, more innovative models to adapt to the changing market demands to drive enrollment and produce sufficient revenue for the college to carry out its mission.

Keeping ERBT and the study in mind, the following framework served as the theoretical concept that guided the understanding of how colleges adopt specific strategies to boost their enrollment results and achieve sustainable financial success.

Figure 5

The framework of Resource-based theory

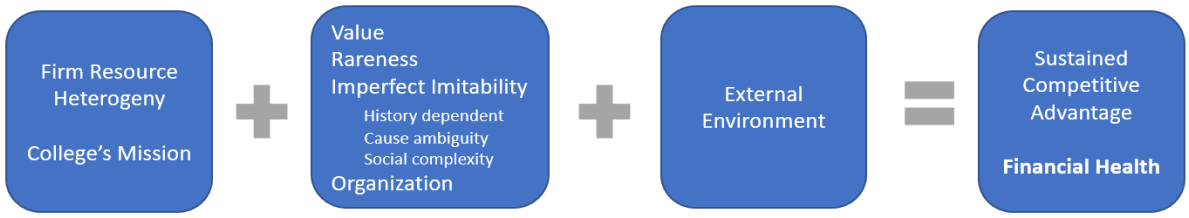


Figure 5 above illustrates the ERBT conditions that need to be present for a firm to achieve sustainable competitive advantage and ensure financial sustainability. First, is the firm's resource heterogeny, which in higher education can be represented by the college's mission. Each mission is unique to a particular institution and drives how senior administration configures its resources to accomplish it. Second, are the internal resources of the institution. Per ERBT, the internal resources need to have value, which means they seek to exploit the opportunities in a firm's internal environment (Utami & Alamanos, 2022). Additional resources should also be rare and imperfectly imitable, meaning they are unique among competitors and not easily obtained by others (Barney, 2001). In a college setting, this refers to how enrollment leaders intentionally leverage resources such as academic programs, support programs, and financial aid to attract specific groups of students to ensure institutional performance (Kozlenkova et al., 2014).

The last component of ERBT is the external environment, which relates to how the organization's leadership synchronizes the internal resources to the external environment. The higher education landscape composed of over 4,000 colleges and universities, represents a highly saturated market making competition for students very challenging. Given changes in student demographics, institutions must adapt to fluctuations in enrollment influenced by factors like race, gender, and socioeconomic background. For instance, higher percentages of Pell-eligible students might necessitate a reevaluation of financial aid structures. Institutions with higher

percentages of international students might forge partnerships with multinational corporations or diplomatic bodies, leveraging external resources to ensure financial stability.

In summary, ERBT provides a robust theoretical foundation to examine the relationship between student demographic characteristics and the financial health of four-year, non-profit private colleges. The framework enriches our understanding of the strategic decisions and resource allocation strategies in the higher education landscape. By acknowledging the interconnectedness of student demographics, external environment, and institutional responses, this framework offers a holistic view of the complex dynamics that shape the future of private higher education institutions in an ever-evolving environment.

CHAPTER 3

DATA AND METHODS

This quantitative research investigated the relationship between student body demographic characteristics and the financial health of four-year, private, and non-profit colleges and universities. The study also explored the predictive power of certain student body attributes on CFI performance. Diversity, percentage of Pell-eligible students, proportion of international students, adult population, gender, and percentage of students receiving aid represented the core demographic indicators. The Composite Financial Index (CFI) and its four constituent ratios: primary reserve, viability, return on net assets, and net operating revenue served as the proxy for institutional financial health. The research aimed to determine if a relationship exists to help campus administrators make strategic recruitment decisions to ensure the financial sustainability of the institution.

Using the firm's Extended Resource-based theory as the conceptual framework, the study's hypothesis suggested that student demographic characteristics are related to private, non-profit institutions' financial health. ERBT states that organizations seek to maximize revenue by leveraging their resources and external environment opportunities to develop a competitive advantage (Hunt & Derozier, 2004; Makadok, 2001). If senior enrollment leadership has a better understanding of how student demographics impact the college's financial health, they can make informed strategic enrollment decisions to achieve competitive advantages that ensure a strong market positioning and financial sustainability. To test this hypothesis, the following research question was explored:

How are student body demographic characteristics related to the financial health of four-year, non-profit private institutions, and which characteristic is most predictive of financial health?

The following chapter details the methodology utilized to examine the relationship between student body demographics and institutional financial health, starting with an overview of the data and the population and descriptions of the independent and dependent variables. Further, an explanation of how descriptive analysis and multiple regression models were deployed to answer the research question is provided. Finally, the chapter concludes by noting the researcher's biases and the data's inherent limitations.

Data Sources and Study's Population

A dataset was constructed using publicly available data from the Integrated Postsecondary Education Data System (IPEDS) of the National Center for Education Statistics (NCES), housed at the U.S. Department of Education. IPEDS gathers information from every college and university that participates in the federal student financial aid programs through surveys conducted annually by the U.S. Department of Education's National Center for Educational Statistics (NCES). NCES provides data collected via annual surveys on 9,800 public and private postsecondary institutions in the United States. Moreover, utilizing the guidelines and definitions specified by the American Institute of Certified Public Accounts (AICPA) and a set of standard data elements that apply to all providers of postsecondary education data, IPEDS supersedes the HEGIS as the primary source of information for higher education finances. The IPEDS database provided the data necessary for the calculation of ratios and the CFI as well as all the student body demographic and institutional variables used in the study.

The Fall 2021 IPEDS data was utilized for the study. The year was identified because it was the most recent year available in IPEDS at the time the study was conducted. The Fall 2021 IPEDS results represent the data for the 2021-2022 academic year. It is important to note that the American Rescue Plan, specifically through its provision of the Higher Education Emergency Relief Fund III (HEERF III) was signed into law by President Joe Biden on March 11, 2021. The plan provided institutions with substantial financial support intended to help institutions address the financial challenges posed by the COVID-19 pandemic. Such substantial financial support may have temporarily inflated institutional income which may have positively influenced ratio performance for this year. The U.S Department of Education made $11 billion in emergency aid available to private non-profit institutions (U.S. Department of Education, n.d.). These suggest that while COVID relief funds provided temporary financial respite for many institutions, they may still have unresolved underlying financial challenges, which are likely to exacerbate given the upcoming demographic trends.

The study focused on all baccalaureate, master's, and doctoral degree-granting, private, four-year, and non-profit colleges and universities with complete IPEDS data sets and serving at least 100 undergraduate students. The study did not include institutions primarily serving graduate or professional programs or special focus institutions as they tend to have different financial models compared to traditional private institutions. Additionally, they serve a different student population which can influence their financial health in ways not representative of the general private institution landscape.

Private colleges and universities were the focus of the study for multiple reasons: the number of predictions by higher education experts regarding their closures and fiscal strain, the fact that unlike their public counterparts, privates don’t count with the backing of state budgets,

majority of privates are reliant on tuition revenue as their main source of income, and the impact they have in enriching our higher education ecosystem by providing an alternative to public institutions. Unlike public institutions, private colleges do not receive state appropriations; hence, one could argue, they are generally self-sustaining and overly reliant on tuition revenue requiring higher vigilance over risk assessment and management practices. Although state appropriations have not recovered from the Great Recession, NCES data reflects that over the last 25 years, very few publics have closed their doors compared to over 100 private non-profit colleges. Christensen predicted that during the 2020s, half of colleges and universities could face closures (Johnson Hess, 2021). Although such dire predictions have not become a reality, there are reasons to think that this can change in the near future, given the upcoming demographic changes, declining college continuation rates, public school competition, and unsustainable tuition discounting model (Eide, 2018). Serving a little over four million students and providing higher graduation rates, smaller classes, and greater faculty-student interaction, these colleges offer an alternative to public institutions. Private colleges and universities are vital to our higher education ecosystem (Hanson, 2022).

Another consideration was only to include small private institutions in the study as they are the most associated with greater financial risk per previous studies (Behaunek & Gansemer-Topf, 2019; Browning, 2013; Hunter, 2012; Lee, 2008; Morgan, 2007; Vahey, 2020). However, given the data availability via IPEDS, all institution sizes were considered to enable comparisons and provide a richer analysis of the private non-profit higher education industry across the U.S.

Study Sample

The sample size was limited by the available data for all variables in the IPEDS database. The sample included all private, non-profit, four-year degree-granting institutions eligible for

title IV with at least 100 enrolled students under the baccalaureate, master, or doctoral Carnegie Classification categories. After the removal of institutions with missing data in any of the variables included in the study, the sample comprised 769 institutions. Below, table 1 offers a breakdown of the sample per location and Carnegie Classification. Based on the table below, 37% of colleges are baccalaureate, 38% are Masters, and 25% are Doctoral institutions with the most concentration of institutions in the Southeast, Mid East, and Great Lakes.

Table 1

Sample Institutions per Location and Carnegie Classification

Sample	Far West	Great Lakes	Mid-East	New England	Plains	Rocky Mountains	Southeast	Southwest
Baccalaureate	20	49	47	26	40	4	90	11
Masters	26	55	71	31	36	4	51	14
Doctoral	20	27	52	24	14	3	40	15
Total	68	132	171	82	90	11	183	40

Operationalization

Independent Variables

To examine the relationship between the student body demographics and the financial viability of private institutions, the study's independent variables were represented by diversity, percentage of Pell-eligible students, proportion of international students, adult population, gender, and percentage of students receiving aid. To further analyze the strength of the relationship, a few more variables historically associated with institutional fiscal performance were added and grouped them into categories so that their effect on institutional financial health

could be controlled. The first group represents all student demographic variables, the second group of variables captures institutional attributes, the third group represents institutional performance measures, and the fourth and final group includes student-associated financial variables. A description of all four groups of independent variables is provided below.

Demographic Variables. Diversity was measured by grouping students into the following categories: percentage of Asian, White, Black, Hispanic, and MultiRace. Given the large shift in student demographics in the last twenty years and the upcoming changes, examining race's relationship to the institution's financial health is critical. As the literature establishes, minority students are more sensitive to tuition and aid and have been associated with high discount rates (Goldrick-Rab et al., 2009; Heller & Rasmusen, 2001; Rine, 2016). Moreover, there are significant gaps in retention rates between White and Asian students compared to Latinx, Black, and Native Americans. According to the NSC Research Center, Asian students have the largest retention rates at private, non-profit institutions, with 86.6% compared to Whites at 77.5%, Latinx at 68.5%, Blacks at 61.1%, and Native Americans at 59.1%.

Given the close relationship of minority populations to discounting which leads to reductions in tuition revenue, one may argue that this demographic variable is directly linked to financial performance. Specifically, the primary reserve ratio as reductions in revenue may limit the ability for institutions to grow their reserves. The Primary Reserve ratio accounts for 35% of the CFI, which is the proxy for financial aid in this study. Given the growth of minority populations, senior college and university administrators must understand the implications of such growth and its impact on enrollment and, consequently, institutional financial sustainability.

Pell Grant-eligible student percentage was an indicator of socio-economic status (SSE). Pell Grants are the foundation of federal financial aid for low-income students enrolled in

college. It is provided to students based on the family's financial need reflected on the FAFSA form. Created in 1972, the Pell promotes access to postsecondary education; however, its eroding value in the face of rising college costs has left institutions with the heavy burden of subsiding tuition for these students (Grants and Work-Study Consortium, 2014). Generally, these students attend less selective institutions. According to The Center on Education and the Workforce, most Pell Grant recipients attend open-access colleges even though thousands are qualified to attend selective institutions with higher graduation rates. Additionally, due to these students' financial limitations, institutions have to provide higher levels of institutional aid, which means their discount tends to be higher. As with race, the relationship with a higher discount may negatively impact tuition revenue leading to poor performance on financial ratios such as the primary reserve ratio and net operating revenue. Given this reality, it is critical to understand the impact of serving this student population on the institution's financial sustainability.

Gender. Measured by the percentage of females in the student body, gender represents an important variable due to historically higher attendance and completion rates for males. However, that has changed in recent decades as females have larger college attendance rates, and White women, particularly, have higher completion rates than males (Buchmann & DiPrete, 2006; Goldin et al., 2006; Hanson, 2022). The observed returns are associated with improvements in the standard of living, heightened motivations to engage in employment, postponed age of marriage, and enhanced academic achievements. On the contrary, the decline in male completion rates has been ascribed to developmental disparities between genders and a link between the absence of fathers and lower levels of education (Buchmann & DiPrete, 2006). The incorporation of gender as a factor was essential, given that variations in responsiveness to tuition fees and financial assistance can also be influenced by gender-related factors (Goldrick-

Rab et al., 2009). For example, some studies have indicated that female students may be more sensitive to changes in tuition and more responsive to financial aid offers (Goldrick-Rab et al., 2009). Additionally, as the percentage of women attending college increases, colleges and universities have to provide flexibility as they tend to balance their educational pursuits with caregiving responsibilities. This means these students are more opt to enroll part time vs. full time, which has tuition revenue implications for the institution.

