STRATEGIC ENROLLMENT MANAGEMENT, TUITION DISCOUNTING, AND STUDENT ENROLLMENT BY INCOME: A TEST OF DEMAND THEORY

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Doctor of Philosophy

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by

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The undersigned, appointed by the dean of the Graduate School, have examined the dissertation entitled

STRATEGIC ENROLLMENT MANAGEMENT, TUITION DISCOUNTING, AND STUDENT ENROLLMENT BY INCOME: A TEST OF DEMAND THEORY

presented by Rocky Christensen,

a candidate for the degree of doctor of philosophy,

and hereby certify that, in their opinion, it is worthy of acceptance.

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DEDICATION

To God who has and continues to guide me to have an impact for his glory through my passions, family, pursuits, research, and calling.

To my wife, Dr. Emily Christensen and my son, Noah.

To the students at Johnson University where I now work and to the students at all the colleges I have attended or worked including Ozark Christian College, BIOLA University, the Medical College of Wisconsin, Central Christian College of the Bible and the University of Missouri.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ABSTRACT

This study applies demand theory to investigate how college discounting practices impact student enrollment across income categories for members and affiliates of the Council for Christian Colleges and Universities. The dependent variable for this study, student enrollment by income category, comes from the Student Financial Aid and Net Price Survey in IPEDS. The independent variables fall into several key categories that form the foundation for demand theory including institutional cost, taste and preferences, competitors prices, institution level covariates, and year effects covariates. The study presents three models that all used log-log fixed effects regression to understand how control variables, and competitors' prices provide greater explanatory power. The results indicate that the third model, which had both control variables and competitors' prices, provided the highest R^2 value and the most statistically significant results. The results from the regression demonstrated that students form different income categories had varying elasticities in response to price paid and the decision to enroll. Students who are inelastic have a result number that is less than 0 and are more likely to enroll as price increases. Students who are elastic have a result number that is greater than 0 and are less likely to enroll at the colleges in this sample.

The results from this study show that students from families with incomes less than $110,000 were inelastic, whereas the highest income category of students with incomes greater than $110,000 were elastic. This showed that families with less than $110,00 of total family income would continue to enroll at increase rates as price increased opposed to higher income peers who would choose to enroll at another college if the average net price increased for the. These elasticity values show a difference from

0 either positive or negative that never exceeded 0.37. These values are moderate, and indicate a less pronounced sensitivity to price fluctuations. The findings from this study provide insight that can equip researchers with future research on topics like Strategic enrollment management, tuition discounting, demand theory, College enrollment by income categories, CCCU student enrollment behavior. Before the initiation of this research project, no studies had been conducted on IPEDS data categorized by income, using net price as a metric to gauge price responsiveness at CCCUs.

CHAPTER 1: INTRODUCTION

The cost of college has directly or indirectly impacted students' ability to attend college. This study pulls upon the historical pricing problems present with the founding of American higher education and the modern impacts of pandemics and recessions to paint the picture of the pricing dilemma. This study presents foundational knowledge of financial aid through an exploration of the federal method, institutional practices, and tuition discounting. The use of demand theory as the theoretical framework guides the study and is well suited to address the impact of tuition discounting on enrollment per income category at CCCU institutions. Demand theory informs the empirical analyses and the building of the log-log regression models that answer the research questions.

Historical Background

Universities, colleges, and higher education were first established in the Middle Ages. According to Janin (2014) they might be considered the "most enduring achievement of the Middle Ages" (p. 7). Many colleges came after Bologna University such as the University of Oxford, University of Cambridge, or the University of Salamanca. There was a passion and necessity built in the middle ages for the existence of formal education in the University model that has never stopped. The founders of Harvard College capture this well saying "After God had carried us safe to New England, and wee had builded our houses, provided necessaries for our lively-hood, rear'd convenient places for God's worship, and settled the civil government: one of the next things we long for, and looked after was to advance learning and perpetuate it to posterity" (Morison, 1963, p. 4). College was a crucial and foundational cornerstone for the earliest college in American history and it remains so to this day. However, since

Bologna University family finances have determined students' ability to attend college. During the Colonial times, the cost of college itself was not prohibitive; however, families could not afford to send their children to college because the family depended on their labor for their business or family farm (Thelin, 2011). This demonstrates the indirect impact of cost on students' ability to attend college. As time progressed, the direct cost of college has escalated significantly and become prohibitive for students to attend. This is especially true at private colleges and select college groups such as the Council for Christian Colleges and Universities.

Statement of the Problem

College pricing and cost have changed significantly since the first college in the US was chartered in 1636 (Thelin, 2011). Colleges face the reality that they need to maximize revenue while fulfilling their institutional mission and priorities that may be a part of their strategic plan. The pricing of colleges is well documented as having a direct effect on students and their enrollment (Davis, 2003; Heller, 1999; John, 1990; Martin, 2002; Rine, 2016; Rine, 2019). Colleges have explored creative strategies to maximize enrollment, such as tuition freeze programs, tuition reset programs, and even free tuition programs (Heller, 1999; John, 1990; Li & Gándara, 2020). These programs and colleges' approaches to pricing are strategies that colleges use; however, the laws of supply and demand should be considered at each college to help understand their prices and how they may be affecting the students who might consider enrolling (Baum, 2004; Toutkoushian & Paulsen, 2016b).

While colleges contemplate their prices, students who control the demand for education are seeing escalating prices that may make them more elastic to consider

competitors' options (Toutkoushian & Paulsen, 2016b). Elasticity is a statistical determination of how likely someone wanting to purchase a good is if the price increases (Syverson, 2019; Toutkoushian & Paulsen, 2016b). This being the case, more elastic students are more likely to consider other college options as the price increases.

Students since the early 1980's have seen college costs outpace inflation and the percentage of family income that needs to be allocated toward students' educations continues to rise as a higher and higher percentage of income is necessary (Davis, 1997; Hillstrom, 2020; Kirshstein, 2012). Escalating costs are still a factor today. Adjusting for inflation, the current cost of college has increased 6% for Private Nonprofit 4-year colleges and 2% for Public Four-Year Colleges above the consumer price index in 2022 compared to 2012 (Ma & Pender, 2022). This is happening at the same time that Federal grant aid has decreased by 32% (Ma & Pender, 2022).

Increasing College Prices

The increasing price of college at some institutions, especially higher priced colleges (based on published cost of attendance) like private institutions, may be impacting some student populations more than others based on their total family income as reported in the FAFSA. For example, lower-income students may be more price-responsive than other students, where cost is their primary concern when deciding where to apply (Levine et al., 2020). Research shows that 234.6 billion dollars was awarded in federal aid for the 2021-22 award year; yet there is still an increasing number of low-income students who lack the financial means to attend college (Ma & Pender, 2022). The cost of college is outpacing the financial support available to families (Bitler et al., 2022; Willoughby et al., 2014).

The cost of college did not slow even in the COVID-19 pandemic, nor should we expect it to slow in the long term when comparing the impact of COVID-19 to other country wide events, such as the 2008 recession (Ma & Pender, 2022). The 2008 recession devastated families' incomes, yet after this large crisis, the years following the recession have shown a consistent increase in the cost of attending colleges for institutions across the nation (Willoughby Eichhorn & Rhyneer, 2014). The cost of attendance increases took place while the national unemployment rate increased drastically and while net worth simultaneously plummeted for families across the country during the years following the recession (Willoughby Eichhorn & Rhyneer, 2014).

President Biden is working to address the problem of college costs and students' ability to consider colleges in the early part of his presidency. President Biden proposed the American Families Plan, which would have provided all students with two years of free community college, and significant increases to programs like the Pell Grant and the TEACH Grant (The White House, 2021). While the American Families Plan, and others like it, were not successful, there continue to be new proposals to address students' ability to afford a college education (Cervantes et al., 2005b; Hannah, 1996; Skinner et al., 2022). College affordability is a national problem that many Presidents have sought to address while unfortunately making little headway for the years following their presidency. For example, President Johnson signed into law the Higher Education Act in 1965, which had a dramatic impact on affordability and presidencies have continued to support the HEA as it was reauthorized nine times to the most recent 2008 authorization (Cervantes et al., 2005a; Watson, 2019). Each reauthorization has carried with it an

evaluation of students' needs and the ability to afford a college education. However, as the years have passed, this amount of funding has struggled to keep up with rising costs.

Federal Aid Fails to Keep Up

College pricing and institutional discounting is more difficult for institutions, given the decreased purchasing power of federal grant aid. For example, "Total federal grant aid decreased by 32% in inflation-adjusted dollars between 2010-11 and 2020-21. Pell Grants declined by 39% ($16.4 billion) and veterans' benefits declined by 3% ($405 million)" (CollegeBoard, 2021, p. 4). This makes it even more challenging for colleges to attract low- income students with the reduced purchasing power of government need-based aid that they can access. The enrollment rates for the neediest students failed to increase at the rates of their higher income peers (Bitler et al., 2022; Hurtado et al., 1997). There is also a difference in how families are able to bounce back from inflation and financial loss that impacts enrollment. For example, students from higher income families also have an ability to come back from financial loss or inflation at a higher rate (Bitler et al., 2022; Hurtado et al., 1997). Colleges that seek to recruit low-income students need to be aware of the financial need of students and the growing gap in financing that is available to them from the government when determining their pricing and discounting. Institutions should use this information to inform strategic enrollment management plans.

External Difficulties

With the recent COVID-19 pandemic, these issues are magnified even further for families who already went through financial troubles in the recession to now having increased hardships due to attending college. Students may not be well versed in how to

get the help they need to make college possible given the discount the college offers them and the remaining amount they are left to finance. Examples of services they might not be familiar with utilizing may be a request for a special circumstance for something like loss of income due to COVID. This process empowers financial aid professionals to determine how current circumstances, such as job loss, might be justified to adjust a student's FAFSA data in Financial Aid Administrator Access (Education, 2019). This adjustment will give the college an Institutional Student Information Record (ISIR), which will document an updated Expected Family Contribution Number, which may, in turn, be used to award more federal aid to families. Unfortunately, families often struggle to know how to navigate processes like these to help them financially, which is more of a concern with the added difficulty of the COVID-19 pandemic.

Laws have been put in place to provide "Emergency Relief Funds," according to Public Law 116-136 Coronavirus Aid, Relief, and Economic Security Act (the CARES Act) and subsequent COVID-19 relief bills. However, eligibility was understood to be restricted to current students at the time of the impact, and colleges were not permitted to use these funds to incentivize new students to enroll or continuing students to re-enroll (Congress, 2020). Further, institutions were encouraged but not required to award these funds based on a student's need, so it was left up to institutional discretion to award these funds (Congress, 2020). While many colleges certainly addressed need, the funds were not restricted to need, and this may be a missed opportunity to assist low-income students with their college aspirations.

While aid such as the Pell Grant fails to keep up with college prices, there are additional added difficulties for colleges seeking to price their education as major

external realities come to bear. Historically, despite nationwide financial crises, federal funding never received a significant increase to offset this drop in family resources. The effects of the 2008 recession, for example, have made college affordability an even more of a concern (Joseph, 2021). The economic hardships this has placed on families are drastic. For example, the unemployment rate increased by 37% from 2007 to 2013 (Willoughby Eichhorn & Rhyneer, 2014). Unemployment rates were devastating, and family net worth plummeted 39% in three years from 2007 to 2010 (Willoughby Eichhorn & Rhyneer, 2014).

Using low-income students as an example there may be factors that could impact certain student populations uniquely that should be considered. For example, when economic difficulties impact families, low-income families may be impacted disproportionately. For example, Joseph (2021) researched the economic resilience of low-income families following the 2007-2009 recession. He found that "poor families" compared to "near poor families" were 33% less resilient and less able to increase their income. Inflation and recession have differential effects and low-income families often struggle the most during these times (Bitler et al., 2022). Considering the way economic hardships impact low-income students may help colleges to consider how pricing and discount strategies might be assessed to determine the impact this has for students in lower income categories.

Theoretical Framework

The escalating costs of college education, coupled with the disproportionate federal financial aid, present a significant problem. This issue is further exacerbated by external challenges. In this context, demand theory (Becker, 1990; Klein, 1973), the

chosen theoretical framework, offers valuable insights. Demand theory provides insight into the quantity demanded as a function of net price, family income, and the average price paid for each student who receives federal financial aid. It tests the impact of the average cost per income bracket, the price elasticity of low-income students, and the relationship between student enrollment and changes in average cost paid per income category at CCCU institutions. The problem statement and the context of increasing college prices, non-proportional Federal financial support, and external difficulties create a scenario that demand theory can effectively analyze and provide insight into. Demand theory in higher education illustrates how future demand for higher education is accounted for and the selection of variables for a statistical model.

Enrollment demand is a focus across the globe for colleges and is an issue that is historically studied in higher education research. Elasticity provides insight into enrollment demand because it shows how a "percentage change in quantity…is caused by a percentage change in a specific factor" (Toutkoushian & Paulsen, 2016a, p. 177). Higher education price elasticities show how a percent change in price will affect a percent change in enrollment. Demand theory forms the foundation for conducting the log-log regression in this study. The coefficients derived from this regression are used as elasticities to understand the relationship between the research questions and the findings of the study.

Research Questions

The research questions for this study address the problem of college cost, varying family finances, student enrollment, and are as follows:

1) How has the average net price charged to students by income level changed across time among institutional members and affiliates of the CCCU?

2) What was the price elasticity of demand by student income level at Council for Christian Colleges and Universities?

3) How does the net price low-income students pay correlate to the enrollment of other income categories?

This study approaches the first research question by first identifying the colleges in the sample. Since there was no official category to group these colleges by in IPEDs the CCCU was contacted directly to determine what list best represented the colleges in membership during the years of the study. Then data was matched to these colleges from IPEDs data as compiled by the Urban Institute (Insitute, 2023) and then extrapolated across the colleges and years to determine the way the average net price changed year to year and what insights were to be gained as a result of answering this research question.

The second and third research questions utilized demand theory to guide the selection of key independent and dependent variables. These variables were then populated with data from the Urban Institute (Insitute, 2023). After compiling all necessary data, the variables were inputted into STATA statistical software to complete a log-log fixed effects regression that follows the empirical framework. The results from the log-log fixed effects regression provided insight into the elasticities by income category and demonstrated the impact that discounting had on enrollment.

Research Methodology

The research in this study utilized a log-log fixed effects regression to interpret the impact on enrollment based on price paid by student per income category. This study

accounted for omitted variable bias by using fixed effects regression. Fixed effects regression accounts for omitted variable bias by addressing unobserved variables that may influence a study's outcomes by "comparing a unit of analysis to itself" to control for time-invariant variables (Riegg, 2008, p. 340).

The utilization of a double logarithm model to best understand the relationship of change in price on enrollment is helpful. The application of logarithms to each predictor and outcome variable is used by researchers and makes the results more natural for interpretation of elasticities (Vittinghoff et al., 2006). All variables X and Y for this study are transformed to Ln (X_1) and Ln (Y_1) (Wang & Jain, 2003).

There are advantages of using a double logarithmic model for this study. Wang and Jain (2003) indicate that one advantage of using a logarithmic model is that it "provides direct estimates of variable elasticities" which make this a strong choice for this study since measuring elasticity is a key part of the research question and estimation of change (Wang & Jain, 2003, p. 105). Another advantage is the ease of comparison and interpretation of the data and results.

This study's specific fixed effects framework is a modified version of the one utilized by Jaquette and Curs (2015). This study applies their framework in a unique way that addresses the three research questions selected for this study. Considering their model and the advantages of using a double logarithmic, this study will utilize the equation below with logarithms (Ln) as denoted:

$$Ln(Y_{\iota\tau}) = \beta(LnX_{\iota,\tau-1}) + Ln(W_{\iota,\tau-1}\gamma) + Ln(V_{\tau-1}\vartheta) + \delta_\tau + \alpha_\iota + \varepsilon_{\iota\tau}$$

ι = institution fixed effects

τ = year fixed effects

β =the effect that is being analyzed, average price paid per income category.

Y = Number of FF FT Title IV eligible students that enroll at institution *i* at a period of time *t* per income category.

$W_{\iota,\tau-1}\gamma$ – is a matrix of institution, and time varying covariates.

$V_{\iota,\tau-1}\vartheta$ – is a matrix of, institution, and time varying covariates.

δ_τ – Year Effects

α_ι – Institution Effects

$\varepsilon_{\iota\tau}$ – Omitted variables

Significance of the Study

This study provides important insight into a population of colleges, Council for Christian Colleges and Universities, a group that has seldom been the focus of research and study. When it comes to the topic of tuition discounting per income category there is no current research that investigates this specific focus of the study, with the variables utilized, across the years included in this study. The use of IPEDS enrollment by income categories is limited in past research so this study can equip future researchers to approach future research in a replicable way. This provides current research that can be built upon in the greater body of literature. It also equips colleges with insights that can be considered for strategic decision making related to enrollment and college costs, particularly among low-income families.

This study also provides results and elasticities that can be utilized to help understand how to better impact enrollment of students by income category. This may be especially significant for colleges that want to grow specific student population categories such as low-income students. Knowing the unique way that these student

populations respond to price can help colleges to be more strategic in the way they approach their strategic plans and strategic enrollment management plans. Current practitioners and researchers alike can build on this study in ways that might lead to increasing enrollment at their specific institution for their specific enrollment strategy. It can also be used to better understand students from specific income categories by utilizing the data specific to income categories form this study.

Summary

Higher education has and continues to serve students sensitive to the price of college. The need for financing has been well established and has been with higher education since its inception in varying forms. Modern colleges address the need to support students' financial needs through tuition discounting. This is where colleges reduce the cost of their own college by offering financial aid to the student. As colleges seek fiscal solvency and students consider their college options, it is important to understand how students from varying income backgrounds choose to enroll at colleges based on net price. This study provides insights into this process, drawing upon past research and utilizing demand theory to guide the log-log fixed effects regression analyses used to answer the study's research questions. This study provides insight into the enrollment decisions of students going to CCCU institutions based on their income using data from IPEDS.

CHAPTER 2: LITERATURE REVIEW

This section will describe enrollment management, including its origins and implementation at colleges. After enrollment management is discussed, research is presented to provide insight into the workings of tuition discounting since some have described the practice of enrollment management as "almost synonymous with tuition discounting" (Kraatz et al., 2010, p. 1524). Tuition discounting refers to the practice that institutions undertake to reduce the tuition cost for some students. While it is possible to pursue other discounting methods, the data that this study relies upon in IPEDS compiles the amount paid by students reflecting a discount, and the average amount paid is never more than tuition for any of the colleges studied (NCES, 2020). The usage of tuition discounting is shared with other studies in the literature, and this study situates itself in a similar context applied to the unique research questions of this study (Behaunek, 2015; Martin, 2002; Tonsil, 2005).

Tuition discounting will be discussed by identifying the specifics of how it is processed and strategically deployed in financial aid offices and how federal calculations, cost calculators, institutional discounting, and packaging policies all influence a student's aid. This section also provides a broader understanding of discounting, the rising percentage of tuition discounting, and how this discounting shapes institutions using this strategy. The subsequent section that is discussed addresses the population of interest to this research, Council for Christian Colleges and Universities (CCCU), their origins, and past research involving this group. This chapter concludes with the remaining gaps in literature that this research addresses.

Enrollment Management

Enrollment management is a term that John Maguire first coined in a 1976 magazine article written for Boston College's alumni (Hossler, 2000). Enrollment management was a response to families' shrinking resources for college and colleges' strategies to recruit these students effectively (Barnes & Harris, 2010; Kraatz et al., 2010). Enrollment management is used in the literature as an ideology that defines methodologies for leading an enrollment department, establishing a collaborative effort, and focusing on a strategic outlook (Hossler, 2000). These principles are found in modern organizational structures and departments that carry the title of Enrollment Management Department. There is research about the way enrollment management as a structure evolves and changes through time and how some now term its institutional implementation as *strategic enrollment management* (Baldin, 2013; Bontrager, 2004; Chen, 2010; Hartunian, 2011; Hossler & Kalsbeek, 2013; Kalsbeek, 2007; Pike & Robbins, 2016; Schultheis, 2013; Seefeld, 2015; Smith, 2007). The fundamental focus of strategic enrollment management is to provide a system that will be deployed across the institution and not just within isolated departments (Baldin, 2013; Bontrager, 2004; Chen, 2010; Hartunian, 2011; Hossler & Kalsbeek, 2013; Kalsbeek, 2007; Pike & Robbins, 2016; Schultheis, 2013; Seefeld, 2015; Smith, 2007).

The principles of enrollment management encompass both philosophical ideals and tangible institutional structures. Enrollment management is not merely a strategy; it is a multifaceted institutional approach that necessitates aligning a college's philosophical approach with structural adjustments within its organizational framework. Hossler and Kalsbeek (2013) divide enrollment management into five key concepts that show both the philosophical ideas and the structural adjustments within organizational frameworks

manifested in easily digested principles. These five core principles functioned within this new enrollment management methodology from its inception. They included: 1) marketing as a focus to recruiting and admitting students, 2) student retention being placed as an equal priority with recruitment, 3) financial aid being used to meet goals by creating an optimal discount strategy that may involve a blend of need-based or merit-based aid, 4) decision making grounded in strategic and empirical research that is developed by teams at colleges which supports the established enrollment management goals, and 5) organizational implications that may require restructuring at a large scale level to implement enrollment management correctly (Hossler & Kalsbeek, 2013).

Enrollment management as a strategy is met with conflicting support. Some criticize enrollment management as threatening institutional values because it reduces autonomy within departments like financial aid. Some term this shift toward enrollment management as a "value-threatening administrative innovation" or "an incipient threat" to institutions (Kraatz et al., 2010, p. 1522). Some argue that departments are placed under leadership roles, emphasizing increasing enrollment and increasing prestige instead of focusing on student access (Kraatz et al., 2010). Researchers also argue that financial aid needs to focus on meeting student needs, as determined by their FAFSA. Utilizing financial aid in enrollment management structures leads some to believe that this allows priorities of enrollment to influence Financial Aid's traditional need based focus (Kraatz et al., 2010).

Others find that enrollment management can be a strategic solution to organizational problems, such as financial aid need based strategies (Hossler & Kalsbeek, 2013). Hossler and Kalsbeek (2013) do not shy away from the criticisms to enrollment

management, stating that many are "fair criticisms" and, at times, enrollment management has constrained "equity outcomes for students from low-income and first-generation backgrounds" (p. 6). However, Hossler and Kalsbeek (2013) find that enrollment management is a necessary structure and strategy for institutions to utilize that supports enrollment growth. Further, they state that the tension institutions face as they maximize net tuition revenue while potentially limiting access will not be removed without enrollment management solutions, which may help balance these two goals. According to Field Hossler and Kalsbeek (2013), enrollment management is a strategic process that allows institutional goals and priorities to be operationalized to support access and student enrollment.

The efficacy of enrollment management will continue to be debated. However, researchers from either side of the efficacy debate agree that enrollment management has been influential for colleges (Baldin, 2013; Bontrager, 2004; Chen, 2010; Claffey & Hossler, 1986; Drumm, 1989; Glover, 1986; Greene, 1987; Hartunian, 2011; Hossler, 1984, 1986; Hossler & Bean, 1990; Hossler & Kemerer, 1986; Ingersoll, 1988; Kalsbeek, 2007; Kreps, 1989; Pike & Robbins, 2016; Schultheis, 2013; Seefeld, 2015; Smith, 2007; Swigger, 1990). Researchers study enrollment management utilizing diverse methodological approaches regarding implementation and the variables influencing college-level decisions. Some unique modes of implementation by researchers are: accounting for geographic information systems as a part of a strategic enrollment management strategy (Baldin, 2013), identifying outcomes in Strategic Enrollment Management models (Bontrager, 2004), measuring high school student retention (Chen, 2010), identifying strategic involvement of senior leadership in the process (Hartunian,

2011), assessing enrollment propensity (Pike & Robbins, 2016), evaluating university partnerships (Schultheis, 2013), providing insight into the role of scholar-practitioner (Seefeld, 2015), detailing faculty involvement (Smith, 2007), understanding the role of telemarketing in the early days (Kreps, 1989), strategizing about the strategic use of financial aid (Hossler, 2000; Kalsbeek & Hossler, 2008), defining library schools (Swigger, 1990), accounting for community colleges (Chen, 2010), and accounting for four-year public universities (Hartunian, 2011).

Research on enrollment management has provided insight into many unique and diverse research questions. This study adds to this diverse body of research as it focuses on how enrollment management is deployed within certain CCCU institutions through financial aid and the utilization of tuition discounting. As a key part of enrollment management, a focus of Financial Aid departments is discounting, emphasizing federal and institutional discounting. This discounting focus will be discussed in greater detail in the next section by looking at the factors involved with federal and institutional funding practices and how factors like the cost of attendance affect these calculations.

Financial Aid: Discounting, the Federal Method, and Institutional Practices

There are many examples of discount models and structures that colleges use. All discount models account for how a student is packaged toward the cost of attendance (FSA, 2018). Packaging is the process of evaluating and adding all Title IV funds that a student qualifies for based on the expected family contribution number from the FAFSA. Packaging toward the cost of attendance must always be followed as directed by the Department of Education to ensure that federal funds are appropriately administered, awarded, and disbursed to the student.

The cost of attendance connected to tuition discounting is defined in two ways. The first way that cost of attendance is tied to tuition discounting is the federal understanding of the cost of attendance, where a college sets the reasonable amount an average student will need to expect to pay for a year of their education. Cost of attendance is inclusive of the following allowable categories: tuition and fees, room and board, books, supplies, transportation, miscellaneous expenses, an allowance for costs expected to be incurred for dependent care (for students with dependents), the one-time direct costs of obtaining a first professional license or certificate (for students who are enrolled in a program that requires such professional licensure or certification), reasonable costs associated with a study-abroad program approved for credit by the students home institution, an allowance for expenses related to the student's disability (for students with a disability), and fees required to receive a loan (for students receiving loans) (FSA, 2018, pp. 3-38). The joint amount of these allowable direct and indirect expenses that each institution sets determines its cost of attendance, which will help determine how much federal financial aid a student can receive.

The second way the cost of attendance is defined is how the institution determines the institutional aid it will award. Some institutions may choose to use both the direct and indirect costs associated with the cost of attendance calculation that the government uses and that they already set. However, some may choose to base their discount model on direct costs and not direct and indirect costs. Direct costs are those charges a student must pay to attend the college, such as tuition and fees, food, and housing (FSA Partners, 2023a). Indirect costs are not paid directly to the college but are necessary for the student to support themselves while completing their education. Indirect costs could include

miscellaneous personal expenses, transportation, dependent care expenses, disability-related expenses, and educational loan fees (FSA Partners, 2023a). After determining the cost of attendance, an institution can determine how much aid a student qualifies for.

If students want to receive government aid, they must start the process by completing the Free Application for Federal Student Aid (FAFSA). The FAFSA allows the student's information to be sent to the Central Processing System and determines eligibility by ensuring a student's information is checked with key departments for database matches. The databases that a student's information is sent to after completing the FAFSA include the Social Security Administration (SSA), the Department of Homeland Security (DHS), the National Student Loan Database System (NSLDS), the Department of Defense (DOD), the Department of Justice (DOJ), Selective Service (SS), and the Department of Veterans Affairs (VA) (FSA Partners, 2023b). After database matches are completed, a student receives a Student Aid Report (SAR), and the institution receives an Institutional Student Information Report, which provides the needed information to package a student. The Central Processing System (CPS) controls the sending and receiving of data between all seven governmental organizations as designated by the circling arrows. The results of this match are then processed on the Student Aid Report (Student Receives) and the ISIR (College Receives) (FSA Partners, 2023b).

