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The Effect of Unfunded Tuition Discount on the Financial Health of Very Small Colleges

Andrea L. Ide
Bethel University

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Financial Health of Very Small Colleges

By:

Andrea L. Ide

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Approved by:

Dr. Mary Whitman, Adviser

Dr. Jim Hunter, Reader

Dr. Craig Lewis, Reader

Abstract

Very small colleges, under 750 students, are valuable and yet vulnerable institutions in American higher education. Without financial stability, very small colleges are more susceptible to failure in the face of economic challenges. Very small colleges adopt many of the same financial strategies used by larger colleges without consideration that the size of the college may require different strategies.

This study considered the relationship between the unfunded tuition discount rate and the financial health of private, non-profit, four-year, baccalaureate colleges. Enrollment, institutional debt and institutional wealth were then used as moderators in a moderation regression analysis to determine the effect each of these variables may have on the relationship between the unfunded tuition discount and the financial health.

The findings of this study revealed a negative relationship between the unfunded tuition discount rate and the financial health of very small colleges. This relationship was moderated by both enrollment and institutional wealth. Implications and recommendations for practitioners include the need to reduce the unfunded tuition discount at very small colleges in order to improve financial health.

Dedication

This dissertation is dedicated to my father, L. David Oleson. While I never intentionally set out to be a college administrator like my father, some family traits run strong. My dad had hoped to put his name on a dissertation of his own, but the Lord had other plans for him. His lifetime of education and ministry has been an example to many and his encouragement of me during this process has been profound. I am so grateful we are able to celebrate this accomplishment together.

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Chapter 1: Introduction

Introduction of the Problem

While scholarships and grants have been in existence since the early days of Harvard and Yale, the popularity of tuition discounting has been on the rise since the 1970s (Davis, 2003). Otherwise known as institutional aid, colleges practice tuition discounting when they award merit or need-based grants and scholarships to students using institutional funds (Hillman, 2012). The funds for these grants and scholarships may come from an endowment, gifts from donors, or they may come directly from an institutions gross revenue (Supplee, 2014). The latter are considered unfunded tuition discounts. The unfunded tuition discount rate is the percentage of tuition and fee revenue that, rather than being used for general college operating expenses, is used instead to cover institutional grant aid awarded to students (Redd, 2000; Supplee, 2014).

The theory behind tuition discounting involves charging the full tuition rate to a number of full-paying students who are able and willing to pay full price, in order to give a discount to other students who are not willing or able to pay the full price (Breneman, 1994). Colleges and universities use this tuition discounting as a strategy to design the demographics of the student body such as increasing the diversity and attracting more academically talented students (Curs & Singell, 2010; Hillman, 2012; Lassila, 2014; Redd, 2000; Reinoehl & Kowalski, 2015), as well as to simply increase the overall enrollment (Browning, 2013). A college will entice an academically talented student with a scholarship to improve the likelihood that the student will attend. Students who may contribute to the campus' racial and socioeconomic diversity may receive institutional aid to offset the full price of tuition and increase accessibility to the college (Summers, 2004).

Ultimately, tuition discounting is a strategy used by colleges to increase the overall tuition revenue (Hillman, 2012; Massa & Parker, 2007; Redd, 2000). Again, the theory behind tuition discounting is by increasing the number of students, the gross tuition revenue (tuition x enrollment) will increase, regardless of how much tuition the student actually pays. It is, theoretically, better to enroll more students at a discounted rate than it is to have fewer students at full price.

Background of the Study

Tuition discounting. Since the 1980s, the overall tuition discount rate at private colleges and universities in the United States has been on the rise (Baum & Ma, 2010; NACUBO, 2017). A number of reasons contribute to this increase, including the increase in tuition rates, and the decrease in the percentage of tuition and fees that may be covered by the federally-funded Pell grant. In 1989-90, a Pell grant covered, on average, 19% of tuition and fees at a four-year private institution (Redd, 2000). Due to the increase in average tuition rates, by 2014-15 Pell grants only covered 15% of tuition and fees (Federal Student Aid, 2017; National Center for Education Statistics [NCES], n.d.).

The need for more financial aid follows the rising price of tuition over the past three decades (NCES, n.d.). The cost of attendance for the average private college has become unaffordable for even middle- and upper-income families, thereby putting pressure on colleges to help cover the cost of their own product (Redd, 2000). This has led to families refusing to pay the full tuition price and demanding institutional aid, regardless of need (Denneen, & Dretler, 2012; Kelderman, 2013). As a result, it is common now for students to "shop around" looking for the best financial aid package, and because of the increased competition for the best students, colleges continually increase their offers (Kim et al., 2009; Summers, 2004; Supiano, 2014).

Administrators are concerned about the rapid growth of unfunded institutional aid and tuition discounts because, as one private college president described the increases, "private colleges are on a treadmill and can't get off" (Davis, 2003, p. 2).

For nearly two decades, researchers have warned against the rising tuition discount rate at colleges and universities (Browning, 2013; Davis, 2003; Doti, 2015; Hillman, 2011; Martin, 2002; Redd, 2000). By the nature of the definition of tuition discounting, an increase in unfunded tuition discounts lead to a decrease in net tuition revenue. Net tuition revenue is the gross tuition revenue minus the unfunded institutional aid, therefore, any unfunded institutional aid given to students subtracts from the bottom line (Breneman, 1994; Browning, 2013; Loomis Hubbell, Massa & Lapovsky, 2002; Summers, 2004). Colleges and universities provide unfunded tuition discounts, in hopes that more students will enroll who otherwise might not have done so, thereby increasing the overall net tuition received. The higher the enrollment, the more likely net tuition revenue will be maximized (Loomis Hubbell et al., 2002; Redd, 2000).

The tuition discount rate is calculated by dividing the gross tuition revenue by the unfunded institutional aid (Loomis Hubbell et al., 2002). Consequently, the higher the tuition discount rate, the less revenue goes to the institution for operating expenses. For colleges like Sweet Briar College with a 63.7% tuition discount rate in 2015, it meant that the institution only realized $0.36 in revenue for every dollar that was charged in tuition (Doti, 2015). The consequences of less revenue means that colleges must earn more money from other sources (Breneman, 1994), financial instability, (Massa & Parker, 2007), or could even lead to college closure (Doti, 2015).

Very small colleges. Revenue earned through tuition and fees is the primary source of income for most private colleges in the U.S. (Redd, 2000); therefore, tuition dependent

institutions count on every student and the revenue they bring. This point is highlighted at very small institutions that do not have many students to begin with and low numbers mean that every student counts significantly (Kershaw, 1976).

In 1976, the Ford Foundation commissioned Kershaw (1976) to study "very small colleges," defined as colleges under 750 FTE (full-time equivalent). Opinions differ as to what constitutes a small college and a very small college.   College Board (2017) defined a small college as one with less than 2000 FTE. Carnegie Commission on Higher Education (2015) categorized small four-year colleges as 1000–2999 FTE, while four-year colleges under 1000 are considered *very small*.

Kershaw (1976) stated, "there has been a tendency to assume that they [colleges under 750 students] are too small to make economic sense" (p.4). In Foster's (1987) assessment of small colleges, particularly those designated as Historically Black Colleges and Universities (HBCU), Foster indicated that his research led him to believe that a college needed to be a minimum of 800 students to be efficient. According to the Carnegie Commission on Higher Education published report, four-year institutions with fewer than 1,000 students were at a "peril point" (Duperre, 1971). It was believed that a college could not take advantage of economies of scale with less than 1000 FTE. Yet, over 4,300 3 under 750 FTE existed in the United States in 2015, 355 private, four-year, baccalaureate colleges (NCES, n.d.).

Economies of scale is an economic term from the business world that refers to the volume of business being done to more readily cover costs and make a profit. Typical business economics suggest that smaller companies may not be able to generate enough volume to cover basic costs, thereby being less profitable (Dickmeyer, 1982). Non-profit higher education is not looking to make a profit, nonetheless, it is necessary to cover the operating costs of the college to

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secure the financial viability of the college. Dickmeyer (1982) studied the costs of large and small higher education institutions to consider the economics of scale at colleges and universities of various sizes. It is true there are fixed costs at all institutions, from the very small to the very large and Kershaw (1976) noted that very small colleges face the same cost and inflation challenges as larger colleges. Very little research has been conducted on the nature of very small colleges under 750 FTE. Other than Kershaw's report, no one has specifically addressed this segment of private higher education.

The size of a college contributes to the unique character of a college, and very small colleges have specific challenges that are not faced by larger institutions. Many very small colleges tend to be "niche" schools serving a specific audience (Hunter, 2012). These include HBCUs, women's colleges, and religious colleges, such as Catholic, Christian, or Jewish. These "niche" colleges do not receive state appropriations and rarely have large endowments (Hunter, 2012). The assumption is that very small colleges are more susceptible to decline and demise because of their inability to absorb downturns in the economy or significant decay in their enrollment numbers (Dickmeyer, 1982; Foster, 1987; Hunter, 2012). In the end, a college fails because it is financially unable to sustain itself. Regardless of the size, a college must be healthy to remain in existence. There is a lack of research to confirm or deny the viability of very small colleges. How small is too small to realistically expect to survive?

Financial health. Financial health is also referred to as financial stability, sustainability, strength, or viability. By any name, financial health is essential for all organizations, be they for-profit or not-for-profit. There is a lack of consensus, however, on how to determine the financial stability of non-profit higher education institutions (Hunter, 2012). The United States Department of Education requires an annual financial responsibility test of colleges and

universities to ascertain the ability of the institution to handle funding received through the federal Title IV student financial aid program appropriately (Department of Education, 2017). Actually, the risk being measured through this test is the likelihood that a college will close in a given year and need to pay back all Title IV funds that were inappropriately applied (Townsley, 2009).

Accreditation standards vary in regions across the U.S., but all require some measure of financial accountability. The standards are rather broad, though, and are more concerned that an institution has standards and policies and follows through with them, rather than holding colleges to a specific measurement of financial health (Northwest Commission on Colleges and Universities, 2017). It is possible that a college could be in very poor financial health and still be accredited simply because they are indeed following their own policies.

Ratio analysis is often used in business to measure how well a business is performing related to itself, its competitors, its industry as a whole, and general business or industry standards (Browning, 2013; Chabotar, 1989). Using ratios to determine the financial strength of a college or university has become widely accepted, though there are differing opinions regarding which ratios to use (Hunter, 2012; Supplee, 2014). Other than the federal financial responsibility test, several indices have emerged as measurements of financial health and strength of a college or university. Two specific measurements are the Composite Financial Index (CFI) and the Department of Education Financial Responsibility score (Hunter, 2012; Sherman, 2016; Supplee, 2014). These indices can use a combination of financial ratios over several years to give a single number score to rate the financial strength of an institution on a scale. Using these measures, an institution can determine the relative financial health of their college and identify area(s) of weakness.

Statement of the Problem

Most small colleges use tuition discounting as an enrollment management tool (Behaunek & Gansemer-Topf, 2017). High percentages of unfunded tuition discounts have been shown to be detrimental to the financial health of larger colleges and universities (Hillman, 2011; Browning, 2013). Unfunded tuition discount rate, along with enrollment size, institutional wealth defined as endowment per student, and institutional debt have all been shown to impact the financial health of larger colleges (Browning, 2013; Doti, 2013; Hunter, 2012; Lee, 2009; Martin, 2002). It is unknown how the unfunded tuition discount rate (UTDR) may affect the financial health of very small colleges, and if the effect is similar to larger colleges.

Purpose

The purpose of this study was to examine the effect of the unfunded tuition discount rate on the financial health (as indicated by CFI score) of very small colleges. The intent was also to examine the possibility that certain variables may have similar, if not a more severe, impact on the relationship between the unfunded tuition discount rate and the financial health of very small colleges. The other variables considered were institutional wealth, defined as endowment per student, and institutional debt. The extent to which each of these variables affects the relationship between the unfunded discount rate and the financial health of very small colleges compared to larger private institutions were examined.

Rationale

As private higher education faces continued challenges to maintain legitimacy and viability, understanding factors that affect the financial health of an institution is essential. A high percentage of colleges that have closed in the past 20 years have been very small colleges (Brown, 2015). As such, very small colleges seem to be at a greater risk of financial failure. It is

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important to understand how industry-standard financial practices, such as giving unfunded tuition discounts, carrying institutional debt, and endowments affect very small colleges and if these practices affect these institutions colleges the same way they affect the financial health of larger colleges.

Research Questions

RQ1: What relationship exists, if any, between the unfunded tuition discount rate (UTDR) and the financial health of private, non-profit baccalaureate colleges?

RQ2: To what degree does enrollment size (FTE) moderate the relationship between the unfunded tuition discount rate and the financial health of private non-profit colleges?

RQ3: To what degree does institutional debt (ID) moderate the relationship between the unfunded tuition discount rate and the financial health of private non-profit colleges of various sizes?

RQ4: To what degree does institutional wealth, defined as endowment per student (EN/STU) moderate the relationship between the unfunded tuition discount rate and the financial health of private non-profit colleges of various sizes?

RQ5: To what extent does the unfunded tuition discount rate, enrollment size, institutional debt, and institutional wealth predict the financial health of very small colleges?

Significance of the Study

This study of factors that affect the financial health of very small colleges is significant for several reasons. A dearth of research focusing on very small colleges was found after an extensive literature review. Therefore, this study may contribute specifically to this unique segment of the higher education universe. It is often difficult to translate research conducted on large universities to a very small college, particularly those in which the entire student body is

smaller than a single section of a freshman level lecture class at a large university. By focusing specifically on very small colleges, the results may be more transferable.

Second, as presidents, CFOs, and boards of very small colleges wrestle with the decisions at hand regarding the financial health of their colleges, this research could help guide the conversations. Browning (2013) determined that for private colleges which were already financially stable, the increased use of unfunded tuition discounting was not detrimental, whereas financially unstable colleges experienced more instability when they increased the unfunded tuition discount rate. Knowing if this also tends to be true at very small colleges will be helpful for administrators and boards as they determine the use of unfunded tuition discounting.

This study may also be significant for presidents and boards who are considering strategic direction needed to improve the financial health of their institution. Boards usually hold the fiduciary responsibility for the college, therefore it is in their best interest to pay close attention to the overall financial health of their institution and the indicators thereof (Prager, Salluzzo, Tahey, & Cowen, 1999). The recent rash of college closings in fall 2017 held two things in common: all of the colleges had enrollments of well below 1000 students and small endowments (Seltzer, 2017). There is a lack of research on the financial health of very small colleges. Depending on the size of the college, the strategy needed may vary from that which is needed for an institution of a larger size.

The lack of accountability for colleges to maintain a specific level of financial health is a concern for some. In 2016, the Department of Education has considered implementing an additional accreditation system for colleges and universities that would require a certain level of financial strength to maintain accreditation and participate in the Title IV program (Abdul-Alim, 2016). More research regarding factors that contribute to the financial health of very small

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colleges may be helpful for both administrators and board members, as they are held to the same standards that large universities are, even though the implications may be very different at these dissimilar types of institutions.

Finally, parents and students may find information about the financial health of very small colleges useful as they make their college attendance choices. College is an expensive investment, so it is important to make the right choice. The niches that many very small colleges serve could be the difference between a student having a successful college experience or not, but it is important to know that the college that is chosen is financially healthy enough to maintain its existence for the time that it takes to earn a degree.

Definition of Terms

Composite Financial Index (CFI): The combination of four financial ratios developed by KPMG/Prager, McCarthy and Sealy (Prager et al., 1999) used to analyze the financial health of a post-secondary institution.

Endowment: Institutional savings and investments intended to support the institution either in a time of crisis or on a regular basis.

Enrollment: The number of full-time equivalent (FTE) students at an institution. This includes both undergraduate and graduate students.

Expendable net assets: "All unrestricted and temporarily restricted net assets, excluding net investment in plant and those temporarily restricted net assets that will be invested in plant" (Prager, Salluzzo, Cowen, Mezzina, & Tahey, 2005, p. 57).

Financial health: An "institution's financial capacity to successfully carry out its current programs, and…the institution's continuing financial capacity to carry out its intended programs" (Prager et al., 1999, p. 3).

Full-time Equivalent (FTE): A calculation used to estimate the full-time equivalent of the

institution's part-time enrollment. The part-time headcount is multiplied by .392857 for

private colleges. This number is then added to the full-time enrollment headcount to

obtain an FTE for all students enrolled (NCES, 2017).

Funded Tuition Discount: Money given to students as scholarships or grants funded from

endowment or scholarship funds.

Institutional Aid (IA): All monies given to students by the institution as scholarships and grants,

whether funded or unfunded. Does not include state or federal aid.

Institutional Debt: "Debts and obligations of the institution owed to outsiders or claims or rights,

expressed in monetary terms, of an institution's creditors" (NCES, 2017, p. 16).

IPEDS: Integrated Post-secondary Education Data System maintained by the National Center for

Educational Statistics and the U.S. Department of Education.

Net Tuition Revenue (NTR): All money actually received by the institution for tuition and fees.

Also equivalent to (Total Tuition Revenue) – (Unfunded Tuition Discount).

Permanently restricted assets: Funds not available for annual operating expenses due to their

investment in plant facilities, or use restrictions noted by donors and may not be used for

expenses without special legal permission (Prager et al., 1999).

Title IV funds: Federal student aid money granted to students attending approved post-secondary

institutions.

Total Expenses: "All expenses on the statement of activities" (Prager et al., 1999, p. 13)

Total Net Assets: The total wealth of an institution. Includes cash on hand, reserve funds,

unrestricted, temporarily restricted, and permanently restricted funds.