The Non-Resident Alien population was another demographic variable used to represent the proportion of international students. International students have a significant impact on colleges and universities across the country representing 4.7 % of U.S. higher education's total student population (IIE, 2022). Their impact is felt across various aspects of the institution such as tuition and fees, room and board revenues, diversity, research contributions, and philanthropic contributions (Altbach & De Wit, 2017; Cooper, 2018; Rhoades, 2017). With their enrollments bouncing post-pandemic and the so-called "Trump Effect" and given the declining graduate high school population in the U.S., international students represent a viable option to increase student enrollment, resulting in revenue gains for institutions. Such revenue gains can positively influence financial ratio performance, as historically, these students pay full tuition. However, current political climate and rising competition from Canada and Europe may inhibit the growth of this student population.

Adult Students. This variable was measured by utilizing the percentage of adult undergraduates defined by the ages of 25-64 as provided by IPEDS. The adult population represents a way for institutions to diversify their revenue as they prepare for the demographic cliff. This student market is growing exponentially, which can have positive effects on the institutions' enrollment if they can attract and retain this population. Hence the importance of

including this variable in the study. According to a report by Forbes (Whitford & Schifrin, 2023), the percentage of adults with college degrees, certificates, or industry-recognized certifications increased from 37.9 % in 2009 to 53.7% in 2021, and 33.4% of college students are 25 or older (Hanson, 2022). However, it is important to note that these students do not contribute to auxiliary revenue such as room and board fees. In general, auxiliary revenue can account for 10-20% of total institutional revenue, hence a large percentage of adult student enrollment relative to traditional, residential students can lead to revenue loss. Additionally, adult students have competing responsibilities which leads to intermittent and part-time enrollment. Both lead to reduction in tuition revenue. If the revenue loss is not outperformed by the increase in the overall enrollment and tuition revenue, then it can have negative implications on institutional financial health.

Institutional Attributes Variables. Geographic location. This study utilized the Bureau of Economic Analysis (BEA) regions to identify the geographic location of the institution. There are eight regions in total: Far West, Great Lakes, Mid-East, New England, Plains, Rocky Mountains, Southeast, and Southwest. As a brick-and-mortar industry, institutions are not able to pick up their buildings and move them to a different location to take advantage of growing areas, and research shows that the median distance students go away for college is 94 miles (Mattern & Wyatt, 2009). Additionally, the demographic cliff will disproportionately impact institutions based on where they are located. Colleges in the Northeast and Midwest regions will be affected the hardest due to migration patterns. Grawe's projections suggest both regions will experience population decreases by more than 15% through 2029. Such drops will have a high impact on their enrollment, and consequently, it could negatively affect their financial health.

Carnegie Classification. First published in 1973, the Basic Classification is derived from the Carnegie Classification, a framework created in 1970 to classify colleges and universities in the United States to reflect the public purpose, mission, focus, and impact of higher education (https://carnegieclassifications.acenet.edu/). The Carnegie segments pertaining to this study included Doctorate-granting Universities, Master's Colleges and Universities, and Baccalaureate Colleges. Doctoral Universities are represented by those awarding at least 20 research doctoral degrees or institutions that awarded under 20 research doctoral degrees but at least 20 professional practice doctoral degrees in at least two programs. Master's Colleges and Universities include those who awarded a minimum of 50 master's degrees and fewer than 20 doctoral degrees and it excludes Special Focus and Tribal Colleges. Baccalaureate/Associate's Colleges includes all four-year colleges awarding at least one baccalaureate degree program that conferred more than 50% of degrees at the associate's level. Research shows that Baccalaureate institutions.

Student headcount was represented by Undergraduate Full-Time Equivalent (FTE) Enrollment. Per IPEDS, FTE is a single value providing a meaningful combination of full-time and part-time students. This variable indicates the total number of students enrolled in credit-bearing courses or programs using fall student headcounts during the selected years for the study. Enrollment is a vital variable in the study for two reasons: it measures the institution's size and determines the college's revenue from tuition and fees. Given most private institutions' dependency on tuition as their main revenue source, enrollment declines can create financial challenges due to decreases in revenue (Eide, 2018; Townsley, 2009).

Admit rate or acceptance rate represents the percentage of students a school admits to their incoming class based on the total number of students who applied. It is calculated by

dividing the number of accepted students by the total number of completed applications. Historically, lower acceptance rates have been associated with highly selective and prestigious institutions as they experience higher student demand and larger application volumes. For example, according to Harvard's admissions site, their acceptance rate for the class of 2026 was 3.2%, while the average for all private colleges in the US is greater than 50%. Highly selective institutions benefit from a substantial pool of well-qualified applicants, whereas less prestigious ones contend with smaller pools and students with comparatively lower academic qualifications. As a result, student outcomes are adversely affected, further reinforcing the cycle where prestigious institutions attract higher demand. This has a direct impact on enrollment revenue as most highly selective institutions only offer need-based scholarships. This means they have a good number of students willing to pay the full cost of tuition, resulting in higher tuition revenue.

Test-Optional Policy. The test policy refers to the admissions criteria set by the college or university. In the study, Test Optional was a dummy variable with "1" representing institutions that have a test-optional policy and "0" representing those that require test scores for admissions. According to the Urban Institute (2021), the number of four-year universities and colleges with test-optional policies has increased from 713 to 1,350 since 2020 with private institutions representing 53% of those. Additionally, studies have found that students who did not submit test scores were more likely to be minorities, women, Pell Grant recipients, first-generation students, and those with learning differences (Hiss & Franks, 2014). Given that test-optional is positively related to minority populations, institutions can use this admissions requirement as a strategic lever to attract the growing number of minority populations.

Institutional Performance Variables. The **yield rate** represents the percentage of admitted students who decide to enroll at the institution. It is calculated by dividing the number

of enrolled students by the number of admitted students. Yield rates are an important measure of the institution's market positioning and hence a key enrollment performance indicator. The more "desirable" the institution, the higher the yield rate. According to Hamid and Orakwue (2022), the average Ivy League schools' yield rate was 70.55% in 2022, compared to the RNL's published average yield rate of 20.3% for four-year private institutions (RNL, 2022). Although the yield rate was found to be insignificant in predicting financial viability during the study by Lee in 2009, the hypothesis holds that different results may be found given the shifts in market demand and institutions aggressively leveraging financial aid dollars to manipulate the yield rate.

Retention rates measure the percentage of first-time undergraduate students enrolled in the fall who return to the same institution the following fall. It is also referred to as first to second-year retention. Retention is one of the most important indicators in higher education because it represents quality and student satisfaction and directly affects the graduation rate. Higher retention rates are usually associated with institutions that have lower acceptance rates. According to NCES (2020), the retention rate for privates with less than a 25% acceptance rate is 92% compared to the retention rate of open admissions institutions at 64%. Student attrition can be very costly for institutions, given the loss of revenue and diminished perception of the quality of education. Lastly, given the upcoming decrease in the number of high school graduates, it is imperative for institutions to retain as many students as possible, as it will be increasingly difficult to make up enrollment numbers with new incoming students.

Graduation rates measure the percentage of first-time, full-time undergraduates who complete their program at the same institution within a specified timeframe (NCES, 2022). The six-year graduation rate was used for this study, as all institutions must publish it according to the 1990 Student Right-to-Know Act. Graduation rates represent the ultimate measure of

performance and quality in higher education. It holds institutions accountable and helps students and their families determine the quality of the college. As one can assume, higher graduation rates vary with the institution's selectivity. According to NCES (2020), six-year graduation rates were the highest at most selective institutions (90 percent), compared to 28 percent at institutions with open admissions policies. With the increasing cost of a college education, graduation rates have become more critical in the institutions' ability to prove the return on investment to students and their families. This consequently drives market positioning and student demand.

Student-Associated Financial Measures. Unfunded Institutional Aid is the portion of institutional grants and scholarships (tuition discounts) not funded by gifts or endowments. As private institutions compete with less expensive public options and more reputable privates, enrollment managers turn to tuition discounting to attract more students and increase or shape enrollment. In other words, tuition discounting represents the revenue forgone by the institution as it waives a portion of tier tuition and fee revenue to the student. Discounting includes two types of aid: funded and unfunded. Funded means the aid is funded by gifts or endowments designated specifically for grants and scholarships. Unfunded aid comes from the general operating budget of the institution. According to Townsley (2009), private colleges that rely on tuition revenue for more than 60% of their revenue are considered tuition-dependent institutions. The higher the percentage, the more reliable the institution is on tuition as the main source of revenue, which means the institution is more vulnerable to enrollment declines and market fluctuations. Of specific interest to this study is the fact that there is a positive relationship between tuition discounting and enrollment of underrepresented minority students. Wayt and McBain (2017) found that as institutions increased their tuition discount rates most had above increases in their proportions of undergraduate students from underrepresented backgrounds.

Because research shows that unfunded discount shows it is highly associated with high financial vulnerability and greater financial risk, the study utilizes the percentage of unfunded institutional aid as an independent variable (Browning, 2013; Behaunek & Gansemer-Topf, 2019; Hillman, 2012; Jalal & Khaksari, 2019; Seltzer, 2019).

Endowment Per Student. Per IPEDS (2023), endowments are defined as the funds required to be held permanently while some of its investment earnings are intended for institutional use. Endowment per student is calculated by dividing the total institutional endowment by full-time enrollment equivalency. In this study, I used the natural logarithm of average endowment per student to stabilize the variance for the regression models (Urdan, 2017).

Endowment per student is often used as a measure to signal institutional wealth. The variable was utilized given its close relationship to the financial health of the institution. Previous studies have found that endowment size is critical to institutional financial health, especially during economically stressed periods because it allows the college to draw cash for operational purposes as needed (Chaffe, 1984; Delucchi, 1997; Hansmann, 1990; Townsley, 2009). Moreover, there is a correlation between higher levels of contributions and higher income (Clotfelter, 2003). Given the U.S. race wealth gap: Black and Latino households earn about half as much as the average White household (Aladangady & Forde, 2021), it could be expected that colleges with a larger percentage of minority students will have less endowment per student amounts and hence would be consider less financially healthy.

Average Net Price. The Higher Education Act of 1965 defines institutional net price as "The average yearly price actually charged to first-time, full-time undergraduates students receiving student aid at an institution of higher education after deducting such aid". It is calculated by subtracting the average amount of federal, state, local government, or institutional

aid from the total cost of attendance (IPEDS, 2023). The relationship between price and enrollment has long been analyzed and documented. Research shows that increases in price are negatively associated with enrollment rates, while student aid is positively associated with enrollment, and the price at one institution is correlated to pricing at its neighboring competitors (Bruckmeier et al., 2013; Gu, 2015; Leslie et al., 2016; Wilkins et al., 2013). Avg. net price was utilized in the study as a key institutional financial measure because of its close relationship to enrollment and influence on the enrollment of minority students.

Average Overall Discount as reported in IPEDS, represents the percentage reduction in the total cost of attendance (including tuition, fees, and other expenses) that institutions typically provide to their students through scholarships, grants, and other forms of financial aid. This metric is a critical indicator of affordability for higher education and varies widely across institutions. On average, the overall discount rate can vary significantly from one institution to another and is influenced by factors such as the institution's financial resources, its commitment to providing aid, and the economic background of its student body. A higher discount rate often indicates that the institution is providing substantial financial aid to students, which can make education more affordable and accessible but may also strain the institution's financial resources. Understanding the average overall discount rate is essential for both prospective students and institutions in assessing the cost and affordability of higher education. It also aids institutions in assessing their financial aid strategies in the context of their peers and national trends.

The Dependent Variables

The research centered around one dependent variable as a proxy for institutional financial health: the composite financial index and the four ratios that comprise it.

The Composite Financial Index was introduced in 1980 by the predecessor firms of KPMG. It was created to help senior college and university leaders understand their financial statements, measure their financial health, and assist in strategic financial planning (Tahey et al., 2010). The composite financial index was selected because, as a combination of financial ratios, it provides a comprehensive way to measure an institution's financial performance while enabling comparison across different institutions (Stobierski, 2020; Tahey et al., 2010). Additionally, while not a perfect measure of financial health, the index has been widely used in strategic decision-making and assessing the financial health of colleges and universities by institutional boards and leadership (Lee, 2008; NACUBO, 2019; Tahey et al., 2005). It is important to note that while the CFI is the most used frame for communicating financial health, it needs to be presented along with other financial drivers such as enrollment, discount rate, faculty and staff headcount, and research awards to effectively provide a more comprehensive financial picture (Tahey et al., 2005).

The index comprises four ratios: the primary reserve ratio, the viability ratio, the return on net assets ratio, and the net operating revenues ratio. The CFI is computed by adding the ratios after converting them into strength factors and multiplying by specific weights (Tahey et al., 2010). The index can run from -4 to 10. According to SFAHE, a score of 3 represents minimal financial health. Higher scores such as those above 5 indicate strong financial health enabling the institution to invest in new initiatives and weather economic difficulties. While each score does not have absolute precision, the ranges of financial health can be used as markers of overall institutional well-being. Below are descriptions of each of the ratios per the SFAHE framework.

The primary reserve ratio measures resource sufficiency, accounting for 35% of the CFI. The ratio determines how long the institution can conduct its regular operations without generating new revenue. The ratio is calculated by dividing expandable net assets by the total operating expenses. A score of .4 represents the minimal financial health for the ratio and means that the institution can conduct its operations for 140 days, equivalent to one semester. The maximum score for this ratio is 3.5.