Upon receiving the ISIR, the institution will first address conflicting information and codes that are problematic for processing the student's file. The institution will also verify any needed documents for a student selected for verification, which is an additional step for students requiring additional documents to verify certain financial or

personal information. Suppose all these final steps are completed to satisfy both the Department of Education's regulations and the Financial Aid Administrator. In that case, the student will receive an Expected Family Contribution (EFC) that can be used to begin the packaging process, which is the system the institution follows in awarding a student aid (FSA, 2018).

Although packaging and packaging priority will be discussed later, this section provides a clear context into how packaging must be implemented at each institution. The amount that a student can receive is based on their remaining need. Pell grants are applied first based on the expected family contribution (EFC). For FSEOG, Federal Work Study, and Subsidized Loans, the award is based on the remaining need or Cost of Attendance (COA) minus expected family contribution minus Estimated Financial Assistance (EFA). The estimated financial assistance is the additional money received at the beginning of the packaging process starting with the amount applied from PELL. For Unsubsidized Loans, the amount that can be received remains after the other amounts have been applied. Still, the expected family contribution is not considered for it, nor is the Parent Plus Loan (FSA, 2018). The calculations for financial and remaining needs are as follows: "COA – EFC = Financial Need…COA – EFC – EFA = Remaining Need (NASFAA, 2019, p. 1)"

The packaging process for the Department of Education begins with the award of the Pell Grant, then Direct Subsidized, then Unsubsidized Loans, then the Parent Plus Loan (IASG Grant, Teach Grant, and Perkins Loans are not included in this assessment, but would also be considered for an institution). The awarding of Federal Campus Based Programs, such as the Federal Supplementary Educational Opportunity Grant or Federal

Work-Study are awarded based on the students EFC and remaining need. The FSEOG grant would be applied after the Pell Grant, but before the Direct Subsidized Loan. However, unlike other programs there is more autonomy for institutions to award to students at their institutions. For example, when awarding FSEOG the amount awarded per student can be a unique amount per institution as long as it is above the stated minimum and below the maximum amount determined by the Department of Education (FSA, 2022). Federal work study is awarded based on student need and set criteria, however, there is institutional discretion on how to approach student employment, identification, and awarding of the work study (FSA, 2022).

This section provided an in-depth explanation of how a student qualifies for funding, especially related to the federal method. This process involves qualifying students for funding and programs based on determinations from completing the FAFSA. Although this is an integral part of the discounting process, it is only half of the equation. The following section will show more precisely how a few selected colleges apply and use their institutional discounts, then discuss tuition discounting at greater length.

Institutional Discounting

Students come from unique backgrounds and have varying abilities to pay for college because demand is affected differently by how each student's college engages in discounting. These discounting principles seek to increase student yield. With its many funding opportunities, the federal method may appear to fully meet a student's needs, making this discounting unnecessary. However, some students don't qualify for any federal aid but have financial need and do not have money saved to afford a college education. Still other students might receive financial aid, but are looking at other

colleges and the net price they are asked to pay will impact their enrollment. Colleges through financial aid step into these students situations to provide discounting to support students ability to go to college. Discounting is regularly found in the form of a discount to tuition only, which this chapter addresses in greater depth and detail. While colleges typically just show the sticker price for an education at their college there is another price, net price, that results after discounts offered by colleges. This net price is not typically an advertised reality, but it is indeed present within institutions' strategies and can be found operating in many current net price calculators. Therefore, this section considers the existence of tuition discounting at colleges, examines how this discounting is calculated, and summarizes the research on discounting.

Institutional discounting in the form of tuition discounting is a regular practice that colleges utilize to offer students a price that would impact their ability to attend their college. Two colleges' net price calculators, Wheaton College and Azusa Pacific University, demonstrate how discounting is utilized to incentivize attendance based on a mixture of aid offered including Federal, state, and institutional aid. These offers provide a compelling strategy for students wanting to attend a Council for Christian Colleges and Universities institution.

All data from the two colleges net price calculators was compiled based upon the assumption of two student examples. First, an 18 year old, freshman, dependent student with a 3.0 GPA, 18 ACT, and a 0 EFC. Then the second example was the same student, but with different test scores. Instead of a 3.0 GPA the change to a 4.0 will be documented as well. The data is kept consistent across all three colleges to provide uniform data that also presents varying approaches to discounting. All colleges offered a

uniform amount for Federal aid in the form of a $7,395 Pell Grant, $1,000 SEOG, $3,500 Subsidized loans, and $2,000 Unsubsidized loans. However, there were unique approaches and decisions when it came to the Parent PLUS loan, Federal work study, and each colleges own scholarships that varied from college to college.

The first college's net price calculator that was reviewed was Wheaton College. Wheaton College's results showed a cost of attendance of $61,058 for the 2023-24 award year (Wheaton College, 2023). They included in their results the maximum Parent Plus loan allowed as well as $1,000 in Federal work study. This being the case all $61,058 were applied either to Grants, scholarships, or the Parent Plus loan to make up the remaining amount to issue a refund to the student for educationally related expenses beyond the sticker price of the college. Additionally Wheaton College offered $28,850 in a "Wheaton Grant" for a student with a 3.0. However, for a student with a 4.0 GPA they offered $11,723 in a "Wheaton Grant" and $20,000 in a Presidential Grant. The net difference between the scholarship amounts offered to a student with a 3.0 GPA vs. a 4.0 GPA was $2,873. However, the college approached the categorization of the scholarships in very different ways with the Wheaton Grant changing $17,127 (Wheaton College, 2023).

The second college's net price calculator that was reviewed was Azusa Pacific University. Azusa's results showed a cost of attendance of $58,842 for the 2023-24 award year (APU, 2023). They did not include any federal work study in their estimate. They did not specifically include a Parent Plus loan, but rather included a maximum loan amount of $21,947 with a similar approach to Wheaton, but categorized it differently as either a Parent Plus loan or another Private Educational Loan. This being the case all

$58,842 were applied either to Grants, scholarships, or the Parent Plus loan to make up the remaining amount to issue a refund to the student for educationally related expenses beyond the sticker price of the college. Additionally Azusa offered $8,000 in what they called “institutional need based aid” and a merit scholarship called the Director’s Scholarship in the amount of $16,000 for a student with a 3.0. However, for a student with a 4.0 GPA they offered $500 more in need based aid for a total of $8,500 and $4,000 more in merit based aid for a total of $20,000. The total difference between the student with a 3.0 and the student with a 4.0 was $4,500 in institutional aid (APU, 2023).

Wheaton College and Azusa Pacific University have net price calculators that show the final price that a student can expect to pay. This price is very different from the advertised price and allows students to see how their education is being discounted. Some websites advise families that the Financial Aid Offer may not arrive until March or April only 3-4 months before residential students need to move into the dorms at the college they have chosen (College Avenue, 2023). Others give a broader range, stating that college may notify students between October and April. This range seems surprising until you consider the way the Federal Laws impacts funding that colleges award students. For example, October has traditionally been the day when the FAFSA opens for students and families.

Since the FAFSA results can impact a student’s institutional, federal and state awards it is logical for colleges to wait until they have this crucial information and up until this time to use estimates provided by their net price calculator or other approaches to estimates. While this might explain waiting until October it is surprising to think that some colleges may not send the official Financial Aid Offer until April. The late release

of information may be largely based on the fact that the Federal Pell Grant amount each year is not finalized until February 1st, pursuant to 20 U.S.C. 1089(a)(2)(F) (Higher Education Act, 1965). From the given timelines, it can be inferred that certain colleges might distribute financial aid offers with the accurate amount as early as October or November. However, these institutions would still need to issue an updated offer after February 1st for Pell Grant recipients, as the finalization of the Pell Grant only occurs at that time. Other colleges might strategically send their first Financial Aid Offer after February 1st when the final Pell Grant payment schedule is published according to the Master Calendar (Higher Education Act, 1965). State aid can also be a factor for delays and adjustments since states like the state of TN might raise scholarship amounts like they have with the Hope Scholarship moving it from $3,500 to $4,500 for freshman students. However, these changes which are reflected in Tennessee Code § 49-4-914 are not implemented until July 1st preceding a student's enrollment in college the following month (Tennessee Code, 2023). These changes also necessitate an update to a student's financial aid and the need to issue another final financial aid Award Offer.

Institutions receive updated award information from the Federal and State governments February 1st and July1st. If they wait to release their financial aid offers until after either of these points it puts the final numbers in students' hands only months before they need to be on campus taking classes. The discounting process described in the previous section would yield a stark difference between how much a student would pay. However, this amount of $16,000-$20,000 at Azusa Pacific University or $28,850-$31,723 at Wheaton College would not be known to the student unless they went through the process to complete their estimate on the calculator or waited until colleges released

their financial aid Offer (APU, 2023; Wheaton College, 2023) The reality that discounting is taking place and that college may be more affordable might be more hidden and if they did not complete an estimate this would be the soonest they would be aware of significant financing for their education.

Discounting is taking place as previously described and this can have a dramatic impact on a students' decision or even ability to enroll in a college. However, what the discounting looks like for students' and how colleges arrive at different types of discounting is important to explore. Tuition discounting falls most predominantly under merit-based and need-based aid categories. Merit aid can be offered automatically or retroactively through a student's application and submission of scores. Institutional merit aid structures are typically built on a scale or are assigned a point that can be converted into a set scholarship (TSU, 2019). Merit aid is predominantly deployed in two ways to offer the student a discount or award: 1) with a graph or chart that the student sees, or 2) through an institutional net price or scholarship calculator. An example of a graph model is used at many colleges including Truman State University (TSU, 2019). The graph model simply uses the exact combination of GPA and ACT a student needs to automatically qualify for a set scholarship. Net price calculators are at all institutions, and an increasing number typically account for merit-based calculation like the graph model as part of the calculator (APU, 2023; Wheaton College, 2023).

The point system assigns points for having a certain GPA and a particular standardized test score. For example, a 2.5 GPA student might get one point, and then every quarter of a GPA increase would get an additional point (e.g., a 2.75 GPA would be worth 2 points, and a 3.0 GPA would be 3 points). This same process would be applied

to the student's highest standardized test score. For example, a student receives a point for a low-range ACT score of 1-19 and then another point for each increase above that (e.g., 2 points for 20, 3 points for a 21, etc.) until there would be a high score range at the top (e.g., scores between 31-36 would be allocated 13 points). These combined GPA and ACT/SAT scores correspond with a scholarship amount.

Institutional need-based aid scholarships are awarded as an extension of the federal method packaged to the direct and indirect cost of attendance, or it is packaged against the direct cost of the institution. With limited funding, some colleges package toward direct costs and work with exceptional cases. If the federal method is used, the cost of attendance would be reduced by a student's expected family contribution and all other aid they will receive, including work-study. After the remaining need is calculated, they would be eligible for need-based scholarships based on certain set thresholds. For example, a student with $5,000 of need would qualify for a set amount of need while another student with $10,000 of need would qualify for more need-based scholarship up to a maximum and based on predetermined thresholds.

This section examined how institutions build their discounting models and how those models are deployed. The two main methods presented provide typical ways to deploy these models. Examples of these models being deployed would be a visible graph or a points system. These models could be embedded into a net price calculator like the one provided by the Department of Education (ED, 2018) or the two specific examples that were assessed at Wheaton College and Azusa Pacific University. The following section will delve more into the way that policies and priorities will substantially impact students.

Financial Aid: Packaging Policies

The packaging priorities an institution uses to award aid can dramatically affect a student depending on how they are applied, what policies have been set institutionally, and how the aid is applied to the student. The essential components of a student's package can be grouped into the following five categories: federal support, state support, external support, and institutional support. Federal support includes the following funding options and programs: Pell Grant, FWS, FSEOG. The second category is state support, with examples such as the GO grant that Louisiana offers, or A+ that Missouri offers, or the Tennessee Hope scholarship (TN, 2023). These are only three examples, but they provide an understanding of scholarships available to students who are residents attending college in their home state and meet specific high school requirements from that state. The third category is external scholarships. This category would include any external scholarships a student might be awarded, such as the Coca-Cola Scholars Program, Davidson Fellows Scholarship, the Gates Millennium Scholars. The fourth and final category is institutional support and scholarships. This category includes scholarships previously described applied to students based on predetermined requirements that allow students to qualify for need or merit-based scholarships.

Institutional policies determine how aid is deployed and in what order. Certain packaging priorities can be inferred from the net price calculator results that were previously mentioned. For example, a student with a 3.0 GPA did not qualify for the Presidents Scholarship but was awarded the Wheaton Grant in the amount of $28,850. The student with a 4.0 GPA received $11,723 in their Wheaton Grant. This is a reduction of $17,127 for this scholarship. They did, however, receive a $20,000 presidents'

scholarship, but this was only a net gain of $2,873. This demonstrates that there must be some institutional policy about maximum aid award such that it led t the need to decrease the Wheaton Scholarship significantly when the Presidents scholarship was added. It might be that the college states that the Wheaton Grant must be last dollar up to a maximum institutional offer of $31,723. However, it is even more curious that when another scenario was run for a student with a 3.9 they received $12,000 in the President's Award and $15,643 in the Wheaton Grant. This resulted in a $1,207 reduction for the student. These results could either be mistakes or the results of discounting policies that dramatically impact a student's net price. Regardless, they are the publicly published estimates students have to base their enrollment decisions on until a final Financial Award Offer is given to them.

Now that a specific situation has been reviewed it will be important to address the Federal packaging process and how this might fit for colleges at large as they build their discounting process. The packaging order awards funds by placing some categories as applying first before others that follow. For example, the federal method requires that Pell be applied first, then accounting can occur to see what else a student qualifies for after applying this to the student's need. Based on the order aid is awarded, some later awards may be reduced or increased based on these prior awards.

The following priority list is an example of how aid might be applied within an institution and provides a clear example of how this part of the process works. The awards presented below form each of the categories are applied and placed in an order that denotes the priority or the need to consider a number lower before moving to a number higher in the award list.

1. Pell Grant (Category 1)
2. State and Outside Aid (Category 2)
3. FSEOG (Category 1)
4. Institutional Merit Aid or Other Automatic Scholarships (Category 4)
5. FWS and Work-Study (Category 1)
6. External Scholarships (Category 3)
7. Subsidized Loan (Category 1)
8. Unsubsidized Loan (Category 1)
9. Need-Based Institutional Aid (Category 4)
10. Parent Plus Loan (Category 1)

This discounting process uses an automatic award in step three for institutional dollars. This step would be awarded assuming that steps one, two, and three did not already exceed the colleges cost of attendance. After these funds have been awarded the college would then calculate the amount of an institutional merit scholarship. The need based scholarship could be awarded in this step, but it could also be pushed later in the process as it is here to step nine after external scholarships are accounted for and an assumption of loans. Allowing a student to not count external scholarships or loans as part of the calculation for a need based scholarship would certainly change the amount the student would otherwise be eligible. Also by having the merit and auto scholarships earlier in the process it might reduce the amount of need based scholarship a student otherwise might receive, which was present in the Wheaton College example (Wheaton College, 2023).

This packaging example shows the way that a student's burden can be impacted simply by choosing where to place certain types of aid and in what order they will be awarded. College net price calculators validate priority considerations and how the institutional discounting strategy is deployed at this stage of the process. Net price calculators show the need-based institutional amount changing by more than $17,000 at Wheaton College based on how much merit-based scholarship a student might receive keeping all other factors constant (Wheaton College, 2023).

Packaging policies and their impact on students are well-researched in the literature (DesJardins & McCall, 2010; Hochstein & Butler, 1983; Lange & Stone, 2001; Mendoza, 2012; Munger, 1983; Nora, 1990; Olivas, 1985; Spaulding & Olswang, 2005; St. John, 2001; Stampen & Cabrera, 1988; Wilkinson, 1998). These studies provide broad perspective ranging from historical assessments (Wilkinson, 1998), to its impact on: students with disabilities (Wolanin, 2005), retention (Hochstein & Butler, 1983; Stampen & Cabrera, 1988), college access (Olivas, 1985; St. John, 2001), private donors (Munger, 1983), Hispanic students (Nora, 1990), parental involvement (Lange & Stone, 2001), changes in the packaging process itself (DesJardins & McCall, 2010), and debt and working (Mendoza, 2012). A few of these studies stand out as examples to better understand how the packaging policies impact specific student populations, predominantly low-income students.

The research supports the idea that financial aid packages with loans or an emphasis on loans can impact student's enrollment and their completion at college (DesJardins & McCall, 2010; Mendoza, 2012; Wolanin, 2005). This can be increasingly impactful for minority students or low-income students and the way that government

support favors loans as a mechanism for college financing (Mendoza, 2012). DesJardins and McCall (2010) provide a vital study removing loans from the packaging equation to consider students' chances of graduating, stopping out, or re-enrolling (DesJardins and McCall (2010)). They found that different types of aid in a student's package had a different impact. For example, another $100 Pell grant would significantly impact a student's enrollment and continuation through college opposed to $100 of loans (DesJardins & McCall, 2010). The second outcome, which was not the primary outcome of the article, was their usage of Princeton's packaging policy. The Princeton model provided an example that others have since followed, where the policy to replace the dollar-for-dollar loan qualification for students with institutional aid or scholarships impacted retention, graduation, and re-enrollment. The outcomes of the Princeton policy had a significant impact leading to a 9% better chance of graduation and a 27% better chance of re-enrollment (DesJardins & McCall, 2010). This then provides an essential assessment about how changing one part of a student's package can have a very different impact on the students. Other researchers have also documented that replacing loans with other aid impacts enrollment of low-income students at colleges positively (Waddell & Singell Jr, 2011) and how different types of aid, such as loans, affects students differently (Hillman, 2010). Researchers provide an essential context within which to understand the impact that packaging policies are constructed and implemented.

If loans and packaging students with loans impacts enrollment and completion, then the loan packaging and disbursement processes that precedes this happening should also be considered. One part of this process that proceeds the student receiving the loan is the packaging process at colleges and whether they follow active or passive

confirmation. Active and passive confirmation relate to how a college disburses loans for a student (FSA, 2022). If a college is active confirmation, then they cannot disburse the loan until the student, the borrower, accepts the loan. However, under passive confirmation a college is allowed to disburse the loan for the student, the borrower, without them accepting the loan (FSA, 2022). The student is still notified that the loan is disbursed and the rights of the borrow to cancel, however, this may lead to higher borrowing and if higher borrowing impacts enrollment and completion it is one more factor that should be considered as part of the packaging strategy and approach at colleges (FSA, 2022).

This section provided insight into the way packaging policies are set up and deployed at colleges. There was information provided to understand how packaging policies impact students dramatically and indifferent way. This section also shows the impact of packaging on low-income students dramatically and directly impacts their ability to enroll and retain at colleges. The following section will show how the department and organizational structure can dramatically impact packaging policies and procedures. Resource dependency theory will help to connect the realities of enrollment management as a system and financial aid offices' deployment of discounting as a practice. It provides a framework to understand better how an enrollment management-focused institution may guide financial aid to be more enrollment management-focused than its historical focus on need-based aid.

Previous Perspectives About Institutional Resources

Perspectives about institutional resources, like resource dependence theory, provide insight into the tension created within organizations because of the reality of

limited resources and shortages, which helps to add perspective to the way discounting is approached by institutions (Bevir, 2007). This dynamic and the shortage that ensues creates problems because an allocation of scarce resources in one place creates a shortage in another (Casciaro & Piskorski, 2005). When this scarcity is encountered, the organization must find a source to meet the needs that it has to continue to function. This search is not done externally but rather internally to use those resources and processes to meet the resource shortage; however, the tension with the way this process works is that when the needs are met by using another resource within the organization, a dependency and power imbalance form (Aldrich & Pfeffer, 1976). This theory has been used to explain organizations, looking at its importance from management, sociology, and environmental perspectives (Davis & Cobb, 2010; Hillman et al., 2009; Pfeffer & Salancik, 2003).

The circumstances and interactions that lead to dependency in organizations are applied differently and are used widely across the research to explain the role of the board (Hillman et al., 2009), board composition (Hillman et al., 2000), board involvement techniques (Hodge & Piccolo, 2005), customer-supplier relationships (Fink et al., 2006), revenue diversification in nonprofit organizations (Froelich, 1999), purchasing (Handfield, 1993), external control (Pfeffer & Salancik, 2003) and higher education (Gornitzka, 1999) to mention a sampling of key topics.

Organizational dependency connects directly with enrollment management research because the literature is a byproduct of the very situation that resource dependency theory seeks to analyze (Schulz & Lucido, 2011). Resource dependency theory is also a commonly used framework in the literature that helps connect the realities

of enrollment management as a system to financial aid offices' deployment of discounting as a practice. Colleges utilizing enrollment management structures experience the realities of resource dependency as well in their processes and in the internal and external realities (Kraatz et al., 2010; Schulz & Lucido, 2011).

Resource dependency theory is utilized to explain certain phenomena in enrollment management because it explains not only the situation, but also the dependency that sets in regarding enrollment management (Kraatz et al., 2010; Schulz & Lucido, 2011). An example of this happening would be the major increase in the number of applicants in the mid-twentieth century while there was a decline in the number of students actually enrolling (Hossler & Hoezee, 2001; Schulz & Lucido, 2011; Sjogren, 1982). Enrollment decline led to a situation in which there was a resource shortage as scarcity set in when fewer students started coming into the institutions. When this shortage threatened the operation of institutions, enrollment professionals began looking within their organizations to identify other resources and processes to meet the shortage (Kraatz et al., 2010; Schulz & Lucido, 2011).

Research shows that institutional dependency can be attributed in part to the structural changes which took place to create enrollment management. The structural changes have been drastic in their changes within higher education organizations and have led to the creation of a Dean of Enrollment, Chief Enrollment Officer, Chief Admissions Officer and other positions which had never previously existed (Baldridge et al., 1982; Black, 2004; Hossler & Bontrager, 2014; Kreutner & Godfrey, 1980). Examples of departments that might be housed under the enrollment umbrella at an institution would include financial aid, admissions, the office of the registrar, student

information systems, new student orientation, retention activities, academic advising, marketing, and international student services (Robinson, 2009).

These structural changes and transitions can lead to a dependency according to Aldrich and Pfeffer (1976), since these departments must all now share the same focus of enrollment management. This focus is shared due to organizational necessity and the requirement to report up to a supervisor of a department that has an emphasis on enrollment management. It further creates an institutional dependency on headcount or full-time enrolled students, because funding is focused upon tuition dollars (Hossler & Kalsbeek, 2013; Robinson, 2009). The way the enrollment management structure functions can create a dependent relationship with some of these departments such as financial aid (Hossler, 2000; Hossler & Kalsbeek, 2008; Kalsbeek & Hossler, 2008; Langston & Scheid, 2014; McGhee, 2015).

The impacts of this dependency are far-reaching. For example, researchers find the financial aid relationship to have drastically changed the vision of the financial aid department and the way it functions (Kirp & Holman, 2005; Kraatz et al., 2010). According to some researchers, this focus has moved away from the historical focus and priority of need-based aid toward one focused on enrollment maximization, reducing need emphasis (Kirp & Holman, 2005; Kraatz et al., 2010). For example, as a key part of enrollment management, the focus is placed upon the enrollment management practice of tuition discounting. Researchers show that this tuition discounting practice can lead to a greater emphasis on merit-based aid and less on need-based aid offered by the institution (Kirp & Holman, 2005; Kraatz et al., 2010; Quirk, 2005).

Resource dependency points to the existence of limited resources that colleges leveraged through the implementation of enrollment management strategies. It provides a context and understanding for the merging of departments under an enrollment management focus and in turn shows how this type of relationship can change the vision and values of departments like financial aid. It also provides a foundation to understand the practices financial aid offices deployed through their tuition discounting strategies, which are assessed in the next section.

Tuition Discounting: A National Perspective and the Research

The National Association of College and University Business Officers (NACUBO) completed the "NACUBO Tuition Discounting Study" and found that the practice of tuition discounting, illustrated in the figure below, continues to be a common trend among the private, non-profit colleges surveyed. It not only continues to be used but is used in an increasing manner year after year. The discounting study shows that colleges discount rate has continued for the past ten years to the projected, highest rate, for 2022-23 of 56.2% for first-time undergraduates and 50.9% for all undergraduates **(NACUBO, 2019, 2023)**.

Figure 1

Average Institutional Tuition Discount Rate by Student Category:2007-2018

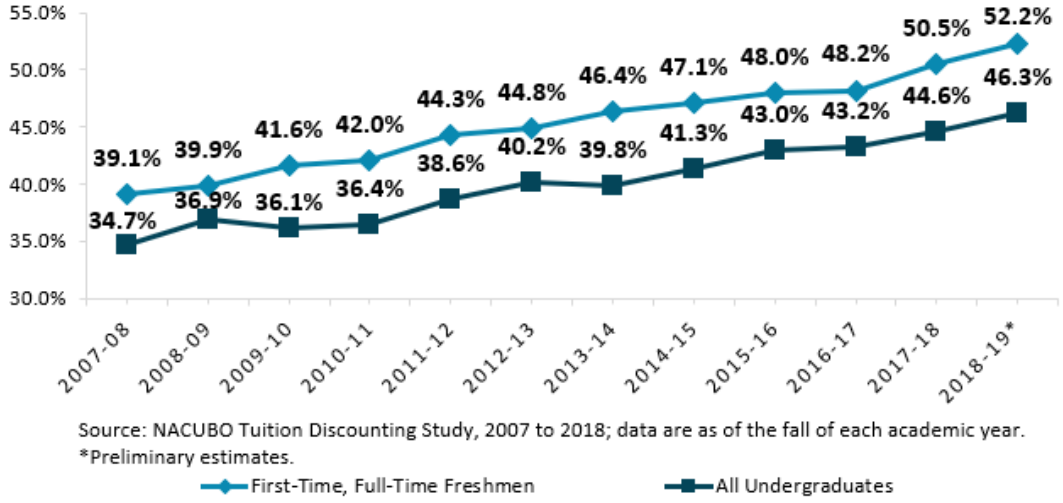
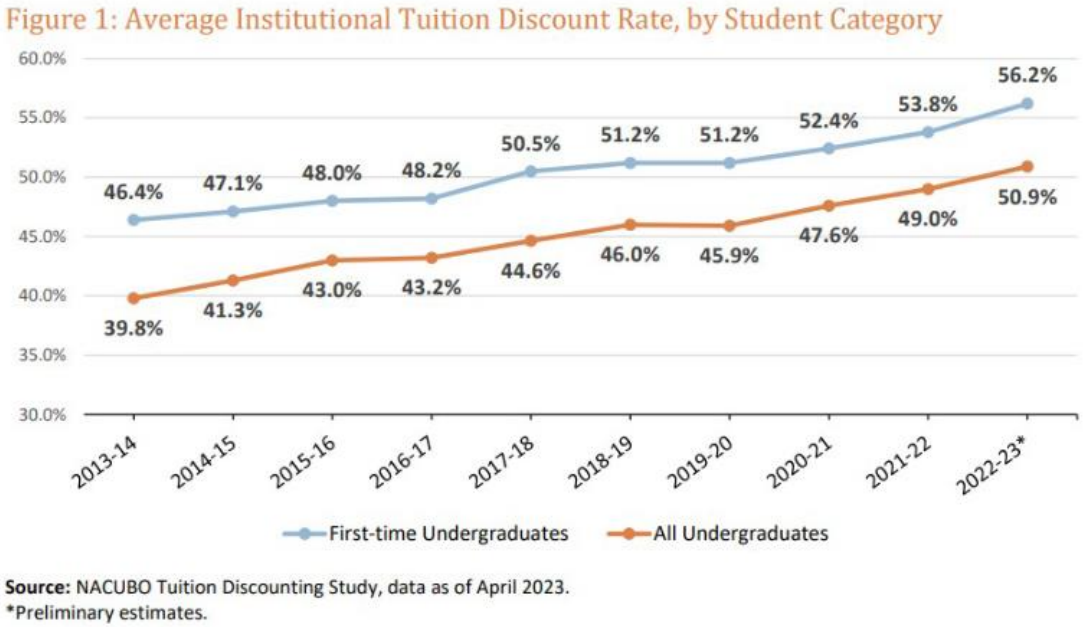


Figure 2

Average Institutional Tuition Discount Rate by Student Category:2013-2022



Utilizing the financial aid packaging model that an institution implements, as described in the previous section, financial aid Departments strategically discount the cost for some students that meet specified criteria. The ultimate aim for this discounting is to use it to leverage Financial Aid offices by awarding institutional grants and scholarships to encourage students to attend the college who would otherwise either not want to come to that specific college or would be unwilling to attend (Hillman, 2012; Martin, 2002; Martin, 2004). It is also used economically to capture the consumer surplus, as illustrated in the figure below, that exists by having a higher sticker price than the equilibrium point or the point at which an equilibrium is arrived at by the supply and demand curves (Rine, 2016).

