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The Cost Of Student Mandatory Fees: An Examination Of The Longitudinal Growth In Student Mandatory Fees At Four-Year Public Universities In Texas And Their Impact On Student Retention Rates

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THE COST OF STUDENT MANDATORY FEES: AN EXAMINATION OF THE LONGITUDINAL GROWTH IN STUDENT MANDATORY FEES AT FOUR-YEAR PUBLIC UNIVERSITIES IN TEXAS AND THEIR IMPACT ON STUDENT RETENTION RATES

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Dedication

This work is dedicated to the student leaders who review, change, and approve or deny student mandatory fees every year –and, especially, to their organizational advisors who help these student leaders understand how important their voices are to a vibrant shared governance environment at colleges and universities across the United States.

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by

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Abstract

The ever-increasing costs and debt incurred by US college students is a hotly contested issue. In March 2022, The Texas Higher Education Coordinating Board (THECB) released a refreshed strategic plan for the state's higher education: *Building a Talent Strong Texas*. The refreshed plan concentrated on access for minority populations, enhanced student completion goals, and expanded the focus on reducing student debt. Texas set out to lead the nation in the least college student debt reported.

One of the least examined or understood college costs is student mandatory fees (Arnott, 2012; Black & Taylor, 2018; Kelchen, 2016; Reinagel & Cooper, 2020). This study sought to examine the rising costs associated with student mandatory fees at four-year public institutions in Texas. The quantitative study used six years of publicly available national panel data to determine a) by what magnitude required fees were increasing, b) whether fees were becoming an increasing proportion of the price of attendance (PoA) for in-state and out-of-state students living off campus without family, and c) to examine the relationship between student fees and institutional fall-to-fall retention rates. Findings included a $488 mean average increase (20%) in-state fees and $591 mean average increase (24%) out-of-state fees at public, four-institutions in Texas (n=32). Despite increases over the six years, fees did not represent a greater proportion of the price of attendance reported. The study also found that rate term for both in-state and out-of-state fees did explain statistically significant variance in institutional student retention rates, but upon further examination no specific variables in the proposed models were significant. Institutional variability did account for over 90% of variance in the proposed model which has implications for the THECB to intervene around institutional flexibility in determining student fees as a component of higher education costs.

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THE COST OF STUDENT MANDATORY FEES

Chapter 1: Introduction

The cost of college is one of the most debated topics within American society. A great deal of the focus has to do with the rising price of higher education and the implications on student access. Casse and Manno (1998) discuss college costs in terms of a "perennial source of American anxiety" for students and parents (p. 38). It appears that these American families have a great deal for which to worry. Inflation-adjusted tuition and fees increased by 231% at public four-year universities, 164% at community colleges, and 153% at private four-year colleges between the 1983-84 and 2013-2014 academic years (Baum & Ma, 2013). This staggering growth slowed after 2013-2014, but the average price per student continued to rise by $800 between the 2014-15 and 2019-2020 academic years (Ma et al., 2019). Indeed, Ma and Pender (2022) explain, "Over the 30 years between 1992-93 and 2022-23, average published tuition and fees increased… from $4,870 to $10,940 at public four-year…after adjusting for inflation" (p.3). The cost of college is rising in the face of the decline of state support, and that cost is being passed along to the consumer. The consumer must understand what he or she is paying.

Davidson (2022) notes student debt carried by the average college graduate has ballooned to approximately $40,000 and collectively about 40 million Americans have accrued about $1.3 billion in collective college student debt. Students and families, or more specifically racially diverse and poor families, are bearing a greater percentage of the cost of college (Davidson, 2022; Ortagus et al., 2020; Sawmill, 2016). As a result, social mobility in US higher education is being negatively impacted. Davidson (2022) aptly notes, "If college costs you so much that it governs your choice of career, it is not preparing you for the best possible life. It is preparing you to pay off your loans" (p. 165). Higher education finance policy has real-world consequences for how our society can face future societal challenges. The costs students bear to attend higher education