Total Tuition Revenue (TTR): All money that would be received by the institution for tuition and

fees if it did not give any unfunded discounts.

Tuition and fees: The amount the institution charges a student for classes and other benefits of

being a student, such as student activity fees and computer usage fees.

Unfunded Tuition Discount (UTD): The money taken from the total revenue and given to

students as scholarships or grants.

Unfunded Tuition Discount Rate (UTDR): The percentage of tuition and fee revenue that, rather

than being used for general college operating expenses, is used instead to cover

institutional grant aid awarded to students (Redd, 2000; Supplee, 2014).

Unrestricted Net Assets: All assets that are not restricted or temporarily restricted by donor

designation and can be spent on operational needs.

Very Small Colleges (VSCs): Colleges with a total enrollment (FTE) of under 750 students.

Assumptions and Limitations

This study was limited to private, non-profit, baccalaureate colleges and universities in

the United States, which are eligible to receive Title IV funds. As a requirement for receiving

Title IV funding, institutions must be in good standing with their local accrediting body. As

such, institutions included in this study were accredited institutions. Since most very small four-

year colleges are private baccalaureate colleges (NCES, n.d.), all institutions classified as

private, non-profit, baccalaureate colleges will be included in this study, with larger institutions

(750+ FTE) serving as the comparison group.

There are multiple indicators of financial health that do not directly involve finances,

such as infrastructure and student satisfaction (Prager et al, 1999, p. 11). However, other than

enrollment size, this study will only consider financial indicators of financial health.

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Delimitations include not distinguishing between need-based and merit aid within the tuition discounting. Because of the nature of data collection being used, it is not possible to distinguish need-based aid from merit aid. This study did not consider institutional selectivity as a variable. Selectivity was found by Summers (2004) to be positively and significantly related to institutional aid, such that the lower the acceptance rate, the higher the amount of institutional aid given to students. Selectivity is a factor that Bowen and Breneman (2001) found to affect the institutional purpose of unfunded institutional aid. This study considered all unfunded tuition discounts, regardless of type or purpose.

Some baccalaureate colleges are privately owned by a hospital or health system. Due to the additional funding nature of these colleges, colleges owned by another entity such as a hospital or health system were not included in this study.

Nature of the Study

This quantitative study examined factors that may affect the financial health of very small colleges at a different rate than larger colleges. Secondary data retrieved from IPEDS was used to analyze the effect enrollment, endowment, and institutional debt have on the relationship between the unfunded tuition discount and the financial health of the institution.

Organization of the Remainder of the Study

A review of the literature is presented in chapter 2. Chapter 3 discusses the methodology of the study, including sampling, data collection and data analysis. The findings of the analysis will be presented in chapter 4, and a discussion of the findings will follow in chapter 5.

Chapter 2: Literature Review

The majority of colleges and universities in the United States practice unfunded tuition discounting (Baum, 2017). With the rise of this practice comes increased expectation of institutional aid, generally known as scholarships and grants, by all students. Institutions have found that students have come to expect a scholarship before enrolling (Kelderman, 2013; Kim, DesJardins, & McCall, 2009). However, tuition discounting can have a negative effect on the financial health of an institution (Browning, 2013; Hunter, 2012; Martin, 2002), depending on the condition of other characteristics. This study is particularly interested in the effect of unfunded tuition discounts on the financial health of very small colleges (<750 FTE).

Very Small Colleges

An extensive literature search returned very little research regarding very small colleges. The definition of *very small college* is debatable since the definition of *small college* varies from one source to another. College Board (2017) defined a small college as one with under 2000 FTE. Getz and Siegfried (1991) designated small colleges as those under 3000 FTE, while Townsley (2009) and Dickmeyer (1982) both defined a small college as under 1000. Kershaw (1976), in the only apparent literature specifically focused on very small colleges, defined very small colleges as those under 750 FTE.

When Kershaw (1976) studied very small colleges in 1976, there were about 370 private, four-year colleges with less than 500 students. In 2015, there were approximately 273 (NCES, n.d.). Some have held that colleges with fewer than 1,000 students cannot survive due to the economy of scale and increasing costs per student (Dickmeyer, 1982; Martin & Samels, 2009). Most very small private colleges serve a particularly limited and specific audience and when this limited pool deteriorates, enrollment contracts and the institution declines further (Kershaw,

1976). Because of the already small population, when the enrollment at a very small college

drops, even slightly, the repercussions are felt throughout the college much more intensely than

at larger institutions (Wootton, 2016). With little margin for error, a decrease in enrollment at a

very small college is much more likely to push the institution to the brink of existence. Indeed,

of the 14 private, four-year, non-profit colleges that have closed in the past two years, 12 had

under 750 students (Brown, 2015; NCES, n.d.).

Advantages and disadvantages of very small colleges. The small college experience is

a distinction that some students obviously value highly, thus very small colleges still exist (Getz

& Siegfried, 1991). Like most private colleges, these schools must distinguish themselves from

each other by emphasizing their location, history, religious affiliation, single-sex, racial diversity,

curricular emphasis, or perceived quality or prestige (Breneman, 1994). Very small colleges

have additional advantages over their larger peers. Very small colleges have more flexibility in

their ability to respond to individual student needs and desires, and are able to engage in more

meaningful faculty-student relationships and educational experimentation (Kershaw, 1976;

Peruso, 2011). The distinct opportunities students have to be more deeply involved within the

tight community is present on a very small college campus (Peruso, 2011). Very small colleges

emphasize to students "you are not just a number here!" It is likely that the president of a very

small college would know the name of every student. These institutions have the ability to

change quickly when change is necessary or when the market indicates (Townsley, 2009).

The disadvantages of a very small college are also apparent. These institutions must be

precise in their decisions and planning because they often do not have much margin for error.

Missing enrollment targets by just two students or over-extending the tuition discount rate by 1%

can significantly affect the annual budget (Dickmeyer, 1982; Townsley, 2009). Other

disadvantages include less variety available in the curricula, potentially weaker, science programs and few, if any, faculty scholars of national reputation (Kershaw, 1976).

Challenges of very small colleges. Research has repeatedly indicated the need for enrollment to be strong to maintain financial health (Heisler & Hougland, 1984; Lyken-Segosebe & Shepherd, 2013; Martin & Samels, 2009; Porter & Ramirez, 2009). Although they did not indicate an exact number, Heisler and Hougland (1984) determined that successful colleges (indicated as colleges that did not close) have relatively high enrollments. Porter and Ramirez (2009) also studied closed colleges and concluded that size was the most significant factor in institutional survival. The more students a college had, the more likely it was to survive. On the list of risk or stress indicators for small, four-year, private colleges, both Lyken-Segosebe and Shepherd (2013), and Martin and Samels (2009) indicated institutional enrollment as a key factor. Martin and Samels quantified institutional enrollment under 1,000 as being a stressor. Lyken-Segosebe and Shepherd identified "small enrollment" as the number one risk factor for college closure.

Low enrollment is considered a challenge to both the revenue and expenses of an institution. With lower enrollment comes lower tuition revenue, thereby reducing the amount available for the annual budget (Lyken-Segosebe & Shepherd, 2013). Less money in the annual budget reduces the amount available to be set aside in reserves. Dickmeyer (1982) found that 41% of colleges under 800 FTE had no available reserves, compared to only 18% of colleges over 1000 FTE. Interestingly, Dickmeyer found no difference in the overall financial health of the three smallest categories (0-199 FTE, 200-399 FTE and 400-599 FTE), indicating the possibility that below 600 FTE financial health of very small colleges is equally as good or equally as bad.

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A common excuse for the difficulties faced by very small colleges are expenses. Every college has expenses, but very small colleges lack the ability to take advantage of economies of scale. Dickmeyer (1982) described fixed costs and sticky costs that every college must assume. Fixed costs are costs that all colleges have and will most likely not change, regardless of size. These can include things like the president's salary, facilities, and the library budget. Sticky costs are costs that are only somewhat sensitive to enrollment. If enrollment increases, many sticky costs, such as contracted faculty salaries, will increase because more faculty is needed to teach more students. However, if enrollment decreases, faculty is not expendable and it is difficult to reduce the expense of faculty salaries short of dramatic lay-offs. Other sticky costs include plant maintenance and residence halls.

Dickmeyer (1982) suggested other explanations for why colleges are very small other than financial problems or the inability to meet fixed costs. Some colleges choose to maintain a small student body to achieve their mission. College of the Atlantic, a college of 350 FTE in Maine, maintains this small student enrollment "to maintain the closeness of our small community [and] we've decided not to grow any larger" (College of the Atlantic, n.d.). Alice Lloyd College is one of the most selective colleges in the U.S., accepting only 9% of applicants, yet with just over 600 students, Alice Lloyd College's mission is to provide higher education to capable students within the Appalachia region regardless of financial status. Because students do not pay tuition, the number of students is kept intentionally small as the institution covers the cost through private gifts and endowment (Alice Lloyd College, n.d.).

Some colleges find that they have become a very small college over time. Enrollment declines into the very small college category and can cause more financial problems, especially considering fixed costs. Brewton-Parker College, Mount Vernon, GA, is a college that has

experienced significant enrollment declines over the past 10 years. Brewton-Parker College had a total enrollment of 1,150 students in 2005. Over the next few years, enrollment declined incrementally, until the college experienced a 25% decrease between 2009 and 2010. The college reached a low of 374 total students in 2015 (NCES, n.d.). Accreditation problems seemed to be to blame for the college's demise (Lederman, 2014).   When accreditation was re-granted, enrollment turned the corner, increasing 15% to 430 FTE in fall 2016 (Corbin, 2016).

Finally, Dickmeyer (1982) pointed to the inability or unwillingness to grow as an explanation for financial problems. Some colleges really want to grow and for whatever reason, they are unable to grow. Trinity Lutheran College in Washington State wanted to grow. Declining enrollments and increased facility expenses led Trinity to sell the 300-acre campus in suburban Seattle-area and moved to the downtown core of a small city 25 miles north (Arnold, 2008). With fewer than 87 students, the entire campus (except student housing) moved into one five-story building that administrators estimated could sufficiently support 350 students. Over the eight years in the new location, the perpetual goal was to grow to 525 students (Winters, 2016). Unfortunately, enrollment never exceeded 225, and in 2016, the college succumbed to the financial difficulty of maintaining such a small school with no reserves andclosed its doors in May 2016 (Winters, 2016).

Economic theory of private colleges. Breneman's (1994) microeconomic theory of private colleges suggests a two-stage optimization process for small college financial health. The first stage is to determine the optimal enrollment as well as the resources (faculty, staff, facilities, etc.) to support that number of students while remaining financially stable (Breneman, 1994). This is not an annual enrollment determination, rather a long-term strategic decision, made once every 20 years or so.

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Once a college has reached its optimal enrollment and resource levels, it moves into stage two. The second stage of optimization in Breneman's (1994) microeconomic theory is to increase the quality of the students and the resources. In stage two, colleges seek to attract students that fit specific characteristics that the college sees as desirable, such as higher SAT scores, racial or religious diversity, socio-economic diversity, or having a specific talent (i.e. musical, or athletic) (Breneman, 1994). The college also seeks to improve the quality of their faculty, staff, and facilities, all while remaining within the constraints of the operating budget.

Some very small colleges may never make it past stage one of Breneman's (1994) theory, as was the case for Trinity Lutheran College. Or, like Brewton-Parker College, they may find themselves back in stage one. For colleges who find themselves perpetually in stage one, the ability to focus on and improve the quality of students, faculty, and staff, or improve their financial resources such as an endowment, becomes increasingly difficult.

Tuition Discounting

The rising cost of college tuition has been an issue that politicians debate and that cause anxiety in parents and students, wondering if they will be priced-out of a post-secondary degree (Gianneschi & Pingel, 2014). From 1982 to 2012, the average price of college tuition rose 166.5% (Davis & Redd, 2013). However, tuition discounts have increased even more, rising by 253% in the same time period (Davis & Redd, 2013). Gianneschi and Pingel (2014) speculated that tuition discounting is, in part, cause for the rising cost of tuition, indicating that colleges must inflate their tuition rate above what is actually needed in order to compensate for the lost revenue given away to students in the form of unfunded tuition discounts.

Tuition discounting, also known as institutional aid, is the money given to students in the form of scholarships and grants. Institutional aid may be funded or unfunded. Sources such as

endowment funds and donor gifts produce funded aid, given to students in the form of scholarships and grants. Unfunded aid, on the other hand, is money offered to students, also in the form of scholarships and grants, but without established funds from which these monies are drawn (Supplee, 2014). The money is subtracted from the estimated gross tuition revenue. Gross tuition revenue (GTR) is the tuition rate multiplied by the number of students enrolled at the institution (Breneman, 1994). The net tuition revenue (NTR) is the GTR minus the unfunded institutional aid. Giving a student unfunded institutional aid is equivalent to giving the student a discount on tuition or reduced tuition.

Since funded tuition discounts come from sources such as an endowment, it is not surprising that there is a positive relationship between endowment size and funded aid (Davis & Redd, 2013; Martin, 2012). While Summers (2004) concluded that size of endowment does not necessarily indicate increased spending on total institutional aid, Martin (2012) found higher funded discounts correlated to lower unfunded discounts.

The tuition discount rate is the overall average amount of discounted tuition at a specific institution. At baccalaureate colleges and universities under 4000 students, the average UTDR in 2012-13 was 40% (Kelderman, 2013). Behaunek and Gansemer-Topf (2017) found that institutional aid rose 6.4% per year from 2003 to 2012. The unfunded portion of the rise in institutional aid was 6.1% per year. As a result of increased tuition over the years, the NTR at private four-year baccalaureate colleges increased 2.3% from 2003-2012, but the increase in unfunded tuition discounts was sharper, causing a much smaller increase in NTR per student during the same period (Behaunek & Gansemer-Topf, 2017). Increases in GTR have been largely offset by the increased unfunded institutional aid to students (Davis & Redd, 2013). In other words, colleges and universities have been taking in more money but have been giving

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away a higher proportion of it, which, in turn, cuts into the amount that the college has to meet its budgetary obligations.

There is strong competition for students among colleges and universities (Redd, 2000), and competition has caused them to use increasingly more institutional resources to recruit and enroll students (Loomis Hubbell, Massa, & Lapovsky, 2002). In 2015-16, institutional aid across all institutional sectors totaled $55 billion (Baum, 2017), and the tuition discount rate among small private colleges was expected to reach 45% in 2016-17 (NACUBO, 2017). Most private and many public colleges use tuition discounting as a strategy to increase enrollment of desirable students such as those who are academically talented, athletes, and diverse students (Browning, 2013; Curs & Singell, 2010; Hillman, 2012; Lassila, 2014; Redd, 2000). While colleges are spending more money on institutional aid in hopes of crafting the characteristics of their student body, many private colleges are spending more money in hopes of simply attracting *any* students (Browning, 2013; Loomis Hubbell et al., 2002).

As the price of tuition has risen, more middle- and upper-income families are refusing to pay the sticker price for college (Kelderman, 2013). The demand and expectation for institutional aid has risen among students (Kim, DesJardin, & McCall, 2009; Redd, 2000). Therefore, colleges have responded by giving more aid. Behaunek and Gansemer-Topf (2017) found that 58% of private, four-year baccalaureate colleges give tuition discounts to 95% or more of incoming first year students. Across all institutions, 86.9% of incoming first year students receive tuition discounts (Davis & Redd, 2013). Colleges and universities have taught students and parents to expect scholarships.

High-tuition/high-discount and low-tuition/low-discount models. There are two schools of thought around the setting of tuition and the use of institutional aid: high tuition, high

discount (HH); and low tuition, low discount (LL) (Curs & Singell, 2010). Using the HH model, colleges set the tuition as high as they dare and then offer high amounts of institutional aid, often unfunded (Rine, 2016). Many private colleges rely on the HH model with hopes of enrolling a certain number of students who do not qualify for institutional aid, thereby netting more tuition revenue from those students. Along with these full paying students, the college hopes to attract additional students with scholarships and grants. The art of the game comes in determining the exact point at which tuition should be set to generate the maximum amount of revenue possible. The rate must be high enough to attract quality students, but not so high as to turn off students who do not require institutional aid. There is also the balance of just how much institutional aid to give qualifying students to get them to enroll without giving them too much, resulting in decreased NTR for the college.

Curs and Singell (2010) concluded that for the HH model to be effective, there must be students who are *unresponsive* or *inelastic* to the tuition increases. This means that even if tuition increases, student enrollment increases; as opposed to those who are *responsive* or *elastic* in which student enrollment decreases as tuition increases. Even at more selective, private liberal arts colleges students are not completely unresponsive to tuition increases. Summers (2004) found increased tuition at more selective liberal arts colleges predicted increases in overall institutional aid and increases in aid were positively and significantly related to increases in FTE. However, the tuition rate was negatively related to FTE, indicating that when a college increases tuition rates, they had better increase the institutional aid rate as well to maintain enrollment levels.

The low-tuition/low-discount model of pricing means a college keeps tuition at a lower rate and gives out lower amounts of institutional aid (Curs & Singell, 2010). Some institutions

that follow this model keep tuition as much as 45% lower than their peer institutions (Rine, 2016). The low sticker price is what the college anticipates will attract students, making the cost of education more affordable. Historically Black Colleges and Universities (HBCU) traditionally use an LL model, assumedly because they enroll more low-income students and there is no point to charge high tuition when the target student cannot afford it (Breneman, 1994). Several institutions, including the very small Converse College (SC), have recently reduced their tuition, as well as the amount of institutional aid given to students, to appear more affordable to students and their families (Camera, 2015). Other institutions, like Grove City College (PA), maintain a lower tuition rate as part of their overall philosophy of not participating in federal Title IV funding (Rine, 2016). When using the LL model, trade-offs are made, exchanging higher tuition revenue possibilities for the ability to attract more students with the lower cost (Curs & Singell, 2010).