At these institutions, growing use of discounting is directed to students based on merit requirements (Martin, 2004). For example, from "1995 to 2008, the percentage of students receiving aid grew so rapidly…that it rivaled the number of students receiving need-based aid" (Drew, 2012, p. 1). This focus on merit aid within the discounting strategy impacts students from wealthy backgrounds at a much higher rate than their low-income peers (Griffith, 2011; Martin, 2004). Some find this to be a troubling trend because it is viewed as a shift away from a primarily need-based aid focus in Financial Aid Departments toward one that has an increasing focus on merit based aid (Kirp & Holman, 2005; Kraatz et al., 2010; Quirk, 2005). This shift and focus on tuition discounting is criticized by some as a key factor affecting college access in the present time because of institutional tuition discounting strategies (Bontrager, 2004; Hartunian, 2011; Kalsbeek, 2007; Kraatz et al., 2010). These strategies focus on discounting to get students who otherwise would not enroll, focusing on increased net revenue. This is not

an isolated practice. It is utilized across public and private institutions, but the research does show that it is used more heavily and regularly at private institutions (Griffith, 2011; Hillman, 2012; Martin, 2002).

Tuition discounting, while adopted at many colleges to improve enrollment, may accidentally threaten the institution's viability. Institutions utilizing tuition discounting with a focus on too high of a discount percentage have failed and been closed because the revenue was no longer sustainable because the discounting was too high (Hillman, 2012; Martin, 2002). This is why Martin (2004) encourages colleges to be aware of specific factors, such as how much of the discounting is based on funded versus unfunded scholarships. Applying these principles, if an institution is focused too much on the numbers and generates a larger class but has too high of a discount, the additional increase can equate to less revenue. This loss of revenue can create a ripple effect of negative impact as the discounting for those students may stay with the college for as many as four years. The literature illustrates that it is also important not simply to focus on the discount percentage at large, but rather to break this down by focusing on funded scholarship discount opposed to unfunded (Hillman, 2012; Martin, 2002). How and to what extent a tuition discounting strategy is used can negatively impact low-income students and threaten the revenue of an institution as well (Hillman, 2012; Martin, 2002).

Tuition discounting has been regularly studied, including how tuition discounting is used and what its effect is at a macro level. Past research has examined how tuition discounting is used: to maximize revenue (Hillman, 2012; Hossler & Bontrager, 2014; Hossler & Kalsbeek, 2008; Kalsbeek & Hossler, 2008; Redd, 2000), to compete with other colleges (Drew, 2012; Griffith, 2011), in potentially harmful ways at colleges

(Hillman, 2012; Martin, 2002; Martin, 2004; Redd, 2000), to disfavor low-income students (Drew, 2012; Griffith, 2011; Hillman, 2012; Kirp & Holman, 2005; Kraatz et al., 2010; McPherson & Schapiro, 1999; Quirk, 2005; Redd, 2000), with merit aid (Davis, 2003; Drew, 2012; Griffith, 2011; Kirp & Holman, 2005; Kraatz et al., 2010; McPherson & Schapiro, 1999; Quirk, 2005), and as an enrollment management strategy (Davis, 2003; Hillman, 2012; Hossler, 2000; Hossler & Bontrager, 2014; Kalsbeek & Hossler, 2008; Kraatz et al., 2010; Redd, 2000). Tuition discounting also affects the rapid rise of the discount rate, enrollment, institutional priorities, and institutional marketing strategies and serves as a gatekeeper for the institution (Bisset, 2014; Fletcher, 2013; Hunter, 2012; Messer, 2016; Rine & Guthrie, 2016; Supplee, 2014). There is no question that the research about tuition discounting is extensive and provides great insight into this strategy and how it impacts higher education.

Tuition discounting is also applied to targeted studies as well such as the way that it can negatively impact low-income students (Olbrecht et al., 2016, p. 4). For example, Olbrecht et al. (2016) conducted a study to determine how individual level student data from five first-year cohorts of students explain the relationship of family finances, merit-based aid, and first year retention. This research presents some concerns with discounting and how it can negatively impact students from varying income brackets differently. Within this article the authors state, “in all research on the correlation between aid and retention, increasing funds in one pot of funding (merit-based aid) often leads to decreased funding in other areas” (Olbrecht et al., 2016, p. 4). This reality points to the dependency relationship described in the previous section and the potential impacts that such foci may have on low-income students who look for need based funding

opportunities more heavily than their more affluent peers. The study goes on to find a significant impact on retention through the use of merit-based aid, which may lead toward an unbalancing of resources toward merit aid and away from need-based aid.

There are also targeted studies that look at how discounting and financial aid received per student directly impact enrollment and can even cause colleges to raise their sticker price (Behaunek & Gansemer-Topf, 2019; Hillman, 2010). Hillman's (2010) research demonstrated that while low-income students were likely to get a discount when they did their discount was nearly half as large as their upper income peers. Behaunek and Gansemer-Topf (2019) research shows that especially at Private Colleges discounting is a standard practice. The strategy of discounting is also leading to higher sticker prices at colleges which is problematic for low-income students since they are attending colleges with lower sticker prices.

These findings amplify the concern raised in the literature that the rise of tuition and the corresponding tuition discounting implemented at more colleges may be impacting low-income students negatively. Specifically, the literature shows a movement of low-income students away from high tuition, high discount schools toward those with lower tuition (Behaunek & Gansemer-Topf, 2019; Cabrera & La Nasa, 2000). These tuition discounting strategies are, at minimum, causing a melt of these students from colleges with higher tuition toward schools with lower tuition regardless of how much the discount may be (Behaunek & Gansemer-Topf, 2019).

These articles highlight current research that presents issues raised within the broader literature about the way that low-income students are impacted by tuition discounting practices at colleges. This research shows that tuition discounting may be a

college access issue for low-income students as institutions utilize tuition discounting strategies that may have a negative impact on them. However, while these factors are established in the literature, much less has been studied about other specific populations like the Council for Christian Colleges and Universities. This next section provides an assessment of this group of colleges and the importance of providing further research to expand the literatures understanding of this group of colleges as it relates to tuition discounting (Behaunek & Gansemer-Topf, 2019; Hillman, 2010).

Study Population: CCCU Institutions

The Council for Christian Colleges and Universities, formed in 1971, was originally named the Christian College Consortium with a focus on fostering greater collaboration between evangelical colleges. Individuals at Seattle Pacific College and Wheaton College established the CCCU. Carl Henry, David McKenna, and Hudson Armerding, among others, sought to address the identity issues present in evangelical colleges and financial and enrollment hardships being faced by these colleges at the time of the organization's inception (Patterson, 2005). Some of the ways that the CCCU addressed identity issues was to enact a statement of faith from the National Association of Evangelicals (Patterson, 2005).

The organization shifted in leadership and in 1999 changed its name to the Council for Christian Colleges and Universities (Abelman & Dalessandro, 2009). The name change represented how the organization "reinvented" itself and made a more dynamic impact in representation in Washington D.C. (Abelman & Dalessandro, 2009, p. 88). Although they were only a small organization at their inception, they have continued to grow and find a small but growing influence in higher education. The following quote

shows exactly where in the greater body of degree-granting institutions the CCCU finds itself:

> According to the National Center for Education Statistics, there are more than 4,300 degree-granting institutions of higher education in the United States. These include nearly 2,600 private institutions, just over 1,000 of which define themselves as religiously affiliated. Of those, 140 Christian colleges & universities in the U.S. have found common cause in the mission of the CCCU (as part of the CCCU's broader membership of more than 185 Christian institutions around the world) (CCCU, 2023, para. 17)

The CCCU grew from nine colleges at its inception to its current membership of 140 colleges and affiliates.

The organization also grew from representing five Protestant denominations to 29 denominations and 20 interdenominational institutions as well as the Catholic Church (CCCU, 2023). This diversity is grounded in shared beliefs, college missions, and adherence to key membership criteria. The colleges that are a part of the CCCU are niche schools, but they represent over 460,000 students (CCCU, 2023). These colleges have also received high rankings like Wheaton University, ranked by U.S. News and World Report as number 67 on the national liberal arts rankings, or Taylor University, which has earned the number one ranking for regional colleges in the Midwest (U.S. News, 2016). The number of students and the national recognition that these colleges and universities represent demonstrate the importance of researching how these colleges operate and the students they impact.

Colleges affiliated with this organization must share commonality with five key criteria, including institutional type/accreditation, Christian mission, employment policy, cooperation and participation, and institutional integrity (CCCU, 2017). The unique requirements for membership with the CCCU make these colleges not only small but also specialized and niche institutions. These colleges share one further characteristic in common as well, and that is their tuition dependency. The amount of total revenue for these institutions that comes from tuition can be as high as 80% (Vander Schee, 1998).

The literature is robust and diverse in addressing the ways the CCCU member colleges operate and the unique impact they have on diverse issues related to higher education. Research addresses CCCU's treatment of gender and gender equity (Dahlvig & Longman, 2014; Joeckel & Chesnes, 2009; Longman & Anderson, 2011; Longman & Lafreniere, 2012; Madsen, 2012; Moreton & Newsom, 2004), minority student population and diversity (Confer & Mamiseishvili, 2012b; Cross & Slater, 2004; Paredes-Collins, 2009), leadership (Burch et al., 2015; Dahlvig & Longman, 2014; Longman & Anderson, 2011; Longman & Lafreniere, 2012; Madsen, 2012; Schouten, 2010; Webb, 2007; Webb, 2008), marketing practices (Vander Schee, 2009), mentoring (Lund, 2007), salary differences (Saunders, 2007), employees (Hall et al., 2004; Webb, 2008), and religion/faith/spirituality (Glanzer & Ream, 2005; Hartley III, 2004; Holcomb & Nonneman, 2004; Morris et al., 2004; Railsback, 2006; Sherr et al., 2007). Beyond the broad inclusion of CCCU's as the population used for research and assessment, there is research that connects CCCU colleges with either enrollment management or tuition discounting, but does not connect the two in the research (Bisset, 2014; Fletcher, 2013; Hunter, 2012; Messer, 2016; Rine & Guthrie, 2016; Schuttinga, 2011; Supplee, 2014;

Vander Schee, 1998). One exception would be Schuttinga (2011) who discusses the discount rate to introduce an assessment of enrollment management at CCCU institutions.

The work of Schuttinga (2011) and Vander Schee (1998) stand as two key studies that get into the specifics of enrollment management and the type of enrollment structure used and adopted at CCCU institutions. Enrollment management structures vary across institutions within CCCU institutions but fall into four categories including marketing committee, coordinator, matrix, and division (Baldridge et al., 1982; Huddleston Jr & Rumbough, 1997; Schuttinga, 2011; Vander Schee, 1998). CCCU's have quickly implemented enrollment management programs over the past 15 years. Researchers show that of the CCCU's surveyed in 1993, 0% had a marketing structure, 16% had a coordinator structure, 3% had a matrix structure, 11% had an enrollment division structure, and 21% had an enrollment structure outside these classifications (Vander Schee, 1998). When this same classification was used more recently in 2013, findings showed that 11.1% had a marketing structure, 13.3% had a coordinator structure, 8.9% had a matrix structure, 60% had an enrollment division structure, and 6.7% had an enrollment structure outside these classifications (Schuttinga, 2011). Enrollment management programs were adopted by 45% of CCCU member institutions by 1998 and, of those who did have an enrollment management program, only 3% had their program in place for more than five years at the time of the survey (Vander Schee, 1998). By 2013, 93% of all CCCUs surveyed had an enrollment management program in place (Schuttinga, 2011).

There have been increases in enrollment management structures between the late 1990s and the first decade or so of the 21st century (Schuttinga, 2011; Vander Schee,

1998). Marketing structures increased 11.1%, coordinator structures decreased 2.7%, matrix structures increased 5.9%, and enrollment division structures increased 49% (Schuttinga, 2011; Vander Schee, 1998). These findings are important because they show the rapid rate of adoption at CCCU institutions and the increased likelihood that any CCCU institution will have characteristics of enrollment management present in their structure and processes. As of 2011, 93% of CCCU-affiliated schools were using some type of enrollment management structures (Schuttinga, 2011). The enrollment division model has had the highest increases and would be the likely norm across CCCU institutions. The way that these institutions implement and use tuition discounting is something that will be discussed in the next section.

Tuition Discounting at CCCU Institutions: An Assessment of the Model Itself

The specific connection of tuition discounting at CCCU institutions is assessed more in the literature than enrollment management specifically. Researchers show how tuition discounting is a factor in decision-making at colleges and the strategic plans and strategies they pursue (Bisset, 2014; Fletcher, 2013; Rine & Guthrie, 2016). Bisset (2014) concludes that tuition discounting negatively impacts mission because it supports strategies that desire to get more students rather than more of the right mission fit students. Bisset (2014) sees discounting strategies at CCCU institutions as misguided and detrimental, because they "drain financial aid budgets and negatively impact institutional revenue goals" (p. 1). These conclusions are comparable to past research on similar topics but with non-CCCU institutions (Hillman, 2012; Martin, 2002). These researchers do not disregard the system all together, but rather raise concerns and

awareness for individual institutions to reevaluate the profitability of their tuition discounting strategy.

Fletcher (2013) lands more in the middle on the issue, in his research at CCCU institutions, by showing that one factor contributing to a successful college is a lower discount rate. Fletcher (2013) here blends the two perspectives by not ousting the entire system, but rather proposing that it should be conducted with lower discount percentages and on a limited basis. Hunter (2012) conducted a regression model, t-test, and chi-square statistic comparing 673 institutions which included CCCU institutions. The study by Hunter (2012) had conclusions that connected to discounting showing that institutions "strengthened their financial position due to lessened tuition increases, more selectivity and an improved faculty to student ratio. On the other hand, institutions weakened their financial position by increasing the discount rate" (p. 110). The degree to which discounting should be shifted to increase viability opposed to removing the entire system remains a question unanswered. It continues to be a viable solution for some CCCU colleges but may not be the best solution for all CCCU colleges.

Tuition Discounting at CCCU Institutions: Potential Consequences

Researchers discuss a variety of potential consequences that can be connected to the practice of tuition discounting. Bisset (2014) concludes in his research that a consequence of using these discounting strategies is that it creates a disproportionate focus on wealthy students.

Bisset (2014) also shows that another consequence is the shifting of financial aid from its historical role of working with need based students. Bisset (2014) also concludes that

tuition discounting, at times, comes out of strategies that focus on quantity and not on strategies grounded in the mission of the institution.

Fletcher (2013) interviewed the leaders of three CCCU institution and provided research that shows potential consequences of tuition discounting. Although this paper has already discussed the delicate balance between discount rate and revenue (Fletcher, 2013) and the consequences that can result from an improper balance. An administrator describes the challenges associated with finding this balance:

> it's not an easy thing to decide exactly where is the line with discount. You know there's affordability, but you don't want to put too much money on the table. But it's not an exact science - decisions are made and they may…we might go in another direction next year because of unintended consequences or it didn't happen the way we had hoped. (Fletcher (2013, p. 92)

Similarly, Supplee (2014) shows that decisions that focus on goals may have ripple effects into the rest of the organization due to the complexity of the change. Aid for affluent students has been increasing over the past ten years at a higher rate than aid for low-income students (Supplee, 2014). These aid discounts have shifted from being funded by endowments and donations to funding based on tuition. More research is needed regarding the enrollment of low-income students at CCCU institutions using IPEDs data.

This study will contribute to the literature by studying tuition discounting at CCCU institutions and the impact this structure has on low-income students at CCCU institutions. This is a timely topic to address because the enrollment management practice of tuition discounting is on the rise at private colleges. Every year the

percentage of discount has increased at colleges for over ten years. With a strategy that is so well utilized and an increasing discount the question remains as to what impact this is having on specific populations such as low-income students. This is a topic that has not been studied and this paper will contribute an understanding of the impact that tuition discounting may be having on these students.

This study addresses how tuition discounting is impacting low-income students at CCCU institutions. While other studies have examined student demand, this study takes a fresh approach through the variables utilized and the population studied. Examples of student demand research are plentiful, but one of the foundational studies was by Leslie and Brinkman (1987), who reviewed most key student demand studies completed up to that time. More recent research demonstrates the importance of measuring how tuition discounting impacts students, enrollment, and equity issues (Altringer & Summers, 2015; Dwenger et al., 2012; Fowles, 2014; Heller, 1997; Hillman, 2012; Hübner, 2012; Jones-White et al., 2013; Martin, 2002; McDuff, 2007; Neill, 2009; Pike & Robbins, 2016; Rose & Sorensen, 1992; Seneca & Taussig, 1987; Singell & Stone, 2007; Souleles, 2000; St. John, 1990; Tierney, 1982; Tonsil, 2005).

Tuition discounting has been applied at both a single institution level as well as a framework to understand broad institution-level data and research (Allen & Wolniak, 2019; Heller, 1997; Steven W Hemelt & Dave E Marcotte, 2011; Leslie & Brinkman, 1987; Millea & Orozco-Aleman, 2017; Shin & Milton, 2006; St. John, 1990; Tierney, 1982). Some studies utilized IPEDS data to address the impact of tuition discounting (Allen & Wolniak, 2019; Steven W Hemelt & Dave E Marcotte, 2011; Millea & Orozco-Aleman, 2017; Shin & Milton, 2006), which is the basis for this study as well. Yet, even

with these diverse applications of tuition discounting, the assessment of students by total family income categories from IPEDS has rarely been used as a key predictor of student enrollment behavior. This study uniquely addresses income and helps to shed light on an important way to apply tuition discounting.

This study and its focus on how discounting impacts students based on their family's total income by income category provides insight into the enrollment behavior of students who have previously not been studied. The results of this study could empower institutions to explore more equitable discounting strategies or financial aid packaging policies that help to encourage access across income groups. The results may encourage CCCU institutions to maximize net tuition revenue and to understand what level of discount has the highest potential to increase low-income student enrollment.

Theoretical Framework

Demand theory is applied to this study to understand the relationship between CCCU institutional pricing and student enrollment by income level. Demand theory has a long history owing its visual origins to the works of Alfred Marshal and his classical work in 1890 established principles and figures that are now common place in the field of Economics and the many other disciplines that use Economic principles (Marshall, 1890). Marshall's work in 1890 was so influential that journals were publishing reviews by scholars like Giddings (1890) and Wagner (1891) right at the time of Marshall's "Principles of Economics." The figures in the Principles of economics helped to visually capture the interworking's of demand theory (Marshall, 1890, p. 157). This work is now a classical economic text which has undergone many revisions through the years since the time it was first written (Marshall, 1890). Demand theory, building off of the

historical roots of economists like Marshall, provide insight for quantity demanded as a function of price, family income, and the average price paid for each student who receives federal financial aid. Demand theory will be applied to test the impact of the average cost per income bracket, the price elasticity of low-income students, and the relationship between low-income student enrollment and changes in average cost paid by high-income students at CCCU institutions.

Demand theory is a theoretical framework used to understand the impact that the price of a good has on the quantity demanded of a good. The law of demand, an outcome of demand theory, states that "the quantity demanded of a good falls when the price of a good rises" (Mankiw, 2017, p. 67). The law of demand shows that price and quantity are inversely related since an increase in one will lead to a decrease in the other. Demand theory posits that the "quantity of a particular good or service demanded is a function of price, the money income of the buyer, the prices of other goods and services, and the buyers' tastes or preferences" (Leslie & Brinkman, 1987, p. 181). The relationship between price and quantity illuminates how the pricing of goods, services, and even colleges are established and the impact that price can have on the quantity demanded of a good.

Demand theory is used in higher education to determine what factors affect students' enrollment in college and their continued demand to remain in college. It is also important to discuss human capital theory and its connection and impact on students' demand and decision-making process. Demand theory applied to higher education helps to provide context for how the demand curve functions as the product's price, a college education, and an impact on the demand of students and their families (Toutkoushian &

Paulsen, 2016a). Students weigh their decision to enroll upon factors such as their families or personal budget, the price of other college options, and the decision that will bring them the most utility (Toutkoushian & Paulsen, 2016a).

DesJardins and Bell (2006) apply these factors of student decision making strategically in their demand function. They provide a framework to determine how many students are willing to attend a college based on their desire or ability to pay for their education based on factors mentioned previously. They used the following formula to drive their assessment of student demand "QxD= f(Px, Y, Pc, Ps, Pe/x, t+1, TP)" where quantity demanded equals the price of tuition (Px), family and student income (Y) "the prices of complementary (such as room and board, books) and substitute goods and services (such as tuition levels at other IHEs), represented by *Pc* and *Ps*; the expected price of the good in future periods (*Pex, t*+1); and the tastes and preferences of consumers" (*TP)* (DesJardins & Bell, 2006, p. 61). The demand function utilized by DesJardins and Bell (2006) demonstrates that demand for higher education is an outcome of multiple variables that fall under four main headings: price, income, competitors' price, and tastes/preferences. Toutkoushian and Paulsen (2016a) show that even with the many empirical studies completed about demand theory, there remain two critical foci with the literature as it relates to demand. First is the ability to forecast what the demand will be in the future. Second is estimating elasticity, which is "the sensitivity of demand to changes in price" (Toutkoushian & Paulsen, 2016a, p. 152).

Demand studies in higher education are found throughout the literature as researchers have researched the impact of demand on enrollment, applying it to many diverse circumstances and variables (Frederick et al., 2012; John, 1990; Long, 2004; St.

John, 1991). Some studies examine how the demand for students is impacted by addressing the population by looking at more national norms and trends (John, 1990; St. John, 1991). Other studies examine how a specific incentive or discount impacts students' demands, such as the Georgia Hope Scholarship or President Obama's American Graduate Initiative (Frederick et al., 2012; Long, 2004). Other studies look at the impact of demand at an institutional level, such as discounting for out-of-state students (Desjardins, 2001; DesJardins & Bell, 2006).

This study builds upon the depth of research and knowledge in studies that use demand for their research in higher education. This study works upon an understanding that tuition discounting and its packaging processes in financial aid offices follow demand principles. Demand theory applied to tuition discounting demonstrates that it may function similarly to studies like those by Frederick et al. (2012) and Long (2004), where demand changes because of the usage of the grant or scholarship moving the demand line up and to the right while keeping the supply line in the same position. This study will now look at the key components that are foundational to demand theory including: price, elasticity, income, competitors prices, tastes and preferences, summation, and price discrimination. These components not only provide insight into demand theory and the theoretical framework which will inform the composition of the empirical framework.

Quantity Demanded: Price

The demand curve is foundational to the process of demand and demand studies. The demand curve determines at what price students would be willing to choose to enroll at an institution based on price. Many researchers have studied the impact that the price

of college charges has on student enrollment (Leslie & Brinkman, 1987). The true cost of college is reflected differently depending on how researchers choose to capture it. For example, some researchers refer to tuition as well as room and board prices or even the amount set for their institutions' cost of attendance (Carlson et al., 1974; Leslie & Brinkman, 1987; St. John, 1993). The utilization of tuition as a norm for college pricing became a common approach and was included in the early 1960s (St. John, 1993). Research on student demand has revolutionized the understanding of student enrollment. This research has become a fundamental aspect for organizations and colleges when considering tuition fees in their projection models.

These projection models, which then accounted for tuition as a factor impacting enrollment, were implemented by organizations like the National Commission on the Financing of Postsecondary Education (NCFPE) as early as 1973. In a staff report released in 1974 by NCFPE, they agree that tuition impacts enrollment and they rely on research that shows that there is a 1-3% reduction in enrollment for every $100 increase in the cost of tuition at colleges (Carlson et al., 1974, p. 25). Since the 1970's, the impact of tuition price changes continues to provide insight into student enrollment behavior (Leslie & Brinkman, 1987).

Leslie and Brinkman (1987) synthesized years of research on student demand and show that across very different studies addressing the impact of singular or multiple factors such as tuition, room, board, and total cost all demonstrate that tuition cost and other factors related to price do indeed impact student enrollment to varying degrees. Heller (1997) provided an update and expansion on the research that Leslie and Brinkman (1987) had completed ten years earlier to equip readers of their work with a

more robust view of how to interpret and understand the effect of the price of colleges and how this increasing price impacts students. Heller (1997) also includes research that accounted for financial aid recipients to determine how sensitive they are to price and the role that discounts in this form have on student enrollment, which is an essential inclusion as it connects with this study. Heller (1997) found that in most cases an increase in tuition led to a decresae in enrollment, however, there were studies he references where an increase in price and an increase in enrollment took place.

The demand function relies heavily on price to determine how changes in college cost impact enrollment. The 1960s brought with it essential research that illustrated the impact that changes in tuition had on enrollment. As research has continued, studies on singular and combined variables such as tuition, room, board, fees, and the total cost can be included in the demand function to determine the impact on enrollment. Price is not only one part of the demand function but rather a critical and necessary factor to understand demand as this section demonstrates.

Elasticity

As previously stated, demand theory in higher education illustrates how future demand for higher education is accounted for and what possible predictive variables can be determined. Enrollment demand is a focus across the globe for colleges and is an issue that is historically studied in higher education research. Elasticity provides insight into student demand because it shows how a "percentage change in quantity…is caused by a percentage change in a specific factor" (Toutkoushian & Paulsen, 2016a, p. 177). Higher education price elasticities show how a percent change in price will affect a percent change in enrollment.

Price elasticity allows policymakers and college leaders to be made aware of how inelastic or elastic their costs are connected to the students they are working to recruit to the college (Toutkoushian & Paulsen, 2016a). If policymakers and college leaders know that their institutions are more elastic, they will know that their students are more likely to be price sensitive. However, if they find that their students are more inelastic, they know that they are less likely to be price sensitive. This elastic information can empower institutions to consider pricing discrimination strategies to maximize enrollment by offering a different price for the good of education to different groups of students. Price elasticity results also provide insight into college enrollment at large or at specific institutional types which helps to add context to current or past circumstances to then consider the implications or applications of this data to future institutions or research (Becker, 1990; Campbell & Siegel, 1967; Heller, 1997; Hillman & Orians, 2013; John, 1990; Tierney, 1982).