should not be determinative of what majors they will choose. As actual university operational costs continue to rise and support for state government declines, colleges and universities are looking for non-tuition revenue-generating sources, such as student fees, to stay afloat (Arnott, 2012; Kelchen, 2016; Reinagel & Cooper, 2020; Strerritt, 2011). In the past two decades, colleges and universities that once used student fees to fund known campus programs such as student recreation centers, unions, and student activities are now using an increasing number of mandatory student fees to fund the basic operations of the college campus (Black & Taylor, 2018; Glater, 2007; Kelchen, 2016; Sharpe, 2016; Wang, 2013).

"More than 90 percent of public colleges and universities now assess mandatory fees" (Reinagel & Cooper, 2020, p. 436). Despite being a universal phenomenon in higher education funding, very little is known about mandatory student fees (Black & Taylor, 2018; Kelchen, 2016). As the public debate on college affordability and price continues, a more nuanced understanding of how colleges account for and pass along those costs is needed by university leaders, public policymakers, and consumers themselves (the student and their families). Research on student mandatory fees can help illuminate the debate about colleges' use, transparency about, and impact of these on specific student outcomes. While a greater preliminary understanding of regional/state differences, institutional characteristics, and student participation in the student mandatory fee process has been generated, additional study of this topic, particularly in the last five years, would be helpful for all constituency groups with a vested interest in college affordability.

While research has been done to quantify student fees, the latest longitudinal examination of student fees is over a decade old (Black & Taylor, 2018; Kelchen, 2016). While Black and Taylor (2018) specifically examined the increased use of student fees and families' literacy on

institutional use of them in the state of Texas, the study is nearly seven years old. This study sought to fill the gap in the research that examines at what magnitude public state colleges and universities continue to raise mandatory student fee rates within the state of Texas. In other words, this study sought to explain what policymakers and families should expect to see in terms of rising college costs as it relates to student fees. More importantly, with greater legislative emphasis on student outcomes and higher education performance-based funding in the state of Texas (Nations, 2023; Osborn, 2023; Perez 2023), this study sought to examine whether these student fees are affecting a key measure of higher education institutional success – student retention. In other words, do these additional fees keep students from returning to public state higher education institutions in Texas?

Background, Context and Theoretical Perspective of the Study

Background

A version of the United States Department of Education dates back as far as 1867 with the current department established in 1979 (Aliyeva et al., 2018). The federal role in US education policymaking included "collecting such statistics and facts as shall show the condition and progress of education …and of diffusing such information respecting the organization and management of schools and school systems, and methods of teaching, as shall aid the people of the United States in the establishment and maintenance of efficient school systems" (Aliyeva et al., 2018, p.7). While many individuals consider US higher education a state issue due to the governance and historical funding mechanism coming primarily from the states, higher education institutions have become increasingly reliant on federal funding that comes from financial aid distributed by the US federal government (Archibald & Feldman, 2014; Casse & Manno, 1998; Davidson, 2022; Kelchen et al., 2017). As a result of this increasing financial dependency,

Congress has increasingly tied the required collection of data and information to eligibility for federal funds. Indeed, with amendments in 1992 and 1998 in the reauthorization of the Higher Education Act of 1965, Congress mandated higher education institutions seeking federal funds must "complete surveys conducted as a part of the Integrated Postsecondary Education Data System (IPEDS) or any other Federal postsecondary institution data collection effort, as designated by the Secretary" (Aliyeva et al., 2018, p.7). These same amendments from 1998 charged the National Center for Education Statistics (NCES) with updating the collection implementation and helped move the agency toward electronic survey data collection (Aliyeva et al., 2018). Along with the changes to receive information in a timelier, more usable way, the survey administrators also used this time to change some of the data reporting requirements including asking higher education institutions to desegregate several of the costs paid by consumers such as splitting out the mandatory fees that students pay annually (Black & Taylor, 2018; Kelchen, 2016). This allowed federal and state policymakers along with consumers themselves to track the institutional costs of attending college more rigorously. These changes allowed researchers to begin analyzing whether these once 'hidden' student fees were having an impact on college students (Arnott, 2012; Kelchen, 2016; Sterritt, 2011).