Breneman (1994) described the use of tuition discounting in his economic theory of private colleges using a demand curve. The demand curve is the graphic depiction (see Figure 1) of the relationship between a college's tuition and the number of students willing to pay to attend that college. When the tuition decreases due to tuition discounting, more students are willing to pay to attend.

DD   Demand curve
P   Tuition rate
X_{FP} Number of full-pay enrollments
X_{PP} Number of students receiving aid, $X_N - X_{FP}$
X_N Total enrollments
a   Ratio of full-pay to total enrollments, X_{FP}/X_N
(1-*a*) Ratio of aided students to total enrollments, X_{PP}/X_N
β   Ratio of unfunded student aid ($) to gross tuition revenue ($)
GTR Gross tuition revenue, PX_N
βPX_N Unfunded student aid (area abc)
NTR Net tuition revenue (area $PacX_NO$)
     =GTR - βPX_N

Figure 1. Private college demand curve. Reprinted with permission. Republished with permission of The Brookings Institution, from *Liberal Arts Colleges: Thriving, Surviving, or Endangered*, D. W. Breneman, 1994; permission conveyed through Copyright Clearance Center, Inc.

Tuition discounting and net tuition revenue. Tuition revenue is the dominant source of revenue for most private colleges (Breneman, 1994; Townsley, 2009). Net tuition revenue (NTR) is the gross tuition revenue (tuition X enrollment) minus the unfunded institutional aid (Browning, 2013; Summers, 2004). Understandably, schools with larger student enrollments generate more NTR, as do schools with higher tuition or lower unfunded institutional aid costs. Most colleges report gross tuition revenue (GTR) as income and unfunded institutional aid as an

expenditure, as if GTR could actually be realized and unfunded tuition discounts were discretionary (Breneman, 1994). Gianneschi and Pingel (2014) suggested that unfunded tuition discounts be considered foregone revenue, meaning revenue that will not be collected. Institutions should consider tuition revenue to be the amount of revenue actually collected rather than calculating the gross and net tuitions. However, for highly selective colleges that can enroll entire classes without giving any tuition discounts, any institutional aid given (funded or unfunded) is a real expenditure, as that is money that could have been collected (Baum, 2017; Bowen & Breneman, 2001).

Regardless of how unfunded tuition discounts are accounted for, Breneman (1994) warned that net tuition revenue must increase proportionately to costs, if possible. Otherwise, other revenue sources will need to increase disproportionately to avoid an operational deficit. Avoiding deficits is an important part of building financial health (Townsley, 2009).

Breneman, Doti and Lapovsky (2001) indicated that effective use of tuition discounting has allowed colleges to increase tuition rates, as well as increased aid, to realize an increase in enrollment, and therefore an increase in net tuition revenue.   Because of this national trend of giving tuition discounts, the National Association of College and University Business Officers (NACUBO) produces an annual report on the status of tuition discounting at colleges and universities in the U.S. In 2017, NACUBO reported that the average tuition discount rose again, reaching the highest levels yet. The report posited that the rising discount rate led to slower growth in NTR at all private colleges and universities (NACUBO, 2017). Davis found in 2003 that small colleges with lower tuition saw less NTR growth than larger institutions or smaller colleges (first-year class <850) with high tuition. Studying the NACUBO report, Kelderman

(2013) concluded that when a college increases its tuition discounting too much to meet enrollment goals, it might not produce enough NTR to cover operating costs.

Behaunek and Gansemer-Topf (2017) found a significant negative correlation between the UTDR and the NTR per student at private, non-profit, baccalaureate colleges. The average UTDR increased significantly between 2003 and 2012, rising 71%; whereas the average NTR of these same colleges only increased by 22% during the same period. This study focused only on the NTR of incoming first year students. Hillman (2011), however, found the UTDR of entire enrollment of larger public institutions was beneficial in increasing NTR at large public universities, but only up to a certain point. When the institution's unfunded tuition discount rate rose above 13%, Hillman found the relationship was no longer positive, indicating that giving unfunded institutional aid to more students to entice them to enroll did not necessarily increase the bottom line for the university.

Adverse effects of tuition discounting. Colleges and universities use unfunded tuition discounts to increase the enrollment of students with desired characteristics, including students with high academic ability and students from diverse backgrounds (racial or socio-economic). Lassila (2010) noted a significant relationship between increased tuition discounts and the enrollment of black and Hispanic students. Summer (2004) found a significant positive relationship between the amount of institutional aid given by more selective colleges and higher diversity and more academically talented students. Some of these highly desired students, however, may be unknowingly in competition with one another. Ehrenberg, Zhang, and Levin (2006) found that an increase in the number of new institutionally funded National Merit Scholars at selective colleges was associated with a reduction of the number of incoming Pell Grant recipients. The significance increased when more National Merit Scholars enrolled or at

institutions with overall growing enrollments. These findings may indicate a trade-off that takes place at colleges and universities when designating institutional aid dollars. Some selective colleges may spend more on merit-based scholarships, such as academic, than on need-based scholarships.

A similar trend was highlighted by Davis (2003) when he found that institutional aid given between 1995-2000 to middle- and high-income students grew faster than for low-income students. As tuition discounting has become the norm, more students are expecting to receive aid, regardless of their ability to pay or personal characteristics. When more money is given to more students, there is less money to go around, and low-income students may receive less aid.

Financial Health

Breneman's (1994) economic theory on private colleges identified two stages of optimization: a) the level of inputs (faculty, staff, facilities, etc.) and enrollments are set to a level that will allow the institution to be financially stable; and b) once the designated levels are reached, an institution will seek to increase the quality of faculty, staff, facilities, and students. The second stage will allow the institution to grow beyond simply surviving and into a thriving mode. Prager, Salluzzo, Cowen, Mezzina, and Tahey (2005) identified very similar concepts as the two levels of institutional financial health. The first level is the "institution's financial capacity to successfully carry out its current programs, and second, the institution's continuing financial capacity to carry out its intended programs for the expected lifespan of the institution" (Prager et al., 2005, p. 4).

Factors contributing to financial health. Several factors may affect an institution's financial health, and not all of them are necessarily financial factors (Barron, 2017; Chessman, Hartley, & Williams, 2017; Hunter, 2012). Enrollment, tuition dependency, economies of scale,

endowment, unfunded tuition discounting, and institutional debt are some of the factors that have been demonstrated to contribute to the financial health of a college.

Enrollment. Every institution has a desired level of enrollment that will allow it to be financially stable (Breneman, 1994). Some very small colleges are financially stable because they function at the enrollment level that is desired (Dickmeyer, 1982; Getz & Siegfried, 1991), but many very small colleges live in a constant state of financial instability, where their very existence is continually challenged (Townsley, 2009). Lyken-Segosebe and Shepherd (2013) studied the 57 four-year private institutions which closed between 2004 and 2013. They found the average enrollment at these colleges was 250 students, with the largest closing college to have just over 1,000 students.

However, increasing enrollment is not always the key to financial stability. Meyer and Sikkink (2004) found an increase in enrollment did not correlate with an increase in financial strength at Coalition of Christian Colleges and Universities (CCCU) member colleges. CCCU colleges are all very small to medium private colleges in the United States. Meyer and Sikkink went on to conclude that CCCU colleges that lost a moderate amount of enrollment (2-7%) over time were financially stronger. While this may seem counter-intuitive, perhaps schools that saw a steady enrollment decline prepared themselves better. The assets to liability ratio was the single ratio Meyer and Sikkink used to determine financial strength, and therefore institutions experiencing enrollment declines may have focused on reducing debt or increasing assets.

Chessman et al. (2017) studied the financial health of independent colleges and universities. They found that independent colleges with enrollments between 2001-3000 FTE maintained higher median financial strength scores than institutions with enrollments over 3000 FTE. Chessman et al. also concluded that institutions over 3000 FTE were 7% less likely than

smaller institutions to see significant improvements in their financial health over time. Bolda and Mack (1983) also found institutions over 3,000 students to be less financially viable while those with enrollments between 2500–2999 to be the most financially viable and that institutions with average enrollments below 1,000 students were the least financially viable.

Similarly, Chessman et al. (2017) found that private institutions with fewer than 1000 FTE were the most likely to see a decrease in financial health over time. Doti (2013) and Hunter (2012) both concluded that larger enrollments have significant positive influence on the financial health of an institution.

Tuition dependency. Tuition dependency is defined as the proportion of tuition revenue used to fund institutional expenses (Rine, 2016). The exact percentage that distinguishes a college as tuition dependent is somewhat arbitrary as Townsley (2009) designated 60%, while Martin and Samels (2009) set the percentage as 85%. Regardless of the exact percentage, being highly tuition dependent is not considered a positive state for private colleges, although Loomis Hubbell et al. (2002) described nearly "all but a handful" (p. 39) of independent institutions as tuition dependent. Both Martin and Samels (2009) and Lyken-Segosebe and Shepherd (2013) described stressed or at-risk colleges as being highly tuition dependent. Rine (2016) and Townsley (2009) described smaller private colleges as having a higher tendency to be more tuition dependent than larger public institutions.

Tuition is the dominant source of revenue for most private colleges (Breneman, 1994). Other sources of revenue include auxiliary income, gifts from private donors, grants from either private or public funds, and returns on endowment investments (Doti, 2013; Townsley, 2009). A college that can raise more funds from private donors or secure grants will be less dependent on tuition alone. The more tuition dependent an institution is, the less likely it is to have a robust

reserve fund, since being highly tuition dependent means that most of the tuition revenue received is designated for current operating expenses (Townsley, 2009). Without a reserve fund, a college is much more susceptible to fluctuations in enrollment, which can be profound at a very small college (Kershaw, 1976).

Economies of scale. Enrollment affects the ability of an institution to scale economies. All colleges have expenses, and many costs are fixed, such as instructional costs, which include full-time and part-time faculty, administration and staff, buildings and campus maintenance, and resources such as technology and library (Dickmeyer, 1982; Getz & Siegfried, 1991). Some assume that a very small college has but two choices when economies of scale put them out of equilibrium: grow to over 1000 FTE or close (Getz & Siegfried, 1991). It is true that sheer size can help larger institutions maintain financial equilibrium more so than smaller colleges (Townsley, 2009). Getz and Siegfried (1991) found that colleges with declining enrollments experienced increased expenditures per-student while colleges with growing enrollments experienced decreased expenditures per-student. This makes sense, as institutions created to serve 350 students have budgets built on 350 students, faculty and staff to serve 350 students as well as facilities and campus resources to serve 350 students. An enrollment decline of just 10 students, a 3% decrease, could mean a $200,000 budget adjustment on $7,000,000. The same 10 students at a small school of 3,000 would mean a $200,000 adjustment on a budget of $60,000,000, or 0.33%.

Every college and university has their own threshold for capacity in the residence halls, classrooms, faculty load, etc. and it requires careful planning and balance of all resources to ensure equilibrium (Meyer & Sikkink, 2004). At larger institutions, there is more room for error in the balancing act, while slight miscalculations can greatly upset a smaller college.

Endowment. An endowment is essentially a savings and investing account into which colleges and universities put donations, hoping that the interest accrued on these investments will cause the original principle to grow. Most colleges spend very little of their endowment each year, usually only a percentage of the interest (Hansmann, 1990). The primary goal of the endowment is to continually produce investment returns so the endowment principle never has to be spent and will carry on providing for the future of the college (Townsley, 2009). Colleges with larger endowments were found to have higher CFI scores, indicating the more endowment a college had, the more viable it was (Lee, 2009). Denneen and Dretler (2012) indicated that colleges with less than $1 billion in their endowments are at risk for institutional failure.

Endowment funds should be able to be directed by the institution to cover short-term costs in times of financial stress, such as enrollment shortfalls (Breneman, 1994; Townsley, 2009). Ideally, colleges would increase their endowments to reduce their vulnerability due to an enrollment drop and their ensuing tuition dependence increase (Breneman, 1994; Hansmann, 1990).

Endowments are also used to fund tuition discounts for students. Davis and Redd (2013) and Martin (2012) both found a significant relationship between the size of an institution's endowment and the amount of funded institutional aid given to students. Summers (2004), however, did not find a significant correlation between endowment size and tuition discount rate at selective colleges, though Summers did not distinguish between funded and unfunded aid and only studied more-selective colleges.

Unfunded tuition discount rate. As previously discussed, the UTDR is the percentage of institutional aid given to students that comes from unrestricted operating funds, not from funded scholarship sources. Both Browning (2013) and Martin (2002) came to similar conclusions: if an

institution is financially healthy or functions with a balanced budget, increasing the UTDR is likely to increase enrollment and improve the financial stability of the institution. Conversely, if an institution is financially unhealthy and runs budget deficits, increasing the UTDR is likely to make the problem worse. Based on these studies, it is logical to conclude that financially healthy institutions did not become financially healthy by using high amounts of unfunded tuition discounts to increase enrollment.

While the UTDR did not appear to have a significant effect on the financial health of the institutions in Supplee's (2014) study of Coalition of Christian Colleges and Universities (CCCU), the UTDR did seem to place a constraint on an institution's ability to improve their financial health in the model used. More so, Hunter (2012) found that tuition discount rate was one of two variables that consistently, negatively, and significantly affected an institution's financial health in a given year. Lee (2009) also found tuition discount rates to have an inverse predictive relationship with institutional financial health and could modestly predict an institution's financial viability.

Institutional debt. Borrowing money is increasingly common in higher education. Not only do students borrow money to attend college, colleges and universities also borrow money to promote the operation of the institution. Institutional debt is a financial obligation to a third- or outside-party (NCES, n.d.). Chabotar (1989) described the debt that non-profit organizations like colleges take on as short-term and long-term. Short-term debt, also known as current liabilities, is money that will be repaid within the year and is often used for leveling cash flow. Long-term debt, known as non-current liabilities, are used for financing larger projects, such as buildings, and are repaid over time (Chabotar, 1989).

Some institutional leaders use debt as a tool to improve the financial health of their institution. Lee (2009) found an institution's capitalization levels (net assets over total assets) to be a significant predictor of financially viable institutions. Hunter (2012) found debt service to positively impact the Department of Education Test of Financial Strength score, indicating a financially healthier institution. Over the past 20 years, colleges and universities have increased the amount of debt they hold. Hunter (2012), Lee (2009), Lyken-Segosebe and Shepherd (2013), and Peruso (2011) all found that the amount of institutional debt held by small, private colleges and universities increased considerably during the same period. The increase may be due to the increased competition between institutions to improve campuses, along with the very low interest rates available on debt (Peruso, 2011).

Denneen and Drutler (2012) described this increase in institutional debt as problematic. "Long-term debt is increasing at an average rate of approximately 12 percent per year and their average annual interest expense is growing at almost twice the rate of their instruction-related expenses" (Denneen & Drutler, 2012, p.3). Taking on too much debt too quickly can be detrimental. Compared to colleges that had closed, Lyken-Segosebe and Shepherd (2013) found that open colleges of similar sizes had higher debt to asset ratios, but much lower amortization schedules and long-term investments, indicating that the large amounts of borrowing done by colleges that closed was done poorly or too quickly. Citing the "crushing weight of debt" (Seltzer, 2017, "A Deteriorating Situation"), Burlington College (VT) closed in 2016. Five years prior, the then-president made a land purchase that put the college $10 million in debt, with no legitimate resources to pay the debt (Seltzer, 2017).

Martin and Samels (2009) and Lyken-Segosebe and Shepherd (2013) included institutional debt as a risk factor in their respective lists of risk indicators for distressed colleges.

Lyken-Segosebe and Shepherd indicated "large expenses on interest payments put institutions at risk" (p. 17). Martin and Samels were more specific by stipulating that institutions that spend more than 10 percent of their annual operating budget on debt service may be at risk. Browning (2013), who investigated the effect of unfunded tuition discounting on the financial health of small private institutions noted that more research is warranted for the effect of debt on institutions of various sizes, indicating that debt may affect very small institutions differently than larger ones.

Using ratio analysis to calculate financial health. For-profit business has used ratios for many years to analyze the profitability and viability of a business (Chabotar, 1989). As non-profit entities, colleges and universities do not need to analyze their profitability, however, they do need a way to study their financial improvement, stewardship, accountability and viability (Chabotar, 1989). The relationship between two specific numbers from an institution's balance sheet is a financial ratio. Viewing these numbers as a relationship "provides a better understanding of financial condition and institutional priorities than either of these data standing alone" (Chabotar, 1989, p. 188). Ratios are useful for determining the appropriate amount of reserves required and debt usage for the operating size of the institution (Prager, Salluzzo, Tahey, & Cowen, 1999). Using financial ratios can allow for comparison between dissimilar types or sizes of institutions or comparing one institution to itself over multiple years without the need to account for inflation. In fact, financial ratios are best when examined over three to five years to spot trends and outliers (Chabotar, 1989; Prager et al., 1999). When examining financial ratios over a period, early warnings of financial distress should appear, giving administrators and trustees areas to scrutinize further.