Elasticity studies provide insight into how demand for college can predict future enrollment, and it also measures price sensitivity. It provides insight into the way that diverse or different student populations may respond to price at a paticular insitution which can impact isnitutional strategies and discounting. These studies also provide essential principles not only for researchers but also for campus leaders, elasticity is a crucial aspect to understand to know how demand functions at higher education institutions (Campbell & Siegel, 1967; Heller, 1997; Hillman & Orians, 2013; John, 1990; Tierney, 1982).

Elasticities have been utilized utilized in numerous studies look at varying college types to better understand enrollment demand by students (Heller, 1997; Hillman &

Orians, 2013; John, 1990; Tierney, 1982). The research conducted by scholars yields insightful data, enhancing our understanding of student reactions to tuition costs at educational institutions. The research is diverse because each institutional type can have a different elasticity response and is continuous because elasticity can and does change over time. The literature demonstrates the need for these studies to continue, because even with the work that is completed, there are still so many more factors that go untested. With this type of research continuing to take place, it helps to illuminate even more circumstances within higher education. These studies do indeed lead to a clearer picture of the higher education landscape at large. They provide more specific applications, which is why it is well suited to look at a group of colleges like the Council for Christian Colleges and Universities.

Most elasticity studies have found that an increase in price will cause a corresponding decrease in enrollment (Becker, 1990; Campbell & Siegel, 1967; Freeman, 1986; Heller, 1997; Leslie & Brinkman, 1987; Psacharopoulos & Soumelis, 1979). However, higher education is an excellent example of an industry where many more factors must be considered to understand the phenomena of demand. Leslie and Brinkman (1987) discuss the confounding reality that even as price has increased year after year at colleges, the aggregate participation rates have not experienced a significant decline. Even as the price has outpaced inflation and the consumer price index, through the years, enrollment has continued to increase (Frances, 1983; Heller, 1997). Price increasing, even outpacing inflation would seem to be a contradiction to what is fundamentally known about how supply and demand function — echoing the words of Leslie and Brinkman (1987) “why is the estimated effect of price on enrollment…not

more visible in the natural world" (p. 200). Many studies work to explain the relationship between price and enrollment, especially given how it sometimes contradicts what would be expected according to the fundamental laws of supply and demand. Leslie and Brinkman (1987) offer five possible realities that may be contributing to this phenomenon progressing, including the way list prices are set, enrollment shifts to lower-cost colleges, growth of need-based student aid, the introduction of new programs, and "aggressive marketing" (p. 200). The number of variables that can be affecting these phenomena is varied as the research continues to be. For example, need-based aid, merit-based aid, and discounting strategies are not going away as a significant impactor of enrollment, nor is the advent of new programs and insights (Rose & Sorensen, 1992; Seneca & Taussig, 1987).

Undoubtedly, public opinion significantly influences students' price sensitivity and is a point to look at further. A study conducted by Langer Research Associates for The Chronicle, involving a representative, random-sample, national survey of 1,025 adults, revealed that despite some skepticism, the majority still highly value a college education. For instance, 78% of respondents would recommend pursuing a Bachelor's degree to those seeking advice. When asked, 'Considering the costs of getting your degree versus the benefits to you personally, was getting your degree worth it or not worth it?' (Kelderman, 2023, para. 10) the majority of college graduates affirmed the worthiness of their degree. The study further indicated that respondents believe college graduates not only benefit themselves but also contribute significantly to their local communities, the state, and society at large (Kelderman, 2023). As long as public opinion remains favorable, students' price sensitivity is likely to be lower than if public sentiment

were predominantly negative. This price sensitivity then translates into how elastic students will be with price increases.

Quantity Demanded: Income

Another critical factor affecting the demand function is student and family income and the price of the colleges they are considering enrolling. Price, as described in the earlier section, has a direct impact on enrollment. However, each student will have a varying response to the price of a college, or the increase of that price based on their income as a family's income increases also demand increases, because the price of college is a lower percentage of their total income. Toutkoushian and Paulsen (2016a) discuss that a student's income shifts as it has a greater or lesser strain on students' budgets and their ability to afford a set amount for the price of education and all alternative goods to that education. This assessment fits well with demand theory, which demonstrates that quantity of a good is a function of several factors, including income such that as income increases, the demand for a good would also increase. The Toutkoushian and Paulsen (2016) assessment explains why a low-income student will more readily consider options based on price than their higher-income peers whose demand is higher because of their income level. Gillespie (2016), Christensen et al. (1975), Toutkoushian and Paulsen (2016a), and Leslie and Brinkman (1987) have all completed research that provides further insight into the way that family income impacts the enrollment decisions of students.

Christensen et al. (1975) provided early research to establish the necessity of accounting for income in Higher Education enrollment and elasticity studies. Christensen et al. (1975) produced one of the earlier works where income was applied to an

assessment of whether students would enroll in college by using the elasticity of demand. They mention in their paper that previous work had included cost, but they realized that not accounting for income is to miss out on “an important component of the family's socioeconomic status” (Christensen et al., 1975, p. 170). Income is indeed an essential component of a family's socioeconomic status, and future research has affirmed this by using this variable as a crucial part of the demand function (DesJardins & Bell, 2006). The work by Christensen et al. (1975) helped set the stage in higher education to better account for student enrollment by utilizing a more accurate assessment of students and their families' income.

Research by Gillespie (2016) provides a more current study where the impact that income has on demand is utilized which provides further support for it being necessary for this study. Research by Gillespie (2016) addresses a foundational economics principle, the elasticity of demand. Income elasticity of demand demonstrates the result of dividing the “percent change in the quantity demanded by the percentage change in income” (Gillespie, 2016, p. 88). Applying income elasticity of demand to higher education shows that a family’s income will affect their choice to attend one college over another college.

The research by Toutkoushian and Paulsen (2016a) is a necessary next point of consideration due to the way they approach income and its impact on enrollment. Toutkoushian and Paulsen (2016a) completed a chart which shows the varied college decision a family with an income of $40,000 would make given changes in the unit cost of education and the unit cost of all other goods an individual might purchase. Their research demonstrates the reality and importance of including income in any assessment

of demand because it has a dramatic impact on a student's choice to enroll at a particular college, given their family's income.

A final point of consideration as it relates to the utilization of family income is the research of Leslie and Brinkman (1987). Leslie and Brinkman (1987) discuss the confounding reality that family incomes have not increased at the rate of college costs, yet college enrollments have not proportionately declined. This reality connects well with Toutkoushian and Paulsen (2016a) and the figure above because it illustrates that while students may not choose one college, in particular, the "other good" they choose to pursue maybe another college opposed to no college at all. Leslie and Brinkman (1987) echo this reality at the end of their paper as they propose one hypothesis for the enrollment paradigm: selecting a substitutionary good like another college. Because students can select less-expensive college options, it provides opportunities for college growth to increase; however, enrollment at a particular elastic institution would undoubtedly be impacted by the family's income.

Quantity Demanded: Competitors Prices

Competition is a vital part of the demand function, and it is also a crucial part of any market that is not perfectly competitive. Higher education is a market with diverse buyers and diverse sellers of education: colleges. How colleges set their prices will affect students' enrollment decisions, as does the price set by competitor colleges. The impact of the price charged by a college, or its competitors, is accounted for in demand theory. Demand theory demonstrates that the quantity demanded is a function of price as well as competitors' prices as part of other variables. The price set by another college has a direct impact on the quantity demanded by students. Leslie and Brinkman (1987)

highlight this circumstance well, saying, "enrollments in higher education institutions or groups of institutions will be associated positively with the tuition prices charged by competitors”(p. 181). If other institutions are more affordably priced, ceteris paribus, then students would have an incentive to consider another institution if what they want to pursue is substitutionary. Toutkoushian and Paulsen (2016a) add further perspective to this situation by assessing student's income. They demonstrate that student demand for education is impacted by their income, which was discussed previously, and the price set by colleges as well as alternative options, which lead a student to choose another college or no college at all. This other reality, not choosing a college at all, is a reality, especially for low-income students whose demand is lower than their higher-income peers.

Many studies understand the importance of accounting for competitors or competitors' prices and have included this as part of their demand function (Hoenack, 1990; Hoenack & Pierro, 1990). Hoenack and Pierro (1990) account for competition in higher education by calculating the impact of colleges within a set geographical distance from a college to determine how their competition impacts student enrollment. Hoenack (1990) concludes that “increased competition makes enrollment demand more sensitive to tuition chargeswhile more financial aid reduces this sensitivity” Hoenack (1990, pp. 418-419).

Competition and the price of alternative college choices is a crucial factor to include in the demand function. The research shows that competitors' prices directly affect students and their decision to enroll in one college over another (Hoenack, 1990; Hoenack & Pierro, 1990; Leslie & Brinkman, 1987). Because there is a direct impact on enrollment when accounting for competitors, prices within the demand function are

essential to include providing the best, most reliable data when determining student demand.

Quantity Demanded: Tastes and Preferences

Students' tastes and preferences are principal factors in the demand function. Researchers represent students' tastes and preferences as a utility, which measures what brings a student the most personal value. Utility quantitatively embodies these tastes and preferences by turning tastes and preferences into a measurable variable. The utility measures how a student attempts to make their college decision to pursue the option that will bring them the most personal benefit or utility (DesJardins & Bell, 2006). A student's utility and the maximization of this utility revolves around a complicated grouping of personal preferences, such as the perceived value of their investment, indirect costs of attending a particular institution, the direct cost of the institution, and the perceived value of making their investment with a particular institution (DesJardins & Bell, 2006). A student's utility could also be influenced by more specific factors such as the prestige of the college to which they are applying, college rankings, a college's location, or even a college's faith-based foundation. These examples of utility demonstrate how varied a student's preferences can be and demonstrate the importance of accounting for this variable in the demand function.

Hoenack (1990) accounts for utility in his research to account for student enrollment responses and what these varied enrollment patterns say about student demand. Hoenack (1990) determines that students will desire to maximize their utility, choosing one college over another or choosing to not enroll in college. The way that

Hoenack (1990) actualizes utility is informative for how this principle factor impacts student demand studies when accounted for in the demand function.

Price Discrimination

Price discrimination is an important topic to address, because it connects directly with the theoretical framework and the utilization of demand theory. This section will provide an assessment of the literature and demonstrate its significance for higher education, this study, and the theoretical framework. Price discrimination is a practice used by an organization offering the same good or similar good to multiple customers, but charging a different price for the product (Cowen & Tabarrok, 2015). This definition assumes that the same good or similar good is "sold at prices that are in different ratios to marginal costs" (Varian, 1989, p. 1). This is a crucial distinction to make because pricing a good or similar good differently may not be discrimination if it is sold for the same price accounting for different shipping or manufacturing costs passed on based on the location of the customer. However, if the prices charged separately are different ratios to the marginal cost, this is where discrimination takes place because one customer is willing to pay more for a similar good than another customer.

When some institutions comprehend how demand affects their enrollment, they have engaged in price discrimination, which is commonly utilized at institutions as part of a tuition discounting strategy. Price discrimination targets students within more individualistic categories. For example, price discrimination provides insight into how pricing differences for low-income students may contrast with pricing for higher-income students and how they might be applied to maximize revenue. Price discrimination allows organizations to increase their revenues by maximizing the highest amount of

return per individual instead of pricing based on the average amount of buyers. How colleges apply price discrimination may create burdens for some students, as evidenced in the research, making it essential to understand better the way that discrimination works as a more foundational level (Braunstein et al., 1999; Dotterweich & Baryla Jr, 2005; Heller, 1999; Steven W Hemelt & Dave E Marcotte, 2011; Long, 2004; Mitchell et al., 2016; Mitchell et al., 2015; Shin & Milton, 2006; Varian, 1989).

Varian (1989) determined that there were three foundational categories within which price discrimination typically functions. These three principles are a foundation upon which the theory of price discrimination traditionally rests. First-degree price discrimination is when the price changes for each person based on every good or service purchased, not holding any good or service constant (Varian, 1989). An example of first-degree price discrimination applied to higher education would be the tactic of discounting differently for each unit of education purchased or credit hour a student is enrolled. A college utilizing the first-degree approach would seek to maximize revenue and charge each student the maximum possible. This would lead to the same three-credit hour class being billed and charged uniquely for every student at the college. While it might be possible that some would pay the same, this would not be the intent.

Second-degree price discrimination happens when each customer purchases a good but pays a different amount per unit based upon how many of the units they choose to purchase (Varian, 1989). An example of second-degree price discrimination applied to higher education would be charging different rates to the students based on how many units of education they purchase, with higher amounts being more advantageously priced, gaining something akin to a bulk discount. A college utilizing this approach might

charge a set credit hour rate for students who take 3-9 hours and a separate per credit hour rate if the student takes 12+ hours. While the institution will return less revenue per credit hour, they will make more because the total amount charged is still greater than the total revenue for 9 hours versus a discounted amount for 12 credit hours.

The advent of new and exciting price-discriminating models for students taking more or fewer hours demonstrates that second-order is an approach to maximize net tuition revenue. For example, Liberty's online Rawlings School of Divinity Doctor of Ministry proposes the following price discrimination strategy:

> Students enrolled between 1 and 8.99 credit hours will be charged the part-time tuition rate of $395 per credit hour. Students enrolled between 9 and 15 credit hours will be charged the block rate of $2,750. Any credit hours above 15 will be charged at the $395 part-time rate (Liberty University, 2023, para. 6).

Liberty's pricing structure is an example of how new strategies are working in previously unapproached ways to maximize revenue through price discrimination methods of even the second-degree.

Third-degree discrimination is when a good is priced differently for each customer based on pre-determined variables, which sort those customers into groups priced differently from other groups (Varian, 1989). The critical difference with third-degree discrimination is that the price remains constant for customers and does not change based on the number of units purchased like second-degree, and they do not pay different rates for each unit they purchase like first-degree. An example of third-degree price discrimination applied to higher education would be the tactic of charging a different price to a student based upon their GPA or ACT scores. Third-degree

discrimination would also be the tactic of charging a lower price to a student based upon how much they and their family make.

Third-degree price discrimination is a foundational approach utilized in tuition discounting systems at many colleges and universities. Colleges have created a complex system, tuition discounting, to determine best how to price the cost of college to students, offering some higher and others lower prices to maximize revenue and limit consumer surplus. Price discrimination at large is discussed in the research and some of its implications are also documented and applied in its many economic variations including higher education institutions (Cowen & Tabarrok, 2015; Davis, 2003; Drew, 2012; Duggan & Mathews, 2005; Epple et al., 2006; Griffith, 2011; Hillman, 2012; Hubbell, 1995; Hubbell & Lapovsky, 2002; Martin, 2002; Martin, 2004; McPherson & Schapiro, 1999; Mixon Jr & Hsing, 1994; Redd, 2000; Rine & Guthrie, 2016; Rine, 2016; Rothschild & White, 1995; Supplee, 2014; Winston, 1999).

Summary of Theoretical Framework

This section addressed demand theory and its connection and fit for this current study with its foundation in economics. The research that uses demand theory and Price Discrimination and Elasticity, both grounded in demand principles, is well documented. The research goes back almost a century and has been a reality even if never expressed since time began since these principles have been utilized and documented in research for almost a century (Pigou, 1929).

The research documents how effective demand theory is as a foundation to research and also how diverse its application is within society and across higher education (Hicks, 1986; McKenzie, 1957; Samuelson, 1974). Research shows that

elasticity provides clarity regarding how specific institutional, geographic parameters, and unique variables are applied in Higher Education (Campbell & Siegel, 1967; Heller, 1997; Hillman & Orians, 2013; John, 1990; Tierney, 1982). This study will uniquely use demand theory to look descriptively at the change of average cost per income bracket, the price elasticity of low-income students, and the relationship between low-income student's enrollment and changes in average cost paid by high-income students at CCCU institutions.

CHAPTER THREE: METHODOLOGY

This study applies demand theory to the enrollment trends of students by income categories based on the net price that they were charged at Council for Christian Colleges and Universities. This is an institution level assessment, utilizing the Integrated Postsecondary Education Data System (IPEDS) data of the impact of tuition cost on enrollment for specific student populations.

The research questions that guide this study are as follows:

1) How has the average net price charged to students by income level changed across time among institutional members and affiliates of the CCCU?

2) What was the price elasticity of demand by student income level at Council for Christian Colleges and Universities?

3) How does the net price low-income students pay correlate to the enrollment of other income categories?

This study uses demand theory to demonstrate the impact of the average cost per income bracket, the price elasticity of low-income students, and the way student enrollment changes based on the average cost paid by students per income category. Previous research has not addressed how the total price paid by income categories affects student enrollment at each level of income category among CCCU institutions. The use of demand theory as the theoretical framework provides a rationale for choices related to the variables used to conduct the analysis, the empirical model and data source used, and the process utilized to compile the data.

Data

This study utilizes the Integrated Postsecondary Education Data System (IPEDS). IPEDS is a data system that compiles multiples surveys that are sent out by the U.S. Department of Education's National Center for Education Statistics. These surveys are a mandatory part of receiving federal funds and have been a requirement since the inception of the Higher Education Act of 1965. All institutions receiving Title IV aid complete these surveys. Title IV Aid refers to the Grants, loans, and federal work study authorized by the Higher Education Act of 1965 and listed in 34 CFR 668.1(c) (Federal Student Aid, 2023). Because IPEDS data submission is required for accredited institutions that award Title IV funds, it supplies a great resource for key data for most colleges over a substantial period of time. Compliance with this is mandated in section 20 U.S.C. 1094(a)(17) of the Higher Education Act (Department of Ed, 2020).

IPEDS data have been used in research before in related areas, which this study builds upon with its own unique focus (Allen & Wolniak, 2019; Steven W Hemelt & Dave E Marcotte, 2011; Millea & Orozco-Aleman, 2017; Shin & Milton, 2006). Many past studies have used IPEDS data to understand tuition discounting and its impact on enrollment, which is the focus of this study (Bailey, 2006; Duggan & Mathews, 2005; Hillman, 2012; Hossler, 2009; Jaquette et al., 2016; Kalsbeek & Hossler, 2009; Kraatz et al., 2010; Lynch et al., 2011; Simmons et al., 2004). Research using IPEDS data to test research questions related to tuition discounting is well documented (Allen & Wolniak, 2019; Steven W Hemelt & Dave E Marcotte, 2011; Jaquette et al., 2016; Millea & Orozco-Aleman, 2017; Shin & Milton, 2006). These studies provide a comparable reference point in the literature. Additionally, the concepts in these articles are well established and provide a support the continued use of these concepts in this paper while

expanding the concepts to address its unique research questions. However, these researchers did not utilize IPEDS research to focus on CCCU institutions like this study.

The specific approach to the data compilation for this research involved the utilization of Stata statistical software to compile all available college datasets available from the Urban Institute, including IPEDS (Urban Institute, 2022). Out of the larger data compiled, the following six IPEDS surveys were utilized: Student Charges, Student Financial Aid and Net Price, Fall Enrollment, Admissions and Test Scores, Admissions, and Finance (Urban Institute, 2022). Each survey was imported, cleaned, and merged into one single wide-format dataset for statistical analysis. The annual unemployment rates by state data were added to the dataset. These data points were gathered from Iowa State University's Iowa Community Indicators Program (University, 2020).

Data Limitations

While many years of data were available, there were limitations in what data were available for key variables included in the study. The Student Financial Aid and Net Price survey that was administered by IPEDS only collected data for "students who were awarded any Title IV Federal financial Aid, by income category" starting in Fall 2008. While these data are still being gathered, the Urban Institute databases used in this study are unavailable starting in Fall 2017, so the analysis was limited to the years of 2008-2016. One institution, Moddy Bible Institute, was eliminated from analyses since they did not have any students who received Title IV aid for two of the years selected for this study.

Missing Data

Each variable was assessed for its viability and to determine how much missing data it contained. Some variables had been 100% reported for each institution in each year such as total revenue or instructional expense. However, other variables had missing data. Some of these "missing" data points were not actually missing, but rather not reported for a reason. For example, total students attending a college within an income range such as 30,001 to 48,000 may not have applied to some institutions and they therefore did not report this value. Across income family income variables between 0.2% to 1.29% of values were missing across all colleges and all years. The variable with the most missing data was the highest income bracket, where 1.29% of all variables across all years was not reported by the respective colleges. This means that students whose total family income was in that range did not attend the respective college. Paired with this is the corresponding missing data for these income ranges' net price. This missing data is very logical. If no students were enrolled with those income ranges then we would not expect applicable net price data to be calculated.

Additional data that appear to be missing were standardized score information, such as ACT composite 25th percentile. The following variables were missing in the data between 7.32% and 9.89%: SAT critical reading 25th percentile, SAT critical reading 75th percentile SAT math 25th percentile SAT math 75th percentile, ACT composite 25th percentile, ACT 75th percentile. The reason for most of these values being missing was related to the admissions criteria each institution sets. For example, institutions who required or considered but did not require on SAT/ACT admissions test scores would list test scores. However, if they recommended or neither required nor recommended test scores, IPEDS would not require any test score information to be submitted.

An example of an institution that answered either “required” or “considered but not required” is Arizona Christian University (IPEDS, 2022a). This college then correspondingly listed test information for the 2016 year and other applicable years (IPEDS, 2022a). However, an example of a college that answered “recommended” or “neither required nor recommended” is Colorado Christian University (IPEDS, 2022c). When you look their data up the survey for the Admissions components is not even there since the data was not required (IPEDS, 2022c). The data is also verifiable with the Open Admissions question that is collected in the IPEDS survey.

There are additional disparities that create concern with missing test score data. For example, the question about SAT/ACT scores showed that some colleges went back and forth on this requirement (IPEDS, 2022b). For example, Central Christian College of Kansas in 2016 reported that they required the SAT/ACT; however, in 2015, they reported that they did not require the SAT/ACT, but just the year before that in 2014, it was required. This irregularity continues, showing that the college required the ACT/SAT for 2013, 2009, and 2008 but does not require it for 2012, 2011, or 2010 (IPEDS, 2022b). While it is possible that the college kept changing its policy, the individual(s) reporting the data may have interpreted the question differently across years. As discussed above, changing this question also changes the data and will cause the score information to be present or missing. If it is a misunderstanding of what needs to be reported, this creates missing data that otherwise could have been utilized.

Another key point to consider with the standardized test data is that missing data can also relate to the narrow usage of standardized testing in the Admissions process. For example, if a college uses the ACT and parts of the SAT not including the SAT writing

section then we can better understand why this variable is missing at a much higher rate than the other SAT variables. It is irregular to find a college, such as Vanguard University of Southern California, that has only one year of missing ACT data (2009), but has reported data for all other included years. While it is possible that no students submitted ACT scores in 2009, this seems unlikely. Not reporting any ACT data is especially surprising since they report that they require standardized test scores and 24% of students applying to the college submitted ACT scores (IPEDS, 2022d).

Given the previously described data and values, the potential issue of missing data emerges as a concern for this study. Missing data is common in many studies, especially longitudinal studies using the same participant or organization. Graham (2009) says that "missing data have challenged researchers since the beginning of field research" and this is certainly a challenge for this dataset. Considering how negatively impactful missing data can be, it is important to address how this study accounts for this challenge.

All missing data were part of the IPEDS surveys that were used. The data used from other sources, such as unemployment data, had no missing data. The first step taken with the missing data was to analyze and investigate why the data were missing to better understand the data. Some data may result from misreporting or changing institutional policies. Whatever the reason for the missing data, its presence must be accounted for, and decisions must be made to ensure appropriate handling as the regression is conducted. The best way to understand the methods this study will utilize is to better understand the research on missing data and statistical solutions that are provided to researchers and that will apply to this study and missing data.

Prior to the 1970's there were no methods or statistical processes yet to be utilized that could help address missing data (Graham, 2009). However, strong models or processes for statistically accounting for missing data began to emerge with works like those produced by Rubin (1972) who pioneered a new way forward. Rubin formalized his process into a theory in 1976 "through the simple device of treating the missingness indicators as random variables and assigning them a distribution" (Little & Rubin, 2019, p. 13). The book "Statistical Analysis With Missing Data" originally published in 1976 is said to be the pioneering work to really deal with missing data in depth (Graham, 2009; Little & Rubin, 2019).

The continued work of researchers refining and improving statistical processes to account for missing data has created standard mechanisms such as the three main ones compiled by Scheffer (2002). The first missingness mechanism, "Missing Completely at Random [MCAR], refers to data where the missingness mechanism does not depend on the variable of interest, or any other variable, observed in the dataset. MCAR is both missing at random, and observed at random" (Scheffer, 2002, p. 153). The second missingness mechanism is "Missing at Random [MAR]… What MAR means is missing, but conditional on some other 'X-variable' observed in the data set, although not on the 'Y-variable' of interest" (Scheffer, 2002, p. 153). The third missingness mechanism is NMAR, which "occurs when the Missingness mechanism depends on the actual value of the missing data" (Scheffer, 2002, p. 153).

The data used in this study are unique and consideration for single imputation was pursued by taking the mean of missing numbered values per institution per year. While taking a mean and following a single imputation process can introduce bias, this was

balanced by applying a mean per institution per year. The bias, while not removed, is minimized and the data are more accurately accounted for. It may appear that some values are not being accounted for since the number of occurrences does not match the total n for the study; however, this is expected since no mean would be added to a college that has never reported values for the data previously. An example of this would be standardized test scores being reported at Colorado Christian University. Since this institution does not require these scores, they are also not required to report it to IPEDS, so no data exists. This example shows that the final data results after utilizing a single imputation have minimized bias and are working effectively for this study.

Sample

This study uses data on all colleges that are either governing members or associate members of the Council for Christian Colleges and Universities. As stated before, colleges affiliated with this organization must share commonality with five key criteria: institutional type/accreditation, Christian mission, employment policy, cooperation and participation, and institutional integrity (CCCU, 2017). The unique requirements for membership with the CCCU make these colleges small, specialized, and niche institutions. Since no "quick group" exists in IPEDS for these institutions, these colleges were grouped based on membership data from the CCCU based on the 2022 official list of member institutions (CCCU, 2022).

While many years of data were available, there were limitations for this study regarding what data were available to capture the key variables in this study. The Student Financial Aid and Net Price survey administered by IPEDS only collected data for "students who were awarded any Title IV Federal Financial Aid, by income category"

starting in Fall 2008 (IPEDS, 2023). The data for some variables were incomplete after 2016, so the analysis was limited to the Fall 2008-2016. Some variables were eliminated at this stage of the process, such as test score data, due to limited consistent completion of this information through the years by institutions in the sample (IPEDS, 2023). Instead, other variables that helped define tastes and preferences such as students test scores or institutional expenditures of a certain type were utilized to support the theoretical model and the research questions such as institutional expenditures and test scores.

Dependent Variable

The dependent variable for this study, student enrollment by income category, comes from the Student Financial Aid and Net Price Survey in IPEDS. This variable helps to provide context into the enrollment demand for students by income category for students in this study. This variable provides data for the enrollment per income category. All other enrollment variables in IPEDS would not provide any insight into the specific enrollment behaviors of students by income category and would instead provide general enrollment or enrollment by categories for aspects not related to total family income. These variables are a part of the "Students who were awarded any Title IV Federal financial aid, by income" category of the IPEDS survey (NCES, 2020). This variable is a compatible choice for this study that provides unique insight into enrollment by income categories and has not been utilized in previous institution level studies utilizing IPEDS data (Allen & Wolniak, 2019; Steven W Hemelt & Dave E Marcotte, 2011; Millea & Orozco-Aleman, 2017; Shin & Milton, 2006). The income categories used reflect income level: $0-$30,000, $30,001-$48,000, $48,001-$75,000, $75,001-$110,000, $110,000 or more (NCES, 2020).