With increased scrutiny over US higher education, more state governing boards and legislatures are becoming increasingly involved in institutional tuition setting (Archibald & Feldman, 2014; Armstrong et al., 2017; Kelchen, 2016), but institutions typically have greater flexibility around mandatory fee setting (Armstrong et al., 2017; Reingel & Cooper, 2020). Thus, institutions and higher education administrators are finding ways to fund more of the college experience through mandatory student fees (Jones, 2018; Reingel & Cooper, 2020; Scott & Bischoff, 2000; Sharpe, 2016; Wang, 2013; Weisbrod et al, 2008; Webster & Middleton, 1999).

Originally borne out of a need to fund a college or university's student services functions, such as the student activities fees for clubs and organizations (Levy, 1995; Meabon et al., 1996; Trow, 1995; Weichselbaum & McClelland, 1978), mandatory fees have exploded (Kelchen, 2016; Reingel & Cooper, 2020). This expansion of student fees has coincided with the increased massification of higher education or focus on serving and educating larger segments of the US population (Altbach, 2014). "Higher education…is now a societal institution that plays a key role in economic and social development. Perhaps most importantly, higher education plays a major role in societal mobility for growing populations, which now care about university access and other issues" (Altbach, 2014, p. 1307). Despite the growth in populations served, state support for higher education has continued to decline (Archibald & Feldman, 2014; Davidson, 2022). Administrators and higher education leaders forecasted this growth in student fees due to challenges with state support of higher education and institutional lack of understanding of the importance of these student service/support functions (Levy, 1995; Trow, 1995). Colleges and universities began to levy these separate service fees to support the important student success goals of student enrollment (more students wanting to attend college), student retention (students staying enrolled or attending college), and student graduation (completing course requirements and earning a degree or degrees). Levy (1995) prognosticated that "in the college of the future, more direct charges for even the most basic student services will be assessed" (p. 42). Once a manageable and inclusive student services fee for a few activities, the required college fee has borne out additional separate mandatory fees for athletics or sports (Davidson, 2021; Kelchen, 2016), disability or counseling, health, and wellbeing (Dworkin et al., 1991; Reingel & Cooper, 2020; Scott & Bischoff, 2000), and libraries or various forms of technology (Jones, 2018; Webster & Middleton, 1999). With this fee expansion comes a need for greater accountability

around the function, purpose, and impact of mandatory student fees (Black & Taylor, 2018; Kelchen, 2016; Reingel & Cooper, 2020). While a greater number of policymakers, scholars, and consumers are increasingly concerned with the rising cost of attending an institution of higher education, few are tracking the changes in student fees and their specific impacts on student success measures such as retention rates.

Context: Texas

In addition to the changes to IPEDS in the late 1990s, scholars have also articulated the deregulation of tuition and fee setting from 2003 state legislative acts within Texas (Black & Taylor, 2018). This deregulation "allowed designated tuition to be set by each governing board in the state with the intent of helping offset the declining revenue stream from state appropriations" as state appropriations dropped from 50% of public college and university's budgets to around 10% at many Texas institutions (Black & Taylor, 2018, p. 6). Colleges and universities in Texas started to see significant cuts in public support through extreme declines in state legislative funding. While this phenomenon was not limited to the state of Texas, the conservative bend of the Republican-controlled Texas legislature may have contributed to greater declines (Black & Taylor, 2018). This state support meant that higher education institutions might increase tuition. Tuition increases, however, are highly publicized within popular media (Archibald & Feldman, 2014; Davidson, 2022; Kelchen, 2016). Thus, there is a greater institutional incentive to control tuition and revise or increase mandatory student fees.

> Black and Taylor (2018) explain, "Texas Legislature formula funding model includes the General Appropriations Act (GAA). This act details how institutions of higher education in Texas can assess fees on top of student tuition. The GAA delineates fees into the non-appropriated state funds categories that include auxiliary income, student services fees, and incidental fees" (p.6).