The Viability ratio accounts for 35% of the CFI and measures whether the debt resources are managed strategically to advance the institution's mission. It is calculated by dividing the expandable net assets by plant-related debt. A score above two is desirable for the institution to fund new initiatives through debt. A score below one signals an inability to respond to adverse conditions and attract capital from external sources to support new initiatives. The maximum score for this ratio is 3.5.

The Return on Net Assets ratio accounts for 20% of the CFI and measures asset performance to support the institution's strategic direction. It is calculated by dividing the change in net assets by the total net assets. The minimal financial health for the ratio is a six percent return on net assets. The maximum score for this ratio is 2.0.

The Net Operating Revenue is calculated by dividing the change in unrestricted assets by total unrestricted revenues. It accounts for 10% of the CFI and measures whether the results of the institution's general operations are positive or negative. The maximum score for this ratio is 1.0.

Calculating the CFI

Once the ratios are calculated, the values from each ratio are divided by their specific strengths' factors to transform them into a common scale: Primary Reserve 0.133; Viability

0.417; Return on Net Assets 2%; and Net Operating Revenue .7%. Each result is then multiplied by the following weighting factors: Primary Reserve 0.35; Viability 0.35; Return on Net Assets 0.20; and Net Operating Revenue 0.10. Lastly, all weighted values are added to obtain the CFI. It is important to note that the weights indicate the relative contribution of each ratio to the CFI. The Primary Reserve ratio accounts for 35%, the Viability ratio for another 35%, the Return on Net Assets accounts for 20%, and the Net Operating Revenue ratio for 10%. Additionally, the weight proportions were established by KPMG, Prager, Sealy & Co., LLC, and Attain.

Using Figure 6 below, The Primary Reserve ratio is determined by dividing Expandable Net Assets by Total Expenses, resulting in a value of 0.326. This ratio was then divided by 0.133 and multiplied by the weight factor 0.35, resulting in a total of 0.86. Similarly, the Viability ratio is calculated by dividing Expandable Net Assets by Total Plant-related Debt, yielding a value of 0.087. This ratio is then divided by the strength factor of 0.417 and multiplied by the weight factor of 0.35 resulting in 0.07. The Return on Net Assets ratio is computed by dividing the Change in Net Assets by Total Net Assets, giving a value of 0.075. This ratio has a strength factor of 2.00% and a Weight Factor of 0.20 resulting in a value of 0.75. Lastly, the Net Operating Revenue Ratio is obtained by dividing the Excess of Operating Revenue over Operating Expenses by Total Operating Revenue, resulting in a value of 0.465. This ratio is assigned a strength factor of 0.70% and a Weight Factor of 0.10. The individual ratios are then summed, yielding a CFI Score of 6.68, providing an overall assessment of the organization's financial performance and health.

Figure 6

CFI Sample Calculation

Ratio	Ratio Calculation	Ratio Value	Strength Factor	Weight Factor	CFI Score
Primary Reserve	Expandable Net Assets/ Total Expenses	0.326	0.133	0.35	0.86
Viability	Expandable Net Assets/ Total Plant-related Debt	0.087	0.417	0.35	0.07
Return on Net Assets	Change in Net Assets/Total Ne	0.075	2.00%	0.20	0.75
Net Operating Revenue	Excess of Operating Revenue over Operating Expenses/ Total Operating Revenue	0.35	0.70%	0.10	5.00
CFI Score					6.68

For the calculation of the CFI in the study, values of the ratio to the maximum and minimum ranges were capped as outlined by the SAFHE framework. Minimum and maximum scores for the ratios are -3.5 to 3.5 for primary reserve and viability, -2 to 2 for return on net assets, and -1 to 1 for net operating revenue. Additionally, CFI ranges were capped at 10 and floored at -4.

Correlations Among CFI and Its Ratios

The correlations presented in Table 2 display the pairwise correlations between the dependent variables examined in the study: CFI, Primary Reserve ratio, Viability ratio, Return on Net Assets ratio, and Net Operating ratio.

The correlation between the CFI and the Primary Reserve ratio is notably strong, with a coefficient of 0.70. This positive correlation suggests that as the CFI increases, private higher education institutions tend to maintain higher levels of Primary Reserves. This finding is consistent with the expectation that financially robust institutions are more likely to have stronger financial reserves.

Similarly, the correlation between Viability and the Primary Reserve ratios is substantial, with a coefficient of 0.74. This positive correlation indicates that private higher education

institutions with higher levels of resource efficiency are more likely to exhibit sound debt management practices giving institutions flexibility and ability to invest as needed to maintain competitive advantage. The correlation between the Viability ratio and the CFI is also substantial, with a coefficient of 0.69. This result suggests that private institutions with higher CFI scores are more likely to exhibit higher viability ratio.

In contrast, the correlation between the Return on Net Assets ratio and the CFI is relatively moderate (0.43). While a positive relationship is observed, it is not as strong as the relationships observed with Primary Reserve and Viability ratios. This suggests that other factors may influence the relationship between the CFI and the Return on Net Assets ratio.

Lastly, the correlation between the Net Operating ratio and the other variables is generally weaker, with coefficients ranging from 0.09 to 0.57. These correlations suggest only modest associations with the Primary Reserve, Return on Net Assets, and Viability ratios. However, the correlation with CFI is notably stronger at 0.57, indicating a positive moderate relationship between the index and the ratio.

Table 2

Dependent Variables Correlations

	CFI	Primary Reserve	Viability	ReturnNetAssets	NetOperating
CFI	1				
Primary Reserve	0.7	1			
Viability	0.69	0.74	1		
ReturnNet Assets	0.43	0.19	0.1229	1	
NetOperating	0.57	0.1	0.09	0.25	1

Variables Summary

Table 3 provides a summary of all variables along with their variable set, name, description, and metric. For those measures that are categorical, such as Carnegie classification, BEA regions, and Test policy, dummy-coded (0/1) variables were created to indicate the category membership. Additionally, for the endowment per student variable, I utilized the natural logarithm to account for large variances in the data. For the calculation of the CFI in the study, the values of the ratios were capped to the maximum and minimum ranges as outlined by the SAFHE framework.

Table 3

Variables Summary

Variable Categories	Variable Name	Description	Metric
Demographic Variables			
Diversity	Asian, White, Black, Hispanic, MultiRace	Student's race	Percentage
Pell Grant-Eligible Student	Pell	Percentage of Pell-eligible students	Percentage
Gender	Women	Percentage of students identified as female	Percentage
Non- Resident Alien Population	NRAlien	Proportion of international students	Percentage
Adult students	UGAdultEnr	Students 25-64 years old	Percentage
Percentage of Student Receiving Aid	StudentwIAid	Percentage of students receiving institutional aid	Percentage
Institutional Attributes			
Student Head Count	FTE	Full-Time Equivalent Enrollment	Number
Test-Optional Policy	TestOpt	Adoption of Test-optional policy	0-1

Geographic Locations	FarWest, GreatLakes, MIdEast, NewEngland, Plains, RockyMountains, Southeast, Southwest		0-1
Admit Rate	AdmitRate	Number of students admitted divided by completed applications	Percentage
Carnegie Classification	Baccalaureate, Masters, Doctoral	Basic Carnegie Classification	Categories
Institutional Performance			
Yield Rate	AdmYield	Proportion of admitted students that enroll	Percentage
Retention Rate	Retention	First to second year retention	Percentage
Graduation Rate	Graduation	Six-year graduation rate	Percentage
Institutional Financial Measures			
Unfunded Institutional Aid	UnfundedInstAid	Portion of institutional aid not funded by gifts or endowment	Percentage
Endowment Per Student	EndowFTELOG	Total institutional endowment divided per student	Natural Logarithm of dollar amount
Avg. Net Price	AvgNetPrice	Price after free student aid is applied	Dollar Amount
Average Overall Discount	AvgOverallDisc		
Dependent Variables			
Primary Reserve Ratio	PrimaryReserve	Measure of resource efficiency	Ranges: -3.5 - 3.5
Viability Ratio	Viability	Measure of debt management	Ranges: -3.5 - 3.5
Return on Net Assets Ratio	ReturnNetAssets	Measure of asset performance	Ranges: -2 - 2
Net Operating	NetOperating	Measure of operating performance	Ranges -1 - 1
Composite Financial Index	CFI	Index comprised of four ratios above	Ranges: -4 - 10

Additionally, Table 4 presents descriptive statistics for the numerical variables in the study. For each variable, calculated was the mean, standard deviation, minimum, and maximum values. As noted in the table below, the average FTE value among all 769 institutions in the study is 3,567, with a high standard deviation of 6,142, which was expected given thebe wide range of institution sizes in the study. Additionally, worth noting is that the average percentage of women in the data set is approximately 58.44, with a low standard deviation of 12.294 confirming the higher number of women versus men attending higher education institutions today. Such a reality is nationally widespread. Moreover, regarding undergraduate adult enrollment, Black, Hispanic, and Pell eligibility percentages, the data shows significant variability among enrollment of these populations across institutions. This aligns with institutional performance variables (retention, graduation, and admit rates) large variations among institutions in the study. Furthermore, it is worth noting that the CFI mean for all institutions in the data set is 6.68, which according to the SFAHE framework indicates strong financial health. This suggests that in aggregate, the private higher education sector seems to be doing well. Lastly, "White" was used as the reference category for race, "Baccalaureate" as the reference category for Carnegie Classification, and "GreatLakes" as the reference category for BEA regions.

Table 4

Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
FTE	3567.218	6142.002	108	83340
AdmitRate	69.416	22.092	4	100
Retention	76.112	12.188	21	99
Graduation	62.205	17.088	12	98
UnfundedInstAid	85.97	20.133	0	100
EndowFTELOG	10.677	1.429	4.61	15.36
AvgNetPrice	24860.932	7096.683	3354	53916

AvgOverallDisc	47.799	12.772	2.51	93.59
StudentwIAid	85.86	14.768	17	100
Pell	31.447	13.159	7	89
AdmYield	23.511	14.036	5	86
Women	58.441	12.294	0	100
NRAlien	5.594	6.645	0	40
Asian	4.499	4.832	0	36
White	57.349	18.19	0	87
Black	11.302	12.663	0	98
Hispanic	11.056	9.082	0	66
MultiRace	3.693	2.369	0	24
UGAdultEnr	10.58	11.71	0	74
PrimaryReserve	1.343	1.038	-1	3.5
Viability	1.89	1.259	-3.5	3.5
ReturnNetAssets	0.197	0.151	-1.4	1.47
NetOperating	0.041	0.164	-1	0.75
CFI	6.68	3.335	-4	10
Baccalaureate	0.372	0.484	0	1
Masters	0.375	0.484	0	1
Doctoral	0.254	0.435	0	1
FarWest	0.086	0.28	0	1
GreatLakes	0.17	0.376	0	1
MidEast	0.221	0.415	0	1
NewEngland	0.104	0.305	0	1
Plains	0.117	0.322	0	1
RockyMountains	0.014	0.119	0	1
Southeast	0.235	0.425	0	1
Southwest	0.052	0.222	0	1
TestOpt	0.932	0.251	0	1

Notes: Study sample size of 769. FTE represents Full-Time Equivalent Student Enrollment. EndowFTELOG represents the natural logarithm of endowment per student. White represents the reference category for race variables. Great Lakes is the reference for BEA regions, and Baccalaureate is the reference category for Carnegie Classification.

Methods and Research Design

To answer the research question, a correlational research approach was deployed. Specifically, multiple regression analysis was conducted to explore the relationship between student demographic characteristics and CFI performance. Multiple regression was selected as it is a powerful technique to understand how groups of predictor variables are related to a

dependent variable and the strength of each predictor variable on the dependent variable (Ethington et al., 2002; Urdan, 2017). Although regression alone cannot prove a causal relationship, it will help identify the variables' explanatory power and their combined explanatory power for the variances in institutional financial health or CFI (Urdan, 2017). To understand which student demographic characteristics were most predictive of institutional financial health, regression models were developed to isolate each demographic variable while controlling for the rest. Additionally, given that the CFI is formed of four rations representing different aspects of institutional financial performance, regression models were conducted to assess the relationship between student demographic characteristics and each of the four ratios. The regression models' results provided a more comprehensive and detailed understanding of how certain demographic characteristics impact different aspects of institutional financial health. Lastly, to ascertain the strength of the relationship between student demographics and institutional financial health, variables historically associated with fiscal performance were added. The variables were divided into four categories, and then regression models were developed to understand changes in the CFI score based on additional variables. The student demographic characteristics that contained the main independent variables in the study were kept together (race, percentage of international students, Pell-eligible, gender, percentage receiving aid, and adult student percentage); the second category contained institutional attributes such as FTE, Carnegie Classification, BEA region, test policy, and admit rate; the third, institutional performance variables included graduation rate, retention rate, and yield rate; and the fourth institutional financial measures tied to students: endowment per student natural logarithm, percentage of unfunded aid, avg. net price, and overall discount. Adding these variables validated the impact that certain student demographics have on the institutions' financial health.