Financial ratios are one tool that can be used to analyze the financial health of an institution. Martin and Samels (2009), Hunter (2012), and Lyken-Segosebe and Shepherd (2013) found several non-financial factors that contribute significantly to financial health. This is one limitation of financial ratios as these significant factors, such as enrollment, are not included in the ratio analysis. Chabotar (1989) noted that other limitations to financial ratios are the prevailing financial conditions, as well as the consistency in which the numbers were developed and the ratio used.

In 1999, Prager, Sealy and Co., KPMG, and Bearing Point developed the Composite Financial Index (CFI) (Prager et al., 2005). The purpose of the CFI is as a proactive tool used to assess the overall financial health of an institution at a specific time, although it is better used for a specific period (Hunter, 2012; Lee 2009). Since its development, the CFI has become widely accepted in higher education as a "robust indicator of financial strength" (Supplee, 2014, p. 254).

The CFI uses a combination of four weighted ratios to calculate a single score on a scale of 1 to 10, although an institution can score lower than 1 and higher than 10. A score of three is considered the low benchmark of a financially healthy institution that gets progressively healthier as the score increases toward 10. A score between one and 2.99 indicates a financially stressed institution, and a score under one indicates a financially distressed institution (Prager et al., 2005; Townsley, 2009). Table 1 describes the scale of CFI scores and the implication for the institution.

Table 1

Scale for Charting CFI Performance

CFI Scoring Range	Implications for Institution
-1 – 1	Assess institutional viability to survive
1 – 3	Reengineer the institution
3 – 5	Direct institutional resources to allow transformation
5 – 7	Focus resources to compete in future state
7 – 9	Allow experimentation with new initiatives
8 – 10+	Deploy resources to achieve a robust mission

Source: Prager et al., 1999.

The four ratios used to calculate the CFI are the Primary Reserve Ratio, the Net Operating Revenues Ratio, the Return on Net Assets Ratio, and the Viability Ratio. Each of these ratios provide individual indicators of various aspects of financial health. An institution may be weak in one or two individual ratios and may produce an overall healthy CFI score. The individual ratios are converted to a common scale using strength factors. These strength factors are then multiplied by the specific weight indicated for each ratio. The final CFI score is then calculated by adding these four resulting numbers (Prager et al., 2005).

The Primary Reserve Ratio measures an institution's ability to fund their operations and fulfill their mission. (Prager et al., 2005). The Net Income Ratio indicates whether or not an institution experienced a surplus or a deficiency during the indicated period. The Return on Net Assets Ratio is the ratio used to determine if a college or university is in a better financial position than previously. Finally, the Viability Ratio measures the ability of an institution to pay their debts with their available assets.

The Department of Education also uses ratios in the calculation of a composite score for all institutions that participate in the Federal Student Aid program (Federal Student Aid, 2016). Every year, colleges and universities must submit an audited financial statement to the Department of Education to be analyzed. The composite score is composed of the primary reserve, equity and net income ratios. The primary reserve ratio is a measure of an institution's viability and liquidity. The equity ratio is a measure of an institution's capital resources and ability to borrow money, while the net income ratio is a measure of a school's profitability. These ratios are calculated using information from the institution's audited financial statement and multiplied by the corresponding strength factor. The strength scores are then weighted and added together to produce a score between -1 and 3. A composite score above 1.5 indicates a financially responsible institution in which oversite is not needed. Institutions with scores between 1.0 and 1.4 are considered "in the zone" (Federal Student Aid, 2016, 2-75) and while they are considered financially responsible, must comply with additional requirements considered as further oversite. Scores between -1 and 0.9 are considered not financially responsible and must comply with further oversite measures, including submitting a letter of credit equal to at least 50% of the federal student aid received (Federal Student Aid, 2016).

Summary

As tuition rates rise at colleges and universities across the U.S., so does tuition discounting (Behaunek & Gansemer-Topf, 2017). Tuition discounting has been a practice at colleges and universities of all sizes for many years. Institutions use tuition discounting in hopes of increasing enrollment, supporting low-income students, and increasing student diversity (Browning, 2013; Lassila, 2010; Summers, 2004). Yet much of the research indicates that, for most institutions, tuition discounting does not result in the desired effects (Behaunek &

Gansemer-Topf, 2017; Davis, 2003; Ehrenberg et al., 2006; Hillman, 2011). Hunter (2012) found tuition discounting to negatively affect the financial health of small colleges, while Browning (2013) and Martin (2002) concluded that tuition discounting had an adverse effect on the financial health of colleges already experiencing financial difficulties. Other factors that have been shown to have an effect on the financial health of higher education institutions include enrollment (Chessman et al., 2017; Meyer & Sikkink, 2004), tuition dependency (Lyken-Segosebe & Shepherd, 2013; Martin & Samels, 2009), economies of scale (Dickmeyer, 1982; Getz & Siegfried, 1991), and endowment (Lee, 2009).

Very small colleges have not been the focus of much research. Small colleges are more likely to be subject to economies of scale (Getz & Siegfried, 1991), to be tuition dependent (Townsley, 2009), and to have small endowments (Hunter, 2012). As such, very small colleges are thought to more likely be in poor financial health.

Chapter 3: Methodology

Very small colleges (<750 FTE) face many challenges. Kershaw (1976) noted "there has been a tendency to assume that they are too small to make economic sense," (p.4). Yet there has been very little research on the financial health of very small colleges, 58% of which are private and non-profit. In an effort to maintain or grow student enrollment, most colleges give unfunded tuition discounts to students, despite the growing research that indicates giving such discounts can be more detrimental than constructive (Browning, 2013; Hillman, 2011). The purpose of this study was to understand the effect of the unfunded tuition discount rate (UTDR) on the financial health of very small colleges compared to larger colleges of similar nature (private, non-profit, baccalaureate). This study also investigated whether or not the strength of the relationship between the UTDR and the financial health was affected by variables such as enrollment size, institutional debt, and endowment.

Research Design

The research methodology employed in this study was a quantitative, ex-post facto design. Publicly available secondary data regarding private, non-profit, baccalaureate colleges and universities was collected from IPEDS and the Department of Education for analysis.

Philosophy and Justification

This study was a quantitative design, using a post-positivist philosophy, also known as the scientific method. Creswell (2009) described the post-positivist stance as one that assumes that there are causes for outcomes and effects, which can be studied and described. Data and evidence were collected to create rational ideas and knowledge (Creswell, 2009). In this study, publicly available data were collected and analyzed to understand the effects of the independent

variables (UTDR, enrollment, institutional debt, and endowment per student) on the dependent variable (financial health).

Theoretical Framework

Breneman's (1994) microeconomic theory of the private college provided the theoretical framework for this study. Breneman (1994) proposed a two-stage optimization process for private colleges. In the first stage, the college determines the desired level of enrollment and resources needed for said enrollment. Resources include facilities, faculty, staff and other programs. The second stage focuses on improving the quality of enrollment and resources (Breneman, 1994).

Since very few institutions can fill all their seats with full-paying, highly-qualified students, many institutions use tuition discounting as a strategy to increase enrollment and quality of students. Tuition discounting is an important part of stage two and used as a tool to improve the quality of students matriculating at the institution. Figure 1 (Chapter 2) illustrates the relationship between tuition, number of full-pay students, total enrollment and unfunded tuition discount, which all together demonstrate the demand curve for an institution.

Breneman (1994) proposed that if less selective colleges set their optimal enrollment at a certain level, they experience compromised control over the unfunded tuition discounting. Conversely, if a cap is placed on the amount of unfunded tuition discounting, there will be less control over the level, or quality, of enrollment (Breneman, 1994). Breneman suggested that colleges find themselves on a continuum of control over enrollment or control over unfunded tuition discounts.

Research Questions and Hypotheses

The following research questions and hypotheses guided this study.

RQ1: What is the degree of relationship, if any, between the unfunded tuition discount rate (UTDR) and the financial health of private, non-profit baccalaureate colleges?

H1o: There is no relationship between the unfunded tuition discount rate and the financial health of private, non-profit baccalaureate colleges.

RQ2: To what degree does enrollment size (FTE) moderate the relationship between the unfunded tuition discount rate and the financial health of private non-profit colleges?

H2o: Enrollment size does not moderate the relationship between the unfunded tuition discount rate and the financial health of private non-profit colleges.

RQ3: To what degree does institutional debt (ID) moderate the relationship between the unfunded tuition discount rate and the financial health of private non-profit colleges of various sizes?

H3o: Institutional debt does not moderate the relationship between the unfunded tuition discount rate and the financial health of private non-profit colleges of various sizes.

RQ4: To what degree does institutional wealth, defined as endowment per student (EN/STU) moderate the relationship between the unfunded tuition discount rate and the financial health of private non-profit colleges of various sizes?

H4o: Institutional wealth does not moderate the relationship between the unfunded tuition discount rate and the financial health of private non-profit colleges.

RQ5: To what extant does the unfunded tuition discount rate, enrollment size, institutional debt, and institutional wealth predict the financial health of very small colleges?

H5o: There will be no significant prediction of financial health of very small colleges by unfunded tuition discount rate, enrollment size, institutional wealth, and institutional debt.

H5oa: In the presence of the other variables, there will be no significant prediction of financial health of very small colleges by the unfunded tuition discount rate (UTDR).

H5ob: In the presence of the other variables, there will be no significant prediction of financial health of very small colleges by the enrollment (FTE).

H5oc: In the presence of the other variables, there will be no significant prediction of financial health of very small colleges by the institutional debt (ID).

H5od: In the presence of the other variables, there will be no significant prediction of financial health of very small colleges by the institutional wealth (EN/STU).

Variables

The independent variables in this study were the unfunded tuition discount rate, the enrollment, the institutional debt, and the endowment per student. The data for each of these independent variables were available in IPEDS. The dependent variable in this study was the financial health of the institution, as indicated by the CFI score or the DoE score.

Population

This study compared the financial health of very small colleges to larger colleges of similar type. The population was a census of all private, non-profit baccalaureate colleges, participating in Title IV funding in the United States as listed in IPEDS. Certain classifications of four-year special focus institutions were included as well (see Baccalaureate and four-year special focus).

Enrollment. Since enrollment numbers can fluctuate from year to year, the average enrollment over five years (2011-12 through 2015-16) was used to determine the size category of the college. Colleges with an average of less than 750 students (undergraduate and graduate) were considered very small colleges and colleges with 751 FTE and over were considered larger.

Baccalaureate and four-year special focus. According to the Carnegie Commission on Higher Education (2015) baccalaureate colleges are those institutions at which more than 50% of degrees awarded are four-year or higher. Baccalaureate colleges also confer fewer than 50 master's degrees and fewer than 20 research doctorate degrees each year.

Four-year special focus institutions are those that award a high percentage of degrees in one particular field or set of related fields (Carnegie, 2015). Only categories of four-year special focus institutions that are primarily undergraduate colleges were included. Included categories were faith-related institutions, other health professional schools, engineering schools, other technology-related schools, business and management schools, art, music, and design schools, and other special focus institutions.

To extract the census sample, a report using finalized data from 2015-16 was run with the following variables: private, not-for-profit, four-year or above, located in the U.S., Title IV postsecondary institution, primarily baccalaureate degree granting.

All branch campuses and adult learning centers which are part of a larger parent institution, were excluded. Institutions that are owned by health systems or hospitals were also excluded as the financial support for these colleges is assumed to be different than an independent college.

A total of 575 colleges and universities fit these criteria. Following the methodology of Martin (2012), colleges were removed from the list that inconsistently reported zero dollars of unfunded institutional aid within the five years examined. Colleges that reported a percentage of unfunded institutional aid in one or more years and zero dollars for other years were assumed to have reporting errors/omissions on the part of the college. Also, colleges that reported more than 3000 FTE, institutional debt more than $75 million, and endowment per student of more than

$122,600 were removed as these colleges were considered outliers. A total of 570 colleges remained part of the population.

Data Collection

The use of IPEDS to collect data allowed for a census sample of private, non-profit, baccalaureate colleges. The Integrated Postsecondary Education Data System (IPEDS), organized by the National Center for Educational Statistics (NCES), holds data for over 7,300 colleges and universities in the United States and U.S. Territories (NCES, 2017). All institutions that participate in the Title IV federal student aid program must submit data in the annual IPEDS survey. Participation is optional for institutions that do not receive Title IV funds (NCES, 2017). Data stored in IPEDS is publicly available.

Once the sample was identified, enrollment data and financial data were also extracted from IPEDS for each year being studied (2011-12 – 2015-16) by variables. Table 2 describes the variables retrieved from IPEDS.

CFI. The Composite Financial Index (CFI) score for each sample institution was calculated by using the numbers extracted from the *Finance* tab of the *Reported Data* of each institution. The CFI score is a sum of four individually weighted ratios including the Primary Reserve Ratio, Net Income Ratio, Return on Net Assets Ratio and Viability Ratio. The Primary Reserve Ratio measures the "resource sufficiency and flexibility" (Prager, Salluzzo, Tahey, & Cowen, 1999, p. 8) of an institution. Fulfillment of the institutional mission is the most important use of available resources and therefore resources must be adequate and flexible enough to serve the purpose of the mission. The Primary Reserve Ratio is measured by dividing the expendable net assets by the total expenses of the institution (see Table 3). The expendable net assets include

Table 2

Data Points Retrieved from IPEDS

Level 1	Level 2	Level 3	Level 4
12-month enrollment	12-month instructional activity and full-time equivalent enrollment: 2003-04 to current year	Reported 12-month full-time equivalent (FTE) undergraduate enrollment	
Finance	Private not-for-profit institutions	Revenues and investment returns	Tuition and fees Total revenues and investment returns – unrestricted Net assets released from restriction
		Expenses by functional and natural classification: Fiscal years 1997 to 2015	Total expenses – total amount
		Student grants	Institutional grants (unfunded) Institutional grants (funded)
		Endowment Assets	Value of endowment assets at the beginning of the fiscal year
		Assets and liabilities	Property, plant, and equipment, net of accumulated depreciation Total liabilities Debt related to property plant and equipment Total unrestricted net assets Temporarily restricted net assets Total net assets Net assets beginning of the year Total change in net assets

long-term debt, and all assets that are not permanently restricted such as endowment funds, or temporarily restricted funds intended for facility investment (Prager et al., 1999). Expendable net assets do not include equity in facility assets, as the Primary Reserve Ratio is intended to measure how long an institution could function without having to sell off assets or somehow generate further income (Prager et al., 1999). Total expenses was the denominator in the Primary Reserve Ratio (see Table 3). This would include all expenses on the financial activity sheet of an institution. An institution should aim to have five months of operating reserves available to use at any given time (Prager et al., 1999).

The Net Income Ratio indicates whether an institution experienced a surplus or a deficiency during the indicated time period. The Net Income Ratio is determined by dividing the remainder of the operating revenue (be it positive or negative) by the total operating expenses. This number is divided by the total operating income (Prager et al., 1999). Table 3 displays this formula. These are all unrestricted funds, as restricted funds are not used for operational budgets unless they are released from restriction. A positive ratio indicates that an institution is operating with a surplus and a negative ratio indicates a deficit. An institution should strive to maintain a two to four percent Net Income Ratio (Prager et al., 1999).

Table 3

Formulas for Calculating Ratios Used in Determining CFI Scores

Primary Reserve Ratio	$\dfrac{\text{Expendable net assets}}{\text{Total Expenses}}$
Net Operating Revenues Ratio	$\dfrac{\text{(Difference of unrestricted operating revenues over unrestricted operating expenses)}}{\text{Total unrestricted operating revenue}}$
Return on Net Assets Ratio	$\dfrac{\text{Change in net assets}}{\text{Total net assets}}$
Viability Ratio	$\dfrac{\text{Expendable net assets}}{\text{Long-term debt}}$

Prager, Salluzzo, Cowen, Mezzina, and Tahey (2005) described the Return on Net Assets Ratio as the ratio used to determine if a college or university is in a better financial position than previously. This ratio looks at overall wealth of an institution as all assets are considered in this ratio. The numerator of the Return on Net Assets Ratio is the change in net assets, including unrestricted, temporarily restricted and permanently restricted assets (Prager et al., 1999). The total net assets, including temporarily restricted and permanently restricted funds, at the beginning of the fiscal year (or end of the previous year) is the denominator for this ratio (see Table 3) (Prager et al., 1999). This ratio is best used over a longer period rather than just a one-time use due to both the internal and external influences on this ratio. For example, Prager et al., (2005) noted that while an improvement in overall net assets is important, strategic spending may cause this ratio to decline or stay stagnant for a time. Regardless, a positive ratio is most important.

Finally, the Viability Ratio measures the ability of an institution to pay their debts with their available assets. The formula for the Viability Ratio uses the same numerator as the Primary Reserve Ratio: expendable net assets. In this case, long-term debt is the denominator (see Table 3) (Prager et al., 1999). Institutions should at least maintain a 1:1 ratio, but preferably 1.25X up to 2.00X. However, resources are spent according to the institutional mission and therefore the appropriate ratio may be different for each institution (Prager et al., 1999).