The usage of student enrollment as a dependent variable is well documented in other institution-level research (Allen & Wolniak, 2019; Steven W Hemelt & Dave E Marcotte, 2011; Millea & Orozco-Aleman, 2017; Shin & Milton, 2006). Each of these studies used enrollment variables that help support their research questions, such as resident first-time, full-time freshman enrollment; non-resident first-time, full-time freshman enrollment; full-time student total headcount; full-time; enrollment; in-state-enrollment; and 12-month enrollment. The successful usage of enrollment as a dependent variable in prior longitudinal studies utilizing IPEDS data makes this a viable variable to consider for this study (Allen & Wolniak, 2019; Steven W Hemelt & Dave E Marcotte, 2011; Millea & Orozco-Aleman, 2017; Shin & Milton, 2006).

Independent Variables

The independent variables for this study were selected based upon how each variable supports the theoretical framework and how they provide explanatory power for the research questions. The independent variables fall into several key categories, which are factors that form the foundation for demand theory, including institutional cost, taste and preferences, competitors' prices, institution-level covariates, and year effects covariates. These variable categories ensure that this study includes pertinent variables relevant to the framework for the data analysis.

Institutional Cost

The first independent variable for this study is the average net price paid by "full-time, first-time degree/certificate-seeking undergraduate" students according to income brackets (NCES, 2020). This is a variable taken from IPEDS that is calculated according to the following criteria: "For institutions that report cost of attendance for the full

academic year, an average yearly net price is generated by subtracting the average amount of federal, state or local government, or institutional grant and scholarship aid from the total cost of attendance." (NCES, 2020).

The following are the five total family income brackets for families as reported on their federal financial aid for the current year in IPEDS that are used for this study: 1) $0-$30,000, 2) $30,001-$48,000, 3) $48,001-$75,000, 4) $75,001-$110,000, and 5) $110,000 or higher. This is a limitation of this study since not all students complete a FAFSA. These variables come from the Student Financial Aid and Net Price Survey in IPEDS (NCES, 2020). These variables are also well-suited for this study because they directly relate to the research questions. Like the dependent variable, the average net price variables provide unique insight into the net price paid by students per income categories, which have not been utilized in many previous institution-level studies utilizing IPEDS data (Allen & Wolniak, 2019; Steven W Hemelt & Dave E Marcotte, 2011; Millea & Orozco-Aleman, 2017; Shin & Milton, 2006).

The variables for this study allow price to be accounted for along with the actual discount students received. This variable will provide context for the impact of the final price, price after discount, on students' enrollment. Utilizing variables that affect the final price students pay is utilized in other institution-level studies. For example, previous work by Allen and Wolniak (2019), Steven W Hemelt and Dave E Marcotte (2011), and Shin and Milton (2006) accounts for tuition, fees, scholarships, and loans to account for a final price paid by students. Millea and Orozco-Aleman (2017) utilize an additional variable to provide explanatory power for their study, "discount factor." The present study also accounts for discounts students receive and how the "bottom line"

price impacts them versus the “sticker price” advertised. This discounting is present in the average price paid by students compared to the total cost of the college and, as a result, is a key variable for this study to include. Additionally, this selection of variables from IPEDs provides key insights into how discounting changes for Title IV students based on income and is more closely aligned with this study.

Competitor Prices

The second independent variable in this study is competitor prices. Many categories of institutions are available for selection to compare with this study. For example, all community colleges, state colleges, and private colleges within or outside the state of each CCCU college could be included since any could be competitor options, and it would be impossible to rule them out. However, this study selected colleges in three main categories to account for students' wide choices and varied preferences. The three main categories used for this study are Public 4-year colleges, private not-for-profit 4-year colleges, and public 2-year colleges. The average price per college category per year was utilized to account for the competitors' prices for this study. These were included as part of the third model, as detailed in Table 7 below.

Taste and Preferences

The next independent variables help to account for the tastes and preferences of students, as discussed in the theoretical framework. These variables include first time, full-time undergraduate student enrollment; percentage of applicants admitted; 25^{th} and 75^{th} percentile SAT/ACT scores of full-time, first-time students; and percent of applicants admitted. These variable selections are aligned with prior research that controlled for these variables when estimating impacts of chosen criteria on student

enrollment (Jaquette & Curs, 2015; Ortagus & Yang, 2018). The variables in this study are effectively tailored to focus on enrollment by student income categories, as they comprehensively represent the tastes and preferences delineated in the theoretical framework. These preferences, integral to the composition of each college, play a pivotal role in influencing a student's enrollment decision, thereby reinforcing the theoretical framework's understanding of student choice. These variables also help to tease out the uniqueness of each college and the way that factors like prestige, as measured by test scores and the admittance percentages or the size of the college impact student demand (IPEDS, 2023).

Multiple IPEDS surveys were used to account for each of these factors including the Admissions and Test Scores survey as well as the Fall enrollment survey. The Admissions and Test Scores survey supplies data for the percentage of students admitted by accounting for the enrolled student response and dividing this by the total amount of applicants. The exact location for this variable is in IPEDS Data Center in the "Number of applications, admissions, and enrollees" section of the "Admissions and Test Scores" module (IPEDS, 2023).

The Admission and Test Scores survey also supplies data for the total number of applicants and students enrolled. Using the number of applicants and the students who enrolled, these numbers can be divided to determine the enrollment percentage. The exact location for this variable is in IPEDS Data Center in the "Number of applications, admissions, and enrollees" section of the "Admissions and test scores" module and is in the "Admissions and Test scores" section (IPEDS, 2023).

This study also utilizes institutional expenditure amounts from the IPEDS Finance survey. These variables account for students' preferences in attending certain colleges based on their institutional priorities and allocation of resources. This study accounts for total yearly expenses for the following expenditures: instructional, academic support, student services, institutional support, and auxiliary enterprises. Researchers have examined the connection between how colleges spend money and certain measurable outcomes (Lee, 2017; Ryan, 2004; Smart et al., 2002).

The next independent variable includes unemployment for each state. Because family income is a key factor to control for in demand theory, it is important to account for how unemployment rates might be affecting enrollment patterns across time for families across income categories. The data that compiles total family income categories is populated by institutions looking at FAFSA data. The FAFSA data for students can be dramatically impacted if one of their parents is directly affected by unemployment. This study pulls unemployment data from the Local Area Unemployment Statistics, U.S. Bureau of Labor Statistics, as gathered by Iowa State University's Iowa Community Indicators Program (University, 2020). Many have utilized unemployment rates in their data (e.g., Allen & Wolniak, 2019; Hemelt & Marcotte, 2011b; Shin & Milton, 2006; Millea & Orozco-Aleman, 2017). Allen and Wolniak (2019) specifically addresses in their research how changes in unemployment will impact opportunity costs and in turn student enrollment. These conclusions from Allen and Wolniak (2019), as well as previous research utilizing institution level IPEDS data, provide rationale for including this variable.

Empirical Framework

This study uses fixed effects regression analysis to answer the research questions in this study to determine how predictive or statistically significant each explanatory variable (independent variable) is at accounting for variation in the response variable (dependent variable). When it comes to controlling for effects in a regression model, fixed effects is used to help account for time-invariant unobservable variables. Examples of the fixed effects for this study are institution and year fixed effects. These effects in the model are fixed so that "heterogeneity that causes the inconsistency" will be controlled and accounted for within the results of the regression (Deaton, 1997, p. 107). Fixed effect is a compatible approach for this study and mirrors other past studies that successfully used fixed effects regression (Allison, 2009; Schroeder et al., 2016; Seber & Lee, 2012).

This study uses years as a fixed variable to help show whether the change in enrollment by income category should be attributed to the particular year that is part of the fixed effects or some other factor. This was done by applying the same year to each observation to determine the effect of a change in a year on the outcome variable (Allison, 2009). For this study, dummy variables for each year were created and added to the regression to ensure that the year fix effects were considered.

Because studies like this can suffer from omitted variable bias, it is crucial to address selection bias and how this study has controlled for bias in this empirical model. Selection bias can come in many forms but falls into two large categories of observed or unobserved bias. Observed bias occurs when variables that affect the outcome of the research or the groups selected are not included, and by not accounting for the variables, it weakens or invalidates the result of the study. This study has already accounted for

observed variable bias by justifying each variable's inclusion (Barnow, 1980), basing each selection on factors consistent with Demand theory, the theoretical framework for this study. Omitted variable bias results from the researcher's bias in selecting which variables to include or exclude from a particular study. The variables not selected may be variables that could impact the student's decision to enroll, and their exclusion creates an omitted variable bias. “Utilizing Fixed effects as a part of the empirical framework helps control these omitted variables, resulting in more accurate findings, but it doesn't eliminate the possibility of them” (Riegg, 2008, p. 340).

Fixed effects has several weaknesses that research has addressed. For example, Currie (2003) lists several key disadvantages with fixed effects, such as the potential for the key variables not to be set or the reduction of sample size. The best way that is known in research to best account for bias is to utilize randomization of the outcome variable in the study and the population impacted. However, while there are certain limitations for utilizing fixed effects regression, and there are other alternatives, this study is best served by fixed effects. Superior ways of controlling for bias are not possible given that the data have already been collected and do not allow the researcher to randomize the students who received the discount to eliminate bias. Further, given the nature of the research questions and the population studied, fixed effects is a strong choice.

There are many strengths that fixed effects regression has for accounting for omitted variable bias. fixed effects regression accounts for omitted variable bias by addressing unobserved variables that may influence a study's outcomes by "comparing a unit of analysis to itself" to control for time-invariant variables (Riegg, 2008, p. 340). For example, when using fixed effects in this study, a dummy variable was assigned to each

year the data were observed for each institution. Fixed effects help to reduce omitted variable bias for this study in the estimation of the average price paid per student (β, which measures the relationship between X and Y) by controlling for a matrix of the institution and time-varying covariates, $W_{\iota,\tau-1}\gamma$, as well as a matrix of institution and time-varying covariates, $V_{\tau-1}\vartheta$. Fixed effects is a robust approach because many variables may not be selected or accounted for that are set over time for the sample institutions. Fixed effects control for consistent factors over time, helping to minimize these numerous potential bias points.

This study's specific fixed effects framework is a modified version of the one utilized by Jaquette and Curs (2015). Jaquette and Curs (2015) studied specific factors related to out-of-state student enrollment. Their model is a good fit for this study because it utilizes variables and factors that were all, for the most part, included in this study, such as institution, state, time, and year fixed effects. This study does not need to measure the prior years' enrollment and thus deviates by focusing on current year enrollment for its time fixed effects.

Logarithm and the Use of Log-Log Specification

The empirical model for this study utilizes a double logarithm model to best understand the relationship of change in price on enrollment. The use of logarithms has a long history that dates back to Sir John Napier calculating them in 1614[1] (Clark, 1921).

[1] Logarithms use their own language for example 10 to the power of -3 which is 10^{-3} is referred to as the characteristic and the decibel version 0.001 is referred to as the mantissa. (Clark, 1921)

Calculating logarithms to a base of 10 is a process originating with Henry Briggs, which allowed charts to be developed that made calculating logarithms a quick process. Today these same logarithms are used in research where logarithms are applied to each predictor and outcome variable (Vittinghoff et al., 2006). This process is called a double logarithmic model, where all variables X and Y are transformed into Ln (X_1) and Ln (Y_1) (Wang & Jain, 2003).

There are advantages to using a double logarithmic model for this study. Wang and Jain (2003) indicate that one advantage of using a logarithmic model is that it "provides direct estimates of variable elasticities," which make this a strong choice for this study since measuring elasticity is a key part of the research question and estimation of change (Wang & Jain, 2003, p. 105). Another advantage is the ease of comparison and interpretation of the data and results. Considering the advantages of using a double logarithmic, this study will utilize logarithms (Ln) in the Empirical Framework.

This study's specific fixed effects framework is a modified version of the one utilized by Jaquette and Curs (2015). This study applies their framework in a unique way that addresses the three research questions selected for this study. Considering their model and the advantages of using a double logarithmic, this study will utilize the equation below with logarithms (Ln) as denoted:

$$Ln(Y_{\iota\tau}) = \beta(LnX_{\iota,\tau-1}) + Ln(W_{\iota,\tau-1}\gamma) + Ln(V_{\tau-1}\vartheta) + \delta_\tau + \alpha_\iota + \varepsilon_{\iota\tau}$$

ι = institution fixed effects

τ = year fixed effects

β =the effect that is being analyzed, average price paid per income category.

Y = Number of FF FT Title IV eligible students that enroll at institution *i* at a period of time *t* per income category.

$W_{\iota,\tau-1}\gamma$ – is a matrix of institution, state, and time varying covariates.

$V\iota,\tau\text{-}1\vartheta$– is a matrix of, state, and time varying covariates.

δ_τ –Year Effects

$\alpha\iota$ – Institution Effects

$\varepsilon\iota\tau$ – Omitted variables

CHAPTER 4: RESEARCH RESULTS

This study explains how discounting and discounting practices impact student enrollment by income categories for members and affiliates of the Council for Christian Colleges and Universities. While the CCCU has members and affiliates across the globe, this study was limited to the United States. The research questions that guided this study and analyses were:

1) How has the average net price charged to students by income level changed across time among institutional members and affiliates of the CCCU?

2) What was the price elasticity of demand by student income level at Council for Christian Colleges and Universities?

3) How does the net price low-income students pay correlate to the enrollment of other income categories?

The data for these colleges were pulled from multiple surveys compiled by the National Center for Educational Statistics in their Integrated Postsecondary Education Data System surveys. This study utilized the following IPEDS Surveys: Student Charges, Student Financial Aid and Net Price, Fall Enrollment, Admissions and Test Scores, Admissions, and Finance. Additionally, unemployment data was utilized to control for the years selected for this study, 2008-2016. The analysis of the findings from the log-log fixed effects regressions will be presented with the individual regressions by student income category merged into a single chart to make the comparison more apparent across income categories.

First, this chapter examines the results of the fixed effects regressions. This assessment provides insight into research question one: How has the average net price

charged to students by income level changed across time among institutional members and affiliates of the CCCU? Data provided in Tables 1 and 2 offer insight into the general pricing of CCCU colleges over time. These tables also help to add context to the regression results later in this chapter.

Second, this chapter captures the results of the completed fixed effects regressions to demonstrate how student elasticity impacts enrollment based on each of the five income brackets. This study utilized three regression models with additional variables added to each model to see how control variables and the inclusion of average alternative college pricing impacts student elasticity and enrollment. Each model utilizes each income bracket as dependent variables and measures the impact to each category based on the changing variables included in Tables 3, 5, and 7.

The Average Net Price Charged to Students Has Changed Significantly

The results of this study show that enrollment and net price have shifted considerably between 2008-2016, as shown in tables 1-4 and figures 1-4. The tables show the average enrollment per income category per year as well as the average net price paid per income category per year. The charts show that the college prices rise per income category over time, as expected, which matches how pricing has moved nationally during these years (CollegeBoard, 2021). The net price paid by students in income brackets changed most drastically for students in the lowest income category. Their net price paid from 2008, as shown in Table 1, was $14,745, but in 2016, the net price paid was $22,276, showing an increase of 51% in the net price paid. At the same time, the two income categories with the least total increase in net price (24%) were students from the highest income category—$110,001 or more in income—and students

with a family income of $48,001-$75,000. While student prices increased, so did the enrollment for each income category. While the price increased the most for low-income students, their enrollment also increased the most (by 352%) over the nine-year period.

Table 1

Average net price, per year, per income bracket

Year	Net Price Less Than 30,000	Net Price 30,001 to 48,000	Net Price 48,001 to 75,000	Net Price 75,001 to 110,000	Net Price 110,001 or Higher	Avg 4-year Non Profit
2008	$ 14,745	$ 16,059	$ 18,223	$ 19,002	$ 20,579	$ 17,390
2009	$ 12,903	$ 13,965	$ 15,558	$ 16,286	$ 17,069	$ 16,730
2010	$ 15,568	$ 15,377	$ 16,522	$ 18,776	$ 21,254	$ 16,810
2011	$ 16,829	$ 16,929	$ 18,723	$ 20,673	$ 23,285	$ 17,200
2012	$ 17,264	$ 16,697	$ 19,344	$ 20,621	$ 21,987	$ 17,240
2013	$ 18,448	$ 18,490	$ 19,792	$ 21,535	$ 23,289	$ 17,290
2014	$ 19,897	$ 20,167	$ 21,500	$ 22,914	$ 25,359	$ 17,450
2015	$ 21,398	$ 20,626	$ 20,891	$ 23,407	$ 26,491	$ 17,760
2016	$ 22,276	$ 22,112	$ 22,536	$ 23,962	$ 25,606	$ 17,960

Figure 3

Average Net Price Paid, Per Year, Per Income Bracket Visualized on a Line Graph

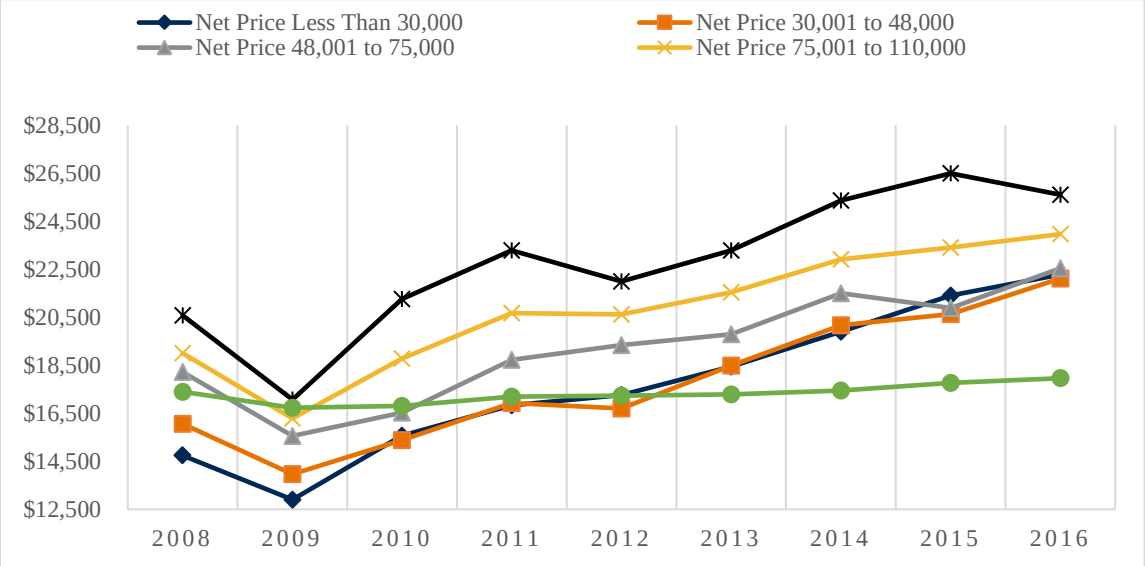


Table 2

Average Student Enrollment, Per Year, Per Income Bracket

Year	Enrollment Less Than 30,000	Enrollment 30,001 to 48,000	Enrollment 48,001 to 75,000	Enrollment 75,001 to 110,000	Enrollment 110,001 or Higher
2008	58	79	111	70	85
2009	90	66	105	97	102
2010	96	78	93	65	49
2011	126	76	53	65	44
2012	127	87	91	75	51
2013	198	119	130	115	91
2014	232	102	122	113	96
2015	215	123	137	144	113
2016	262	157	146	147	119

Figure 4

Average Student Enrollment, Per Year, Per Income Bracket, Visualized on a Line Graph

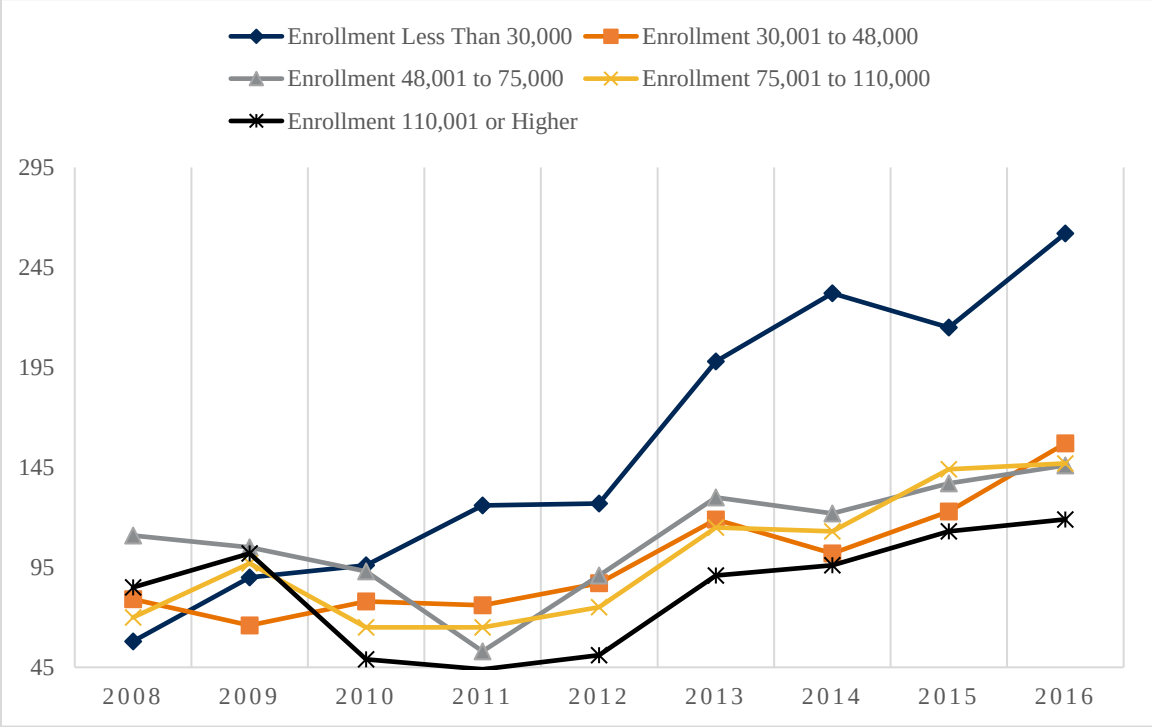


Table 3

Percent Net Price Changes From Previous Year, Per Year, Per Income Bracket

Year	Net Price Less Than 30,000	Net Price 30,001 to 48,000	Net Price 48,001 to 75,000	Net Price 75,001 to 110,000	Net Price 110,001 or Higher
2009	-12%	-13%	-15%	-14%	-17%
2010	21%	10%	6%	15%	25%
2011	8%	10%	13%	10%	10%
2012	3%	-1%	3%	0%	-6%
2013	7%	11%	2%	4%	6%
2014	8%	9%	9%	6%	9%
2015	8%	2%	-3%	2%	4%
2016	4%	7%	8%	2%	-3%

Figure 5

Percent Net Price Changes From Previous Year, Per Year, Per Income Bracket Visualized

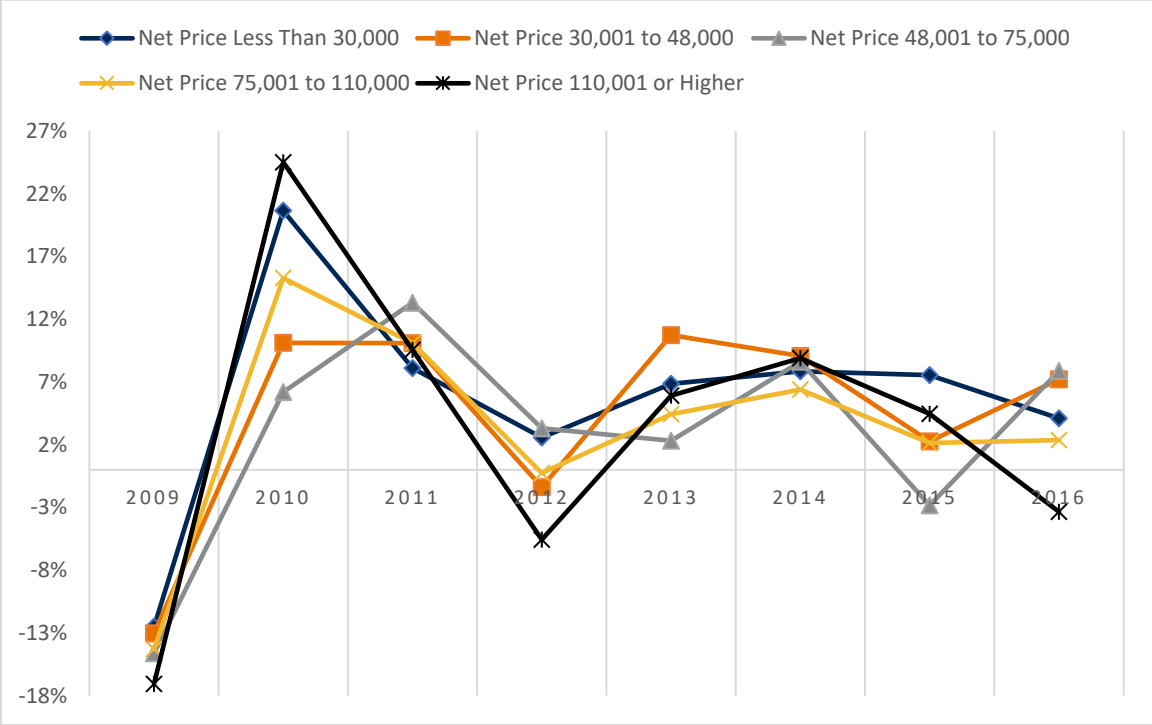


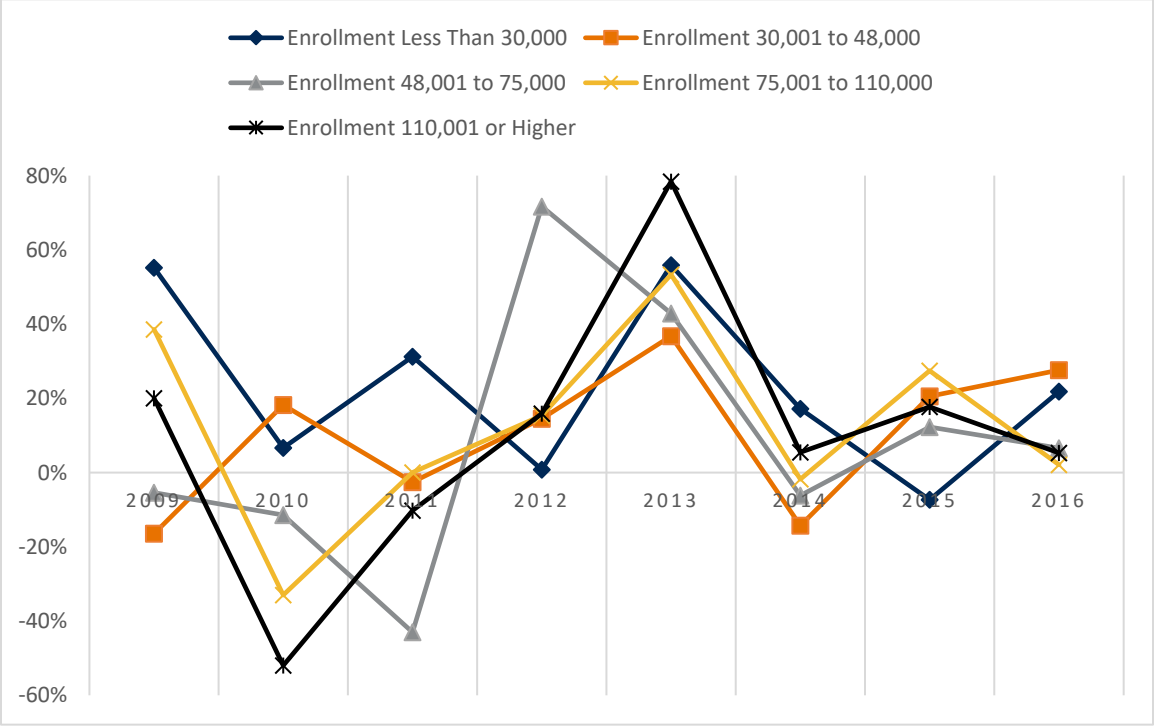
Table 4

Percent Enrollment Changes From Previous Year, Per Year, Per Income Bracket

Year	Enrollment Less Than 30,000	Enrollment 30,001 to 48,000	Enrollment 48,001 to 75,000	Enrollment 75,001 to 110,000	Enrollment 110,001 or Higher
2009	55%	-16%	-5%	39%	20%
2010	7%	18%	-11%	-33%	-52%
2011	31%	-3%	-43%	0%	-10%
2012	1%	14%	72%	15%	16%
2013	56%	37%	43%	53%	78%
2014	17%	-14%	-6%	-2%	5%
2015	-7%	21%	12%	27%	18%
2016	22%	28%	7%	2%	5%

Figure 6

Percent enrollment changes from previous year, per year, per income bracket visualized



Figures 5-9 help to visually represent the data and better capture how enrollment responds to price. Figure 5 provides a visual representation of how enrollment was impacted each year by the net price charged to students with family incomes of less than $30,000. This figure shows predictable responses to price in years like 2009 where price decreased, and enrollment increased or 2015 where price increased, and enrollment decreased. This figure also clearly shows the way this population responded in surprising ways like 2010-2014 where price increased while enrollment also increased. Figure 6 provides a visual representation of how enrollment was impacted each year by the net price charged to students with family incomes between $30,001 and $48,000. This figure shows predictable responses to price in years like 2011, where price decreased and enrollment increased. This figure shows how this income category, more often than not, responds differently to price, like in 2009 when prices decreased while enrollment decreased as well or in 2016 when price increased, and enrollment also increased. Figure 7 visually represents how enrollment was impacted each year by the net price charged to students with family incomes between $48,001 and $75,000. This figure shows predictable responses to price in years like 2011, where price increased and enrollment decreased or 2015, where price decreased and enrollment increased. This figure also clearly shows the way this population responded in surprising ways like 2016, where price increased while enrollment also increased. Figure 8 visually represents how enrollment was impacted each year by the net price charged to students with family incomes between $75,001 and $110,000. This figure shows predictable responses to price in years like 2012 where price decreased, and enrollment increased or 2014, where price increased and enrollment decreased. This figure also clearly shows the way this

population responded in surprising ways like 2013, where price increased while enrollment also increased. Figure 9 visually represents how enrollment was impacted each year by the net price charged to students with family incomes greater than $110,001. This figure shows predictable responses to price in years like 2012, where price decreased, and enrollment increased or 2011, where price increased and enrollment decreased. This figure also clearly shows the way this population responded in surprising ways like 2015, where price increased while enrollment also increased.