Thus, Texas governing boards have greater control over tuition, but there is some specific leeway for institutions to control their mandatory fees. Black and Taylor (2018) set out to fill the gap in the literature related to mandatory student fees in Texas but only reported on the 2016-2017 academic year – at this point over seven years old. Their study also did not account for the impact that these mandatory student fees might be having on the success outcomes (i.e., retention or graduation) of the very Texas institutions that were implementing them. Thus, this research worked to expand and quantify the impact of student fees in Texas as examined by Black and Taylor (2018). This current study sought to answer not only how mandatory student fees, longitudinally, have contributed to students' overall price of attendance at Texas's four-year public colleges and universities, but also how this may have impacted student retention rates. Since no extant research exists on how mandatory fees are impacting the very success outcomes they are reported to support (i.e., retention), this study sought to fill that gap. This research may result in consumers and policymakers alike gaining greater clarity on the increase in mandatory student fees within public four-year colleges in Texas.

Theoretical Perspective

Not surprisingly, researchers have been working to identify the causes of the rise in higher education for decades. I have chosen to adopt the most relevant and complementary theories of US higher education finance. Baumol and Bowen's (1965) 'cost disease,' applies to industries – particularly service-oriented industries such as higher education – where the productivity of their workforce or technological advances cannot create efficiencies that drive down the cost to produce the good or service (Archibald & Feldman, 2014; Baumol & Bowen, 1965; Baumol, 1967). These two researchers, originally applying this theory to the entertainment industry, sought to explain challenges in supply and demand, not dictating efficiencies that

would bring down the costs of certain goods and services in high-demand areas. The argument is that some industries, due to their specialized goods or services produced, will be less efficient and thus cost more ('cost disease') to produce (Baumol & Bowen, 1965). Baumol (1967) would go on to explicitly link cost disease to the profession of teaching and eventually higher education. Archibald and Feldman (2014) would later apply this concept to modern higher education and why the cost of college was not getting any cheaper with significant advances in learning technologies.

William Bowen, Baumol's original co-author and fellow economist, chose to create an alternative, though later viewed as a highly complementary theory to cost disease, the revenue theory of cost, sometimes called *the Bowen effect*. Bowen's (1980) revenue theory of cost argues not only are costs determined by revenue, but higher education institutions are predisposed towards higher costs. Bowen (1980) lays out four principles of higher education institutions utilizing the revenue theory of cost: "1) The dominant goals of institutions are educational excellence, prestige, and influence; 2) There is virtually no limit to the amount of money an institution could spend for to accomplish these goals; 3) each university raises all the money it can; and 4) each university spends all it raises" (p. 19-20). Increasing institutional expenditure (or cost for the consumer), thus, becomes the cumulative effect of these four principles. While Archibald and Feldman (2008) advocated that rising costs of college could best be explained through Baumol's cost disease in the previous several decades of higher education costs leading up to 1995, Martin and Hill (2014) studied higher education expenditures in a more recent time frame from 1987 to 2005 (pre-2008 economic crash) and 2008 to 2011 (post-crash) and came to the opposite conclusion, particularly in loose constraint budget periods and more so for private universities versus public universities. More importantly, Martin & Hill (2014) were able to use

both cost disease and revenue theory of cost to calculate a cumulative effect which explained 61 percent of the public university change in the tight revenue constraint and “74 percent of the public university change during the loose revenue period” (p. 17). While Archibald and Feldman (2008, 2014) might advocate that these theoretical frameworks be used separately, Martin & Hill's (2014) more recent scholarly work has demonstrated that both theories work together to demonstrate how university cost increases can be explained. Using these combined theories accounts for the rise in student mandatory or required fees because these fees are less likely to be expended on instructional staff and more on the rising expenditures by higher education institutions on everything else. Researchers using these theoretical frameworks have accounted for the rise in higher education costs and provided a roadmap for why it is important to study the different components of higher education.