Because long-term debt is not a statistic available in IPEDS, a proxy was selected for this data point. After the comparison of ten institutions audited financial reports to data reported in IPEDS and IRS 990 forms, it was determined that *debt related to property and plant*, found in IPEDS, was a suitable proxy for the long-term debt variable in both the CFI calculation and the institutional debt variable. In seven out of the 10 cases, *debt related to property and plant* was

the same amount, or very similar, as the long-term debt listed in the audited financial statement. In each of the three institutions in which the numbers were not the same, the *debt related to property and plant* was listed as $0. However, when consulting the institutions reported IRS 990 form, it was found that the long-term debt listed in the audited financial report was listed as tax-exempt bond liabilities and/or secured mortgages.   Ideally, IRS 990 forms would have been consulted for all years in which an institution reported $0 for *debt related to property and plant*. However, only three years of IRS 990 forms were available for free, and due to financial limitations, it was impractical to secure the remaining two years of 990 forms. Therefore, schools that reported $0 of *debt related to property and plant* were considered to have no debt. As such, according to Prager et al (1999), scores for those institutions with no debt do not include the viability ratio and were calculated with an adjusted weighting. Specifically, Table 4 describes the data directly reported in IPEDS that was used to calculate the CFI scores.

Table 4

Calculating CFI with IPEDS data

Primary Reserve Ratio (PRR)	(Total unrestricted net assets + temporarily restricted net assets + debt related to property, plant, and equipment – property, plant, and equipment net of accumulated depreciation)/Total Expenses
Net Operating Revenues Ratio (NORR)	(Current year total unrestricted net assets – Last year total unrestricted net assets)/(Total unrestricted revenues and investment return + unrestricted net assets released from restriction)
Return on Net Assets Ratio (RNAR)	Total change in net assets/Net assets beginning of the year
Viability Ratio (VR)	(Total unrestricted net assets + temporarily restricted net assets + debt related to property, plant, and equipment – property, plant, and equipment net of accumulated depreciation)/Debt related to property, plant, and equipment

Each ratio, when calculated, was divided by a designated value to calculate a strength score according to the Prager et al. (1999) formula. Table 5 describes the strength score values for each of the ratios.

Table 5

CFI Strength Score Values

Primary Reserve Ratio	0.133
Net Operating Reserve Ratio	0.013
Return on Net Assets Ratio	0.02
Viability Ratio	0.417

Finally, the ratios divided by the strength values, were weighted and added together to give the final CFI score. Ratios were weighted and added as such:

PRR(.35)+NORR(.10)+RNAR(.20)+VR(.35)

If an institution did not report any long-term debt, determined as *debt related to property and plant*, the weighting changed as such:

PRR(.55)+NORR(.15)+RNAR(.30)

DoE. Department of Education Financial Responsibility scores (DoE) were retrieved from the Department of Education website (Department of Education, 2017). As these scores were already calculated, no further calculations were needed. However, there were two institutions for which less than three composite scores were reported for the five-year period studied, and therefore, these colleges were removed from the sample.

For comparison purposes, Table 6 describes the formulas used by the Department of Education in calculating the various ratios used in the DoE score.

Table 6

Formulas for Calculating Ratios Used in Determining DoE Scores

Primary Reserve Ratio (PRR)	$\dfrac{\text{Expendable Net Assets}}{\text{Total Expenses}}$
Equity Ratio (ER)	$\dfrac{\text{Modified Net Assets}}{\text{Modified Assets}}$
Net Income Ratio (NIR)	$\dfrac{\text{Change in Unrestricted Net Assets}}{\text{Total Unrestricted Revenue}}$

Expendable Net Assets = (unrestricted net assets + temporarily restricted net assets – annuities, term endowments, and life income funds that are temporarily restricted – intangible assets – net property, plant and equipment + post-employment and retirement liabilities + all debt obtained for long-term purposes – unsecured related-party receivables)

Modified Net Assets = (unrestricted net assets + temporarily restricted net assets + permanently restricted net assets – intangible assets – unsecured related-party receivables)

Modified Assets = (total assets – intangible assets – unsecured related-party receivables)

Calculated ratios are multiplied by the strength factor score, as described in Table 7. If a score is results in greater than 3, the score is equal to 3 and if a score is less than -1 the score is -1. The scores are then weighted and added together for a final composite score. The weighted ratio formula is:

$$PRR(.40)+ER(.40)+NIR(.20)$$

Table 7

DoE Strength Score Values

Primary Reserve Ratio	10
Equity Ratio	6
Net Income Ratio (if negative)	1 + (25x net income ratio)
Net Income Ratio (if positive)	1+ (50x net income ratio)

Data Analysis

Three different statistical analyses were used to analyze the five research questions.

Method applied to hypothesis 1: To test hypothesis 1 the relationship between the unfunded tuition discount rate (UTDR) and the financial health of the sample colleges was assessed for linearity, and the appropriate bivariate statistical analysis was applied, in this case, a Pearson's *R* correlation. The correlation between the UTDR and financial health were determined for the entire population, for very small colleges (<750), and for larger colleges (>750).

Method applied to hypothesis 2: Testing the second hypothesis delves deeper into the relationship between the unfunded tuition discount rate and the financial health of a very small

college by asking if the size of a college effects this relationship. A moderated regression analysis was used to analyze this effect. A moderation regression analyzes the effect that a moderating variable has on the relationship between the predictor variable and the dependent variable. As a result, a one unit change in the predictor variable will result in a certain change in the dependent depending on the value of the moderator. In this analysis, the UTDR was the predictor variable, financial health the dependent variable, and FTE was the moderating variable. This moderation regression was run for the entire population, for very small colleges (<750), and for larger colleges (>750).

Method applied to hypothesis 3: The level of institutional debt carried by colleges may effect the relationship between the UTDR and the financial health. Institutional debt (ID), in this study, was defined by the amount of *debt related to property and plant*, as reported in IPEDS. To test this hypothesis, a moderated regression analysis was applied, with the UTDR as the predictor variable, financial health as the dependent variable, and ID as the moderating variable. This moderation regression was run for the entire population, for very small colleges (<750), and for larger colleges (>750).

Method applied to hypothesis 4: The literature indicated that institutional wealth, as defined by endowment size per student (EN/STU), effects institutional success (Lee, 2009). The fourth question examined what effect institutional wealth has on the relationship between the UTDR and financial health. To test this hypothesis, a moderated regression analysis was applied, again with the UTDR as the predictor variable, financial health as the dependent variable, and this time with EN/STU as the moderating variable. This moderation regression was run for the entire population, for very small colleges (<750), and for larger colleges (>750).

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Method applied to hypothesis 5: Any one of the previously examined independent or moderating variables alone may or may not have an effect on financial health. The final hypothesis was tested to understand any relationship these variables have together in effecting the financial health of very small colleges. A multiple regression analysis was performed to test this hypothesis, with UTDR, FTE, ID, and EN/STU as the independent variables, and financial health as the dependent variable. The first regression analysis used CFI as the dependent variable and the second used DoE as the dependent variable.

Limitations of Methodology

The use of IPEDS as the data source for this study decreases the limitations that may be present with other forms of data collection. Most institutions input their data into IPEDS from independently audited income statements and balance sheets. IPEDS is accepted as a generally reliable and consistent measure (Doti, 2013). However, there is still room for error as all data is input by persons at participating institutions and that person may be unfamiliar with IPEDS definitions or processes. As a result, errors in submission may be made, despite the fact that the IPEDS system prompts users when any unexpected data is entered or questions are skipped. Accounting practices may vary between institutions as well, resulting in misrepresentative data for institutions. Different accounting practices were apparent for institutions that reported $0 in *debt related to plant and property* in IPEDS and yet reported liabilities on the IRS 990 form related to plant and property. Data entry errors and accounting differences which resulted in unexpected results, particularly for categories which contributed to variables such as UTDR and ID, may confound the results of this study. However, compared to voluntary participation in data collection attempts, IPEDS is particularly successful in collecting requested data and enjoys

relatively high completion rates, probably due to the threat of losing access to Title IV funds when institutions fail to comply.

Using the CFI as the measure of financial health has limitations. While the CFI is a generally accepted measure of institutional health, it only measures financial components of institutional health. As noted by Hunter (2012), non-financial components contribute to an institution's overall health of which financial health is a part.

The CFI score of individual institutions is not publicly available. Therefore the CFI score for each institution was calculated using publicly available data. Each of the necessary components to calculate the CFI score was available in IPEDS, except long-term debt. Using *debt related to plant and property* as a proxy for long-term debt is consistent methodology, but is known not to be an accurate reflection of long-term debt for all institutions. In an effort to include institutions that truly have no debt, all institutions reporting $0 on *debt related to plant and property* were included.

Additional limitations of this study include the chosen statistical methods. Moderation effects are difficult to detect in non-experimental studies (McClelland & Judd, 1993). Errors in the predictor variable and the moderating variable amplified when these two variables are multiplied together to produce the interaction effect which can reduce the statistical power of the analysis. As a result, Evans (1985) concluded that even effects as small as 1% in explaining the variance in the dependent variable should be considered significant, though McClelland and Judd (1993) warned that the odds are against researchers who seek significant moderation effects in non-experimental studies.

Two moderating variables used in this study were positively skewed, meaning the mean is not representative of the sample. To avoid multicollinearity, all independent variables were z-

scored, and while this helps to maintain homoscedasticity, it did cause the low values used in the moderation analysis to be too low, such as in the case of ID and EN/STU. These variables could not have negative values, yet the low values produced by subtracting one standard deviation from the mean resulted in negative numbers. As a result, all negative numbers were transformed to zero. Hayes (2013) suggested using the Johnson-Neyman technique to avoid using arbitrary values of plus or minus one standard deviation for the high and low values. Using this technique will determine where on the continuum the moderator no longer has a significant effect on the predictor variable, thus allowing a more precise interpretation of the interaction. The Johnson-Neyman technique, however, was not available on the statistical software used for this study.

Ethical Considerations

Ethical considerations in this research reflected the standards set out in the Belmont Report (1979). The three principles guiding ethical research involving human subjects are (a) respect for persons, (b) beneficence, and (c) justice. Due to the public nature of the secondary data that was used in this study, respect for persons and justice was demonstrated through the careful and accurate handling of the data, including the data analysis and reporting. The data used in this study was obtained through IPEDS which is maintained by the National Center for Education Statistics and the Department of Education. The data were collected from all obligated institutions and is publicly available on the IPEDS and DoE websites. Respect for persons and institutions has been demonstrated by not using specific names.

Chapter 4: Results

The purpose of this study was to understand the effect of the unfunded tuition discount rate (UTDR) on the financial health of very small colleges (<750) compared to larger colleges of similar nature (private, non-profit, baccalaureate). This study also investigated whether the strength of the relationship between the UTDR and the financial health is moderated by variables such as enrollment size (FTE), institutional debt (ID), and institutional wealth, as defined by endowment/student (EN/STU). Table 8 provides a convenient table of abbreviations.

This chapter will discuss a description of the population and the adjustments made to the population, and a description of the very small college sample (<750) and the larger college sample (750+). The data will be described by variable as well as by sample set. Finally, the results of the data will be presented according to the research question.

Description of Population

A census sample including all private, baccalaureate, non-profit colleges was retrieved from IPEDS. After removing colleges that were part of multi-campus or health systems and colleges with missing data, 575 colleges remained in the population. Some of the remaining colleges' data were outside the acceptable range and considered outliers, as defined by the outlier labeling rule (Hoaglin, Iglewicz, & Tukey, 1986). The outlier labeling rule indicates that data more than three standard deviations above or below the mean should be removed. In this study all data points three standard deviations above the mean were removed from the study, causing each analysis to have a varying number of subjects. However, because the data was positively skewed with the lowest possible score for the independent variables being zero, no data points were removed for being three standard deviations below the mean. For example, College A may have had FTE, ID, and UTDR within the range, but the EN/STU was an outlier (more than three

standard deviations above the mean). Therefore, College A was included in the analyses examining the relationships between FTE or ID to UTDR and financial health, but was not included in the analysis looking at EN/STU. Some of the data points were very much out of the range, such as the largest enrollment (FTE) which was more than 10 standard deviations from the mean at 8,213. The largest ID at $333,456,703, was 17.5 standard deviations above the mean, and the largest EN/STU was 81.6 standard deviations above the mean at $2,591,218/student. Fifteen data points were removed from FTE, 62 from ID, and 80 from EN/STU. Five institutions reported values over three standard deviations in each of the FTE, ID, and EN/STU categories and were removed entirely from the study, leaving 570 in the full sample.

The variability within the sample of 570 colleges that fit the criteria of private, baccalaureate, non-profit institutions, was vast. Nearly 45% of colleges in this sample were very small colleges with 256 colleges having an average enrollment of under 750 FTE during the five-year study period. The smallest college in the sample averaged just 15 students.

Since this study sought to explore the nature of the relationship between the size of a college, the amount of institutional debt, the institutional wealth, the unfunded tuition discount rate and the financial health of an institution, it was important to maintain the reported values, even if they were zero. The number of institutions that reported zero on some variables is notable. Ninety-seven institutions reported $0 of institutional debt, 79 institutions reported having $0 of endowment, and 66 institutions reported 0% UTDR. It is assumed that data input to IPEDS is accurately reported. However, it is possible that institutions misreported data in IPEDS, thereby making these statistics inaccurate. See Chapter 3 "Limitations" for further discussion. Thirteen colleges reported $0 in all three of these variables. The minimum value for each of these variables, zero, and the number of institutions reporting zero does skew the

distribution. However, it also highlights the large variance in ranges of each of the variables in the study as the largest mean ID in the range was $73,670,000, the largest mean EN/STU in the range was $121,800, and the highest mean UTDR in the range was 92.1%.

Over the five years studied, 2011-2016, changes in each of the variables were notable. Overall, enrollment tended to decrease over the five years, with 56% of institutions seeing a reduction in enrollment and a median drop of 2.07%.   The largest drop in enrollment for any one school was by 1676 students. Institutional debt slightly increased over the five years; however, endowment per student increased more dramatically. Seventy-two percent of institutions increased their endowment per student, with a median increase of 12.6%.   The mean UTDR steadily increased over the five-year period, rising from 26.18% in 2011 to 29.48% in 2016. Sixty-six percent of colleges increased UTDR during the period studied. Figure 2 describes the average year-to-year changes over the period studied.

While these changes over time are interesting to consider, the possibility of individual institutional data input errors could affect the outcome of these descriptive statistics. If an institution misreported their ID or endowment in 2011 these statistics could be inaccurate, particularly if "0" was inappropriately reported in 2011.
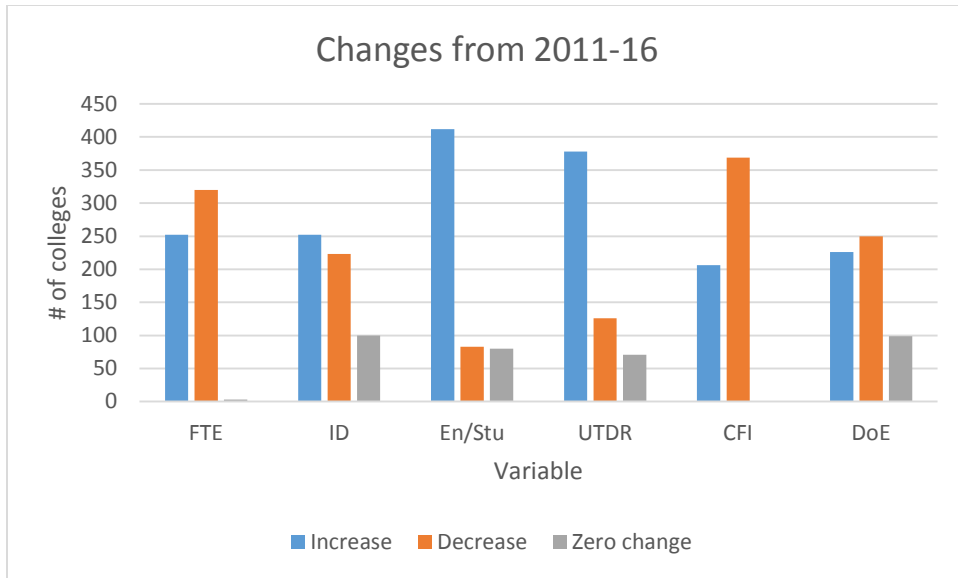
Figure 2. *Change in independent and dependent variables, 2011-2016*

Description of sample – Very Small Colleges. Colleges with an average enrollment of under 750 FTE were considered very small colleges. A total of 256 colleges from the population fit this criterion. The mean enrollment for this set was 310 FTE and the median was 257. As in the full sample, the variance in this group was large. Although 78% of institutions reporting $0 in ID were in the <750 sample, the mean ID was $4,124,000 with a maximum value of $41,690,000. Of the 79 institutions that reported $0 in EN/STU over the five-year period, 96% of them were <750. Similarly, 83% of the 66 institutions that reported 0% UTDR were very small colleges. Table 8 provides the descriptive statistics for the sample set of colleges <750 FTE.

Table 8

Descriptive Statistics for <750 FTE, 2011-2016

	FTE	ID	EN/STU	UTDR	CFI	DoE
Valid	256	254	236	256	256	256
Mean	310	$4,124,000	$1,448,000	20.44	2.23	2.29
Std. Deviation	217	$6,888,000	$2,431,000	18.78	2.71	.65
Minimum	15	$0	$0	0.000	-6.58	-.50
Maxi-mum	737	$41,690.000	$121,500	76.56	9.19	3.0
Skewness	.4	2.57	2.49	.63	-.09	-1.5
Kurtosis	-1.2	7.5	6.5	-.48	.22	2.86

Also noteworthy was the number of colleges in the very small college set that had low financial health scores. A CFI score of <3.0 indicates an unhealthy institution. In the full sample, there were 288 colleges that averaged less than 3.0, 57% of which were <750. Similarly, a DoE score of 1.0 or less indicates an unhealthy college. In the full sample, 16 subjects averaged less than 1.0 over the five-year study period. Thirteen of the 16, or 81%, of the colleges averaging less than 1.0 on the DoE were in the <750 set.