It is important to take notice of how price changes from one year to the next and the corresponding impact of enrollment either up, down, or flat the following year. These pictures visually show that no income category responds the same and each response is unique in its volatility to net price increase. The figures also show student enrollments that increase even as price increases and some years where there was a price increase when there is also a corresponding increase in enrollment for that income category. However, to understand the impact of price more fully on student enrollment by income category an assessment of the regression results is essential.

Figure 7

Student Enrollment and Net Price Paid: Per Year for Students With Family Incomes Less Than $30,000

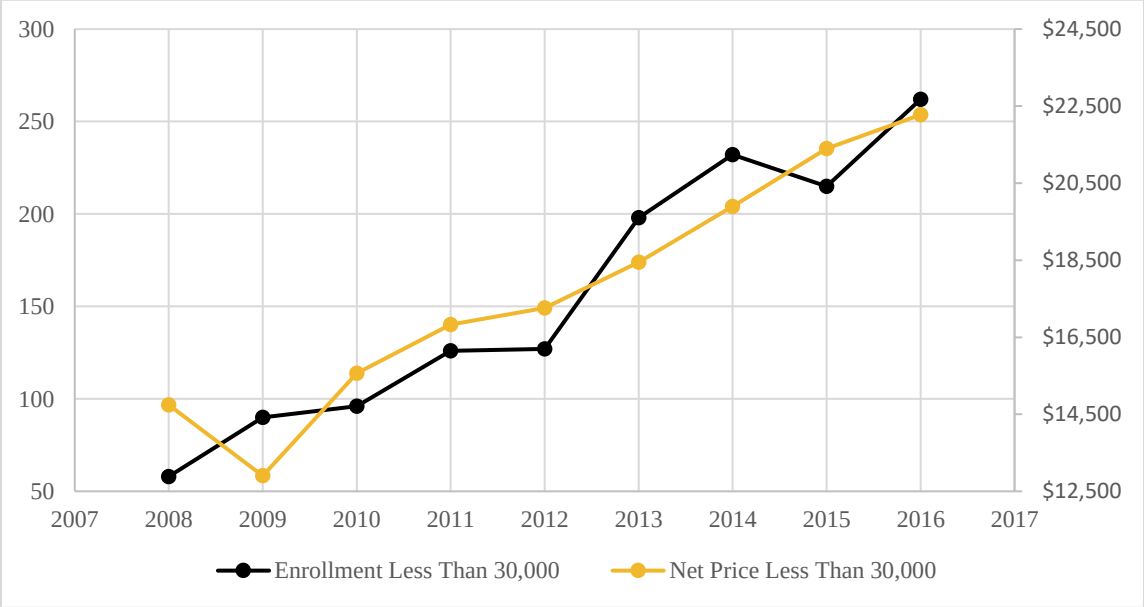


Figure 8

Student Enrollment and Net Price Paid: Per Year for Students With Family Incomes Between $30,001 and $48,000

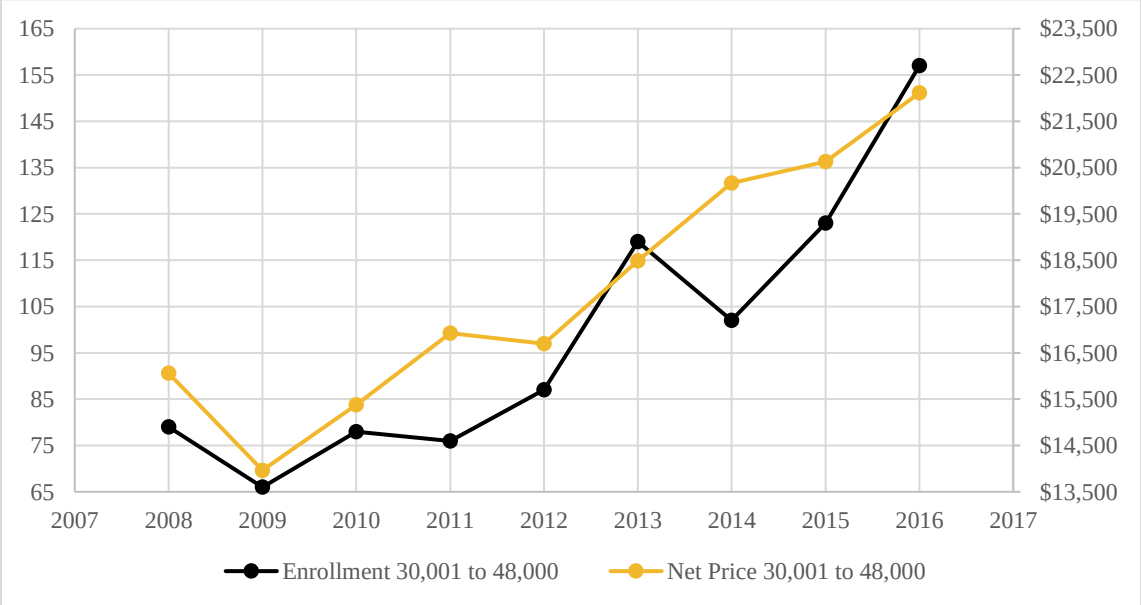


Figure 9

Student Enrollment and Net Price Paid: Per Year for Students With Family Incomes Between $48,001 and $75,000

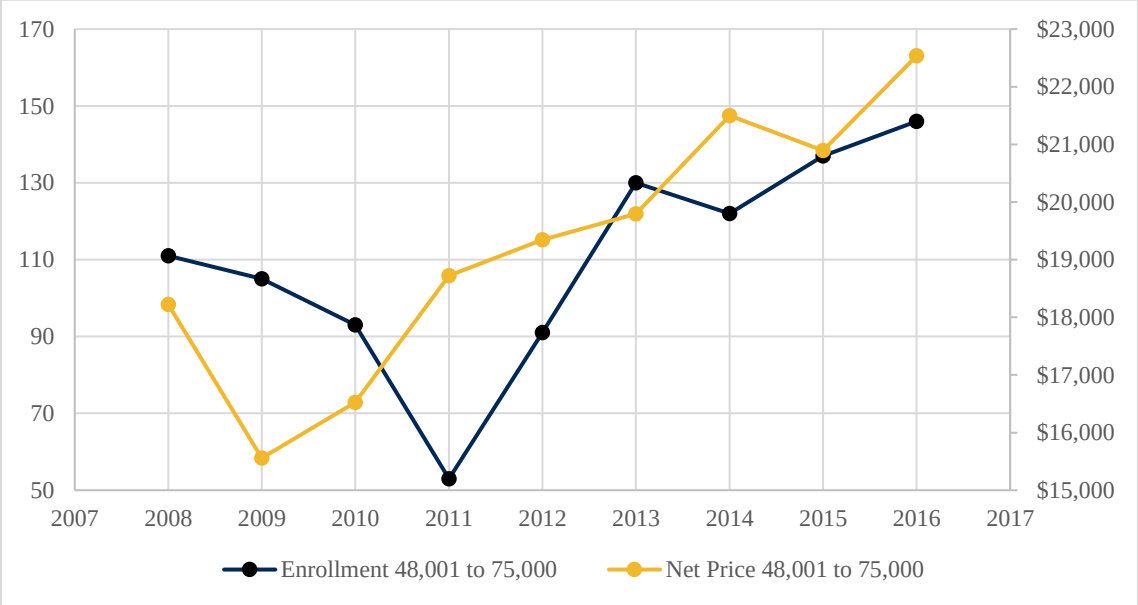


Figure 10

Student Enrollment and Net Price Paid: Per Year for Students With Family Incomes Between $75,001 and $110,000

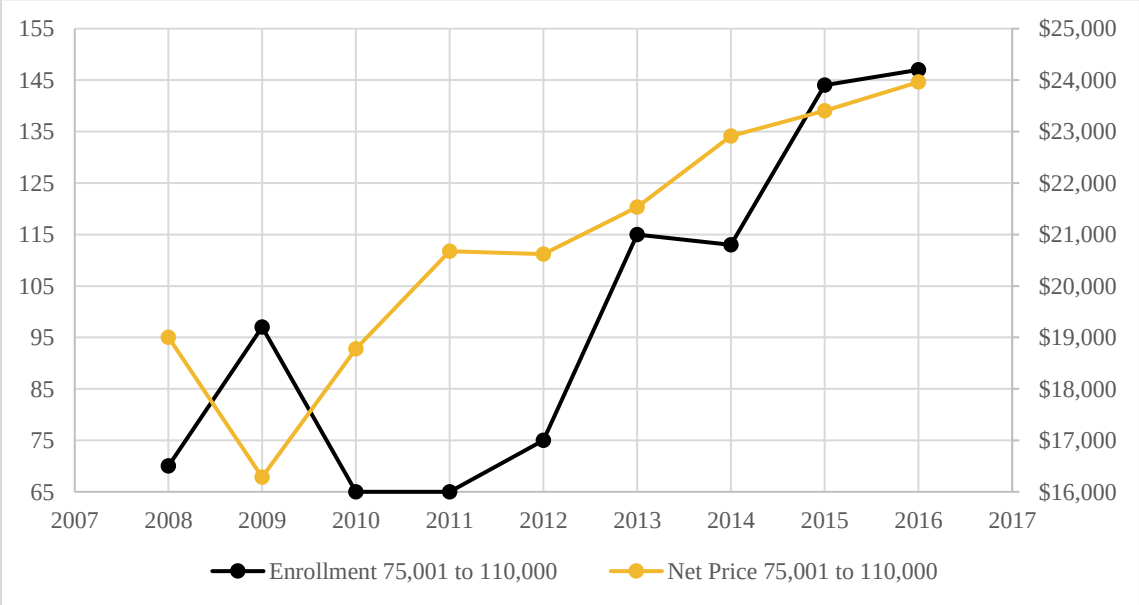
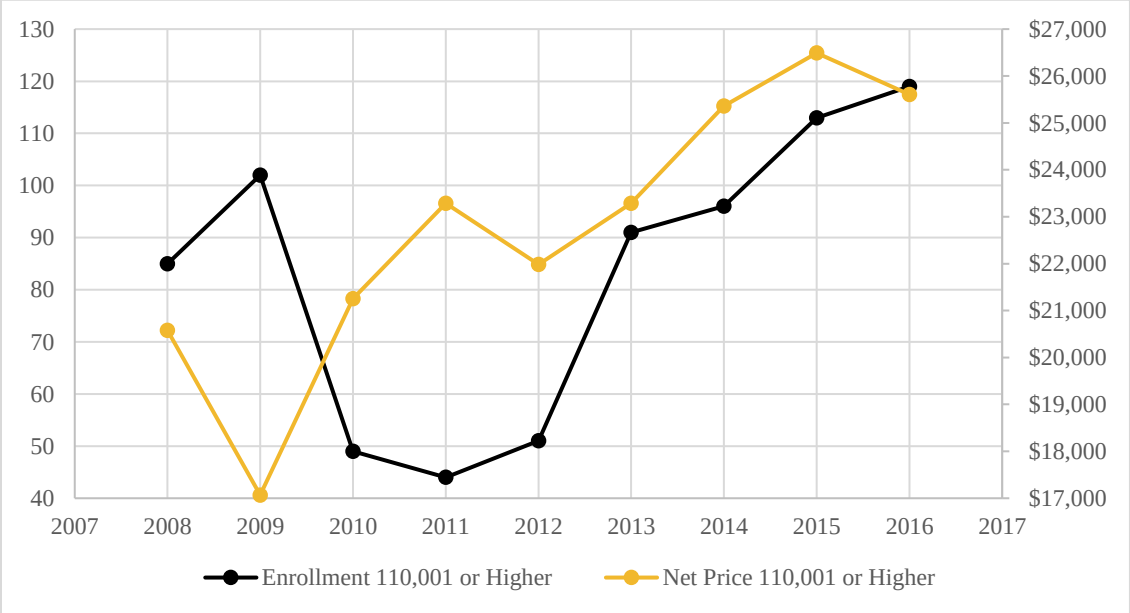


Figure 11

Student Enrollment and Net Price Paid: Per Year for Students With Family Incomes Greater Than $110,001



Results Impacting Research Question Two: Model One

Table 5 shows the correlation between net price for each income category using only net price per income category. The coefficients represented in the elasticity column show a marginal impact for enrollment based on the fluctuation of price across all student income brackets. As demonstrated in table 6 the elasticity shows the impact of a 1% change in college cost on the demand by students to enroll at a CCCU institution based on their income level. When translating this into a student price coefficient the tuition mean was divided by a thousand to measure the enrollment change per thousand dollars. The resulting percentage was multiplied by the coefficient to produce the student price coefficient.

Table 5

Regression Model 1: Only Net Price With No Controls

VARIABLES	Enroll Less Than 30,000	Enroll 30,001 to 48,000	Enrolled 48,001 to 75,000	Enroll 75,001 to 110,000	Enroll 110001 or Higher
Net Price - Less Than 30,000	0.34***				
	(0.07)				
Net Price - 30,001 to 48,000		0.05			
		(0.07)			
Net Price - 48,001 to 75,000			0.11		
			(0.08)		
Net Price - 75,001 to 110,000				0.12	
				(0.10)	
Net Price - 110001 or Higher					-0.24*
					(0.14)
Observations	999	999	999	999	999
R-squared	0.17	0.04	0.04	0.05	0.19
Number of unitid	111	111	111	111	111
Institution FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Control Variables	NO	NO	NO	NO	NO

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6

Model 1: Change in Enrollment Per Tuition Increase

Income Category	Elasticity	Enroll Mean	Tuition Mean	% $1,000 is of tuition	Enroll Increase per $1,000	Enroll Change
0-30,000	0.34	59.08	$16,902.42	5.92%	2.01%	1.19
30,001-48,000	0.05	37.63	$17,288.18	5.78%	0.29%	0.11
48,001-75,000	0.11	53.63	$19,214.80	5.20%	0.57%	0.31
75,001-110,000	0.12	53.5	$21,584.90	4.63%	0.56%	0.30
> 110,000	-0.24	54.81	$23,605.71	4.24%	-1.02%	-0.56

Table 6 provides clear insight into the student price coefficients and student elasticity. The student price coefficient for students with incomes below $30,000 is 2.01%. With a 2.01% student price coefficient, given the enrollment mean, the growth per $1,000 in increased tuition would yield 1.188 students. The student price coefficient for students with incomes from $30,0001-$48,000 is 0.29%. With a 0.29% student price coefficient, given the enrollment mean, the growth per $1,000 in increased tuition would yield 0.109 students. The student price coefficient for students with incomes from $48,0001-$75,000 is 0.11%. With a 0.11% student price coefficient, given the enrollment mean, the growth per $1,000 in increased tuition would yield 0.307 students. The student price coefficient for students with incomes from $75,0001-$110,000 is 0.12%. With a 0.12% student price coefficient, given the enrollment mean, the growth per $1,000 in increased tuition would yield 0.297 students. The student price coefficient for students with incomes equal to or greater than $110,000 is -0.24%. With a -0.24%

student price coefficient, given the enrollment mean, the growth per $1,000 in increased tuition would yield -0.557 students.

These regression results provide insight into the varying price responsiveness of students from each income category. These results show that the most price responsive student income group, either positive or negative, was the lowest and highest income populations with enrollment percentage changes of 2.01% and 1.02%. More price responsive students are those that will more quickly choose a substitutionary good like another college or pursue another opportunity that they might have that could replace their college education. The least responsive income category was students with a family income of $30,001-$48,000 with a slight 0.29% change in enrollment for every $1,000 or about 0.109 students. The least price responsive students are those who will continue to pursue a college even when it increases. Students who are less responsive to price are choosing to not pursue other opportunities or substitutionary goods like alternative colleges or career choices that do not require college. The other two income categories were closely related with only a .01% difference in student enrollment impacted for every $1,000 of price increase.

Results Impacting Research Question Two: Model Two

Table 7 and Table 8 directly addresses research question two because it shows the correlation between net price for each income category with the inclusion of control variables. These variables control for the types of institutions students might be drawn toward based upon the tastes and preferences established in the theoretical framework. Compared to Table 6, the coefficients represented in the elasticity column have either no change or almost no change for family incomes equal to or less than $48,000. However,

students with family incomes greater than $48,000 did show changes that were between 27% and 57% different than the results of table 6. Table 7 compared to table 5 shows a higher statistical significance of the variable, "Net Price – 110001 or Higher." This variable is statistically significant and shows an effect at the p<.05 compared to p<0.1. Additionally, this regression explained a greater percentage of the variance, as demonstrated in the presentation of a stronger R^2 value across all regression results for each of the income categories.

Table 7

Regression Model 2: Control Variables Added to the Model

VARIABLES	Enroll Less Than 30,000	Enroll 30,001 to 48,000	Enroll 48,001 to 75,000	Enroll 75,001 to 110,000	Enroll 110001 or Higher
Net Price - Less Than 30,000	0.34***				
	(0.06)				
Net Price - 30,001 to 48,000		0.04			
		(0.07)			
Net Price - 48,001 to 75,000			0.07		
			(0.08)		
Net Price - 75,001 to 110,000				0.08	
				(0.10)	
Net Price - 110001 or Higher					-0.33**
					(0.13)
Observations	999	999	999	999	999
R-squared	0.22	0.11	0.09	0.10	0.24
Number of unitid	111	111	111	111	111
Institution FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Control Variables	YES	YES	YES	YES	YES

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8

Model 2: Change in Enrollment Because of an Increase in Net Price Paid Per Income Category

Income Category	Elasticity	Enroll Mean	Tuition Mean	% $1,000 is of tuition	Enroll Increase per $1,000	Enroll Change
0-30,000	0.34	59.08	$16,902.42	5.92%	2.01%	1.19
30,001-48,000	0.04	37.63	$17,288.18	5.78%	0.23%	0.09
48,001-75,000	0.07	53.63	$19,214.80	5.20%	0.36%	0.20
75,001-110,000	0.08	53.5	$21,584.90	4.63%	0.37%	0.20
> 110,000	-0.33	54.81	$23,605.71	4.24%	-1.40%	-0.77

Table 8 provides key insights into the way enrollment might change per income category based on $1,000 increase in the price of tuition. The student price coefficient for students with incomes below $30,000 is 2.01%. With a 2.01% student price coefficient, given the enrollment mean, the growth per $1,000 in increased tuition would yield 1.188 students. The student price coefficient for students with incomes from $30,0001-$48,000 is 0.23%. With a 0.23% student price coefficient, given the enrollment mean, the growth per $1,000 in increased tuition would yield 0.087 students. The student price coefficient for students with incomes from $48,0001-$75,000 is 0.36%. With a 0.36% student price coefficient, given the enrollment mean, the growth per $1,000 in increased tuition would yield 0.195 students. The student price coefficient for students with incomes from $75,0001-$110,000 is 0.08%. With a 0.08% student price coefficient, given the enrollment mean, the growth per $1,000 in increased tuition would yield 0.198

students. The student price coefficient for students with incomes equal to or greater than $110,000 is -0.33%. With a -0.33% student price coefficient, given the enrollment mean, the growth per $1,000 in increased tuition would yield -0.766 students.

These regression results provide insight into the varying price responsiveness of students from each income category. These results show that the most price responsive, either positive or negative, for students in these income levels, with the added control variables, continues to be the lowest and highest income populations. The changes in enrollment for the lowest and highest income levels are 2.01% and -1.40%. Compared to table 4 students in the highest income category are increasingly more price responsive and are leaving the colleges at a 27% higher rate. Students with income levels between $48,001-$110,000 showed a noticeable change with the inclusion of control variables with results that were 50-57% lower.

Results Impacting Research Question Two: Model Three

Table 8 shows the correlation between net price for each income category using net price per income category, the inclusion of control variables, the average price of 4-year private colleges, 2-year public colleges, and Public 4-year or above colleges. These variables help to address competitor prices and the way they function as a substitute good for the education they might otherwise pursue at these institutions based on the average prices at these institutions. Compared to Table 7 the coefficients represented in the elasticity column all changed from the previous regression. Some changed modestly while others changed dramatically. Students with family incomes less than $30,000 represented a 12% reduction in the coefficient whereas, all other income brackets realized an increase of varying percentages for each income category. These changes ranged from

students in the highest income bracket with a 6% increase to students in the three middle income brackets with significant increase of between 275% and 429% increases.

Table 9

Regression Model 3: Control Variables and Competitor Prices Added to the Model

VARIABLES	Enroll Less Than 30,000	Enroll 30,001 to 48,000	Enrolled 48,001 to 75,000	Enroll 75,001 to 110,000	Enroll 110001 or Higher
Net Price - Less Than 30,000	0.30***	-0.27***	-0.31***	0.02	0.15
	(0.08)	(0.09)	(0.08)	(0.11)	(0.13)
Net Price - 30,001 to 48,000	0.31***	0.15	-0.20*	-0.22	-0.45***
	(0.10)	(0.11)	(0.11)	(0.14)	(0.16)
Net Price - 48,001 to 75,000	-0.42***	-0.02	0.37***	0.19	0.31
	(0.13)	(0.14)	(0.14)	(0.18)	(0.21)
Net Price - 75,001 to 110,000	0.20**	0.07	-0.01	0.27**	0.00
	(0.09)	(0.10)	(0.09)	(0.12)	(0.14)
Net Price - 110001 or Higher	0.02	0.16	0.14	-0.46***	-0.35**
	(0.11)	(0.12)	(0.11)	(0.15)	(0.17)
Observations	999	999	999	999	999
R-squared	0.25	0.15	0.14	0.13	0.26
Number of unitid	111	111	111	111	111
Institution FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Control Variables	YES	YES	YES	YES	YES

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 10

Model 3: Change in Enrollment Because of an Increase in Net Price Paid Per Income Category

Income Category	Elasticity	Enroll Mean	Tuition Mean	% $1,000 is of tuition	Enroll Increase per $1,000	Enroll Change
0-30,000	0.3	59.08	$16,902.42	5.92%	1.77%	1.05
30,001-48,000	0.15	37.63	$17,288.18	5.78%	0.87%	0.33
48,001-75,000	0.37	53.63	$19,214.80	5.20%	1.93%	1.03
75,001-110,000	0.27	53.5	$21,584.90	4.63%	1.25%	0.67
> 110,000	-0.35	54.81	$23,605.71	4.24%	-1.48%	-0.81

The data in table 8 compared to table 5 presented results and information that had more statistically significant variables and a stronger R^2 which explained more of the variance in the study. Table 8 compared to table 5 shows statistical significance for all net prices paid per income bracket except students in the $30,001-$48,000 range which still presented a non-statistically significant variable at even the $p<0.1$ range. Additionally, this regression explained the greatest percentage of the variance compared to the previous two regression models as, demonstrated in the presentation of a stronger R^2 value across all regression results for each of the income categories.

Table 10 provides insight into the way price will impact students by income category. The student price coefficient for students with incomes below $30,000 is 1.77%. With a 1.77% student price coefficient, given the enrollment mean, the growth per $1,000 in increased tuition would yield 1.049 students. The student price coefficient

for students with incomes from $30,0001-$48,000 is 0.87%. With a 0.87% student price coefficient, given the enrollment mean, the growth per $1,000 in increased tuition would yield 0.326 students. The student price coefficient for students with incomes from $48,0001-$75,000 is 1.93%. With a 1.93% student price coefficient, given the enrollment mean, the growth per $1,000 in increased tuition would yield 1.033 students. The student price coefficient for students with incomes from $75,0001-$110,000 is 1.25%. With a 1.25% student price coefficient, given the enrollment mean, the growth per $1,000 in increased tuition would yield 0.669 students. The student price coefficient for students with incomes equal to or greater than $110,000 is -1.48%. With a -1.48% student price coefficient, given the enrollment mean, the growth per $1,000 in increased tuition would yield -0.813 students.

These regression results provide insight into the varying price responsiveness of students from each income category. These results show that the most price responsive, either positive or negative, for students in these income levels, with the added control variables, shifted to the middle-income bracket and the lowest income populations. The middle-income bracket has a lower enrollment mean, 53.63 compared to the lowest at 59.08, so the lowest income bracket will show more change in enrollment than the middle-income bracket. All income brackets except the lowest income bracket impact enrollment at a higher rate compared to the regression model presented in table 6.

Results Impacting Research Question Three

Table 8 also provides insight into the relationship between student enrollment from one income range on the pricing for students from other income ranges. A focus for this study so far has been on the impact that discounting has on low-income students

considering the discounting for students from other income categories. Enrollment of students from the lowest income range, families who earn less than $30,000, showed a varying response to the net price paid by other students.