To examine the relationship between the variables above, the following regression models were estimated:

Model 1: $CFI = \beta 0 + \beta S + \varepsilon$

Model 2: $PR = \beta 0 + \beta S + \varepsilon$

Model 3: $V = \beta 0 + \beta S + \varepsilon$

Model 4: $RNA = \beta 0 + \beta S + \varepsilon$

Model 5: $NO = \beta 0 + \beta S + \varepsilon$

Model 6: $CFI = \beta 0 + \beta S + \beta I + \varepsilon$

Model 7: $CFI = \beta 0 + \beta S + \beta I + \beta P + \varepsilon$

Model 8: $CFI = \beta 0 + \beta S + \beta I + \beta P + \beta F + \varepsilon$

Model 9: $CFI = \beta 0 + \beta S + \beta I + \varepsilon$

Model 10: $PR = \beta 0 + \beta S + \beta I + \beta P + \varepsilon$

Model 11: $RNA = \beta 0 + \beta S + \beta I + \beta P + \beta F + \varepsilon$

Model 12: $NO = \beta 0 + \beta S + \beta I + \beta P + \beta F + \varepsilon$

Where CFI, PR, V, RNA, and NO are the dependent variables representing the composite financial index along with its four comprising ratios: Primary Reserve, Viability, Return on Net Assets, and Net Operating. $\beta 0$ is the intercept. β represents the regression coefficients. S represents the student demographic variables (race, percentage of international students, Pell-eligible, gender, percentage receiving aid, and percentage of adult students), I represents the grouping of institutional attributes variables (FTE, Carnegie Classification, BEA region, test policy, and admit rate), P captures the institutional performance variables (graduation rate, retention rate, and yield rate), and F denotes the student-associated financial measures

(endowment per student natural logarithm, percentage of unfunded aid, avg. net price, and overall discount). Lastly, ε represents the error term.

Limitations and Potential Bias

As with any quantitative research, this study has several limitations that may impact the interpretation and application of the results. Although the research is confined to private, four-year, non-profit institutions, they have various missions, serve different student populations, and deploy unique enrollment strategies, all of which are hard to account for in quantitative research. Examples of such distinct missions include women's colleges and HBCUs. Another limitation of the study is that it was focused on aggregate institutional measures, so specific strategies implemented by institutions to boost enrollment and gain a competitive edge in the marketplace were not captured. Thus, the study offers minimal insights into specific enrollment strategies that may assist colleges and universities in positively impacting their financial health.

Additionally, the study uses the CFI and its four comprising ratios as the single measure of institutional financial health. Although the CFI is the most widely used measure to assess the institution's financial strength and facilitates peer assessment, the scores do not necessarily mean the institution is fulfilling its mission. Additionally, financial ratios bring with them the following limitations: ratios cannot indicate unquantifiable issues (i.e., leadership decisions, reputation, community support), inflation can distort financial ratios if appropriate adjustments are not made, the quantitative nature of the ratios ignores the nature of changes, and ratios are lagging indicators (Baily & Miller, 1993; Davis & Sonnenbert, 1993; DiSalvio, 1989; Townsley, 2002). Moreover, the study utilized a single source of data which limited the research to a single year of study. IPEDS started collecting CFI financial information in 2020, given that was the Covid

pandemic year, the study focused on 2021 only. Given the lagging nature of financial indicators, studying several years could have resulted in additional insights.

Regarding potential biases, the study was influenced by my experiences as a former enrollment manager at private, non-profit institutions and my previous position as an enrollment management consultant at Ruffalo Noel Levitz. I intrinsically believe enrollment plays a critical role in the livelihood of any institution, especially at institutions that do not count on large endowments and deploy a high-price, high-aid business model. Having spent 15 years working in enrollment management at multiple private institutions, I understand the significant role these institutions play in transforming students' lives and the communities they support. Moreover, I am acutely aware of the pressures on enrollment managers to perform. In my experience, declining enrollment could mean dire financial circumstances for the institutions, such as budget cuts or layoffs.

Lastly, as an enrollment manager at RNL, my close work with university and college presidents and governing boards provides me with insight into the financial realities of different types of institutions and the factors that contribute to them. As such, I understand the breadth of such factors, which helped me select the enrollment and financial variables in the study. As I embarked on this research, I was keenly aware of my perspectives and was committed to approaching this study through a pragmatic lens to shape my methodology and findings.

Conclusion

Deploying the Extended Resource-Based Theory (ERBT) as the conceptual framework, this study investigated the relationship between student demographic characteristics and the financial health of four-year, private, and non-profit colleges and universities. The demographic characteristics represented by diversity, percentage of Pell-eligible students, proportion of

international students, adult population, gender, and percentage of students receiving aid serve as the independent variables. The Composite Financial Index (CFI) and the four ratios that comprise it: Primary Reserve, Viability, Return on Net Assets, and Net Operating serve as the dependent variables and proxy for institutional financial health.

IPEDS was used as the data source to study 769 private non-profit institutions during the year 2021. Descriptive statistics and multiple regression analysis were deployed to address the study's research question. Withstanding limitations such as differences in mission, deployment of unique enrollment strategies, and populations served, the study seeks to provide enrollment managers with the ability to make informed enrollment decisions that lead to the financial vitality of the institutions they serve.

CHAPTER 4

RESULTS

Overview

This chapter presents the analytical findings of the study's research question: How are student body demographic characteristics related to the financial health of four-year, non-profit private institutions? Specifically, the purpose of the analysis was to isolate and examine the relationship between demographic characteristics (i.e., diversity, Pell eligibility, international student proportion, adult students, and gender) and the institutional Composite Financial Index score during the year 2021-22 at 769 private, four-year, and non-profit institutions. Additionally, the study sought to understand which of the student demographic characteristics are most predictive of institutional financial health. To conduct the analysis, I created a series of multiple regression models to study the level of effect student body characteristics have on the CFI.

The results of the study are presented in five sections. The first section includes the analysis of the models developed to measure the relationship of demographic variables on the CFI. The second section reflects the results of four models developed to assess changes to the CFI results when adding institutional and student-related financial variables to the student demographic characteristics. The third section includes the results from regressions of student demographic variables against each of the CFI ratios: Primary Reserve, Viability, Net Return on Assets, and Net Operating. The fourth section discusses the explanatory power of the model when adding institutional and student financial variables to the student body demographic characteristics for each of the CFI ratios' models. Lastly, the fourth section discusses how specific independent variables fit under the conceptual framework to explain the relationship between student and institutional characteristics and the college or university's financial health.

Section I Effect of Student Body Demographic Characteristics on CFI

This section presents the results of the regression analysis conducted to explore the relationships between the student demographic variables (diversity, Pell eligibility, gender, non-resident alien population, and percentage of students receiving institutional aid) and the CFI. The analysis revealed the following results:

Per Table 5, the overall regression model was statistically significant ($F(9, 759) = 6.91$, $p < 0.001$), indicating that at least one of the predictor variables was associated to CFI performance. To gain a deeper understanding, I examined the individual predictor variables.

1. The variable "Black" was statistically significant ($p = 0.033$) and had a positive coefficient of 0.0257. These results suggest that institutions with a higher percentage of black students relative to white are associated with an increase in CFI performance. This contradicts Lee's (2009) findings, which found that the percentage of minority students was insignificant in predicting financially viable from non-viable institutions.

2. The variable "Pell" was highly statistically significant ($p < 0.001$) and had a negative coefficient of -0.0562. This implies that a larger percentage of students receiving Pell Grants is associated with lower CFI score values. Such findings align with the recent finding from Zemsky (2020), which indicated that Pell-eligible students were more likely to attend an institution at market risk.

3. The variable "UGAdultEnr" was statistically significant ($p = 0.028$) with a negative coefficient of -0.0268. An increase in "UGAdultEnr" is associated with a decrease in the CFI index.

4. The percentage of women had a coefficient of 0.0174 and a p-value of 0.084, indicating a marginally significant relationship.

5. NRAlien, Asian, Hispanic, MultiRace, and StudentwIAid were not found to be statistically significant predictors, as their p-values exceeded the 0.05 threshold.

Overall, the regression model had an R-squared value of 0.0758, indicating that approximately 7.58% of the variance in the CFI index can be explained by the demographic variables in the model. The adjusted R-squared was 0.0648, adjusted for the number of predictors, suggesting a relatively modest fit for the model. These findings suggests that there are other factors besides the student demographic variables in this model that are related to the CFI index performance.

Table 5

Effects of Student Demographic Variables on the CFI

	Model (1a)
NRAlien	0.00624
	(0.0212)
Asian	0.0345
	(0.0312)
Black	0.0257**
	(0.0120)
Hispanic	-0.0102
	(0.0141)
MultiRace	0.0271
	(0.0519)
Pell	-0.0562***
	(0.0142)
Women	0.0174*
	(0.0101)
StudentwIAid	-0.00603
	(0.00953)
UGAdultEnr	-0.0269**
	(0.0122)
Constant	7.763***
	(1.043)
R-squared	0.076

Notes: Dependent variable = CFI. Sample size = 769 institutions. The reference category for race variables is White. All variables are measured by the proportion of students. The constant represents the intercept. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Section II Other Determinants of CFI Performance

This section reflects the results of four models developed to assess changes to the CFI results when adding institutional and student financial variables to the student body demographic characteristics. Table 6 provides the results from these models. The dependent variable in each model is the CFI index. In the first model (1a), the student demographic variables were controlled (International students, race, Pell Eligibility, gender, students receiving aid, and adult population). The second model (2a) adds controls for institutional characteristics variables (FTE, Carnegie classification, BEA regions, test policy, and admit rate) that could affect the CFI index. In the third model (3a), controls were added for institutional performance characteristics (graduation, retention, and yield rates); and the last model (4a) includes student-associated financial measures: endowment per student, unfunded aid, average net price, and average overall discount.

As one moves from model (1a) to (4a), the explanatory power of the models increases as indicated by the higher R-square values: 0.0758, 0.1117, 0.1442, and 0.2240 respectively. The addition of student-associated financial measures had the biggest effect in the model as reflected in the changes in the proportion of the variation in the CFI index. The variation increased by over seven percentage points when those variables were added to the model. Looking across the models, the percentage of black students remained significant with positive coefficients across all four models. This suggests that increases in the percentage of Black students relative to White may be associated with better financial health, as measured by the CFI. By model (4a), the Black variable coefficient 0.0340 estimates that for every percentage point increase in the proportion of Black students relative to white students, the CFI increased by approximately 0.0340 units. Like the Black variable, Pell eligibility was significant but only in the first two models. Contrary to

the positive relationship of Black students on CFI performance, the coefficient for the percentage of Pell-eligible students was negative, suggesting that as the percentage of Pell-eligible students increases, the CFI decreases. However, Pell eligibility was not significant once institutional performance and student financial measures were added to the model.

Additionally, institutional characteristics such as the FTE and Admit Rate and the institutional performance variable Graduation Rate contribute significantly to explaining variations in the CFI. It is worth noting that of all these variables, the Admit Rate had a negative coefficient (-0.1916), signaling that less selective institutions (colleges with higher admit rates) are correlated with lower CFI performance. Furthermore, BEA regions MidEast and Plains in model (3a) had significant explanatory power over the CFI. The MidEast coefficient was negative (-.8858), which indicates that institutions in the Mid-East region relative to the Great Lakes are associated with lower CFI performance. These findings align with what is currently happening in the Mid-East region regarding declining enrollments and this market becoming highly saturated. According to WICHE (2020), between 2019 to 2037, this area will experience on average a nine percent enrollment decline. On the other hand, the Plains region was positively associated with CFI performance indicating that institutions in this region experience better CFI performance relative to the Great Lakes region. This aligns with WICHE data which shows that the growth of the high school population in these areas is increasing. On average the high school population is projected to grow by 27% between 2019-2037 (WICHE, 2020).

Moreover, student-associated financial measures such as endowment and overall discount play a substantial role in explaining CFI variations in the model (4a). The average overall discount has a negative impact on CFI, while endowment per student has a positive coefficient (1.072) indicating a positive relationship with the CFI. The overall discount rate

coefficient was -0.0422 indicating an inverse relationship with the CFI. For every unit increase in the overall discount rate, the CFI decreased by 0.0422. These findings align with previous studies that highlight the importance of endowment and discount rates to institutional financial health (Behaunek & Gansemer-Topf's, 2019; Hillman, 2012; Jalal & Khaksari, 2019; Lee, 2008; Lyken-Segosebe, 2013; Redd, 2000; Rine, 2016; Zemsky, 2020;).

Finally, the findings imply that a combination of student demographics, institutional characteristics, performance measures, and financial factors collectively are correlated to institutional financial health, as reflected in the CFI. It is also important to note that model (4a), which is the model with the highest R-square only accounts for 22.40% of the variance in the CFI indicating that there are other factors besides the variables in this model that are correlated to CFI performance.