Description of sample – Larger colleges. A total of 314 colleges averaged enrollments over 750 FTE during the period studied. The mean enrollment for this set was 1522 FTE, with the largest college having 2912 FTE. Not unexpectedly, the range of variables was larger in this set than in the <750 set. The maximums for the full sample were found in the larger college set, including the largest ID, $73,670,000, the largest EN/STU, $121,800, and of course the largest

enrollment 2912 FTE. However, the highest CFI scores were not found in the larger college set.

The highest CFI score in the 750+ set was 8.9 compared to 9.19 which was found in the <750

set. Similarly, the lowest CFI score, -6.96, was also in the 750+ set compared to -6.58 in the

<750 set. Table 9 provides the descriptive statistics for the 750+ sample.

Table 9

Descriptive Statistics for 750+ FTE, 2011-2016

	FTE	ID	EN/STU	UTDR	CFI	DoEScore
Valid	299	254	254	314	314	314
Mean	1522	$25,260,000	$38,310	33.86%	3.57	2.56
Std. Deviation	549	$19,730,000	$32,940	15.43%	2.31	.38
Minimum	760	$0	$0	0%	-6.96	.40
Maximum	2912	$73,670,000	$121,800	92.1%	8.90	3.00
Skewness	.68	.58	.92	-.32	-.54	-2.11
Kurtosis	-.47	-.65	-.08	.46	.84	6.23

Description of Variables

All data for the variables used in the statistical analysis were retrieved from IPEDS.   The

following section describes the statistics for each variable, including methods used to calculate

variables that were not directly available. These descriptive statistics are provided to consider

the annual changes over the five years, however, it is important to note that some colleges moved

between groups. Colleges were grouped strictly according to FTE and depending on the

fluctuation of enrollment, the same college may have been categorized in the <750 sample in one

year and in the 750+ sample the next year. For the final statistical analysis, the average

enrollment of all five years was used to determine in which group each college fell.

Table 10

Descriptive Statistics for Unfunded Tuition Discount Rates for <750 FTE and 750+ FTE

Samples (2011 – 2016)

Unfunded tuition discount rate. The UTDR is the unfunded institutional aid divided by the gross tuition and fees. IPEDS reports tuition and fees minus discounts and allowances in the form of both funded and unfunded institutional grants. The following formula was used to calculate UTDR:

$$\frac{\text{tuition and fees + funded institutional grants+ unfunded institutional grants}}{\text{unfunded institutional grants}}$$

The UTDR steadily increased over the five years studied in both the under 750 FTE sample and the 750+ FTE sample. However, 78% of larger colleges reported an increase in UTDR versus just 51% of very small colleges during the time studied.

The <750 set included 55 institutions that reported $0 of unfunded tuition discounts given during the five years studied. This accounts for 83% of the total number of colleges that reported 0% UTDR. This is also reflected in the lower mean and median UTDR for the <750 FTE set, even though this set contained the highest maximum UTDR for any one college. The mean UTDR for the larger colleges was 1.66x the mean UTDR for very small colleges.   Table 10 describes the UTDR of colleges <750 FTE and 750+ FTE for the years studied.

	Mean	Median	St. Dev.	Minimum	Maximum
2011-2012					
<750	19.13	15.8	19.05	0	82.4
750+	31.82	34.2	15.42	0	91.9
2012-2013					
<750	20.24	16.9	19.77	0	94.6
750+	32.73	35.5	15.76	0	92.9
2013-2014					
<750	20.46	17.9	19.45	0	94.5
750+	34	36.8	15.64	0	91.1
2014-1015					
<750	21.44	18.35	20.06	0	93.1
750+	34.38	37.25	16.12	0	91.9
2015-2016					
<750	21.94	21.2	20.53	0	93.4
750+	35.64	38.2	16.12	0	92.7

Institutional debt. Debt on property, plant, and equipment, as reported in IPEDS, was used for institutional debt (ID). Of the variables used in this study, reported ID was the greatest difference between very small and larger colleges. The mean ID for larger colleges was 6.1 times greater than the mean ID for the very small colleges. However, when considered in terms of amount of debt per student, the difference nearly disappeared. Very small colleges had a mean debt per student of $11,674, while larger colleges average $14,482 per student. There were colleges in both groups that had $0 of ID. Table 11 describes the ID for <750 FTE and 750+ FTE colleges for the years 2011-2016.

Descriptive Statistics for Institutional Debt for <750 FTE and 750+ FTE Samples

(2011 – 2016)

	Mean	**Median**	**St. Dev.**	**Minimum**	**Maximum**
2011-2012					
<750	$3,812,507	$289,953	$7,155,737	$0	$57,943,387
750+	$23,176,310	$18,723,532	$20,183,015	$0	$72,510,000
2012-2013					
<750	$3,824,315	$358,411	$6,446,116	$0	$35,318,096
750+	$23,479,580	$20,760,927	$19,556,463	$0	$71,080,000
2013-2014					
<750	$4,004,628	$696,612	$6,710,303	$0	$37,500,022
750+	$24,854,803	$22,110,721	$19,723,883	$0	$72,821,272
2014-1015					
<750	$4,179,376	$790,795	$6,973,478	$0	$36,608,015
750+	$25,224,785	$23,009,241	$19,611,797	$0	$72,212,934
2015-2016					
<750	$4,393,571	$934,258	$7,663,219	$0	$54,650,450
750+	$25,906,063	$22,647,030	$19,906,591	$0	$72,060,703

Table 11

Institutional Wealth. Institutional wealth, as EN/STU, was calculated by dividing the value of the institutions' endowment at the beginning of the year by the reported number of full-time equivalent students. Both of these values were reported in IPEDS.

The mean EN/STU for the larger college sample was 2.6x that of the very small college sample. However, because of the number of colleges that reported $0 of endowment, this data was somewhat skewed. Therefore, one should consider comparing the median statistic as well. The median EN/STU for larger colleges was eight times that of the very small college set. This vast difference between sample sets is due, in part, to the large number of colleges in the very small college sample (76) that reported $0 of enrollment, compared to only three in the larger college sample. While many very small colleges had lower EN/STU, it is interesting to note, that the smallest college in the sample had an EN/STU of $281,883, thereby indicating that small size does not necessarily mean that a college has no endowment. Table 12 describes the statistics for EN/STU for the <750 FTE sample and the 750+ FTE sample for the years studied.

Table 12

Descriptive Statistics for Endowment/Student for the <750 FTE and 750+ FTE Samples

(2011 – 2016)

	Mean	Median	St. Dev.	Minimum	Maximum
2011-2012					
<750	$12,132	$3,028	$20,653	$0	$118,699
750+	$36,984	$26,707	$33,177	$0	$121,578
2012-2013					
<750	$12,804	$3,573	$21,170	$0	$110,874
750+	$37,204	$27,554	$33,154	$0	$119,655
2013-2014					
<750	$13,853	$3,609	$22,971	$0	$113,801
750+	$39,054	$28,734	$33,953	$0	$122,453
2014-1015					
<750	$13,550	$3,651	$22,393	$0	$115,004
750+	$38,512	$30,251	$32,177	$0	$119,760
2015-2016					
<750	$13,643	$3,964	$22,437	$0	$120,895
750+	$38,290	$31,900	$31,418	$0	$119,419

CFI. The CFI score, a measure of financial health, was calculated using the Prager, Salluzzo, Tahey, and Cowen (1999) formulas previously discussed in Chapters 2 and 3. The larger college sample generally had higher mean CFI scores for each year studied, including a higher overall mean of 3.57 compared to an overall mean of 2.22 for the very small college set. The extremes of the range, however, varied between the two groups. The larger college set had the extreme minimum of the range with the overall mean of -6.96, while the very small college set had the higher maximum value with an overall mean of 9.19. It is interesting to note, the number of years with "10", the highest possible CFI score, as the maximum value of the <750 FTE set, as shown in Table 13 which describes the CFI score for the <750 FTE and 750+ FTE samples.

Table 13

Descriptive Statistics for CFI scores for the <750 FTE and 750+ FTE Samples (2011 – 2016)

	Mean	Median	St. Dev.	Minimum	Maximum
2011-2012					
<750	1.95	1.97	3.32	-7.04	10
750+	3.04	3.06	2.65	-5.39	9.1
2012-2013					
<750	2.40	2.49	3.38	-7.14	10
750+	4.68	5.0	2.9	-8.91	10
2013-2014					
<750	2.63	2.45	3.77	-10	10
750+	5.0	5.12	3.0	-8.07	10
2014-1015					
<750	2.37	2.23	3.49	-10	10
750+	3.77	4.1	2.74	-8.61	9.55
2015-2016					
<750	1.61	1.6	2.53	-6.23	6.46
750+	1.72	1.62	1.72	-9.08	7.16

DoE. The Department of Education calculates a composite score of financial

responsibility for every college which participates in the Federal Student Aid program (Federal

Student Aid, n.d.). These scores are published annually and are publicly available on the

Department of Education website. The larger college sample generally had higher means for

each year studied, including a higher overall mean of 2.56 compared to an overall mean of 2.29

for the very small college set. The larger college sample had a minimum of .4, while the very

small college sample had a minimum of -.5. Both groups had a maximum score of 3, which is

the highest possible score to receive.   Table 14 describes the average DoE scores of the <750

FTE sample and the 750+ FTE sample for the years studied.

Table 14

Descriptive Statistics for DoE scores for the <750 FTE and 750+ FTE Samples (2011 – 2016)

	Mean	Median	St. Dev.	Minimum	Maximum
2011-2012					
<750	2.22	2.3	.74	-.8	3
750+	2.46	2.5	.47	.6	3
2012-2013					
<750	2.32	2.5	.74	-.9	3
750+	2.74	3	.44	.5	3
2013-2014					
<750	2.31	2.5	.8	-1	3
750+	2.74	3	.44	-.7	3
2014-1015					
<750	2.20	2.4	.78	-1	3
750+	2.36	2.3	.5	-.8	3
2015-2016					
<750	2.22	2.4	.76	-1	3
750+	2.36	2.4	.5	-.8	3

Results by Research Question

The first research question asks simply about the relationship between the UTDR and the financial health of a college. The second, third, and fourth questions consider how a third variable may moderate the interaction between the UTDR and the financial health. The final question considers the effect that all variables may have together on the financial health of a college.

Results of RQ1. Question 1 asked what is the degree of relationship, if any, between the UTDR and the financial health of private, non-profit baccalaureate colleges? This question established the nature of the relationship between the UTDR and the financial health of a college. The null hypothesis was that there would be no relationship between the UTDR and the financial health of private, non-profit baccalaureate colleges.

Assumptions of normality for correlations and moderation regression analyses were checked. Two independent variables, ID and EN/STU were positively skewed and the dependent variable DoE was negatively skewed. The researcher chose not to transform the data to account for the skewness as results did not vary when log transformations were attempted. To address issues of multicollinearity, all independent variables were centered using z-scoring. Three correlations were run, once with the full sample, once with the <750 set, and once with the 750+ set, using both CFI and DoE scores for the measure of financial health. In the full sample, neither the CFI ($r = -.02$, $p =.64$) nor the DoE ($r = -.03$, $p =.42$) scores correlated significantly with UTDR. The null hypothesis was confirmed for the full sample.

However, in the sample of very small colleges, <750 FTE, both CFI ($r = -.15$, $p =.02$) and DoE ($r = -.14$, $p =.02$) were significantly correlated to UTDR at the .05 level of significance, though the relationship was negative. For this sample, the null hypothesis was rejected.

In the sample of larger colleges, those with more than 750 FTE, the relationship between the financial health and the UTDR remained negative, though neither measure (CFI $r = -.09$, $p =.13$; DoE $r = -.1$, $p =.08$) was significant at the .05 level. For larger colleges, the null hypothesis was confirmed.

Results of RQ2. Question 2 asked to what degree does enrollment size moderate the relationship between the unfunded tuition discount rate and the financial health of private non-profit colleges? The null hypothesis predicted that enrollment size does not moderate the relationship between the unfunded tuition discount rate and the financial health of private non-profit colleges.

It was noted in the previous question that when considered by themselves, the UTDR of very small colleges had a significant negative relationship with financial health. This question sought to understand the impact FTE has on the relationship between UTDR and financial health of both very small colleges and larger colleges.

Two regression analyses were run, one with CFI as the dependent variable, Y, and one with DoE score as the dependent variable, also Y. In a moderation regression, the effect of the independent variable X on Y is dependent on M. To analyze the dependent effect, the independent variable, X, and moderating variable, M, are multiplied together. The moderation regression equation is

$$\hat{Y} = i + b_1 X + b_2 M + b_3 XM$$

Interactions that were significant were probed for further clarity. The effect of X on Y as moderated by M was manipulated by raising and lowering M. A low version and a high version of M were created by adding and subtracting one, as the standard deviation of z-scored data is

85

one. This allowed an analysis to be run with an average number of M, a high number of M, and a low number of M. By doing this, the effect of X on Y can be studied at varying levels of M. These regressions were interpreted in terms of simple slopes. For example, with FTE as the moderating variable, the three moderation regressions run were interpreted as:

   a. When the FTE (M) was low, each standardized UTDR (X) has x effect on the CFI (Y).

   b. When the FTE was average, each standardized UTDR has x effect on the CFI.

   c. When the FTE was high, each standardized UTDR has x effect on the CFI.

   In the full population the interaction was significant with the DoE score as the dependent variable ($R^2 = .09$, $F(3, 551) = 17.69$, $p = <.001$), indicating that FTE has a moderating effect on the relationship between UTDR and the DoE score. At average levels of FTE, the DoE was decreased .05 points for every standardized UTDR (UTDR $b = -.05$, $t(551) = -2.21$, $p = .03$, $pr^2 = .01$). A standardized UTDR is 18.27% and average FTE is 963 students. Therefore, when a college has about 963 students, every 18.27% of UTDR is subtracting .05 points from the DoE score. At low levels of FTE, the DoE was decreased .11 points for every standardized UTDR (UTDR $b = -.11$, $t(552) = -3.54$, $p = <.001$, $pr^2 = .02$). Low levels of FTE are determined by subtracting one standard deviation (SD = 741) from the mean FTE. Therefore, when a college has about 222 students, every 18.27% of UTDR is subtracting .11 points from the DoE score. At high levels of FTE, the DoE increased by .001 points for every standardized UTDR (UTDR $b = .001$, $t(552) = .03$, $p = .98$, $pr^2 = .00$). This equation was not significant meaning that at high levels of enrollment (mean FTE + one standard deviation), 1704 FTE, every standardized UTDR does not affect the DoE score. Figure 3 displays the simple slopes of this moderation regression, showing the more detrimental effect of UTDR on the DoE score of colleges with low FTE

compared to average FTE and high FTE. Therefore, for the full sample, the null hypothesis was confirmed for the CFI dependent variable but was rejected for the DoE dependent variable.
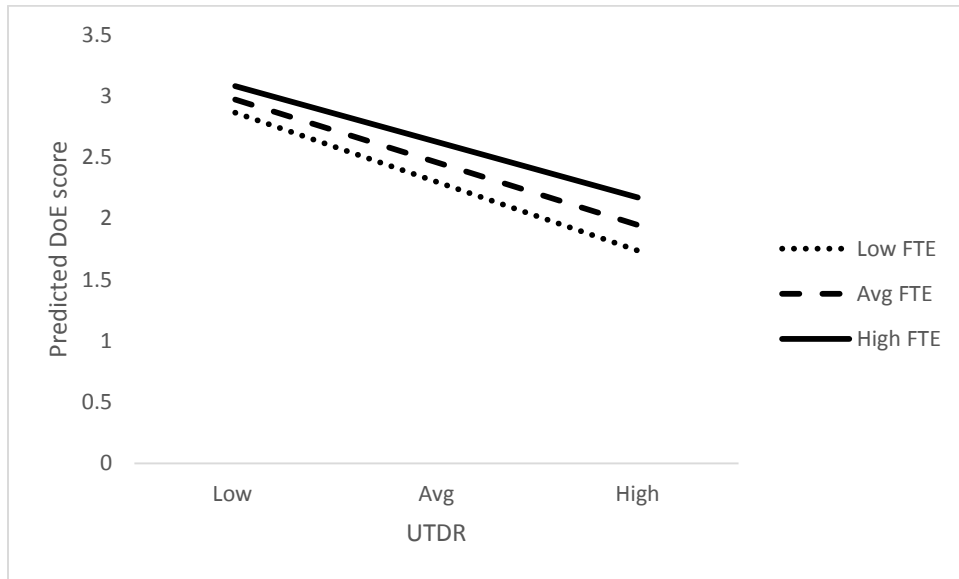
Figure 3. Predicted DoE scores estimated by UTDR for various values of FTE in Full Sample

In the <750 sample The interaction between UTDR and FTE was not significant for the CFI (UTDR $b = -.24$, $t(252) = -1.37$, $p = .17$, $pr^2 = .01$)or the DoE (UTDR $b = -.07$, $t(252) = -1.77$, $p = .08$, $pr^2 = .03$) scores.