Statement of the Problem

Researchers, policymakers, and consumers are alarmed by the rising cost of attending college (Archibald & Feldman, 2014; Armstrong et al, 2017; Davidson, 2022). However, there is little understanding of how mandatory student fees are impacting college affordability and accessibility within the United States or the state of Texas (Black & Taylor, 2018; Kelchen, 2016). If a stated goal both federally and within the state of Texas is to enroll, retain, and graduate more students, understanding the rising cost of college is an important policy goal (Archibald & Feldman, 2014; Davidson, 2022). While one seminal study has longitudinally studied the rise in student fees nationally within the United States (Kelchen, 2016) and one previous study examined mandatory student fees in Texas (Black & Taylor, 2018), each of these has now aged. The last longitudinal review of mandatory student fees is over a decade old and the one-year snap-shot study is almost eight years old. This study sought to update the research

to assist policymakers and consumers in identifying the impact of mandatory student fees on the overall price of college at four-year public higher education institutions in Texas. Additionally, student fees are often justified as providing services and facilities that support the student experience as well as institutional goals of student enrollment, success, and retention (Black & Taylor, 2018; Davidson, 2021, Cuillier & Stoffle, 2011; Kelchen, 2016). This makes examining the student fee relationship to retention that much more compelling. Also, as state policymakers are more readily tying performance measures, such as retention and graduation rates, to higher education funding formulas (i.e. performance-based funding), this study expands the literature to identify whether required fees appear to be impacting Texas public institutional retention rates.

Purpose of the Study

In purpose, this study sought to evaluate how changes in mandatory student fees at four-year public colleges and universities are affecting the overall cost at these institutions. Because of the impacts student fees have on student affordability in higher education, the author sought to answer the following question(s):

- **R1: From 2017-2018 to 2022-2023, are the average amount of required (mandatory) student fees increasing at four-year, public universities in Texas?**
- **R2: From 2017-2018 to 2022-2023, are student fees becoming a greater percentage (proportion) of the overall price of attendance at four-year, public universities in Texas?**

Answering and addressing these first two questions extends the current research on how public universities are using mandatory student fees, by what magnitude, and to what extent it is impacting the overall bottom line cost that consumers pay for attending higher education in Texas. In addition, this study sought to examine whether these mandatory student fees may be impacting a student success outcome they are designed to support - student retention. To do this, the study uses student fees and price of attendance variables to create a new student fee rate term

variable. As a result, the study investigated whether mandatory student fees are correlated with student retention rates at four-year public universities in Texas.

- **R3: During the period studied (2017-2023), do mandatory student fees have any relationship with student retention at four-year, public universities in Texas?**

If the original intent of required fees, sometimes called student service fees, is greater student engagement to support keeping students at the higher education institution, then it is worthy of attention to study the relationship between these fees and the student retention outcome. The goal of student access and retention is well-outlined in the literature. There is a need to know if spending more money on mandatory fees to provide more student support services helps keep the students enrolled at the institution. The answer has implications for higher education administrators and state policymakers alike.

Significance of the Study

This quantitative study examined the rise of required student fees across four-year, public institutions in Texas using a panel data set (Jaquette & Parra, 2014; Menard, 2002; Yaffee, 2005). Additionally, the study sought to quantify the term rate of student fees for each institution's price of attendance. The price of attendance includes other student charges including tuition, housing, books and supplies, and other expenses. I determined if student fees are becoming a greater percentage of these costs. Finally, I created a term rate variable of student fees/price of attendance to determine whether the change in required fees correlates to changes in retention rates also using six years of retention panel data analysis.

Descriptive and inferential statistics will be used to answer the research questions posed within this quantitative study (Creswell, 2015; Field, 2018; Tabachnick & Fidell, 2013). SPSS 26

statistical package will be used to organize, screen, and structure the panel data, then be employed to run the descriptive and inferential statistics.