All variables were either statistically significant at the $p<0.01$ or the $p<0.05$ except the variable representing families in the highest income range, $110,001 and higher, which was not statistically significant. The results showed that the discounting for other income categories only negatively impacted low-income student enrollment when accounting for students from the income range of $48,001-$75,000. Discounting for these students is -0.42. A negative coefficient for this single income category demonstrates that when these students paid more for their education, it decreased enrollment for students with less than $30,000 of family income. However, when students from other family income brackets paid a higher net price, this led to higher enrollments.

Enrollment for other income brackets show a varied response in enrollment based on the net price paid for students from families in the less than $30,000 income range. Enrollment for students from families with incomes between $30,001 and $75,000 was negatively impacted when the net price for families with less than $30,000 of income increased as represented by the statistically significant coefficients of -0.27 and -0.31. However, this had a modest reverse effect for the enrollment of students from families with incomes of $75,001 and greater. The coefficient was 0.02 for families with incomes from 75,001 to 110,000 and 0.15 for families with incomes of 110,001 and higher. However, these values were not statistically significant at even the <0.1 threshold.

Summary

This chapter provided a deeper understanding of the research question through an analysis of findings from the data analysis. The data showed that the average net price charged to students by income-level changed substantially over time. Enrollment and net price both increased over the years in the study. The most substantial increase in net price paid by any income category was that of the lowest income category for families with incomes less than $30,001. The data provided a clearer picture of how the average net price charged to students by income-level changed year to year for CCCU's changed.

This chapter also presented the results of log-log regression analysis that were conducted to determine the price elasticity of demand by student income-level. The results were presented in three separate models to best understand how control variables best account for the variance in the study. The results show that even as net price paid per student increased for families from certain income ranges the student enrollment continued to grow. Overall, the changes in enrollment were modest and the elasticities across all populations were inelastic.

This chapter also looked at the results of the log-log regressions to see how the net price paid for students in different income categories impacted low-income student enrollment. Price paid for students in income brackets did have a correlation that impacted low-income student enrollment. The coefficients were not related to the highest income categories of students, but middle income to lower income family income brackets did present statistically significant results that showed that price paid in other income categories does affect low-income student enrollment.

CHAPTER 5: CONCLUSION

This chapter will provide an overview of the study and summarize the findings. The first section is a general study summary. The second section provides a discussion of the research findings with an assessment of how the study answered each of its three research questions. The third section will address limitations that should be considered and that provide context for the interpretation and application of the findings. The fourth section details implications for theory, institutional policy, and procedures. These findings can be utilized for future research incorporating demand theory, looking at tuition discounting at higher education institutions, assessing enrollment management, addressing enrollment variation based on total family income, or a unique mixture of other applications across the literature. Practitioners may find this study's outcomes actionable for setting institutional elasticities, strategic planning, or auditing tuition discounting policies and procedures.

Study Summary

This study investigated how college discounting practices impact student enrollment across income categories for members and affiliates of the Council for Christian Colleges and Universities. To accomplish this, the study utilized data from the Integrated Postsecondary Education Data System (IPEDS) to examine the relationship between the net price paid per income category and the enrollment of corresponding income categories. The study examined the objective through the following three research questions. The three research questions were:

1) How has the average net price charged to students by income level changed across time among institutional members and affiliates of the CCCU?

2) What was the price elasticity of demand by student income level at Council for Christian Colleges and Universities?

3) How does the net price low-income students pay correlate to the enrollment of other income categories?

Discussion of Research Findings

Research Question One

The first research question in this study was, "How has the average net-price charged to students by income-level changed across time at Council for Christian Colleges and Universities?" This study provided insights into the way the enrollment and net price have fluctuated year to year from 2008-2016. The results from the study and the years assessed show that CCCU colleges were not exempt from the impacts of the 2008 recession. The data shows an unprecedented reduction of costs in 2009 through significant discounting. This reduction of costs broke with any current or future trends of pricing at these institutions. The average net price across income categories was -14% which led to an increase in student enrollment of 18% during a year of great economic hardship for colleges, students, and families alike. However, in future years these colleges continued to increase their prices and posted the highest year to year increase in the very next year, 2010, where they increased the prices by an average of 15% across all income categories.

For context, the average price of 4-year nonprofit initiations was utilized. This average price data provides key context since the colleges utilized in this study, CCCU colleges are also this type of institution. Utilizing the data from Table 2, CCCU colleges, compared to the average 4-year nonprofit institutions, charges were much more drastic

both with the reduction of prices in 2008 as well as the increases in 2009 and future years. For example, in 2008 4-year nonprofit institutions reduced their prices by 4%, $17,390-$16,730, but never increased their prices above 2% year to year. The total average cost increase from year 2008-2016 was 3%, $17,390-$17,960. CCCU institutions had a much more drastic total increase ranging from 24% in the highest income category, $20,579-$25,606, to 51% more paid in net price for the lowest income categories, $19,002-$23,962. These price difference demonstrate that CCCU institutions net price per income category shows much more volatility than average comparable net price changes.

Research Question Two

The second research question in this study was “What was the price elasticity of demand by student income level at Council for Christian Colleges and Universities?” An elasticity provides insight into student demand because it shows how a "percentage change in quantity…is caused by a percentage change in a specific factor" (Toutkoushian & Paulsen, 2016a). Higher education price elasticities show how a percent change in price will affect a percent change in enrollment. Standard elasticity standards impact the interpretation of the coefficients and the elasticities that they represent:

> University of Minnesota Libraries Publishing (2016) stated: If the absolute value of the price elasticity of demand is greater than 1, demand is termed price elastic. If it is equal to 1, demand is unit price elastic. And if it is less than 1, demand is price inelastic (p. 150).

The elasticities that best answered the research question were found in Model 3. Model 3, the model with the highest R^2 (see Table 8) accounted for control variables

which included standardized test scores, institutional expenditures, and unemployment data. Model 3 also utilized the average prices of Public 4-year Colleges, Private Not-for-profit 4-year colleges, and Public two-year colleges as competitor colleges' prices. Utilizing both the control variables and competitor college data provided the most statistically significant results and the highest explanatory power, R^2, for how the independent variables impacted enrollment by income category.

This study generated varied elasticities per student income category as detailed in Table 8. Students with family incomes of $30,000 or less had an elasticity value of 0.30. Students with family incomes between $30,001 and $48,000 had an elasticity value of 0.15. Students with family incomes between $48,001 and $75,000 had an elasticity value of 0.37. Students with family incomes between $75,001 and $110,000 had an elasticity value of 0.27. Students with family incomes greater than $110,000 had an elasticity value of -0.35. These elasticity values show a difference from 0 either positive or negative that never exceeds 0.37. These elasticities represent student populations with modest inelastic responses to price increases for families with incomes less than $110,000. However, these results do show a modest elastic response for students with family incomes greater than $110,000.

The positive elasticities for most student populations was not expected because demand theory states that as price increases, demand will decrease except in perfectly inelastic circumstances (University of Minnesota Libraries Publishing, 2016). However, these positive coefficients do not make the study findings invalid nor flawed, but rather they provide context for the unique population of colleges that were part of the sample as well as unique internal and external realities. Positive coefficients have been found in

studies like this that endeavor to see how college pricing impacts student enrollment. Early examples of this would be articles compiled by Leslie and Brinkman (1987) where they catalog researchers who also arrived at positive coefficients in their study (Hoenack & Weiler, 1975; Kohn et al., 1976; Radner & Miller, 1970). When Heller (1997) provided an update to the seminal work by Leslie and Brinkman (1987), he too found studies that have positive coefficients in the literature. Given the existence of positive coefficients in the literature, there is support for the viability of this study's results. However, more must be said to explain why and what positive coefficients might say about this study and the unique community of colleges utilized for its analyses.

Demand theory states that as the price increases, demand decreases. Researchers provide insight into why positive coefficients might result from a study like this. Leslie and Brinkman (1987) provided perspective in the past that financial aid and need-based aid might mitigate the negative impact of tuition increases by still making the bottom line more affordable for students (Heller, 1999; Van der Klaauw, 2002). Even the most recent research shows that financial aid does indeed impact enrollment so this could also be a point to support positive coefficients for the results of this study (Dynarski et al., 2022). Additionally researchers have found that in some cases private colleges have been able to raise their prices and also raise their enrollments because of the perception of quality at these colleges that is more prevalent than other institutional types (Dotterweich, 2005; Heller, 1997). These colleges affiliation with the CCCU may also have an impact on enrollment with the expectation of faith-based missions and operations. These may be unique factors that impact the taste and preferences of students and families choosing these colleges even when the price increases.

The results from this study should not be used to support the idea that enrollment will always increase no matter the amount price is raised. There are other factors and external realities that must be considered. For example, the highest drop in enrollment year to year for students from incomes of $48,001 and higher was during 2009 and 2010, while colleges had their highest price increases. However, during this same time, students from families with incomes less than $48,001 did indeed have year-to-year enrollment increases.

Research Question Three

The third research question in this study was, "How does the net price low-income students pay correlate to the enrollment of other income categories?" This is a relevant research question as it connects to researchers' concerns about the impacts of tuition discounting on low-income student enrollment (Griffith, 2011; Martin, 2004). While this study is limited in its focus, it provides the results necessary to test how discounting one student income population impacts other student populations' enrollment, especially low-income students.

The results shown in Table 7 demonstrate that discounting for students from families with different incomes impacts the enrollment of students from other income categories. As discussed in the literature review, the existence of limited resources at organizations like colleges can lead to a reality where students receive different amounts of aid based on strategic enrollment decisions (Bevir, 2007; Casciaro & Piskorski, 2005). Decisions about scholarships, amounts, and strategies can then trickle down into an impact on the tuition discount students pay. Demand theory at this stage of the process provides insight into the way that students who have been strategically allocated a set

price to pay for their education respond by either enrolling or not enrolling (Desjardins, 2001; DesJardins & Bell, 2006; Frederick et al., 2012; Giddings, 1890; Leslie & Brinkman, 1987; Mankiw, 2017; Marshall, 1890; St. John, 1991; Toutkoushian & Paulsen, 2016a; Wagner, 1891). Based on the principles of demand theory, price becomes a major motivating factor for the decision to enroll or not enroll. This decision about price has already been impacted by decisions on how much to discount for students in different categories.

These principles are in effect as we see the way the coefficients change as other students' net price paid are taken into consideration. Enrollment for students in the lowest income category can range from -0.31 to 1.5 depending on the net price offered to other students. This means that the likelihood of enrolling is indeed modestly impacted by the net price paid by other students to varying degrees. The implications of differing prices on other students' enrollment could be varied. Researchers have found that there can be reductions in enrollment for some student income categories based on institutional priorities and focus on other income categories or aid that caters to different income categories (Drew, 2012; Griffith, 2011; Hillman, 2012; Kirp & Holman, 2005; Kraatz et al., 2010; McPherson & Schapiro, 1999; Quirk, 2005; Redd, 2000). Future research might benefit from an analysis of how individual students respond when they find higher discounts are offered to their peers. The emergence of net price calculators and other required Department of Education measures creates more transparency where a student could easily put in different values to see how other peers aid packages might differ from there aid package.

Students from the highest income category deserves some special assessment. As discussed in the literature review, researchers posit that the scholarships and funding offered by colleges that has the potential to advantage higher income families can have a negative impact on the enrollment of students from low-income families (Drew, 2012; Griffith, 2011; Hillman, 2012; Kirp & Holman, 2005; Kraatz et al., 2010; McPherson & Schapiro, 1999; Quirk, 2005; Redd, 2000). Reviewing the results from Table 7 the coefficients do provide insight into the effects of the net price paid by students from high-income families has on the enrollment of students from low-income families. The study had a coefficient of 0.15, as detailed in Table 8, but this elasticity and the coefficient were not statistically significant at the $p<0.1$ threshold. Because the results are statistically insignificant, this study is not able to speak into the relationship between discounting for the highest income families and enrollment of students from the lowest incomes. However, the results presenting a 0.15 result make this a good research topic for the future to see what statistically significant results from future works might reveal.

Limitations of this Study

The data utilized for this study and the model decided upon provide insight for the research questions as detailed above; however, there were limitations with the data that are important to note. The first is the limitations of the data itself. IPEDS had a limited date range for the data of interest for this study. The Student Financial Aid and Net Price survey administered by IPEDS only collected data for "students who were awarded any Title IV Federal Financial Aid, by income category" starting in Fall 2008 and ending in Fall 2017. Other variables had limited information after 2016, so the analysis was limited

to the Fall 2008-2016. Future research will have access to more robust data, and additional years of data.

A second limitation of this study is the omitted variable bias. Omitted variable bias can result from my bias in selecting which variables to include or exclude from this study. The variables that are not selected may be variables that could impact the student's decision to enroll, and their exclusion could create an omitted variable bias. While this bias was acknowledged and variables were strategically selected, bias is still a potential limitation for this study. This study further helped to minimize the omitted variables bias by utilizing Fixed effects as part of the empirical framework to control these omitted variables. Fixed effects help to reduce omitted variable bias for this study in the estimation of the average price paid per student (β, which measures the relationship between X and Y) by controlling for a matrix of the institution and time-varying covariates, $W_{\iota,\tau-1}\gamma$, as well as a matrix of, institution, and time-varying covariates, $V_{\tau-1}\vartheta$. Fixed effects regression was utilized to generate more accurate findings, but it does not eliminate the possibility for them, and this limitation should be acknowledged (Riegg, 2008, p. 340).

A third limitation of this study was the population that was utilized. While the findings and elasticities will be very helpful when studying Council for Christian Colleges and Universities, it should be noted that the expansion of these results to other colleges unilaterally should be avoided. The findings from this study speak well into the research questions for these colleges within the years of the study; however, an expansion of this to other colleges outside the parameters of this study may not be directly applicable.

A final limitation of this study was the use of quantitative data, specifically log-log fixed effects regression. The outcomes from this study are insightful, but there is room for future research to add more vibrancy to this research through targeted surveys, interviews, or qualitative research. The qualitative research for this study is limited in presenting part of the story. Still, future researchers could supplement this study's results with the stories of students and the colleges working with those students to triangulate the data through multiple research streams. Future research could build upon this with targeted research questions that would help to add even more insight into understanding student discounting and its impact on student enrollment per income category.

Implications for Theory, Institutional Policies, and Procedures

Implications for Theory

As mentioned before, the results from this study were not expected because of the utilization of demand theory. An outcome of demand theory states that "the quantity demanded of a good falls when the price of a good rises" (Mankiw, 2017, p. 67). The law of demand shows that price and quantity are inversely related since an increase in one will lead to a decrease in the other. Applying demand theory as defined, one expects that the results of this study would show decreases in all income categories as the net price paid per student increased; however, the result of this study went the other direction. As many students from income brackets, like the lowest income bracket, saw increased prices, they continued to enroll and enrolled in increasing amounts. These students had modest inelastic behavior to the increase in the net price they paid to go to the colleges in this sample.

Positive coefficients have been found in studies like this current study, as stated above in response to Research Question Two (Heller, 1997; Heller, 1999; Hoenack & Weiler, 1975; Kohn et al., 1976; Leslie & Brinkman, 1987; Radner & Miller, 1970; Van der Klaauw, 2002). These studies and the current study's results demonstrate that demand theory in higher education at large can at times present a unique buyer and seller relationship that is different across other industries (DesJardins & Bell, 2006; Leslie & Brinkman, 1987; Toutkoushian & Paulsen, 2016a). It also illustrates the unique population of colleges that were a part of this study and the unique way that students across income categories respond when the price of education is raised (CCCU, 2022; Confer & Mamiseishvili, 2012a; Schuttinga, 2011; Supplee, 2014; Vander Schee, 1998). Students carrying response to price based on institutional type may be related to the perception of quality at these colleges that is more prevalent than other institutional types (Dotterweich, 2005; Heller, 1997). These colleges' affiliation with the CCCU may also have an impact on enrollment with the expectation of certain agreed upon principles and norms. For example, colleges affiliated with this organization must share commonality with five key criteria: institutional type/accreditation, Christian mission, employment policy, cooperation and participation, and institutional integrity (CCCU, 2017). The unique requirements for membership with the CCCU make these colleges small, specialized, and niche institutions. These specialized and niche institutions may then speak to a divergence in traditional demand theory.

The unique population utilized for this study exhibited these modest inelastic results for most student populations. While this might initially be concerning, justification is detailed above for why this does not invalidate the study. Further, it

should also inform the way we utilize demand theory for future studies, making note that there may be divergence from a traditional outcome of demand theory. This study and the unique population demonstrate that when demand theory is applied for future applications a similar divergence might be planned for or compared.

Implications for Institutional Policies and Procedures

Practitioners can utilize the findings from this study to gain insight into their own institutions. For non CCCU institutions, the data can provide a framework for analysis, and for CCCU institutions, it could provide elasticities to consider as institutional pricing and discounting are considered. Institutions can consider how students from each income category responded differently and use this as a starting point for their assessment or they can build their elasticities within the parameters utilized by this study. As competition increases for colleges, there is considerable pressure to determine the right price to set the cost of education and what discounting strategy an institution might pursue to maximize net revenue (Cheslock & Riggs, 2021). This is a complicated process, leading many to seek out consultants to provide insight into questions such as the following:

> Hossler and Bontrager (2014) noted: We have a set of merit scholarships of varying amounts. Can we achieve a better result by changing the amounts of those scholarships? Can we improve our outcomes by changing the groups of admitted applicants offered those scholarships? We need to reduce our tuition discount rate. Should we reduce the value of our merit scholarships or limit need-based grant-in-aid? And depending on which of these alternatives we choose, what are the likely impacts on overall enrollment, diversity, academic profile, net revenue, and so on, of our enrolled first-year class? (p. 226)

At the heart of all these questions and strategic assessment is the desire to educate students to fulfill a college's institutional mission, meet enrollment goals, and to maintain fiscal solvency. This study equips institutions with more insight into the way student's family income impacts their likelihood to enroll. Specifically, the study found varying elasticity rates from -0.35 to 0.37 illustrating that utilizing a one size fits all model or a single elasticity is not nuanced enough to account for the varying responses by students with varying family incomes.

This research could also be specifically useful for enrollment management strategies and strategic enrollment management plans. Enrollment management was discussed at length in the literature review and returning to this literature the research can inform decision making at this level. For example, the data from this study can equip practitioners who have established Strategic Enrollment Management plans to consider not only the impact of tuition discounting and pricing but also the importance for viewing students from different income categories differently. Given the way in which the elasticities vary per income category practitioners can approach their SEM plans and institutional strategies with this in mind. For example, one goal that almost every college has in their SEM plan is the increase of enrollment or the shaping of their class to maintain their desired enrollment while increasing net tuition revenue (Baillie & Gordon, 2017; Bradshaw, 2023; Hossler & Kalsbeek, 2013). Colleges can utilize the outcomes of this study to target enrollment goals that have unique goals, strategies, and tactics that are shaped by the differing response of students by income category.

This study also equips colleges to consider how they might tailor their enrollment strategies for a targeted income category such as low-income student enrollment.

Colleges may not want to look at all income categories all at once or may not have individualized strategies for every income category. However, the results of this study provide insight into how a single income category could be assessment to support a strategic goal within the SEM plan. If a goal of an institution was to grow their low-income student population, the strategies and tactics might include strategic ways for the tuition discount to be adjusted for this population based upon the determined elasticity for this income category. All decision should be shaped as this study shows through a careful assessment of the elasticity of students in this income category to best understand how to increase student enrollment and to support this group of students.

CONCLUSION

This study's purpose was to better understand CCCU college's enrollment and the way in which enrollment varies based on family income. The three research questions were answered for this study and insight into the behavior of students by income categories was made possible. The responses of these students were assessed with log-log fixed effects regression and the addition of control variables strengthened the study. The final coefficients from the study were utilized as elasticities to demonstrate the impact on enrollment per $1,000 change in enrollment. The study accomplished its purpose by providing context to the general behavior of student enrollment and by determining elasticities for students by income category for the years specified.

Student's enrollment is impacted by price as expected, but in different ways than anticipated. All students with family incomes of $110,000 or less should enroll at increasing rates even while they were paying more for their education. This was demonstrated by the negative elasticities for these students in these income categories.

However, families with incomes greater than $110,000 might choose to not enroll at a CCCU institution if the price were increased. This is reflected in the study's positive elasticities for students in this income category. Overall, the study's results can be applied at colleges to consider how student enrollment might vary or be unique based upon family income. Future researchers can utilize this study to continue to add nuance and more understanding of students' enrollment behaviors at CCCU institutions based upon family income utilizing demand theory.

APPENDIX A

Descriptive Statistics

Variable	Mean	S.D.	Min	Max	Number
Enrolled - Less Than 30,000	3.654	1.321	-1.099	7.596	-0.16
Enrolled - 30,001 to 48,000	3.127	1.514	-2.303	6.196	-0.27
Enrolled - 48,001 to 75,000	3.011	1.373	-1.792	6.17	-0.23
Enrolled - 75,001 to 110,000	2.994	1.676	0	6.211	-0.27
Enrolled - 110001 or Higher	3.05	1.935	0	6.98	-0.26
Net Price - Less Than 30,000	9.609	0.498	4.407	10.945	-0.18
Net Price - 30,001 to 48,000	9.668	0.458	6.335	10.946	-0.17
Net Price - 48,001 to 75,000	9.819	0.413	4.431	11.035	-0.18
Net Price - 75,001 to 110,000	9.961	0.378	5.193	10.844	-0.23
Net Price - 110001 or Higher	10.12	0.36	5.814	11.066	-0.14
SAT Comp 25th Percentile	4.279	3.325	0	7.313	-0.23
SAT Comp 75th Percentile	4.411	3.427	0	7.378	-0.23
ACT Comp 25th Percentile	1.954	1.448	0	4.682	-0.25
ACT Comp 75th Percentile	2.101	1.554	0	4.754	-0.25
Instructional Expenditures	16.199	1.601	9.578	21.626	-0.27
Academic Support Expenditures	14.691	1.712	7.287	20.571	-0.24
Student Service Expenditures	15.232	1.616	6.207	19.675	-0.3
Institutional Support Expenditures	15.663	1.378	9.189	20.474	-0.29
Auxiliary Services Expenditures	15.064	1.874	3.332	20.711	-0.24
Unemployment	7.062	2.068	2.7	13.7	-0.07
Public 4 Year Avg Price	8.898	0.305	7.998	9.515	-0.05
Private NFP 4 Year Avg Price	10.043	0.257	9.208	10.555	-0.12
Public 2 Year Avg Price	8.193	0.472	6.382	9.079	0.14

APPENDIX B

Regression Model 1: All Variables Utilized for Table 3

VARIABLES	Enrolled Students - Less Than 30,000	Enrolled Students - 30,001 to 48,000	Enrolled Students - 48,001 to 75,000	Enrolled Students - 75,001 to 110,000	Enrolled Students - 110001 or Higher
Net Price - Less Than 30,000	0.34***				
	(0.07)				
Net Price - 30,001 to 48,000		0.05			
		(0.07)			
Net Price - 48,001 to 75,000			0.11		
			(0.08)		
Net Price - 75,001 to 110,000				0.12	
				(0.10)	
Net Price - 110001 or Higher					-0.24*
					(0.14)
Year 2008	-0.26***	-0.08*	-0.10**	-0.17***	-0.12*
	(0.04)	(0.04)	(0.04)	(0.06)	(0.06)
Year 2010	0.12***	0.14***	0.05	-0.01	0.07
	(0.04)	(0.04)	(0.04)	(0.06)	(0.06)
Year 2011	0.09**	0.06	0.03	0.12**	0.21***
	(0.04)	(0.05)	(0.04)	(0.06)	(0.06)
Year 2012	0.11***	0.05	-0.00	0.08	0.25***
	(0.04)	(0.05)	(0.04)	(0.06)	(0.06)
Year 2013	0.07	0.05	-0.00	0.11*	0.37***
	(0.04)	(0.05)	(0.04)	(0.06)	(0.06)
Year 2014	0.05	0.00	-0.06	0.09*	0.44***
	(0.04)	(0.05)	(0.04)	(0.06)	(0.06)
Year 2015	0.00	-0.02	-0.12***	0.08	0.51***

	(0.04)	(0.05)	(0.04)	(0.06)	(0.06)
Year 2016	-0.06	-0.06	-0.13***	0.08	0.56***
	(0.04)	(0.05)	(0.04)	(0.06)	(0.07)
Constant	0.49	2.92***	2.71***	2.43**	5.72***
	(0.63)	(0.71)	(0.79)	(0.96)	(1.35)
Observations	999	999	999	999	999
R-squared	0.17	0.04	0.04	0.05	0.19
Number of unitid	111	111	111	111	111
Institution FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Control Variables	NO	NO	NO	NO	NO

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

APPENDIX C

Regression Model 2: All Variables Utilized for Table 5

VARIABLES	Enrolled Students - Less Than 30,000	Enrolled Students - 30,001 to 48,000	Enrolled Students - 48,001 to 75,000	Enrolled Students - 75,001 to 110,000	Enrolled Students - 110001 or Higher
Net Price - Less Than 30,000	0.34***				
	(0.06)				
Net Price - 30,001 to 48,000		0.04			
		(0.07)			
Net Price - 48,001 to 75,000			0.07		
			(0.08)		
Net Price - 75,001 to 110,000				0.08	
				(0.10)	
Net Price - 110001 or Higher					-0.33**
					(0.13)
Year 2008	-0.18***	-0.09	-0.20***	-0.21**	-0.13
	(0.07)	(0.07)	(0.07)	(0.09)	(0.11)
Year 2010	0.11***	0.13***	0.04	-0.02	0.05
	(0.04)	(0.04)	(0.04)	(0.06)	(0.06)
Year 2011	0.06	0.00	-0.01	0.07	0.18***
	(0.04)	(0.05)	(0.04)	(0.06)	(0.06)
Year 2012	0.07	-0.05	-0.10**	-0.01	0.19**
	(0.05)	(0.05)	(0.05)	(0.07)	(0.08)
Year 2013	0.02	-0.07	-0.14**	-0.02	0.28***
	(0.06)	(0.06)	(0.06)	(0.08)	(0.09)
Year 2014	0.00	-0.15**	-0.24***	-0.07	0.33***
	(0.07)	(0.08)	(0.07)	(0.09)	(0.11)

Year 2015	-0.04	-0.19**	-0.33***	-0.10	0.39***
	(0.08)	(0.09)	(0.09)	(0.11)	(0.13)
Year 2016	-0.11	-0.25***	-0.36***	-0.11	0.43***
	(0.09)	(0.10)	(0.09)	(0.12)	(0.14)
SAT Comp 25th Percentile	0.02	0.15	-0.26	-0.25	-0.33
	(0.26)	(0.28)	(0.27)	(0.35)	(0.39)
SAT Comp 75th Percentile	-0.03	-0.16	0.24	0.25	0.33
	(0.25)	(0.27)	(0.26)	(0.33)	(0.38)
ACT Comp 25th Percentile	0.09	-0.32	-0.09	-0.13	-0.29
	(0.23)	(0.25)	(0.24)	(0.31)	(0.36)
ACT Comp 75th Percentile	-0.05	0.33	0.14	0.20	0.33
	(0.21)	(0.23)	(0.22)	(0.29)	(0.33)
SAT Critical Reading	0.11	0.06	-0.11	0.04	-0.03
	(0.11)	(0.11)	(0.11)	(0.14)	(0.16)
SAT Math	-0.03	0.01	0.13	-0.14	0.35*
	(0.13)	(0.14)	(0.13)	(0.17)	(0.20)
ACT Composite	0.01	-0.05	-0.01	0.06	-0.30**
	(0.09)	(0.10)	(0.10)	(0.13)	(0.14)
Insitructional Expenditures	0.07	-0.03	-0.08	0.02	-0.07
	(0.09)	(0.09)	(0.09)	(0.12)	(0.13)
Academic Support Expenditures	-0.03	0.06	0.09*	0.14**	0.14**
	(0.05)	(0.05)	(0.05)	(0.06)	(0.07)
Student Service Expenditures	0.20***	0.23***	0.13*	0.15*	0.15
	(0.07)	(0.07)	(0.07)	(0.09)	(0.10)
Institutional Support Expenditures	0.16***	0.30***	0.11*	-0.01	-0.01
	(0.06)	(0.06)	(0.06)	(0.08)	(0.09)