In the 750+ sample, the interaction was significant with the DoE as the dependent variable indicating that for larger colleges, FTE has a moderating effect on the relationship between UTDR and the DoE score ($R^2 = .08$, $F(3, 295) = 8.79$, $p = <.001$). At average levels of FTE, the DoE was decreased .01 points for every standardized UTDR (UTDR $b = -.01$, $t(295) = -.57$, $p = .57$, $pr^2 = .001$). This is a very negligible effect and not significantly different from zero. At low levels of FTE, the DoE was decreased .082 points for every standardized UTDR (UTDR $b = -.08$, $t(295) = -2.76$, $p = .01$, $pr^2 = .02$). Low levels of FTE are determined by

subtracting one standard deviation (SD = 549) from the mean FTE. Therefore, when a college

has about 973 students, every 15.43% of UTDR is subtracting .08 points from the DoE score. At

high levels of FTE, the DoE increased by .06 points for every standardized UTDR (UTDR $b =$

.06, $t(295) = 1.67$, $p = .1$, $pr^2 = .01$). This equation was not significant meaning that at high levels

of enrollment (mean FTE + one standard deviation), 2071 FTE, every standardized UTDR does

not significantly effect the DoE score. Figure 4 displays the simple slopes of this moderation

regression, showing the more exaggerated effect of UTDR on the DoE score of colleges with

high FTE compared to average and low FTE.

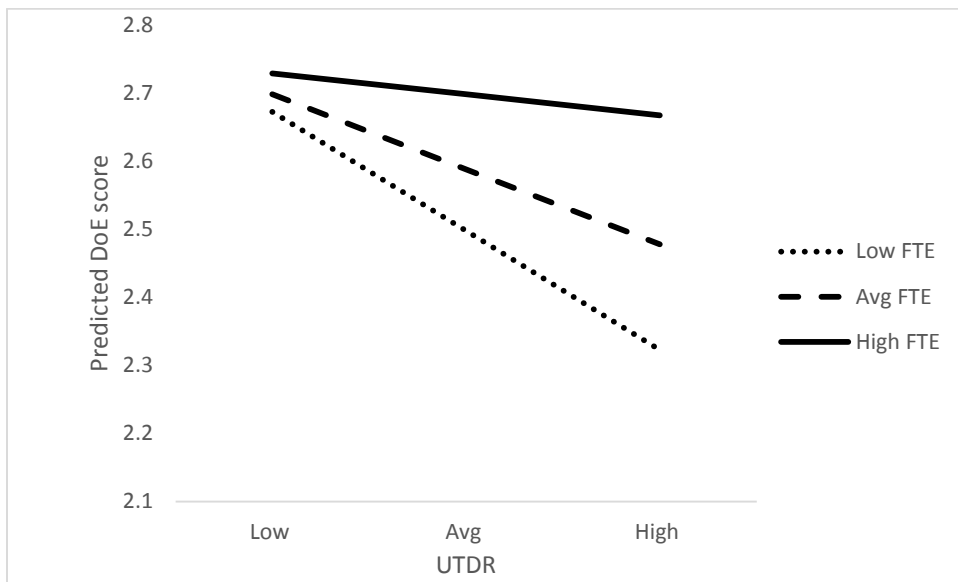*Figure 4.* Predicted DoE scores estimated by UTDR for various values of FTE in

colleges 750+ FTE.

Results from RQ3. The third question was to what degree does ID moderate the

relationship between the UTDR and the financial health of private non-profit colleges of various

sizes? The null hypothesis suggested ID does not moderate the relationship between the UTDR

and the financial health of private non-profit colleges.

In the full sample set, the moderation interaction of UTDR*ID was not significant in either the CFI (UTDR*ID b = .04, $t(504)$ = .31, p = .76, pr^2 = .01) or DoE (UTDR*ID b = .02, $t(504)$ = .58, p = .56, pr^2 = .01) regression analysis.

In the <750 sample, the interaction was not significant in either the CFI (UTDR*ID b = .24, $t(250)$ =.13, p = .9, pr^2 = .03) or DoE (UTDR*ID b = .06, $t(250)$ = 1.28, p = .2, pr^2 = .02) moderation analysis.

For colleges larger than 750 FTE, the moderation interaction was not significant in the CFI (UTDR*ID b = -.07, $t(250)$ = -.49, p = .63, pr^2 = .01)or the DoE (UTDR*ID b = -.03, $t(250)$ = -1.09, p= .28, pr^2 = .01) moderation analyses.

Results of RQ4. The fourth question inquired to what degree does institutional wealth, defined as EN/STU, moderate the relationship between the UTDR and the financial health of private non-profit colleges of various sizes. The null hypothesis was institutional wealth does not moderate the relationship between the UTDR and the financial health of private non-profit colleges.

In the full sample set, the interaction between UTDR and EN/STU was not significant in either the CFI (UTDR*EN/STU b = -.05, $t(486)$ = -.43, p = .67, pr^2 = .00) or the DoE (UTDR*EN/STU b = .01, $t(486)$ = .31, p = .76, pr^2 = .01) moderation analyses.

In the <750 sample, the moderation interaction was significant for the CFI equation (R^2 = .09, $F(3, 232)$ = 7.67, p = .003). At average levels of EN/STU, the CFI was decreased .58 points for every standardized UTDR (UTDR b = -.58, $t(232)$ = -3.39, p = <.001, pr^2 = .05). A standardized UTDR is 18.78% and average EN/STU is $14,480. Therefore, when a college has about $14,480 EN/STU, every 18.78% of UTDR subtracts .58 points from the CFI score. At low levels of EN/STU, the CFI was not significantly affected by the EN/STU (UTDR b = -.25, $t(232)$

= -.95, p = .34, pr^2 = .004).   Low levels of EN/STU were determined by subtracting one standard

deviation (SD = $24,310) from the mean EN/STU; however, this would result in a negative

number and it is impossible to have a negative EN/STU. This probe was not possible, nor was it

significant. At high levels of EN/STU, the CFI decreased by .93 points for every standardized

UTDR (UTDR b = -.93, t(232) = -4.15, p = <.001, pr^2 = .07). This means that at high levels of

EN/STU (mean EN/STU + 1 standard deviation), $38,790, every 18.78% UTDR decreased the

CFI score by .93 points. Figure 5 displays the simple slopes of the effect of UTDR on CFI for

various values of EN/STU.
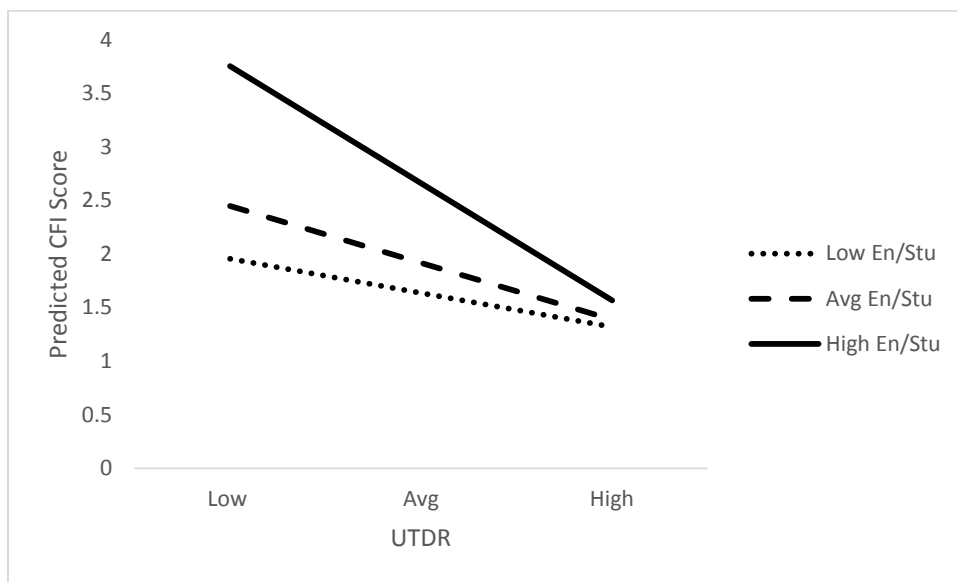
Figure 5. Predicted CFI scores as estimated by UTDR for various values of EN/STU in

colleges <750 FTE.

In a moderation regression analysis, the moderating (M) and predictor variable (X) can be

interchanged in order to make more practical interpretations from the results. The results of this

research question are better interpreted when EN/STU becomes the predictor variable and UTDR

becomes the moderating variable, while the dependent variable does not change. In this analysis

of the <750 sample, the moderation interaction is the same and therefore still significant ($R^2 =$ .09, $F(3, 232) = 7.67$, $p = .003$). When interpreting the data and studying the moderating effects of M on the X-Y relationship, however, EN/STU and UTDR have been interchanged. At average levels of UTDR, the CFI was increased .48 points for every standardized EN/STU (EN/STU $b = .48$, $t(232) = 2.85$, $p = .005$, $pr^2 = .03$). A standardized EN/STU is \$24,310 and average UTDR is 20.44%. Therefore, when a college has a UTDR of 20.44%, every \$24,310 of EN/STU adds .48 points to the CFI score. At low levels of UTDR, the CFI was even more significantly affected by the EN/STU (EN/STU $b = .83$, $t(232) = 3.55$, $p = <.001$, $pr^2 = .05$). Low levels of UTDR were determined by subtracting one standard deviation (SD = 18.78%) from the mean UTDR, resulting in 1.66%. Therefore, when a college has a UTDR around 1.66%, every \$24,310 of EN/STU increases the CFI score by .83 points. At high levels of UTDR, the CFI increased by only .12 points for every standardized EN/STU (EN/STU $b = .12$, $t(232) = .55$, $p = .58$, $pr^2 = .001$). This equation was not significant, meaning that when UTDR is high, 39.22%, the EN/STU does not have a significant relationship with the CFI score. Figure 6 displays the simple slopes of the effect of EN/STU on CFI for various values of UTDR.

In the 750+ sample, the moderation interaction was not significant in the CFI equation, nor the DoE equation ($p = .29$).
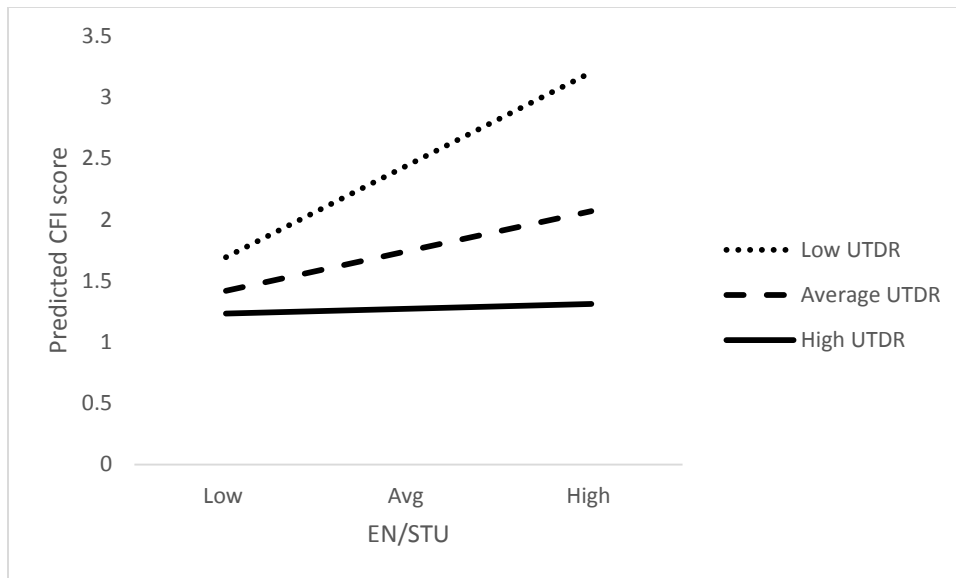
Figure 6. Predicted CFI scores as estimated by EN/STU for various values of UTDR in colleges <750 FTE.

Results of RQ5. The final question to what extent does the unfunded tuition discount rate, enrollment size, institutional debt, and institutional wealth predict the financial health of very small colleges? The null hypothesis stated there will be no significant prediction of financial health of very small colleges by unfunded tuition discount rate, enrollment size, institutional debt, and institutional wealth in the presence of the other variables. The null hypothesis was divided into four sub-hypotheses:

H5a$_o$: In the presence of the other variables, there will be no significant prediction of financial health of very small colleges by the unfunded tuition discount rate (UTDR).

H5b$_o$: In the presence of the other variables, there will be no significant prediction of financial health of very small colleges by the enrollment (FTE).

H5c$_o$: In the presence of the other variables, there will be no significant prediction of financial health of very small colleges by the institutional debt (ID).

H5d$_o$: In the presence of the other variables, there will be no significant prediction of financial health of very small colleges by the institutional wealth (EN/STU).

A multiple regression is used to predict the dependent variable based on two or more independent variables. In regression, the combination of the variables in the model may or may not contribute to significant variance in the dependent model. The first multiple regression analysis on the very small college sample (<750) included all four independent variables and CFI as the dependent variable and produced $R^2 = .1$, $F (4, 231) = 6.44$, $p = <.001$. The full model explained 10% of the variance in the CFI score. As can be seen in Table 15, individual variables within the model that accounted for unique, non-zero amounts of variance in the CFI score included UTDR ($p = .002$), EN/STU ($p = .002$), and ID ($p = .006$). In the CFI model, UTDR and ID had significant negative regression weights with the CFI score, indicating that colleges with higher UTDR or ID were expected to have lower CFI scores, after controlling for the other variables. EN/STU had a significant positive regression weight, indicating that colleges with increased EN/STU were expected to have increased CFI scores, after controlling for other variables. When holding the other variables constant, a one-unit increase in UTDR results in an estimated .55 decrease in CFI score. Similarly, a one-unit increase in ID estimates a .68 decrease in CFI score, and a one-unit increase in EN/STU predicts a .57 increase in CFI score.

Table 15

Regression Coefficients and Multiple R-Squared for Independent Variables and CFI

Variable	Correlation	F	R^2	B	t-value	p-value	VIF
CFI model		6.44	.1	1.92	11.59	<.001	
UTDR	-.17**			-.55	-3.13	.002**	1.1
EN/STU	.15**			.57	3.20	.002**	1.2
ID	-.02			-.68	-2.78	.006**	1.5
FTE	.02			.31	1.52	.13	1.5

*Note: **p <.05, ***p <.001*

In the second multiple regression analysis, all four independent variables were used and DoE was used as the dependent variable, resulting in $R^2 = .07$, $F(4, 231) = 4.19$, $p = .003$. This model accounts for 6.8% of the variance in the DoE score of an institution. In this model, only UTDR and ID had unique, significant amounts of variance on the DoE score, and both variables had negative regression weights. This indicated that colleges with increased UTDR or ID were expected to have lower DoE scores, after controlling for the other variables. Holding the other variables constant, a one-unit increase in UTDR predicts a .126 decrease in DoE score, and a one-unit increase in ID estimates a .165 decrease in DoE score. FTE and EN/STU did not contribute to this multiple regression model. Table 16 provides the results of the DoE full model analysis.

Table 16

Regression Coefficients and Multiple R-Squared for Independent Variables and DoE

Variable	correlation	F	R^2	B	t-value	p-value	VIF
DoE model		4.19	.078	2.25	52.55	<.001***	
UTDR	-.17**			-.13	-2.75	.006**	1.1
EN/STU	.02			.06	1.27	.21	1.2
ID	-.09			-.17	-2.59	.01**	1.5
FTE	-.02			.07	1.39	.17	1.5

Note: **p <.05, ***p <.001

Summary

A total of 570 private, baccalaureate, non-profit colleges and universities were the population for this study. Of the colleges in the population, 256 colleges were very small colleges with average enrollments under 750 students. This study sought first to identify the relationship between the UTDR and the financial health (measured by both CFI and DoE scores) of private, non-profit colleges. While the full sample and the sample of 750+ had no significant correlation between the UTDR and the financial health scores, the <750 sample resulted in significant correlation, thereby rejecting the null hypothesis. There was a significant correlation between the UTDR and the CFI score (r = -.17, p =.008) and DoE score. (r = -.17, p = .007).

This study also questioned the effect of other variables on the relationship between the UTDR and the financial health. Moderation regression was used to determine what, if any, effect FTE, ID, and EN/STU had on the relationship between UTDR and financial health. Two moderation regressions were run with each moderating variable on the full sample, the very small college sample (<750) and the larger college sample (750+), once with CFI as the measure

of financial health and once with DoE as the measure of financial health. FTE was a significant

moderator of the UTDR effect on financial health in the full sample and the 750+ sample when

using DoE as the financial health measure. EN/STU was a significant moderator of the effect of

UTDR of financial health in the very small college population when using CFI as the measure of

financial health.

Finally, the fifth research question inquired about the ability of the four independent

variables to predict the financial health of very small colleges. Table 17 describes the null

hypothesis and results of all analyses for all the research questions.

Table 17

Null Hypotheses and Results

H1$_o$: There is no relationship between the UTDR and financial health.	a. Confirmed for full sample, CFI b. Confirmed for full sample, DoE c. Rejected for <750 sample, CFI d. Rejected for <750 sample, DoE e. Confirmed for 750+sample, CFI f. Confirmed for 750+ sample, DoE
H2$_o$: Enrollment size (FTE) does not moderate the relationship between UTDR and financial health.	a. Confirmed for full sample, CFI b. Rejected for full sample, DoE c. Confirmed for <750 sample, CFI d. Confirmed for <750 sample, DoE e. Confirmed for 750+ sample, CFI d. Rejected for 750+ sample, DoE
H3$_o$: Institutional debt (ID) does not moderate the relationship between UTDR and financial health.	a. Confirmed for full sample, CFI b. Confirmed for full sample, DoE c. Confirmed for <750 sample, CFI d. Confirmed for <750 sample, DoE e. Confirmed for 750+ sample, CFI f. Confirmed for 750+ sample, DoE
H4$_o$: Institutional wealth (EN/STU) does not moderate the relationship between UTDR and financial health.	a. Confirmed for full sample, CFI b. Confirmed for full sample, DoE c. Rejected for <750 sample, CFI d. Confirmed for <750 sample, DoE e. Confirmed for 750+ sample, CFI f. Confirmed for 750+ sample, DoE
H5$_o$: There will be no significant prediction of financial health of very small colleges by unfunded tuition discount rate, enrollment size, institutional wealth, and institutional debt.	a. Rejected for CFI. UTDR, ID, and EN/STU are significant b. Rejected for DoE. UTDR significant
H5$_o$a: In the presence of the other variables, there will be no significant prediction of financial health of very small colleges by the unfunded tuition discount rate (UTDR).	a. Rejected for CFI. b. Rejected for DoE.
H5$_o$b: In the presence of the other variables, there will be no significant prediction of financial health of very small colleges by the enrollment (FTE).	a. Confirmed for CFI. b. Confirmed for DoE.