The study used variables for the academic year 2017-2018 through the currently available year of 2022-2023 for the student fees and institutional characteristics. Retention data will be drawn for the available years within the study timeline, inclusive of Fall 2018 (Academic Year 2017-18), 2019 (Academic Year 2018-19), 2020 (Academic Year 2019-2020), 2021 (Academic Year 2020-21), 2022 (Academic year 2021-22). The author then imputed the data and used the mean scores to create a sixth year (2022) of retention data (Academic year 2022-2023). The data source used was almost exclusively from the National Center for Education Statistics (NCES) using the Integrated Postsecondary Education Data System (IPEDS). Three covariate variables will be constructed by the researcher, including 1) minority-serving versus non-minority institutions, 2) institutional size, and 3) Carnegie classification using existing IPEDS data about total undergraduate enrollment or classifications currently provided within the secondary data.

The dependent variable is student retention rates, available from existing IPEDS panel data from the Fall Enrollment (FE) survey (IPEDS Data Center Manual, 2015; Jaquette & Parra, 2014). Proponents of mandatory fees, which financially support such items as libraries, sports or athletics, student services, and student health centers, argue these services and facilities provide additional support or experiences for students (Black & Taylor, 2018; Davidson, 2021, Cuillier & Stoffle, 2011; Kelchen, 2016) in service to institutional retention goals. This study sought to examine this possible relationship (fees and student retention). Thus, the independent variable – term rate of student fees as part of the institutional price of attendance – will be calculated using two IPEDS data fields from the student charges section of the Institutional Characteristics survey (IPEDS Data Center Manual, 2015). To determine fixed effects, Allison (2009) articulates

"measurements must be directly comparable, that is, they must have the same meaning and metric" (p. 2). Thus, the author converted the student fee and price of attendance variables into a term rate to create an opportunity to consider possible fixed effects between the dependent and independent variables.

Additional variables from institutional characteristics were calculated to provide a greater possible explanation of the relationship between the variables, specifically harkening to the research literature on college costs and student fees based on institutional size, type, and student population served (minority-serving institutions versus non-minority serving institutions including variables with Hispanic Serving Institutions, Tribal Colleges and Historically Black Colleges and Universities) (Cage, 1992; Davidson, 2022; Jones, 2018; Keppler, 2010; Rames, 2000; Reinagel & Cooper, 2020; Scott & Bischoff, 2000; Sawmill, 2016; Trow, 1995). Institutional type was created by collapsing and dummy-coding an existing IPEDS collected measure on Carnegie classification Basic 2018. The institutional size is constructed using IPEDS undergraduate enrollment specifically pulled from each institution's enrollment statistics. Finally, the author reviewed and classified the sample population of institutions on whether they were minority-serving institutions by using existing IPEDS IC characteristics data on Tribal Colleges and Historically Black Colleges and Universities (HBCU) as well as using existing calculations from IPEDS on whether an institution serves at least 25% of Hispanic students in its undergraduate enrollment (IPEDS Data Center Manual, 2015). Universities achieve their Hispanic Serving Institution (HSI) designation by enrolling at least 25% Latinx full-time equivalent (FTE) undergraduates (Higher Education Act [HEA], 1965). The goal of clearly supporting greater racial minority enrollment and retention within Texas higher education is articulated in the state's 2015 and 2022 strategic plans (THECB, 2022). Scholars have also noted

that Texas contains the second largest concentration of HSIs (94) and second largest concentration of Hispanic population in the US (10.4 million) (Flores & Lea1, 2023). Additional exploration of the non-majority institution variable is justified by extensive literature on the challenges of non-majority students being underserved in areas of access and affordability as well as the unmet goal of social mobility (Altbach, 2014; Davidson, 2022; Flores & Leal, 2023; Li, 2018, Ortagus et al., 2020; Sawmill, 2016; THECB, 2022).