Table 6

Effects of Student Demographic, Institutional Attributes, Institutional Performance, Student Financial Measures on CFI

	Model (1a)	Model (1b)	Model (1c)	Model (1d)
NRAlien	0.00624	-0.0203	-0.0232	-0.0347
	(0.0212)	(0.0225)	(0.0223)	(0.0218)
Asian	0.0345	0.0223	-0.00537	-0.0298
	(0.0312)	(0.0355)	(0.0356)	(0.0344)
Black	0.0257**	0.0266**	0.0301**	0.0340***
	(0.012)	(0.0126)	(0.0127)	(0.0125)
Hispanic	-0.0102	-0.00821	-0.0122	0.00721
	(0.0141)	(0.0163)	(0.0161)	(0.0158)
MultiRace	0.0271	-0.0113	-0.00585	-0.0459
	(0.0519)	(0.0575)	(0.0569)	(0.0547)
Pell	-0.0562***	-0.0558***	-0.012	-0.0241
	(0.0142)	(0.0147)	(0.0174)	(0.0182)
Women	0.0174*	0.0278***	0.0155	0.0123
	(0.0101)	(0.0103)	(0.0105)	(0.01)
StudentwIAid	-0.00603	0.00759	-0.0013	-0.00335
	(0.00953)	(0.0104)	(0.0106)	(0.0105)
UGAdultEnr	-0.0269**	-0.0211	-0.00683	0.00684
	(0.0122)	(0.0132)	(0.0133)	(0.013)
FTE		5.28e-05**	3.85e-05*	4.05e-05*

		(2.28E-05)	(2.26E-05)	(2.19E-05)
Masters		-0.464	-0.482*	0.134
		(0.297)	(0.293)	(0.292)
Doctoral		-0.369	-0.476	0.129
		(0.36)	(0.355)	(0.349)
FarWest		-0.141	-0.116	0.3
		(0.607)	(0.598)	(0.587)
MidEast		-0.743*	-0.886**	-0.615*
		(0.379)	(0.375)	(0.363)
NewEngland		0.0271	-0.0582	0.116
		(0.466)	(0.459)	(0.452)
Plains		0.704	0.884**	0.717*
		(0.441)	(0.438)	(0.422)
RockyMountains		0.565	0.748	0.428
		(1.025)	(1.009)	(0.974)
Southeast		-0.354	-0.0306	-0.174
		(0.393)	(0.393)	(0.377)
Southwest		0.0933	0.518	-0.307
		(0.633)	(0.629)	(0.613)
TestOpt		-0.0507	-0.11	-0.232
		(0.477)	(0.481)	(0.467)
AdmitRate		-0.0192***	-0.00726	0.000981
		(0.00725)	(0.00793)	(0.00797)
Graduation			0.0710***	0.0415***
			(0.0152)	(0.01503)
Retention			-0.01	-0.0133
			(0.0188)	(0.0182)
AdmYield			-0.0012	-0.00329
			(0.0108)	(0.0117)
EndowFTELOG				1.073***
				(0.127)
UnfundedInstAid				0.00444
				(0.00643)
AvgNetPrice				-5.57e-05*
				(3.04E-05)
AvgOverallDisc				-0.0422***
				(0.015)
Constant	7.763***	7.845***	3.526*	-2.974
	-1.043	-1.172	-1.839	(2.457)
R-squared	0.076	0.112	0.144	0.224

Notes: Dependent variable = Return on Net Assets ratio. Sample size = 769 institutions. The reference category for race variables is White. Baccalaureate is the reference for Carnegie Classification variables. Great Lakes is the reference category for BEA regions. Endow FTELOG represents the natural logarithm of endowment per student. AvgNetPrice and EndowFTELOG are measured in average dollars per student. All other variables are measured by the proportion of students. Constant represents the intercept. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Section III Effect of Student Demographics on CFI's Individual Ratios

Given the low R-Square value for the model in the first section (relationship of demographic variables and CFI performance), the study explored whether the demographic variables could be correlated to each ratio differently. In other words, which of the ratios' variances can be most explained by student body characteristics? Four different models were developed to assess the relationship between demographic characteristics and each of the four ratios: Primary Reserve, Viability, Return on Net Assets, and Net Operating. The results are presented below.

Model 1: Regression for Primary Reserve Ratio

The model was statistically significant ($F(9, 759) = 16.35$, $p < 0.001$), suggesting that at least one of the predictor variables has a significant relationship to the Primary Reserve Ratio. Based on the R-squared value, 16.24% of the variation in this ratio was explained by the predictor variables in the model. As reflected in Table 7 below, the analysis suggests that three predictor variables have a statistically significant correlation to the Primary Reserve. Notably, the variables "MultiRace" ($p = 0.008$), "Pell" ($p < 0.001$), and "UGAdultEnr" ($p < 0.001$) are all statistically significant. These variables, along with others, explained approximately 16.24% of the variation in Primary Reserve. It is worth noting that both the Pell and UGAdultEnr coefficients were negative, which means the increases in the percentage of these populations are negatively associated with the ratio. This aligns with the results of the Demographics-CFI model presented in the first results section. Likewise, the MultiRace coefficient was positive, which means increases in this student population result in increases in the ratio. As in the Demographics-CFI model, this race variable is positively related to the ratio's performance.

Table 2

Effects of Student Demographic Variables on Primary Reserve Ratio

	PrimaryReserve
NRAlien	0.00948
	(0.00627)
Asian	0.0101
	(0.00924)
Black	0.00319
	(0.00356)
Hispanic	0.00239
	(0.00416)
MultiRace	0.0412***
	(0.0154)
Pell	-0.0162***
	(0.00421)
Women	0.00516*
	(0.00298)
StudentwIAid	-0.00235
	(0.00282)
UGAdultEnr	-0.0193***
	(0.00362)
Constant	1.645***
	(0.309)
R-squared	0.162

Notes: Dependent variable = Primary Reserve ratio. Sample size = 769 institutions. The reference category for race variables is White. All variables are measured by the proportion of students with those characteristics. Constant represents the intercept. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Model 2: Regression for Viability Ratio

The model was statistically significant (F (9, 759) = 2.88, p = 0.0024), suggesting that at least one predictor variable was related to the Viability ratio. However, the R-squared value was relatively low (0.0330), indicating that only 3.30% of the variation in Viability could be explained by the predictor variables in the model. With an adjusted R-squared of 0.0215, adjusted for the number of predictors, the model had a low fit, indicating that demographic characteristics play a very small role in predicting viability ratio performance.

Model 3: Regression for Return on Net Assets

The model was statistically significant ($F(9, 759) = 9.94$, $p < 0.001$), suggesting that at least one predictor variable was associated with the Return on Net Assets ratio. Approximately 10.55% of the variation in Return on Net Assets can be explained by the predictor variables in the model. Black ($p < 0.001$), Hispanic ($p = 0.002$), UGAdultEnr ($p < 0.001$), and StudentwIAid ($p = 0.003$) were all statistically significant. Additionally, Hispanic, UGAdultEnr, and StudentwIAid all had negative coefficients, indicating that growth in these populations is inversely related to the ratio's performance. Lastly, as with the rest of the models in this section, the R-squared value (10.55%) suggests that there are other unaccounted variables influencing the Return on Net Assets ratio.

Model 4: Regression for Net Operating

The model was not statistically significant ($F(9, 759) = 0.64$, $p = 0.7639$), indicating that the predictor variables do not have a significant relationship with the Net Operating ratio. The R-squared value of 0.0075 suggests that only about 0.75% of the variation in Net Operating ratio can be explained by the predictor variables in the model. Lastly, the adjusted R-squared is -0.0042, adjusted for the number of predictors, indicating that the model is not a good fit for predicting the ratio.

Student Characteristics Association with Primary Reserve and Return on Net Assets Ratios

When comparing all four models in Table 8, student characteristics are notably associated with the institutions' Primary Reserve and Return on Net Assets ratios. Model 1 (Primary Reserve) appears to have the strongest relationship as it was statistically significant, and it explains a moderate proportion (16.2%) of variation in the ratio. These results suggest that three of the demographic characteristics variables (Pell, MultiRace, and Adult) are related to the

institutions' resource efficiency and flexibility to support their mission. Specifically, as the percentage of adult and Pell-eligible student populations increases, it has an inverse relationship to the ratio performance. In other words, institutions with a higher proportion of adult students and Pell-eligible students relative to others in the study tended to have lower primary reserves compared to their operating expenses. Such indicates that these institutions may face greater financial challenges in maintaining adequate reserves for unexpected expenses or financial stability. Likewise, model 3 (Return on Net Assets) was also statistically significant and explains a moderate proportion of variation in the Return on Net Assets ratio (10.55%). Based on this model, growth in the percentage of Hispanics, adult students, and students with institutional aid were negatively associated with the institutions' efficiency in generating financial returns on their net assets. This implies that institutions with a higher proportion of these student groups may face challenges in generating satisfactory financial returns on their invested assets. It could be due to various factors, such as differences in program offerings, student support services, or tuition structures. Model 2 (Viability), while statistically significant, explained a relatively low proportion of variation in the ratio. This suggests that the variation in the ratio is not well explained by the student demographic characteristics. Finally, Model 4 (Net Operating) was not statistically significant and had a low explanatory power on the ratio.

In conclusion, the analysis of these four regression models highlights the importance of considering student demographics when assessing the financial health and performance of educational institutions. It underscores that certain student groups, such as adult students and Pell-eligible students are correlated to the primary reserve and return on net assets ratios. However, it's essential to acknowledge that other unaccounted factors may also contribute to

these financial outcomes, and further research is needed to understand the complexities of the relationship between student demographic characteristics and institutional financial performance.

Table 8

Comparison of CFI Ratios Regression Models

	PrimaryReserve	Viability	ReturnNetAssets	NetOperating
NRAlien	0.00948	0.0062	0.00163*	-0.000299
	(0.00627)	(0.00817)	(0.000941)	(0.00108)
Asian	0.0101	0.00892	0.00258*	0.000671
	(0.00924)	(0.012)	(0.00139)	(0.00159)
Black	0.00319	0.000135	0.00258***	0.00068
	(0.00356)	(0.00464)	(0.000535)	(0.000612)
Hispanic	0.00239	-0.0022	-0.00190***	-0.000287
	(0.00416)	(0.00543)	(0.000625)	(0.000715)
MultiRace	0.0412***	0.0197	-0.000376	-0.00241
	(0.0154)	(0.02)	(0.00231)	(0.00264)
Pell	-0.0162***	-0.00557	-0.000147	-0.000324
	(0.00421)	(0.00548)	(0.000631)	(0.000722)
Women	0.00516*	0.00358	-0.000135	0.000124
	(0.00298)	(0.00389)	(0.000448)	(0.000512)
StudentwIAid	-0.00235	-0.00366	-0.00128***	-0.000437
	(0.00282)	(0.00368)	(0.000424)	(0.000485)
UGAdultEnr	-0.0193***	-0.0108**	-0.00195***	0.000483
	(0.00362)	(0.00472)	(0.000544)	(0.000622)
Constant	1.645***	2.159***	0.312***	0.0798
	(0.309)	(0.403)	(0.0464)	(0.053)
R-squared	0.162	0.033	0.105	0.008

Notes: Sample size = 769 institutions. The reference category for race variables is White. All variables are measured as proportion of students. The constant represents the intercept. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Section IV Other Determinants of CFI's Individual Ratios Performance

The following section reflects the results of a series of models developed to assess changes to each of the CFI ratios when adding historically associated financial health-related variables to the student body demographic characteristics. The first four models in this section

are dedicated to the Primary Reserve Ratio. Followed by four models dedicated to the effect of these variables on Viability, another four to Return on Net Assets, and the last four to Net Operating ratio.

Primary Reserve Ratio Regression

Table 9 provides the results from these models. In the first model (1b), the student demographic variables (International students, race, Pell Eligibility, gender, students receiving aid, and adult population) were controlled. The second model (2b) adds controls for institutional characteristics variables (FTE, Carnegie classification, BEA regions, test policy, and admit rate) that could affect the CFI index. In the third model (3b), controls for institutional performance characteristics (graduation, retention, and yield rates), and the last model (4b) includes student-associated financial measures (endowment per student, unfunded aid, average net price, and average overall discount) were added.

When adding institutional characteristics variables (model 2b), the R-square increased to 0.2279 from 0.1624, which means adding these variables helped explain a larger percentage of the variation in the Primary Reserve ratio. Like model (1b), the percentage of Pell-eligible and adult students have statistically significant negative coefficients, suggesting that as the percentage of these populations increases, the Primary Reserve ratio tends to decrease. Additionally, master's and Doctoral colleges and universities have statistically significant negative coefficients relevant to baccalaureate institutions (-.3951 and -.4502 respectively). This signals that institutions with higher percentages of graduate-level students, relative to baccalaureate, tend to have lower Primary Reserve ratios. Lastly, just as it was found in the CFI models, the Admit rate had a significant inverse relationship with the ratio performance confirming that institutions with more selective admissions processes (lower admit rates) may

have higher Primary Reserve ratios, while those with less selective processes (higher admit rates) tend to have lower Primary Reserve ratios.

Turning to the results in model (3b), the R-square increased to 0.2698 indicating that this model explains more variability in the Primary Reserve Ratio compared to model (2b). Like model (2b), the Masters, Doctoral, and AdmitRate variables had the same effect on the ratio. However, the percentage of Pell-eligible and adult students was no longer significant in explaining the variance of the ratio diminishing the relationship of student demographic characteristic and the ratio performance. Furthermore, two new variables emerge with statistically significant positive coefficients: Southwest region and Graduation rate (.4333 and .0202). These findings suggest that institutions located in the Southwest relative to institutions in the Great Lakes region tend to have higher Primary Reserve Ratios. Likewise, colleges and universities with higher graduation rates tend to have higher Primary Reserve ratios signaling that the institution has flexibility when it comes to resources to support their operations.