H5$_o$c: In the presence of the other variables, there will be no significant prediction of financial health of very small colleges by the institutional debt (ID).

a. Rejected for CFI.
b. Confirmed for DoE.

H5$_o$d: In the presence of the other variables, there will be no significant prediction of financial health of very small colleges by the institutional wealth (EN/STU).

a. Rejected for CFI.
b. Confirmed for DoE.

Chapter 5: Discussion

Overview of Study

Very small colleges have been defined as colleges with fewer than 750 full-time equivalent (FTE) students (Kershaw, 1976). It has long been assumed that very small colleges were susceptible to poor financial health and failure due simply to the low number of enrolled students (Dickmeyer, 1982; Duperre, 1971; Foster, 1987; Martin & Samels, 2009).

Most private colleges use tuition discounting as an enrollment management tool (Behaunek & Gansemer-Topf, 2017). High percentages of unfunded tuition discounts have been shown to be detrimental to the financial health of larger colleges and universities (Browning, 2013; Hillman, 2011). Unfunded tuition discount rate (UTDR), along with enrollment size (FTE), institutional debt (ID), and institutional wealth, defined as endowment per student (EN/STU), have all been shown to impact the financial health of larger colleges (Browning, 2013; Doti, 2013; Hunter, 2012; Lee, 2009; Martin, 2002). This study inquired about the effect of these variables on the financial health of very small colleges. Do these variables effect very small colleges in the same way they effect larger colleges?

Research Questions

The first research question considered the relationship between the UTDR and the financial health of private, non-profit, baccalaureate colleges in the U.S. Using a Pearson *R*, no significant relationship was found between the UTDR and either CFI or DoE scores for either the full sample or the 750+ sample. The relationship in the <750 sample, however, was statistically significant for both the CFI and the DoE scores. For this subset, then, the null hypothesis was rejected.

Questions 2, 3 and 4 examined the possibility that other variables could affect the relationship between the UTDR and the financial health of an institution. The second research question considered the possibility that the FTE may moderate the relationship between the UTDR and the financial health of a college. The interaction between FTE and UTDR in the moderation regression was significant for the full sample and the 750+ sample when using DoE as the measure of financial health. All other moderation interactions (<750 sample and regressions with CFI as the measure of financial health) were not significant.

Question 3 followed the same procedures as question 2, only this time, ID was the moderating variable used to examine the relationship between the UTDR and the financial health. ID, however, did not appear to influence this relationship in any of the sample sets, regardless of measure of financial health.

The fourth question was similar, using EN/STU as the moderator to study the relationship between UTDR and financial health. In only the <750 sample with the CFI as the measure of the dependent variable was the interaction between EN/STU and UTDR significant, indicating a moderating effect.

The final question used a multiple regression to study the effect of all four of the independent variables (UTDR, FTE, ID, and EN/STU) together on the financial health of very small colleges. When CFI was used as the measure of financial health, UTDR, ID, and EN/STU each were significant predictors of financial health in the presence of the others. However, when DoE was used as the measure of financial health, UTDR and ID were the only significant predictors of financial health.

Conclusions

Studies have found UTDR to impact the financial health of colleges (Behaunek &
Gansemer-Topf, 2017; Browning, 2013; Davis, 2003; Ehrenberg et al., 2006; Hillman, 2011).
However, previous studies have not looked specifically at the relationship between the UTDR
and the financial health of very small colleges. This study found a significant negative
relationship between the UTDR and financial health of very small colleges. For very small
colleges, UTDR correlated negatively with CFI and DoE. The relationship does not seem to be
true for larger private, non-profit, baccalaureate colleges. Even though the larger colleges in this
study had higher average UTDRs than very small colleges, the UTDR did not have the same
negative relationship on the financial health of the larger colleges and in fact seemed to have no
relationship with CFI or DoE scores.

The effect of UTDR on the financial health was moderated, however, by FTE in the
moderation regression analyses of the full population. Even though UTDR and financial health
were not correlated in the full sample, when the moderation interaction was added, the
relationship became significant indicating that FTE has a significant effect on the relationship
between the UTDR and financial health. We can see this moderating effect when considering
the relationship at low, average and high levels of the moderating variable. When FTE was
average, approximately 963 students, for every 18.27% of UTDR the DoE score was predicted to
decrease .05 points. When FTE was low, about 222 students, the DoE score was predicted to be
reduced .11 points for every 18.27% of UTDR, but at higher levels of FTE, around 1704
students, the DoE score was only predicted to be reduced by .001 for every 18.27% of UTDR.
These are not large values, even when considering the small range of the DoE score, nonetheless,

the significant reductions in DoE score for the very small colleges but not the larger colleges seems to be a noteworthy point.

The moderation of FTE on the UTDR-financial health relationship in just the very small college sample was not significant. Initially, this seemed to be counter to the correlation analysis that indicated a significant relationship between UTDR and financial health. However, considering that UTDR and financial health were already significantly correlated, the moderation regression indicates that the relationship is not further affected by FTE. FTE and UTDR had a significant positive correlation in the <750 sample ($r = .28$, $p = <.001$), but there was no relationship between FTE and either financial health measurement. The larger 750+ sample, however, FTE was significantly and positively correlated with CFI ($r = .30$, $p = <.001$) and DoE ($r = .23$, $p = <.001$), but not with UTDR. In the multiple regression analysis of the <750 sample with all independent variables together, UTDR was the only variable to be a significant predictor of financial health in both measures of financial health (CFI and DoE). It seems, then, for very small colleges, under 750 FTE, whether 25 students, 325 students, or 725 students, UTDR is a more significant predictor of financial health than FTE.

There are several reasons why very small colleges may be negatively affected by higher UTDR more so than larger colleges with the same characteristics. When giving unfunded tuition discounts, a college is foregoing a portion of revenue that would otherwise be used to operate the college. At a very small college, there is a reduced amount of revenue from tuition and fees compared to a larger college simply because of the reduced number of students, and yet smaller and larger colleges, according to Dickmeyer (1982), may have similar expenses, known as fixed and sticky costs. Fixed costs are those expenses that a college must expend regardless of how many students and sticky costs are those that are not easily reduced should there be a need to cut

the budget. Regardless of the number of students, there is a base level of funding needed to cover operating costs. When less of that funding is realized due to increased UTDR, less is available for operating costs. This would likely lead to increased possibility of deficit spending and contribute to lower financial health scores.

Decreased revenue also contributes to lower reserve funding. Dickmeyer (1982) found that 41% of very small colleges had no reserve funding. A reserve fund allows a college to have some financial stability should enrollment decrease and tuition revenue be unexpectedly reduced. When a very small college increases the UTDR, less money is available for operating expenses as well as the reserve fund. These colleges are essentially, to borrow a term from personal finance, living paycheck to paycheck.   The lack of reserve funding directly effects the financial health of a college as reserve funds are part of the calculation of both financial health scores used in this study, the CFI and the DoE scores.

When a very small college with limited tuition revenue gives away higher amounts of their tuition revenue, the margin for error grows increasingly smaller. It would seem that very small colleges would be very aware of the need to stay within the set parameters to stay within the desired level of unfunded tuition discounts. However, student financial aid is as much an art as it is a science and the ability to predict which students will matriculate, and therefore take the discount offered, is difficult. At a very small college, fewer students account for a larger percentage of the population. Depending on the size of the school, it is possible that just a couple of extra unfunded scholarships could push the institutional discount rate higher than intended, thereby reducing the net tuition revenue and wreaking havoc on the institutional budget.

Institutional debt does not seem to have a significant effect on the relationship between UTDR and financial health. The interaction effect was not statistically significant for any of the three samples analyzed. The amount of debt a college takes on for property, plant and equipment appears to be inconsequential to the relationship between UTDR and financial health. ID was negatively significant in the multiple regression model run with CFI as the measure of financial health, signifying that debt does have a role in the overall financial health of the college, in conjunction with other variables. In the presence of the other three independent variables, ID was expected to contribute three of the 10% of the variance in the CFI score, but was not significant in the DoE model. Considering the colleges in this study had a wide range of both ID and FTE, institutional debt per student would have been a different way to approach this variable and may have produced a different result.

Institutional wealth can be measured by endowment and has been shown to be a predictor of financial health (Lee, 2009; Martin & Samels, 2009; Townsley, 2009). This study considered the possibility that EN/STU moderated the effect of UTDR on financial health. UTDR negatively correlated with the financial health of very small colleges, but when EN/STU was added as a moderator in a regression, the relationship did not change as some might expect. In fact, for very small colleges, high levels of EN/STU more adversely effected the relationship between UTDR and financial health when measured by CFI. This finding seems counter-intuitive to other findings, such as Lee (2009), which indicated that an increase in endowment increases the financial health. In the full population and the larger college sample, EN/STU did not affect the relationship between UTDR and financial health. However, for very small colleges the interaction of EN/STU and UTDR adversely effects the relationship between UTDR and the predicted CFI score, particularly at higher levels of EN/STU. As displayed in Figure 5, at high

levels of EN/STU and low levels of UTDR, the predicted CFI score is high. However, as UTDR increases, the CFI score decreases more dramatically at high levels than medium and low levels of EN/STU. This finding indicates that high levels of UTDR seems to offset any positive contribution EN/STU make to the CFI score.

A more practical way of understanding this interaction is to swap the independent and the moderating variable thereby looking at the effect of UTDR on the relationship between EN/STU and financial health. Because the independent variable and moderating variable are multiplied together in the moderation regression formula, they are interchangeable and result in the same significant interaction. The interpretation, however, is more sensible since the results of analysis with EN/STU as the moderator was rather unexpected. The impact of UTDR as the moderator on the EN/STU – financial health relationship is seen much more starkly in Figure 6. The effect of a high UTDR on the financial health of a very small college is virtually unchanged, regardless of the amount of EN/STU. On the other hand, the financial health of a very small college with a low UTDR improves sharply as the EN/STU increases.

In the very small college sample, endowment per student had a significant positive effect on the CFI score in the presence of the other variables in the multiple regression. Holding all other variables constant, with a one unit increase in EN/STU, the CFI score is predicted to increase .57 points. Provided UTDR remains constant, increasing EN/STU results in the expected increase in CFI score. However, as was shown in the moderation regression with EN/STU as the moderator, increasing both the EN/STU and UTDR results in a predicted decrease in CFI score. This variance suggests that increases in UTDR are detrimental to the financial health of a college, regardless of the EN/STU.

Implications for Theory and Practice

The results of this study have implications for theory and practice for very small colleges in the United States. The implications for theory relate to Breneman's (1994) economic theory of private colleges. Breneman described unfunded tuition discount in terms of a demand curve (see Figure 1). According to this study, the same demand curve has a different effect on very small colleges than it does on larger colleges. Breneman's theory focused on the strategic use of unfunded tuition discounts to increase FTE, assuming increased FTE would equate to increased financial health. Breneman described a two-stage optimization process toward financial health of a private college. First, the level of inputs (faculty, staff, facilities, etc.) and enrollments are set to a level that will allow the institution to be financially stable; and once the designated levels are reached, an institution will seek to increase the quality of faculty, staff, facilities and students. The second stage will allow the institution to grow beyond simply surviving and into a thriving mode. According to the findings of this study, more important than enrollment levels leading to financial stability, a college's unfunded tuition discount rate leads to financial stability. Breneman suggested using UTDR to achieve appropriate FTE levels, but this study would suggest nearly the opposite: FTE levels should dictate appropriate UTDR. This study found that as a college increases FTE over 750, increased UTDR does not have as much of a detrimental effect on financial health. Breneman suggested that an institution can maintain control on a continuum between control of UTDR or control of FTE. This study found that very small colleges should seek to maintain control of the UTDR more so than FTE and each very small college should maintain the most appropriate UTDR rather than using the UTDR to increase FTE.

The results of this study have implications for practice at very small colleges. This study looked at the effect of UTDR on the financial health of very small colleges from a number of angles and nearly every one resulted in the same conclusion: high UTDR is detrimental to the health of very small colleges. The very small colleges in the lowest quartile of reported UTDR (<1.2%) had an average 47% less students, 71% less ID, and 35% less EN/STU, but had 46% higher CFI scores and 14% higher DoE scores than the top quartile of reported UTDR. The lowest quartile had a mean UTDR of 0% and the highest quartile had a mean of 47%. Contrarily, the bottom quartile of reported UTDR among the larger colleges had an average 1% less students, 51% less ID, 66% EN/STU, and 74% less UTDR, but only 18% increase in CFI score and 3% increase in DoE score when compared to the top quartile. This would indicate that there is a point at which UTDR no longer effects the financial health of an institution so severely and the institution can focus on other areas to maintain their financial health, such as increasing EN/STU or decreasing ID. Therefore, it is more advantageous for a very small colleges with high UTDR to focus on reducing the UTDR than increasing FTE or even EN/STU.

Recommendations for Practitioners

The conclusions of this study result in some recommendations for practitioners. Much of the literature has indicated that unfunded tuition discounts are a risk factor for institutions, particularly private colleges (Behaunek & Gansemer-Topf, 2017; Browning, 2013; Hunter, 2012; Redd, 2000). Yet, against the recommendations of many, the national average UTDR continues to rise (National Association of College and University Business Officers, 2017). This study, focused on very small colleges, provides a similar conclusion: high amounts of unfunded institutional aid is detrimental to the overall financial health of an institution, particularly institutions with less than 750 students. While other studies suggest colleges, particularly very

small colleges, focus on increasing enrollment as the way to secure or maintain financial health (Hunter, 2012; Supplee, 2014), this study recommends focusing on means of decreasing the UTDR. Since unfunded institutional aid is used to attract students, it is likely that enrollment will drop or stagnate when the UTDR is reduced. However, by focusing on increasing the percentage of revenue that is to be retained, institutions can realize financial health with fewer students. Because UTDR effects the financial health of very small colleges more considerably than larger colleges, this should be the emphasis. Institutional leaders should determine the UTDR at which the institution needs to achieve to best fund their budgets. It may take incremental steps over several years to achieve the ideal rate. Reducing the UTDR can be achieved through multiple methods, likely used in conjunction. Some colleges have reduced their tuition as well as their UTDR to help students compensate for the loss in financial aid (Camera, 2015; Rine, 2016). Other colleges have focused on reducing the amount of unfunded institutional aid given by changing the type of student the institution focused on recruiting (Massa & Parker, 2007). Changing the focus from increasing FTE to reducing UTDR may result in fewer students, which may be difficult for some very small colleges to grasp, but recognizing that financial health and stability is a necessary goal to achieve. Without financial health, a very small college is subject to closure.

Recommendations for Academics

The results of this study led to conclusions that align with previous research, such as the detrimental effect of UTDR on the financial health of very small colleges, and the moderating effect of EN/STU on the relationship of UTDR and financial health.

As noted in the limitations, the Johnson-Neyman technique was not used in this study. This technique would be helpful to determine the point at which unfunded tuition discounting

becomes negatively significant, similar to Hillman's (2011) study on large public colleges. Considering 21% of very small colleges in this study gave $0 unfunded tuition discounts and 18% more had UTDR of less than 10%, there may be a rate at which unfunded institutional aid is actually helpful to the financial health of very small colleges.

College selectivity was not a variable used in this study, but is one that has been studied in other research on unfunded tuition discounts. While some may assume that a very small college has low selectivity, the number of colleges in this study that gave $0 unfunded institutional aid indicates there may be some very small colleges that have higher demand rates than others. A study of UTDR, financial health, and selectivity at very small colleges may provide more information.

Finally, to expand upon these conclusions further, case studies of very small colleges that are financially healthy may be particularly informative. Through comparative study of specific institutions, distinctions of financially healthy very small colleges may be highlighted and could be a model for other institutions. A closer look at institutions that do not give unfunded institutional aid may provide direction for other very small colleges struggling to reduce their UTDR. There were several types of colleges included in the very small college sample, including Jewish colleges, Christian colleges, and health-focused colleges. Any of these sub-groups may have specific characteristics that make them financially healthy or unhealthy and could be studied.

Concluding Comments

Very small colleges have a unique place in the higher education system in the United States. Many of these colleges provide education focused on a specific subject matter, such as religion or health, and can serve students in more specific ways than larger colleges. Meaningful faculty-student relationships and student opportunities are important advantages of very small colleges. Yet, very small colleges have a higher rate of closure than larger colleges (Brown, 2015; Lyken-Segosebe & Shepherd, 2013). For this segment of higher education to remain viable for the long term, financial stability must be maintained. The results of studies such as this one will support leadership decisions to change course when needed to achieve the results desired.

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