Auxiliary Services Expenditures	0.14**	0.14**	0.18***	0.15**	0.24***
	(0.06)	(0.06)	(0.06)	(0.08)	(0.09)
Unemployment	0.02	-0.01	-0.03*	-0.02	-0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Constant	-8.08***	-7.80***	-3.05*	-4.26**	-0.32
	(1.51)	(1.65)	(1.63)	(2.10)	(2.50)
Observations	999	999	999	999	999
R-squared	0.22	0.11	0.09	0.10	0.24
Number of unitid	111	111	111	111	111
Institution FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Control Variables	YES	YES	YES	YES	YES

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

APPENDIX D

Regression Model 3: All Variables Utilized for Table 7

VARIABLES	Enrolled Students - Less Than 30,000	Enrolled Students - 30,001 to 48,000	Enrolled Students - 48,001 to 75,000	Enrolled Students - 75,001 to 110,000	Enrolled Students - 110001 or Higher
Net Price - Less Than 30,000	0.30***	-0.27***	-0.31***	0.02	0.15
	(0.08)	(0.09)	(0.08)	(0.11)	(0.13)
Net Price - 30,001 to 48,000	0.31***	0.15	-0.20*	-0.22	-0.45***
	(0.10)	(0.11)	(0.11)	(0.14)	(0.16)
Net Price - 48,001 to 75,000	-0.42***	-0.02	0.37***	0.19	0.31
	(0.13)	(0.14)	(0.14)	(0.18)	(0.21)
Net Price - 75,001 to 110,000	0.20**	0.07	-0.01	0.27**	0.00
	(0.09)	(0.10)	(0.09)	(0.12)	(0.14)
Net Price - 110001 or Higher	0.02	0.16	0.14	-0.46***	-0.35**
	(0.11)	(0.12)	(0.11)	(0.15)	(0.17)
Year 2008	-0.26***	-0.10	-0.26***	-0.24**	-0.16
	(0.07)	(0.08)	(0.08)	(0.10)	(0.11)
Year 2010	0.12***	0.11**	0.06	-0.04	0.00
	(0.05)	(0.05)	(0.05)	(0.06)	(0.07)
Year 2011	0.06	-0.06	0.00	-0.02	0.02
	(0.06)	(0.07)	(0.07)	(0.09)	(0.10)
Year 2012	0.07	-0.15	-0.10	-0.15	-0.04
	(0.09)	(0.09)	(0.09)	(0.12)	(0.13)
Year 2013	0.01	-0.21*	-0.15	-0.19	-0.00
	(0.10)	(0.11)	(0.10)	(0.14)	(0.15)
Year 2014	-0.00	-0.31**	-0.25**	-0.28*	-0.01

	(0.12)	(0.13)	(0.13)	(0.17)	(0.19)
Year 2015	-0.04	-0.37**	-0.36**	-0.35*	-0.01
	(0.14)	(0.15)	(0.15)	(0.19)	(0.22)
Year 2016	-0.08	-0.43**	-0.36**	-0.35*	0.03
	(0.16)	(0.17)	(0.16)	(0.21)	(0.24)
SAT Comp 25th Percentile	-0.07	0.19	-0.14	-0.17	-0.30
	(0.25)	(0.27)	(0.26)	(0.35)	(0.39)
SAT Comp 75th Percentile	0.06	-0.20	0.13	0.17	0.30
	(0.24)	(0.26)	(0.25)	(0.33)	(0.38)
ACT Comp 25th Percentile	0.19	-0.25	-0.08	-0.14	-0.28
	(0.23)	(0.25)	(0.24)	(0.31)	(0.35)
ACT Comp 75th Percentile	-0.14	0.27	0.14	0.22	0.32
	(0.21)	(0.23)	(0.22)	(0.29)	(0.33)
SAT Critical Reading	0.15	0.08	-0.08	0.09	0.00
	(0.10)	(0.11)	(0.11)	(0.14)	(0.16)
SAT Math	-0.10	-0.06	0.05	-0.21	0.27
	(0.13)	(0.14)	(0.13)	(0.17)	(0.20)
ACT Composite	0.02	-0.03	0.03	0.10	-0.24*
	(0.09)	(0.10)	(0.10)	(0.13)	(0.14)
Insitructional Expenditures	0.09	-0.02	-0.06	0.02	-0.07
	(0.08)	(0.09)	(0.09)	(0.12)	(0.13)
Academic Support Expenditures	-0.05	0.05	0.08*	0.14**	0.13*
	(0.05)	(0.05)	(0.05)	(0.06)	(0.07)
Student Service Expenditures	0.16**	0.19***	0.09	0.13	0.12
	(0.07)	(0.07)	(0.07)	(0.09)	(0.10)
Institutional Support Expenditures	0.15**	0.29***	0.10	-0.04	-0.05
	(0.06)	(0.06)	(0.06)	(0.08)	(0.09)
Auxiliary Services Expenditures	0.12**	0.11*	0.16***	0.16**	0.23***
	(0.06)	(0.06)	(0.06)	(0.08)	(0.09)

Unemployment	-0.00	-0.02	-0.05***	-0.04*	-0.04
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)
Public 4 Year Avg Price	0.38*	0.43*	0.55**	0.67**	0.96***
	(0.21)	(0.23)	(0.22)	(0.29)	(0.33)
Private NFP 4 Year Avg Price	-1.28***	-0.39	-0.90**	-0.23	-0.09
	(0.42)	(0.46)	(0.44)	(0.58)	(0.65)
Public 2 Year Avg Price	0.40***	0.41**	0.18	0.24	0.19
	(0.16)	(0.17)	(0.16)	(0.21)	(0.24)
Constant	-1.13	-10.14*	1.31	-5.84	-7.72
	(4.85)	(5.25)	(5.03)	(6.62)	(7.50)
Observations	999	999	999	999	999
R-squared	0.25	0.15	0.14	0.13	0.26
Number of unitid	111	111	111	111	111
Institution FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Control Variables	YES	YES	YES	YES	YES

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

APPENDIX E

Wheaton College Net Price Calculator Questions and Responses: Scenario 1

Net Price Calculator Question	Response
Contact Information	No data was entered
Are you interested in receiving more information after completing the calculator?	No, thank you.
What is the student's date of birth?	1/1/2005
What is the student's marital status as of today?	Single/Never Married
Does the student have children or dependents other than a spouse who will receive more than 50% of their financial support from the student? - Do not include roommates, friends, or relatives who support themselves. Do not include foster children	No
Is the student currently serving on active duty in the US Armed Forces, a member of the National Guard, or Reserves enlistee for purposes other than training?	No
Is the student a veteran of the US Armed Forces? - Answer "Yes" if the student was engaged in active duty in the US Armed Forces, National Guard, or Reserves for purposes other than training AND was released under a condition other than dishonorable.	No
Is the student a child or spouse of a military service member or veteran? - If you are not a child or spouse of a military service member or veteran, select “Neither”	No
What is your relationship to the student?	I am the Student
Is the student a US Citizen?	Yes
What is the student's state of residency?	AL - Chosen to be out of State
What is the student's preferred housing option for the first year of enrollment?	On Campus

What best describes the prospective student's current academic level? - Select the academic level that best describes the student's current status. If the student is in between academic levels, select the academic level for the upcoming school year.	High School Student
When does the student expect to graduate from high school? - The estimates presented in this calculator are based on the current financial aid award year and policies. Results in future years may differ due to changes in financial aid policies or the student's financial circumstances.	Class of 2024
What is the student's cumulative GPA on a 4.0 scale? - Unweighted GPA is measured on a scale of 0 to 4.0.	3.0
Has the student been identified as a National Merit Semi-finalist?	No
Did the student complete AP, IB, and/or honors credits in high school	No
For which of the following test(s) has the student completed and received scores? - Select "Neither" if the student has not taken the SAT or ACT exam or is scheduled to take the exam at a future date. Select "Don't Know" if the student has taken the SAT or ACT, however does not know the individual test scores.	ACT
Please enter the student's ACT scores: - ACT Composite: The highest possible score is 36.	18

Wheaton College Net Price Calculator Questions and Responses: Scenario 2

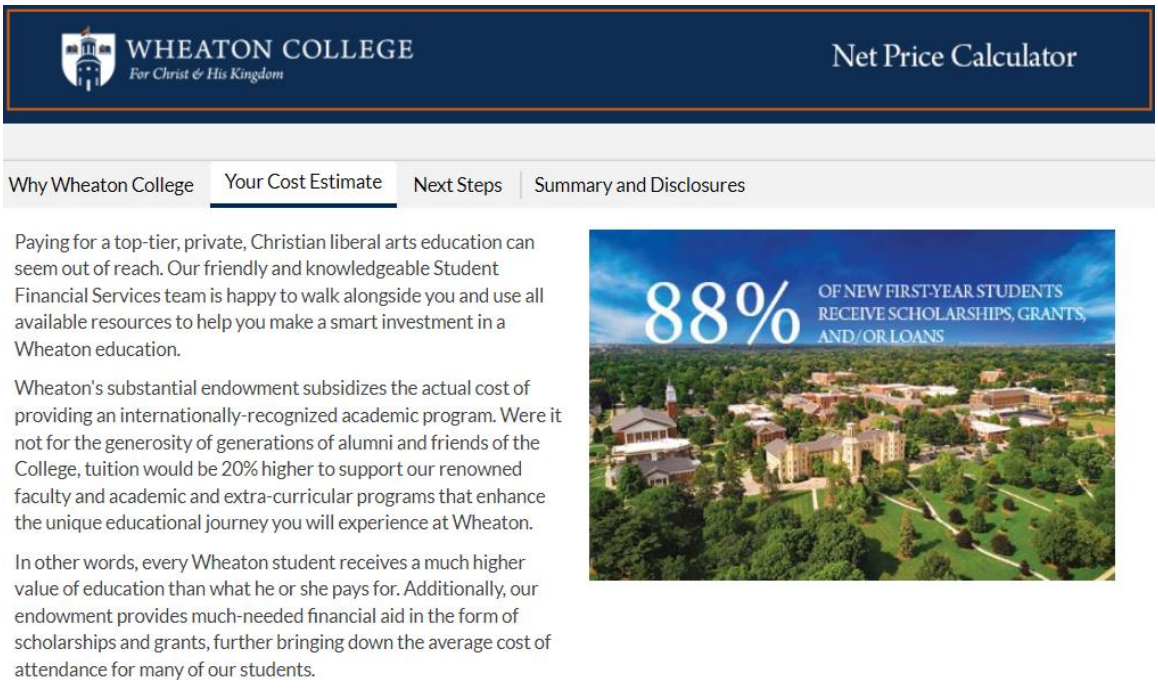
Net Price Calculator Question	**Response**
Contact Information	No data was entered
Are you interested in receiving more information after completing the calculator?	No, thank you.
What is the student's date of birth?	1/1/2005

What is the student's marital status as of today?	Single/Never Married
Does the student have children or dependents other than a spouse who will receive more than 50% of their financial support from the student? - Do not include roommates, friends, or relatives who support themselves. Do not include foster children	No
Is the student currently serving on active duty in the US Armed Forces, a member of the National Guard, or Reserves enlistee for purposes other than training?	No
Is the student a veteran of the US Armed Forces? - Answer "Yes" if the student was engaged in active duty in the US Armed Forces, National Guard, or Reserves for purposes other than training AND was released under a condition other than dishonorable.	No
Is the student a child or spouse of a military service member or veteran? - If you are not a child or spouse of a military service member or veteran, select “Neither”	No
What is your relationship to the student?	I am the Student
Is the student a US Citizen?	Yes
What is the student's state of residency?	AL - Chosen to be out of State
What is the student's preferred housing option for the first year of enrollment?	On Campus
What best describes the prospective student's current academic level? - Select the academic level that best describes the student's current status. If the student is in between academic levels, select the academic level for the upcoming school year.	High School Student
When does the student expect to graduate from high school? - The estimates presented in this calculator are based on the current financial aid award year and policies. Results in future years may differ due to changes in financial aid policies or the student's financial circumstances.	Class of 2024

What is the student's cumulative GPA on a 4.0 scale? - Unweighted GPA is measured on a scale of 0 to 4.0.	4.0
Has the student been identified as a National Merit Semi-finalist?	No
Did the student complete AP, IB, and/or honors credits in high school	No
For which of the following test(s) has the student completed and received scores? - Select "Neither" if the student has not taken the SAT or ACT exam or is scheduled to take the exam at a future date. Select "Don't Know" if the student has taken the SAT or ACT, however does not know the individual test scores.	ACT
Please enter the student's ACT scores: - ACT Composite: The highest possible score is 36.	18

APPENDIX F

Wheaton College Net Price Calculator Results: Scenario 1



Below you will find a summary of the estimated costs for the 2023-2024 academic year and your estimated eligibility for student aid.

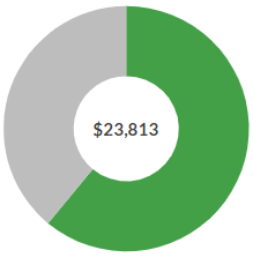
Your published cost of attendance:

Tuition & Fees	$44,196
Food & Housing	$13,512
Wheaton College Direct Cost	**$57,708**
Books & Supplies	$910
Other Expenses	$2,440
Wheaton College Indirect Cost	**$3,350**
Total Cost	**$61,058**

Your estimated grants and scholarships:

Federal Grants	
Pell Grant	$7,395
SEOG Grant	$1,000
Wheaton College Grants and Scholarships	
Wheaton Grant	$28,850
Total Grants and Scholarships	**$37,245**

Your Estimated Net Price



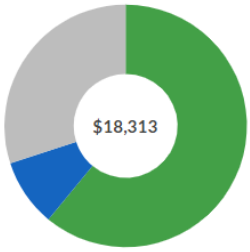
Total Cost	**$61,058**
Grants and Scholarships	– $37,245
Your Estimated Net Price	**$23,813**

Your estimated eligibility for other aid programs:

Loans

Direct Subsidized Loan	$3,500
Direct Unsubsidized Loan	$2,000

Your Estimated Out-of-Pocket Cost



Total Cost	**$61,058**
Grants and Scholarships	– $37,245
Student Loans	– $5,500
Your Estimated Out-of-Pocket Cost	**$18,313**

Other Available Resources:

Federal Work-Study	$1,000
PLUS Loan (Parent Loan)	$17,313

Wheaton College Net Price Calculator Results: Scenario 2

WHEATON COLLEGE
For Christ & His Kingdom

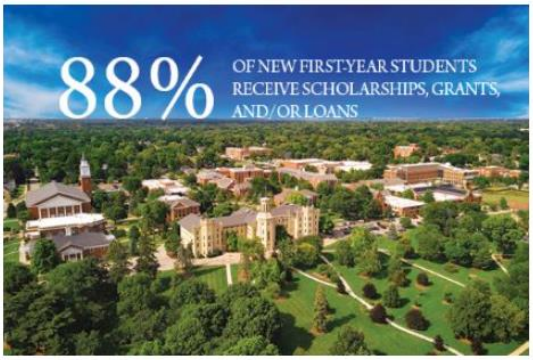
Net Price Calculator

Why Wheaton College | Your Cost Estimate | Next Steps | Summary and Disclosures

Paying for a top-tier, private, Christian liberal arts education can seem out of reach. Our friendly and knowledgeable Student Financial Services team is happy to walk alongside you and use all available resources to help you make a smart investment in a Wheaton education.

Wheaton's substantial endowment subsidizes the actual cost of providing an internationally-recognized academic program. Were it not for the generosity of generations of alumni and friends of the College, tuition would be 20% higher to support our renowned faculty and academic and extra-curricular programs that enhance the unique educational journey you will experience at Wheaton.

In other words, every Wheaton student receives a much higher value of education than what he or she pays for. Additionally, our endowment provides much-needed financial aid in the form of scholarships and grants, further bringing down the average cost of attendance for many of our students.



Below you will find a summary of the estimated costs for the 2023-2024 academic year and your estimated eligibility for student aid.

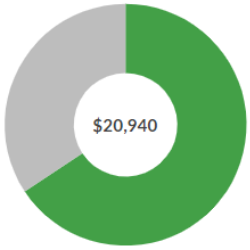
Your published cost of attendance:

Tuition & Fees	$44,196
Food & Housing	$13,512
Wheaton College Direct Cost	**$57,708**
Books & Supplies	$910
Other Expenses	$2,440
Wheaton College Indirect Cost	**$3,350**
Total Cost	**$61,058**

Your estimated grants and scholarships:

Federal Grants	
Pell Grant	$7,395
SEOG Grant	$1,000
Wheaton College Grants and Scholarships	
Presidential Scholarship	$20,000
Wheaton Grant	$11,723
Total Grants and Scholarships	**$40,118**

Your Estimated Net Price



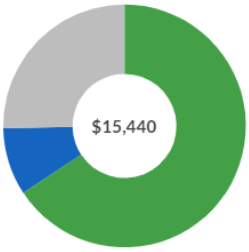
Total Cost	**$61,058**
Grants and Scholarships	– $40,118
Your Estimated Net Price	**$20,940**

Your estimated eligibility for other aid programs:

Loans

Direct Subsidized Loan	$3,500
Direct Unsubsidized Loan	$2,000

Your Estimated Out-of-Pocket Cost



Total Cost	**$61,058**
Grants and Scholarships	– $40,118
Student Loans	– $5,500
Your Estimated Out-of-Pocket Cost	**$15,440**

Other Available Resources:

Federal Work-Study	$1,000
PLUS Loan (Parent Loan)	$14,440

APPENDIX G

APU Net Price Calculator Questions and Responses: Scenario 1

Net Price Calculator Question	Response
Answer the questions below to help determine your annual cost of attending Azusa Pacific University.	n/a
What is your weighted high school GPA? - (4-point scale)	3.0
Please tell us about yourself. We would like to send you (the student) more information about Azusa Pacific University. Complete the information below if you'd like to hear from us. Click "Continue" to finish your estimate.	Continue with no information inputted
We need to begin with four simple questions about the student.	n/a
How old are you?	18
Are you married?	No
Are you the primary source of financial support for any children?	No
Are you a U.S. veteran or active duty military?	No
What is your state of legal residence?	Alabama - Chosen to be out of State
Where will you be living while in college? On campus Off campus (not at parent's home) Off campus (living at parent's home)	On Campus
If you have already filed your FAFSA and know your Expected Family Contribution (EFC), please enter it below and click “Submit EFC”. If you have not filed or do not know your EFC, click the Continue button.	0

APU Net Price Calculator Questions and Responses: Scenario 2

Net Price Calculator Question	Response
Answer the questions below to help determine your annual cost of attending Azusa Pacific University.	n/a
What is your weighted high school GPA? - (4-point scale)	4.0
Please tell us about yourself. We would like to send you (the student) more information about Azusa Pacific University. Complete the information below if you'd like to hear from us. Click "Continue" to finish your estimate.	Continue with no information inputted
We need to begin with four simple questions about the student.	n/a
How old are you?	18
Are you married?	No
Are you the primary source of financial support for any children?	No
Are you a U.S. veteran or active duty military?	No
What is your state of legal residence?	Alabama - Chosen to be out of State
Where will you be living while in college? On campus Off campus (not at parent's home) Off campus (living at parent's home)	On Campus
If you have already filed your FAFSA and know your Expected Family Contribution (EFC), please enter it below and click “Submit EFC”. If you have not filed or do not know your EFC, click the Continue button.	0

APPENDIX H

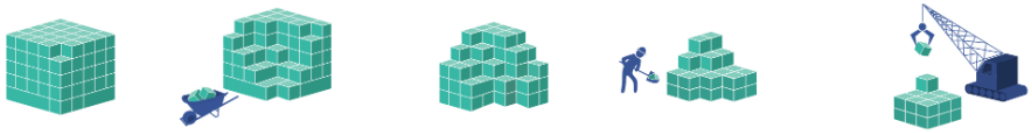
Azusa Pacific University Net Price Calculator Results: Scenario 1

AZUSA PACIFIC UNIVERSITY

SCHOLARSHIP — FINANCIAL INFORMATION — NET PRICE

Breaking Down True Yearly Cost

To find out true cost, subtract all aid received from the total cost. Keep in mind this is an estimate. Contact our admissions team for more information on these costs and how to maximize financial aid.



Total Costs | minus Scholarships | minus Grants | minus Loans | = True Yearly Cost

The following estimate is based on one academic year (two semesters).

ESTIMATED COST OF ATTENDANCE		
Tuition and Fees		$43,600
Housing and Food		$10,674
Total Estimated Direct Cost		**$54,274**
Books and Supplies		$938
Other (Personal, transport...)		$3,630
Total Estimated Cost		**$58,842**
Expected Family Contribution(EFC)		$0

Estimated Scholarship(s)

Director's Scholarship	$16,000
Total Estimated Scholarship	**$16,000**

Other Gift Aid

Pell grant	$7,395
Estimated Other Gift Aid	$8,000
Total Estimated Other Gift	**$15,395**

Estimated Total Scholarships and Other Gift	**$31,395**

ESTIMATED NET PRICE	**$27,447**

View Self-Help Options -

LOANS: Unlike scholarships and grants, loans must be paid back with interest. In addition to the low-cost Direct Student Loan estimated below, you may qualify for Parent PLUS and alternative/private loans up to the cost of attendance. However, you are under no obligation to borrow.

Please visit studentaid.gov/loans to learn more about Federal Loans.

Other Forms of Aid - These funds were not included in the estimate above

Loans	$5,500
Alternative Loan Eligibility	$21,947
Total Estimated Other Assistance	**$27,447**

Azusa Pacific University Net Price Calculator Results: Scenario 2

AZUSA PACIFIC UNIVERSITY

SCHOLARSHIP — FINANCIAL INFORMATION — NET PRICE

Breaking Down True Yearly Cost

To find out true cost, subtract all aid received from the total cost. Keep in mind this is an estimate. Contact our admissions team for more information on these costs and how to maximize financial aid.

Total Costs | minus Scholarships | minus Grants | minus Loans | = True Yearly Cost

The following estimate is based on one academic year (two semesters).

ESTIMATED COST OF ATTENDANCE		
Tuition and Fees		$43,600
Housing and Food		$10,674
Total Estimated Direct Cost		**$54,274**
Books and Supplies		$938
Other (Personal, transport...)		$3,630
Total Estimated Cost		**$58,842**
Expected Family Contribution(EFC)		$0

Estimated Scholarship(s)

Provost's Scholarship	$20,000
Total Estimated Scholarship	**$20,000**

Other Gift Aid

Pell grant	$7,395
Estimated Other Gift Aid	$8,500
Total Estimated Other Gift	**$15,895**

Estimated Total Scholarships and Other Gift	**$35,895**

ESTIMATED NET PRICE	**$22,947**

View Self-Help Options -

LOANS: Unlike scholarships and grants, loans must be paid back with interest. In addition to the low-cost Direct Student Loan estimated below, you may qualify for Parent PLUS and alternative/private loans up to the cost of attendance. However, you are under no obligation to borrow.

Please visit studentaid.gov/loans to learn more about Federal Loans.

Other Forms of Aid - These funds were not included in the estimate above

Loans	$5,500
Alternative Loan Eligibility	$17,447
Total Estimated Other Assistance	**$22,947**

APPENDIX I

Both College's Net Price Calculator Disclaimers or Terms of Use

Wheaton College's Terms of Use:

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DIRECT, INDIRECT, INCIDENTAL, CONSEQUENTIAL, SPECIAL, PUNITIVE OR EXEMPLARY DAMAGES IN CONNECTION WITH THESE TERMS OR THE NET PRICE CALCULATOR, HOWEVER CAUSED, UNDER ANY THEORY OF LIABILITY.

4. DATA; PRIVACY POLICY. You acknowledge and agree that any and all information submitted by you in connection with your use of the Net Price Calculator ("Data") shall be treated in accordance with Institution's privacy policy https://www.wheaton.edu/

5. MISCELLANEOUS. These Terms will be governed by the laws of the State of Illinois, without giving effect to any conflicts of laws principles. Both parties agree that the sole venue for actions related to the subject matter hereof shall be within the state of Illinois. Notwithstanding the foregoing, however, nothing in these Terms shall be deemed or construed as a waiver of any statutory or constitutional immunities to suit. These Terms shall inure to the benefit of both the Institution and its Licensors, which shall be express third party beneficiaries, and shall be enforceable by and for the benefit of each. If any provision of these Terms is, for any reason, held to be invalid or unenforceable, the other provisions of these Terms will remain enforceable and the invalid or unenforceable provision will be deemed modified so that it is valid and enforceable to the maximum extent permitted by law. Any waiver or failure to enforce any provision of these Terms on one occasion will not be deemed a waiver of any other provision or of such provision on any other occasion. (Wheaton College, 2023, para. 3)

Azusa Pacific University's Net Price Calculator Disclaimer

While every effort is made to ensure the accuracy of the APU Net Price Calculator please keep in mind that this estimate does not represent a final determination, or actual award, of financial assistance. It shall not be binding on the Secretary of Education, Azusa Pacific University, or the State, and may change. You must complete the Free Application for Federal Student Aid in order to be eligible for, and receive, an actual financial aid award that includes Federal grant, loan, or work-study assistance under Title IV. 100% of our full-time, traditional undergraduate students received assistance through scholarships and grants in the current academic year. (APU, 2023, para. 4)

APPENDIX J

Permission to Publish

Rocky Christensen
To: kredd@nacubo.org

Thu 8/24/2023 8:46 PM

Ken,

My name is Rocky Christensen, a PhD candidate at the University of Missouri. I previously reached out and had permission to publish the "Figure 1: Average Institutional Tuition Discount Rate, by Student Category" in my dissertation. However, now, as I move to finalize my dissertation, I no longer have access to that email account and need to document this approval. Hopefully, this is still possible for me and if so, if you could confirm my approval, I would be most grateful. Thank you for your continued consideration of using this figure in my dissertation.

Also, would I be able to receive a digital copy of the study itself to look at for other potentially actionable data for my dissertation?

I hope you have a great day,

Rocky

P.s This message was composed with speech to text because of a hand injury. Please excuse typos.

KR

Ken Redd <kredd@nacubo.org>
To: Rocky Christensen

Fri 8/25/2023 8:36 AM

TDS press release final.pdf
223 KB

You have our permission to use the public information from the study.

I cannot provide a copy of the study. But I have attached the press release, which is a public document. You may use any of the information from the press release. You do not need to ask us for further permission related to this document.

Ken Redd | He, Him, His
Senior Director, Research and Policy Analysis
202.861.2527
1110 Vermont Avenue NW | Suite 800
Washington, DC 20005
nacubo.org

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VITA

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