Lastly, when adding the student-associated financial measures (model 4b), the R-squared increased significantly. The value increased by almost 14 percentage points from 0.2698 to 0.4094. Similar to models (2b) and (3b), the Doctoral designation had an inverse effect on the ratio. Additionally, the endowment per FTE log had a highly significant ($p < 0.001$) positive coefficient, implying that institutions with larger endowments per full-time equivalent enrollment tend to have higher Primary Reserve ratios. Furthermore, the average overall discount rate was found to have a significant inverse relationship with the ratio, indicating that as the discount rate increases the ratio decreases. This aligns with the CFI model findings confirming the current literature on the negative impact of discount rates on colleges and universities' financial health.

In summary, each model adds more predictor variables and improves the ability to explain the variation in the primary reserve ratio. However, the final model (Model 4b) includes a wide range of factors, including student demographics, institutional characteristics, and performance metrics, that collectively highly contribute to understanding the primary reserve ratio performance in private higher education institutions.

Table 9

Effects of Student Demographic, Institutional Attributes, Institutional Performance, and Student Financial Measures on Primary Reserve Ratio

	Model (1b)	Model (2b)	Model (3b)	Model (4b)
NRAlien	0.00948	0.00159	0.000635	-0.00632
	(0.00627)	(0.00653)	(0.0064)	(0.00592)
Asian	0.0101	0.00866	-0.00222	-0.0141
	(0.00924)	(0.0103)	(0.0102)	(0.00933)
Black	0.00319	0.000492	0.000463	0.00284
	(0.00356)	(0.00367)	(0.00366)	(0.0034)
Hispanic	0.00239	0.000713	-0.000897	0.00562
	(0.00416)	(0.00472)	(0.00464)	(0.00429)
MultiRace	0.0412***	0.0153	0.0207	0.0027
	(0.0154)	(0.0167)	(0.0164)	(0.0148)
Pell	-0.0162***	-0.0179***	-0.000294	-0.00655
	(0.00421)	(0.00425)	(0.00499)	(0.00494)
Women	0.00516*	0.00964***	0.00464	0.00298
	(0.00298)	(0.00298)	(0.00301)	(0.00273)
StudentwIAid	-0.00235	0.00249	-0.00141	-0.00169
	(0.00282)	(0.00301)	(0.00305)	(0.00285)
UGAdultEnr	-0.0193***	-0.0105***	-0.00493	0.00169
	-0.00362	(0.00382)	(0.00383)	(0.00352)
FTE		5.90E-06	6.26E-07	3.57E-06
		(6.61E-06)	(6.51E-06)	(5.96E-06)
Masters		-0.395***	-0.394***	-0.127
		(0.0862)	(0.0841)	(0.0792)
Doctoral		-0.450***	-0.491***	-0.226**
		(0.105)	(0.102)	(0.0949)
FarWest		0.0409	0.029	0.235
		(0.176)	(0.172)	(0.159)
MidEast		-0.0838	-0.144	-0.038
		(0.11)	(0.108)	(0.0986)

NewEngland		0.0825	0.0457	0.111
		(0.135)	(0.132)	(0.123)
Plains		-0.033	0.053	0.0118
		(0.128)	(0.126)	(0.115)
RockyMountains		-0.173	-0.126	-0.213
		(0.297)	(0.29)	(0.264)
Southeast		-0.0451	0.0771	0.035
		(0.114)	(0.113)	(0.102)
Southwest		0.274	0.433**	0.135
		(0.184)	(0.181)	(0.166)
TestOpt		0.131	0.077	-0.0195
		(0.138)	(0.138)	(0.127)
AdmitRate		-0.00922***	-0.00553**	-0.00132
		(0.0021)	(0.00228)	(0.00216)
Graduation			0.0202***	0.0064
			(0.00436)	(0.00415)
Retention			0.00638	0.00354
			(0.00541)	(0.00493)
AdmYield			-0.0032	-0.00223
			(0.0031)	(0.00317)
EndowFTELOG				0.437***
				(0.0345)
UnfundedInstAid				0.00106
				(0.00175)
AvgNetPrice				-1.51e-05*
				(8.26E-06)
AvgOverallDisc				-0.00913**
				(0.00408)
Constant	1.645***	1.889***	0.0802	-2.896***
	(0.309)	(0.34)	(0.529)	(0.667)
R-squared	0.162	0.228	0.27	0.409

Notes: Dependent variable = Primary Reserve ratio. Sample size = 769 institutions. The reference category for race variables is White. Baccalaureate is the reference for Carnegie Classification variables. Great Lakes is the reference category for BEA regions. Endow FTELOG represents the natural logarithm of endowment per student. AvgNetPrice and EndowFTELOG are measured in average dollars per student. All other variables are measured by the proportion of students. Constant represents the intercept. Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1.

Viability Ratio Regression

Table 10 provides the results from these models. In the first model (1c), the student demographic variables (International students, race, Pell Eligibility, gender, students receiving aid, and adult population) were controlled. The second model (2c) adds controls for institutional characteristics variables (FTE, Carnegie classification, BEA regions, test policy, and admit rate) that could affect the CFI index. In the third model (3c), controls were added for institutional performance characteristics (graduation, retention, and yield rates), and the last model (4c) includes student-associated financial measures (endowment per student, unfunded aid, average net price, and average overall discount).

Unlike the 40% explanatory power of the Primary Reserve ratio modes, the Viability ratio models only helped explain 21% of the variance in the Viability ratio. When adding the institutional characteristics variables, the R-squared increased to 0.0808 from 0.0330. The AdmitRate was the most statistically significant variable in this model with $p < 0.001$ and a negative coefficient of -.0097. As with the CFI and Primary Reserve ratio, more selective institutions had higher Viability ratios. Additionally, being classified as Doctoral and institutions located in the Mid-East relative to the Great Lakes region had an inverse relationship to Viability ratio performance. Conversely, FTE and percentage of women had a statistically significant positive coefficient, indicating that as FTE and percentage of women increase, the Viability ratio increases.

When adding institutional performance variables, model (3c), the explanatory power of the model increases by 2.56 percentage points with an R-squared of 0.1064. The highest statistically significant variable is the Graduation rate, which aligns with the effect of this variable on the Primary Reserve ratio. Like the model (2c), Doctoral and MidEast variables had a

statistically significant negative coefficient, signaling that such institutional classification and location tend to result in lower Viability ratios. Conversely, being located in the Southwest region relative to the Great Lakes had a positive effect on the Viability ratio performance.

Lastly, when adding student financial measures, there was a significant increase in the R-squared value. This model's R-squared value was 50% higher than the model (3c) R-squared. The model suggests that increases in graduation rates and endowment per student are related to increases in the Viability ratio. Conversely, increases in the average net price and average overall discount rate are correlated to decreases in the ratio.

Overall, the admission rate (AdmitRate) was consistently associated with the Viability Ratio, with higher admission rates linked to lower viability ratios. Other variables such as graduation rates, endowment per student, and overall discount also showed significant relationships with viability ratios in the more comprehensive models. However, it is important to keep in mind that the R-squared values were relatively low, which means additional analysis is necessary to find out additional factors impacting the Viability ratio performance.

Table 10

Effects of Student Demographic, Institutional Attributes, Institutional Performance, and Student Financial Measures on Viability Ratio

	Model (1c)	Model (2c)	Model (3c)	Model (4c)
NRAlien	0.0062	-0.00242	-0.00443	-0.00629
	(0.00817)	(0.00864)	(0.00859)	(0.00829)
Asian	0.00892	0.0035	-0.00714	-0.0159
	(0.012)	(0.0136)	(0.0137)	(0.0131)
Black	0.000135	0.000459	0.00233	0.00434
	(0.00464)	(0.00485)	(0.00491)	(0.00476)
Hispanic	-0.0022	-0.00768	-0.00805	0.00168
	(0.00543)	(0.00624)	(0.00622)	(0.006)
MultiRace	0.0197	-0.0124	-0.0104	-0.0247
	(0.02)	(0.0221)	(0.0219)	(0.0208)
Pell	-0.00557	-0.00641	0.00767	-0.00109

	(0.00548)	(0.00563)	(0.00669)	(0.00691)
Women	0.00358	0.00871**	0.00494	0.00358
	(0.00389)	(0.00394)	(0.00404)	(0.00382)
StudentwIAid	-0.00366	0.0017	-0.000413	9.29E-06
	(0.00368)	(0.00399)	(0.00409)	(0.00399)
UGAdultEnr	-0.0108**	-0.00754	-0.00325	0.00151
	(0.00472)	(0.00506)	(0.00514)	(0.00493)
FTE		1.94e-05**	1.39E-05	1.44e-05*
		(8.74E-06)	(8.73E-06)	(8.34E-06)
Masters		-0.148	-0.151	0.103
		(0.114)	(0.113)	(0.111)
Doctoral		-0.263*	-0.292**	-0.033
		(0.138)	(0.137)	(0.133)
FarWest		0.115	0.117	0.344
		(0.233)	(0.23)	(0.223)
MidEast		-0.288**	-0.335**	-0.188
		(0.146)	(0.145)	(0.138)
NewEngland		-0.306*	-0.337*	-0.187
		(0.179)	(0.177)	(0.172)
Plains		0.165	0.216	0.139
		(0.169)	(0.169)	(0.16)
RockyMountains		0.269	0.314	0.16
		(0.393)	(0.389)	(0.37)
Southeast		-0.211	-0.119	-0.185
		(0.151)	-(0.152)	(0.143)
Southwest		0.418*	0.539**	0.187
		(0.243)	(0.243)	(0.233)
TestOpt		0.0326	0.0547	0.0461
		(0.183)	(0.186)	(0.178)
AdmitRate		-0.00973***	-0.00467	-0.00261
		(0.00278)	(0.00306)	(0.00303)
Graduation			0.0215***	0.0110*
			(0.00585)	(0.00581)
Retention			0.000495	0.000334
			(0.00725)	(0.0069)
AdmYield			0.00401	2.26E-05
			(0.00416)	(0.00443)
EndowFTELOG				0.453***
				(0.0483)
UnfundedInstAid				0.00331
				(0.00244)
AvgNetPrice				-4.59e-05***
				(1.16E-05)

AvgOverallDisc				-0.0255***
				(0.00571)
Constant	2.159***	2.428***	0.541	-1.540*
	(0.403)	(0.45)	(0.709)	(0.934)
R-squared	0.033	0.081	0.106	0.213

Notes: Dependent variable = Viability ratio. Sample size = 769 institutions. The reference category for race variables is White. Baccalaureate is the reference for Carnegie Classification variables. Great Lakes is the reference category for BEA regions. Endow FTELOG represents the natural logarithm of endowment per student. AvgNetPrice and EndowFTELOG are measured in average dollars per student. All other variables are measured by the proportion of students. Constant represents the intercept. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Return on Net Assets Ratio Regression

Table 11 presents the results from the Return on Net Assets ratio models. In the first model (1d), the student demographic variables were controlled (International students, race, Pell Eligibility, gender, students receiving aid, and adult population). The second model (2d) added controls for institutional characteristics variables (FTE, Carnegie classification, BEA regions, test policy, and admit rate) that could affect the CFI index. In the third model (3d), I added controls for institutional performance characteristics (graduation, retention, and yield rates), and the last model (4d) included student-associated financial measures (endowment per student, unfunded aid, average net price, and average overall discount).

When adding institutional characteristics variables to student demographic variables, model (2d)'s R-squared value increased to 0.1514. Black remained a significant positive predictor of the ratio. Percentage of Hispanic and adult students continued to be significant negative predictors. Additionally, institutions located in the MidEast region compared to Great Pain had a significant inverse relationship on the Return on Net Assets ratio. Lastly, as seen in the other model ratios' results, the model showed that less selective institutions tended to have lower Return on Net Assets ratios.

The addition of institutional performance variables led to a modest increase in the R-squared value of 2.33 percentage points. Black, Hispanic, StudentwIAid, UGAdultEnr, MidEast, AdmitRate variables had the same effect as of models (1d) and (2d). Three new significantly predicting variables emerged in this model: Graduation and Pell with a positive relationship to the ratio, and the AdmYield with an inverse relationship to the ratio performance with a coefficient of -.0012. These last two findings regarding the AdmYield inverse relationship to the ratio and Pell being positively correlated were unexpected as high admitted student yields are usually associated with highly selective institutions, and Pell had shown a negative relationship in all other models.

Lastly, when adding the student-related financial variables, the model helped explain 19.85% of the variance in the Return on Net Assets ratio. Endowment per FTE and Unfunded Institutional Aid surfaced as statistically significant variables in predicting ratio performance. As expected, the larger the endowment per FTE, the larger the ratio, and as Unfunded Institutional Aid increased, the ratio decreased.

Overall, these models suggest that variables like the percentage of Black students, Hispanic students, the region where the institution is located, graduation rates, admission yield, endowment per student, and unfunded institutional aid are associated with changes in ReturnNetAssets. However, the R-squared values indicated that there are other unaccounted factors influencing ReturnNetAssets, and these models explain only a portion of the variance. Further analysis is needed to uncover additional factors.

Table 11

Effects of Student Demographic, Institutional Attributes, Institutional Performance, and Student Financial Measures on Return on Net Assets Ratio

	Model (1d)	Model (2d)	Model (3d)	Model (4d)
NRAlien	0.00163*	0.000546	0.000666	5.69E-06
	(0.000941)	(0.000995)	(0.000988)	(0.001)
Asian	0.00258*	0.000436	-0.000305	-0.000808
	(0.00139)	(0.00157)	(0.00158)	(0.00158)
Black	0.00258***	0.00237***	0.00220***	0.00204***
	(0.000535)	(0.000558)	(0.000566)	(0.000575)
Hispanic	-0.00190***	-0.00230***	-0.00264***	-0.00247***
	(0.000625)	(0.000718)	(0.000716)	(0.000726)
MultiRace	-0.000376	-0.00314	-0.00261	-0.00364
	(0.00231)	(0.00254)	(0.00253)	(0.00251)
Pell	-0.000147	0.000282	0.00204***	0.00194**
	(0.000631)	(0.000648)	(0.00077)	(0.000835)
Women	-0.000135	0.000211	-0.000328	-0.000387
	(0.000448)	(0.000453)	(0.000465)	(0.000461)
StudentwIAid	-0.00128***	-0.000819*	-0.00136***	-0.00143***
	(0.000424)	(0.000459)	(0.000471)	(0.000483)
UGAdultEnr	-0.00195***	-0.00188***	-0.00127**	-0.00087
	(0.000544)	(0.000582)	(0.000591)	(0.000596)
FTE		1.24E-06	8.82E-07	1.14E-06
		(1.01E-06)	(1.00E-06)	(1.01E-06)
Masters		-0.0121	-0.0123	0.00401
		(0.0131)	(0.013)	(0.0134)
Doctoral		0.0162	0.0111	0.0256
		(0.0159)	(0.0158)	(0.0161)
FarWest		0.0470*	0.0465*	0.0460*
		(0.0268)	(0.0265)	(0.027)
MidEast		-0.0350**	-0.0408**	-0.0372**
		(0.0168)	(0.0166)	(0.0167)
NewEngland		0.03	0.027	0.022
		(0.0206)	(0.0204)	(0.0208)
Plains		0.0198	0.0299	0.0319
		(0.0195)	(0.0194)	(0.0194)
RockyMountains		0.0293	0.0362	0.0237
		(0.0453)	(0.0448)	(0.0447)
Southeast		0.000183	0.0146	0.0156
		(0.0174)	(0.0175)	(0.0173)
Southwest		0.00878	0.0275	0.0125

		(0.028)	(0.0279)	(0.0282)
TestOpt		0.0179	0.00405	-0.00636
		(0.0211)	(0.0214)	(0.0215)
AdmitRate		-0.00102***	-0.000904**	-0.000639*
		(0.00032)	(0.000352)	(0.000366)
Graduation			0.00214***	0.00122*
			(0.000673)	(0.000702)
Retention			9.16E-05	-0.000252
			(0.000835)	(0.000834)
AdmYield			-0.00122**	-0.00108**
			(0.000479)	(0.000536)
EndowFTELOG				0.0160***
				(0.00584)
UnfundedInstAid				-0.000768***
				(0.000295)
AvgNetPrice				1.84E-06
				(1.40E-06)
AvgOverallDisc				0.000539
				(0.00069)
Constant	0.312***	0.318***	0.233***	0.137
	(0.0464)	(0.0518)	(0.0816)	(0.113)
R-squared	0.105	0.151	0.175	0.198

Notes: Dependent variable = Return on Net Assets ratio. Sample size = 769 institutions. The reference category for race variables is White. Baccalaureate is the reference for Carnegie Classification variables. Great Lakes is the reference category for BEA regions. Endow FTELOG represents the natural logarithm of endowment per student. AvgNetPrice and EndowFTELOG are measured in average dollars per student. All other variables are measured by the proportion of students. Constant represents the intercept. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Net Operating Ratio Regression

None of the models developed to assess the effect of the dependent variables on this ratio showed strong predictive power, as indicated by the low R-squared values (0.0075, 0.0269, 0.0342, and 0.0404). Most importantly, the p-values for the predictor variables and all four models reflect that they were not statistically significant in explaining the variation in the Net Operating ratio (Prob > F = 0.7639, 0.4831, 0.3386, 0.3153 respectively).

Comparing all Ratios

In conclusion, when comparing all four ratios' model results, the Primary Reserve ratio appears to be the most impacted ratio by the variables in the study. Specifically, 40.94% of the variance in the ratio can be explained when adding the student financial measures. This suggests that while student demographic characteristics were modestly related to the institutions' resource efficiency, student financial measures such as endowment and average overall discount are largely associated to the ratio performance. The second most impacted ratio was the viability ratio, with an R-squared value of 0.2131 when all variables are considered. Like the Primary Reserve ratio, the explanatory power of the model significantly increased when student financial measures were added. However, per the R-squared, the explanatory power of the model is moderate indicating that there are other factors besides the variables in this model that impact debt management performance. It is important to note, that across all these three ratios' regression results, the percentage of Black students and the Admit Rate were consistently present and with highly significant correlations. The Black variable had a positive relationship to the ratios, while the AdmitRate had an inverse relationship indicating that increases in the enrollment of Black students and more selective institutions may be modestly related to better financial health. Lastly, there was no statistically significant relationship between the variables in the study and the Net Operating ratio.

Section V Aligning Internal Resources and the External Environment

The theoretical framework for this study adopted the Extended Resource-Based Theory (ERBT) to analyze how enrollment managers and senior college administrators make strategic decisions regarding their student body composition and institutional levers to maximize revenue and ensure financial health in the face of external environmental changes. ERBT evolved from

RBT and emphasizes the interplay between a firm's capabilities, internal resources, and external environment. ERBT can help explain how colleges strategically leverage admissions criteria, student aid, and pricing to shape student body composition with the goal of ensuring financial sustainability. As student demographics change in the college enrollment landscape, understanding the impact that student body characteristics have on the financial health of the institution can enable enrollment managers to seek competitive advantages to shape the composition of the student body.

The theory states that there are three conditions necessary for a firm to achieve sustainable competitive advantage and ensure financial sustainability. First, akin to a firm's mission, each college's unique mission drives how senior administrators allocate their resources to achieve it. For example, institutions dedicated to social mobility or to serving underrepresented populations are keenly aware of the student resources necessary to ensure student success and may seek federal, state, or private funding to help them achieve their mission. Such funding is not always available leaving these institutions in a precarious situation. Second, the institution's internal resources must possess value, aiming to exploit opportunities within the institution's environment. These resources should also be rare and difficult to imitate, indicating their uniqueness among competitors. In a college setting, this translates to how enrollment leaders strategically utilize resources like academic programs, support services, admission criteria, and financial aid to attract specific student groups, thereby ensuring institutional performance. Lastly, the framework recognizes the significance of synchronizing these internal resources with the external environment, particularly in today’s highly competitive education landscape marked by demographic shifts.

The regression findings from the models conducted in the study provide empirical evidence for the relationships between student demographic and institutional characteristics, and the institution's financial health, as measured by the CFI. Statistically significant predictor variables such as Black, UGAdultEnr, and Pell, AdmitRate, Graduation, FTE, EndowFTELog, and AvgOverallDisc are all related to the variance on CFI performance. When combined all these variables accounted for 22.40% of the variance in the CFI. Based on the conceptual framework, these variables represent those internal levers that can be managed to achieve a sustainable competitive advantage with the goal of ensuring long-term financial sustainability. ERBT emphasizes the importance of strategic resource allocation and adaptation to external environmental changes, which is reflected in how these variables were analyzed in the model. For instance, the inverse relationship between the average overall discount and the CFI supports the notion that colleges can strategically leverage discounting to recruit specific student populations while achieving financial sustainability. Institutions with larger endowments have the ability to fund their discounts enabling them to adjust the composition of the student body to best meet objectives. However, institutions with low endowments, have to fund discounts with operational dollars, which if not highly monitored can lead to poor financial performance as it was seen on the model results and the literature on this topic. Another example is the inverse relationship between the percentage of adult students and the CFI. Given the growing trend of this population, enrollment managers need to consider how the presence of a significant adult student population relative to the traditional population can impact an institution's revenue structure and financial dynamics. Adult students tend to live off campus, tend to take longer to graduate, and take less credits. This means a loss of auxiliary and tuition revenue compared to traditional age students. ERBT stresses the importance of strategic decisions in response to

environmental changes. In this context, institutions enrolling adult learners may need to make strategic choices about program offerings, support services, and pricing models to ensure both access for adult students and financial sustainability.

ERBT highlights that competitive advantage can be achieved by doing things differently from competitors. In the context of changing demographics, institutions can differentiate themselves by developing programs, services, and policies that resonate with diverse student populations. This differentiation can enhance an institution's ability to attract and retain students, contributing to its financial sustainability. Given the upcoming demographic changes, long-term sustainability for private colleges and universities requires a careful balance between serving the growing diverse student populations and managing financial resources effectively. Institutions that can successfully navigate these challenges can position themselves for stability and success in a changing demographic landscape. ERBT's emphasis on aligning internal resources with external changes is particularly relevant in this scenario.

In summary, ERBT provides a theoretical framework that encourages higher education institutions to proactively respond to demographic changes by strategically configuring their resources, aligning with their missions, and maintaining a competitive advantage in a dynamic environment. This approach enables institutions to navigate the challenges and opportunities presented by shifting student demographics while ensuring their financial health.

Conclusion

In conclusion, this chapter provided a comprehensive analysis of the relationship between student body demographic characteristics and the financial health of four-year, non-profit private institutions. The primary research question sought to understand how factors such as diversity, Pell eligibility, international student proportion, adult students, and gender relate to the

institutional Composite Financial Index (CFI) score in the year 2021 across 769 private institutions.

The results of the analysis revealed several key insights. Firstly, the percentage of Black students was found to have a positive relationship with CFI performance, contradicting previous research conducted by Lee and Zemsky. Conversely, a higher percentage of Pell-eligible students was associated with lower CFI scores, aligning with recent findings. Other demographic variables, such as the percentage of women and non-resident alien students, were not found to have a relationship to institutional financial health.

Subsequent analyses, including the incorporation of institutional and financial variables, demonstrated that a combination of student demographics, institutional characteristics, performance measures, and financial factors collectively contribute to an institution's financial health, as indicated by the CFI. Notably, the addition of student-associated financial measures, such as endowment per student and overall discount, were substantially connected to the explanatory power of the models. Furthermore, institutional characteristics, such as FTE, Admit Rate, and BEA regions, played a significant role in explaining CFI variations. Notably, the MidEast region was negatively associated with CFI performance, possibly due to declining enrollments, while the Plains region exhibited better CFI performance due to population growth.

Overall, these findings underscore the complexity of factors influencing institutional financial health. While this analysis shed light on important relationships, it's essential to acknowledge that the models presented here only account for a portion of the variance in the CFI, indicating the presence of other unexplored factors. Future research should continue to investigate these multifaceted relationships to provide a more comprehensive understanding of the financial dynamics within private higher education institutions.

CHAPTER 5

DISCUSSION

The following chapter discusses the contribution of this study as it relates to the prior literature on the financial health of four-year, non-profit private institutions. The first section provides an overview of the study. Next is the interpretation of the results as it relates to the research question, followed by the limitations of the study. The final section includes the implications for enrollment managers and higher education policymakers and suggested directions for future research.

Overview

In recent years, numerous news reports have raised concerns regarding the financial health and future of private higher education. According to a Forbes survey (Whitford & Schifrin, 2023), numerous private, non-profit colleges across the nation are experiencing declining enrollments, possess modest endowments, and maintain limited reserves, notwithstanding their diligent endeavors in recent years to implement cost-saving measures. Inevitably, this will be exacerbated by the upcoming demographic cliff, when the number of college-going 18 to 22-year-olds will precipitously start declining in 2025. These declines in the traditional high school graduate population, accompanied by the growth of minority students, significant equity gaps in wealth and college retention and attainment, and growth of non-traditional student populations mean a highly saturated competitive market and higher cost to educate students putting significant financial pressure on tuition-dependent institutions. As a response, college and university governing boards and leaders have become hyper-focused on assessing financial viability.

Given the current environment, this study endeavored to investigate the relationship between student body demographic characteristics and the financial health of four-year, non-profit private institutions. While a substantial body of research exists on financial ratios (Buddy, 1999; Chabotar, 1989; Collier, 1979; Dickmeyer & Hughes, 1982; DiSalvio, 1989; Everett, 1995; Lee, 2009; Lupton et al., 1976; Sherman, 2016) determining the financial viability of institutions, how non-financial indicators ought to complement the ratios to paint the whole picture, and how certain enrollment key performance indicators are linked to financial performance (Hanover Research, 2014; Lee, 2009; Lyken-Segosebe & Shepherd, 2013; Martin & Samels, 2009; SHEEO, 2018; Tahey et al., 2010), a gap existed on how student body demographic characteristics impact ratio performance and consequently institutional financial viability.

Using ERBT as the conceptual framework, this research's primary aim was to ascertain whether student demographic characteristics bear a statistically significant relationship to the performance of the Composite Financial Index (CFI) and if so, to identify which student characteristic exhibits the strongest predictive power over institutional financial health. The CFI served as a proxy for institutional financial health in the study. The overarching objective was to furnish enrollment managers and institutional administrators with empirical insights that inform strategic decision-making in enrollment management. Additionally, the study serves as a valuable resource for policymakers, researchers, and leaders within the higher education sector, providing critical insights into the imperative of sustaining private higher education institutions in the United States.

Findings and Interpretation

As noted in Chapter Three, multiple regression analyses were conducted on a sample of 769 four-year, private, non-profit institutions for the 2021-22 academic year to study the effect of

student body characteristics on CFI performance. The analysis found that student demographic characteristics play a modest role in predicting institutional financial health. Specifically, only three of the student demograhic variables (percentage of black students, Pell eligible, and adult students) were associated with CFI performance. Additionally, the findings underscore the complex relationship between student demographics and institutional financial health, with indirect correlation through variables like overall discount rates, retention, and graduation rates.

Association of Student Demographic Characteristics to CFI Performance

The percentage of Black students, Pell-Eligible, and adult students were significantly related to explaining 7.6% of the variance in the CFI. While these populations were related to CFI results, their relationship differed. Percentage increases in the Black student population relative to White students were positively correlated to the CFI. For every unit of increase in the percentage of Black students, CFI increased by 0.0257. This finding contradicted Lee's (2009) research, which showed no significant association between minority students and financially viable institutions. Although this relationship is very modest further investigation of this population is advised to understand this relationship. When compared to previous studies, could the reason for the dissonance be that income gaps for this population in relation to others have improved over the years, and hence, these population does not require as much aid to enroll in college as they used to? Another explanation for the findings could be that the percentage of this population at most private institutions tends to be modest and those that decide to attend may have more means to pay for college. Historically, Black and other minority students tend to have higher enrollment rates in public and community colleges compared to privates due to perceived affordability and open-access policies.

Conversely to the findings for the percentage of Black students, for each percentage point increase in the Pell-eligible student population, the CFI decreased by .0562 revealing an inverse relationship between the two variables. Similarly, the percentage of adult students also had a negative relationship to the CFI. For every percentage point increase, CFI decreases by 0.0268. Out of all three variables, the percentage of Pell-eligible students was the most predicting variable with a p-value of $p < 0.001$. Such findings align with Zemsky et al. (2020) research which stated that Pell-eligible students were more likely to attend institutions with financial risks. Pell eligible students tend to have limited financial resources, which means that to enroll this population, universities need to provide more aid resulting in decreased tuition revenue. With private institutions being highly dependent on tuition revenue, enrolling a higher percentage of these students can be inversely associated with institutional financial health.

Other Institutional Variables' Association to Financial Health

Given the relatively modest fit for the model, additional variables were examined to understand the role of other factors in assessing institutional financial health. To that end, institutional attributes (FTE, Carnegie Classification, BEA region, test policy, and admit rate), institutional performance variables (graduation rate, retention rate, and yield rate), and student-related financial measures (endowment per student natural logarithm, percentage of unfunded aid, avg. net price, and overall discount) were examined. The findings showed that when combined, all these variables can help explain 22.4% of the variance in the CFI, which means they moderately predict institutional financial health. The most statistically significant variables were the admit rate, graduation rate, the endowment per student log, and the average overall discount. These findings align with previous research (Behaunek & Gansemer-Topf's, 2019; Hillman, 2012; Jalal & Khaksari, 2019; Lee, 2008; Lyken-Segosebe, 2013; Martin & Samels,

2009; Redd, 2000; Rine, 2016; Zemsky, 2020) that highlight the relationship between these factors and the financial viability of institutions. Lower admission rates, higher graduation rates, and higher endowment per student are generally associated with highly selective institutions. Given their national reputation, these institutions have selective admissions policies that disadvantage minority and low socioeconomic student populations. Additionally, because they enroll a highly qualified student body, they tend to have better graduation rates, and consequently their endowment per student is much higher. In general, these institutions serve a small number of minority and low socioeconomic students. However, the vast majority of private institutions in the United States are not highly selective and do not count with large endowments to help them fund scholarships (discounts) and operational costs, leaving them to heavily depend on tuition revenue. Hence, these findings suggest that although student demographics have a very modest association with CFI performance, they are indirectly correlated to institutional financial health, especially for not highly selective institutions.

Furthermore, it is critical to note that according to research overall discount rates are highly influenced by student demographics (Behaunek & Gansemer-Topf's, 2019; Hillman, 2012; Jalal & Khaksari, 2019; Redd, 2000), which means that they are indirectly related to CFI performance. Given the income gaps between Asian, White, Black, and Hispanic in our country and higher tuition rates at private institutions, minority students require higher financial assistance leading to higher discount rates and hence lower tuition revenue. In order to fund these discounts (scholarships), institutions with modest endowments have to dip into their operational dollars, which means reductions in revenue leading to poor financial performance. This represents a challenge given the projected growth of minority populations, especially at institutions that have a large percentage of unfunded discounts and heavily depend on tuition

revenue. Moreover, there are significant gaps in retention and graduation rates between White and Asian students compared to Hispanic and Black students. With the highly statistically significant predicting power of graduation rates ($p < 0.001$) on the CFI performance, this confirms the indirect association that student demographics have to colleges' financial health.

Direct and Indirect Impact of Student Demographics to CFI's Ratios Performance

To further investigate the association of the student demographic characteristics to financial health, the study analyzed the relationship between these variables and each of the CFI ratios. Findings showed that student demographic attributes play a role in influencing two of the four ratios, the Primary Reserve and Net Assets Return ratios, helping explain 16.2% and 10.55% of the variance respectively. Specifically, results suggest that a higher proportion of adult students and Pell-eligible students tend to be associated with lower primary reserves relative to the institutions' operating expenses. These findings suggest that because Pell eligible students require additional financial resources, which leads to reduced revenues, institutions are not able to grow their reserves and hence the relationship with the Primary Reserve ratio. Additionally, growth in the percentage of Hispanics, adult students, and students with institutional aid negatively impacts the institutions' efficiency in generating financial returns on their net assets. As it relates to adult students, these findings could be explained by the fact that most adult students do not live on campus and hence they do not contribute to auxiliary revenue generation such as room and board fees. This means that as colleges enroll a higher proportion of those students relative to residential students, they forgo a substantial amount of revenue, which means returns on assets such as housing and dining facilities decrease. Regarding Hispanic students, further research is recommended to understand the relationship of segment of these students on institutional financial health. In general, this population tends to have lower income than their

white counterparts, which means they may have limited financial resources requiring additional financial aid from institutions. Additionally, Hispanic students come from cultural backgrounds where living with family or close-knit communities is common, which could influence their decision to live off campus.

It is worth noting that once institutional attributes, performance variables, and student-related measures were added, the model helped predict 40.9% of the Primary Reserve, 19.8% of the Return on Net Assets ratio, and 21.3% of the variance in the Viability ratio. As seen on the CFI results, student-related financial measures such as average overall discount rate were significant predictor factors of the CFI variance. With the Primary Reserve ratio accounting for 35% of the CFI, these findings indicate that student demographic characteristics have a moderate association to the college's ability to meet immediate or unforeseen financial needs.

Moreover, the findings indicated that student demographic variables such as percentage of non-resident alien and gender had no association to institutional financial health. Historically, the enrollment of non-resident alien students is not only associated with enrichment of the college experience because of the cultural diversity, but also because these students tend to pay full tuition. Nevertheless, these trends are evolving rapidly. As the political climate in the U.S. intensifies, and competition from Canada and Europe rises, recruiting these students has become increasingly challenging. Colleges now have to incentivize student enrollment through scholarship programs to stay competitive.

Extended Resource-Based Theory to Explain Colleges Strategic Response to Environment

The Extended Resource-Based Theory (ERBT) aligns with the study’s findings to help explain how colleges strategically shape their student bodies and allocate resources for financial sustainability amid external changes. ERBT highlights the importance of aligning resources with

the institution's mission, leveraging unique internal assets, and adapting to external shifts. The study's regression findings reveal relationships between student demographics and other institutional characteristics and financial health, emphasizing the strategic use of variables like enrollment rates, graduation rates, and discounts to achieve sustainable competitive advantages. Moreover, it underscores the need for institutions to differentiate themselves through programs, services, and policies that resonate with diverse student populations, enabling them to navigate demographic changes while ensuring financial well-being and long-term stability.

Overall, these findings underscore the direct and indirect association of student demographic characteristics and institutional financial health as measured by the CFI. It also highlights the complexity of factors impacting institutional financial health. While this analysis shed light on important relationships, it's essential to acknowledge that the models presented here only account for a portion of the variance in the CFI, indicating the presence of other unexplored factors.

Implications for Enrollment Managers and Higher Education Leaders

Based on the findings presented in the study, several key recommendations can be made for higher education leaders, enrollment managers, and policymakers:

Data-Informed Enrollment Strategies: Given the direct and indirect impact of student demographic characteristics in predicting institutional financial health, institutions should adopt a diversified enrollment strategy that considers the unique attributes, needs, and financial implications of their student body. To do so, institutions should establish a culture of data analysis to inform decision-making regarding enrollment and financial strategies. Competitor analysis, academic program demand analysis, student market projections, market positioning, and ongoing tracking of key performance enrollment indicators are all examples of internal and

external data analyses. Leveraging them enables the strategic allocation of resources so the institution can develop market differentiators that lead to long-term financial sustainability. Additionally, college administrators should encourage collaboration between enrollment, finance, and academic departments to track institutional performance indicators and develop cross-siloed data-informed resource allocation strategies.

Retention and Graduation Rates: Given the significant relationship between graduation rates and institutional financial health, institutions should prioritize efforts to improve overall student success, with a particular focus on closing the retention and graduation rate gaps that exist for Hispanic and Black student populations.

Discount Rates: Institutions should closely monitor and manage their discount rates. Understanding the indirect impact of student demographics on discount rates is crucial. Leaders should consider how these rates affect the institution's financial health and explore strategies to optimize discounting while maintaining affordability. For example, when serving low socio-economic status students, the inverse relationship between Pell eligibility and CFI suggests that institutions should strike a balance between access and financial sustainability. While higher discount rates can attract this student population, those same rates can negatively impact the financial outlook of the college. The current model high-price, high-aid model is proving to be unsustainable. As established by the research the single greatest indicator of at-risk institutions is the discount rate (Martin & Samels, 2009; Redd, 2000; Townsley, 2009)

Policy Implications: Policymakers should take note of the findings regarding the financial risks associated with Pell-eligible and adult students and consider policies that provide targeted support to these students and the institutions serving these populations. The following are recommendations for adoption:

1. Adjusting Pell Grant amount to keep pace with the rising college costs.
2. Implement financial incentives for institutions that serve a large percentage of these student populations, such as increase in state and federal state appropriation formulas or enhanced eligibility for competitive grants.
3. Explore options for expanding need-based financial aid programs to assist not only with tuition but also with other costs of attendance, such as textbooks, housing, and transportation.

In conclusion, these recommendations emphasize the need for a holistic approach to addressing the complex factors that are correlated to institutional financial health. Institutions should adapt and refine their strategies to align with their specific circumstances, continually assess their financial performance, and prioritize the equitable success of all student populations to enhance their long-term financial sustainability.

Recommendations for Future Research

The results of this study and review of the literature suggest opportunities for future research. While the study provided a good snapshot of the year 2021-22, conducting a longitudinal study to track changes in student demographics and their effects on institutional financial health over an extended period can provide insights into how demographic shifts impact financial stability and the long-term sustainability of colleges and universities. Additionally, further research could analyze more in-depth analysis of specific student population characteristics. For example, explore the relationship of various subgroups within the Black and Hispanic student population, such as first-generation college students or students from different socio-economic backgrounds.

Given the growth of minority populations and the growing trends in adult student enrollment nationwide, future research could assess the impact of federal and state policies related to student financial aid, access, and affordability on institutional financial health. For example, how changes in policies, such as adjustments to Pell Grants, FAFSA simplification, or loan forgiveness programs, impact colleges and universities' financial outlook. Furthermore, future research could explore the relationship between faculty and staff diversity and institutional financial health. Assess whether diversity in the workforce impacts student success, retention, graduation, endowment, and ultimately, financial viability.

Lastly, it would be of scholarly and practical value to conduct comparative studies between different types of institutions (e.g., public vs. private, research-intensive vs. liberal arts) to determine how student demographics interact with institutional characteristics to influence financial health. Similarly, case studies of institutions that have successfully implemented strategies to improve financial health while prioritizing diversity and equity could provide specific strategies to help institutions successfully navigate the current and upcoming higher education landscape.

Conclusion

Against the backdrop of an increasingly challenging higher education landscape characterized by declining enrollments, limited endowments, and a looming demographic shift, this research sought to explore the intricate relationship between student demographic characteristics and institutional financial health. This study's use of the Composite Financial Index (CFI) as a proxy for financial health, alongside rigorous statistical analysis, revealed that while student demographics play a modest role in predicting financial outcomes, their relationship is nuanced and multifaceted. Notably, the study identified only three student

demographic variables: percentage of Black students, Pell-eligible students, and adult students as significant but modest predictors of CFI performance. The findings underscore the complex relationship between student demographics and institutional financial health, with indirect effects through variables like overall discount rates, retention, and graduation rates, shedding new light on the complex dynamics at play. Moreover, the research emphasized the need for a holistic approach to addressing these challenges, calling for data-informed enrollment strategies, a focus on improving retention and graduation rates, and policy adjustments to support at-risk student populations and the institutions that serve them.

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