The quantitative nature of this study follows the pattern of existing research studying the impact and magnitude of mandatory student fees in the United States and the state of Texas. Researchers have pointed to the excellent existing and robust secondary data collected by the NCES through various annual surveys (fall, winter, spring) within IPEDS, which allows for the extraction of key variables, such as tuition, fees, and costs across a set of defined higher education institutions (Black & Taylor, 2018; Davidson, 2021; Kelchen, 2016). IPEDS allows researchers to acquire a panel dataset, or longitudinal time-series data (five or six years of data), that contains repeated measurements of a certain number of variables (e.g. student fees or price of attendance) over a period (2017-2023) for observed cases (35 institutions of higher education within Texas). This panel data set allowed the researcher to demonstrate changes over time for specific variables, such as required student fees, cost of attendance, and student retention rates.

As previously discussed, the context of this study is in the state of Texas. Four-year public institutions completed similar IPEDS database surveys to provide greater apples-to-apples information around both cost (student fees levied, cost of attendance) and outcomes (retention rates). Within this four-year public university cohort, my goal was to identify changes and trends in increasing undergraduate student fees, the term rate of student fees within the overall cost of

attendance reported by this cohort of institutions, and the impact (or magnitude) of required fees changes on the year-to-year retention rate of each of the cohort institutions.

The two main goals of longitudinal research are 1) to define patterns of change between two or more variables as well as 2) to identify the positive or negative direction and magnitude of a possible causal relationship between two or more variables (Creswell, 2015; Menard, 2002). While this study does not demonstrate a causal relationship between student fees and retention rates, I sought to be able to show some correlational relationship on how the annual percent increases in required fees may impact year-to-year retention rates across the specific institutions identified. A correlation would have implications for college access, affordability, and student debt within the state of Texas. This is the first study to undertake this type of specific evaluation between mandatory/required student fees and institutional retention rates within Texas. Utilizing retrospective panel data from 35 public institutions in Texas, this study sought to demonstrate specific changes and trends in student fees and the price of attendance that have implications for policymakers and consumers of Texas higher education.

Definition of Key Terms

To assist readers with better understanding the study, a few key terms have been defined in this section.

Fees, or Required (or Mandatory) Student Fees: Student fees are used to support a wide range of institutional priorities that are non-instructional, teaching, or research oriented. The traditional purposes are to fund student services or auxiliary enterprises designed to meet actual or perceived student needs, such as student activities or involvement, campus union facilities, or recreation centers (Kelchen, 2016). As a variable, IPEDS describes Required Fee as a fixed sum charged to students for items not covered by tuition and required of such a large proportion of all

students that the student who does not pay the charge is an exception (IPEDS Glossary, 2023-2024).

Tuition: The amount of money charged to students for instructional services. Tuition may be charged per term, per course, or per credit (IPEDS Glossary, 2023-2024). Instructional services, usually associated with teaching and research, are intentionally vague for college administrators. IPEDS did not desegregate college tuition and fee-related costs until the late 1990s (Black & Taylor; Kelchen, 2016).

Price of Attendance (POA): The amount of tuition and fees; food and housing; books, course materials, supplies, and equipment; and other expenses that a full-time, first-time degree/certificate-seeking student can expect to pay to go to college for an academic year. Costs reported to IPEDS by the institution are those amounts used by the financial aid office to determine a student's financial need for the academic year, which is typically nine months. POA for four-year institutions is usually divided out by housing accommodations (living on-campus, living off-campus with family, living off-campus without family) (IPEDS Glossary, 2023-2024).

Student affairs or student services: Typically, non-instructional (professors/instructors), college personnel who educate and develop students predominately outside of the classroom. “These professionals develop students’ cognitive and interpersonal skills, foster leadership, ethics, and cultural understanding. They also stress the importance of wellness, help establish the students’ identities, and spark their exploration of careers and of service to society” (Long, 2012, p. 2). Because of their non-instructional function, they are usually not paid for with college tuition or state appropriations, but instead funded through mandatory/required student fees (Kelchen, 2016). Many student affairs or student services personnel’s positions are primarily associated with the function of student retention.

Retention, or student retention: As a variable, a measure of the rate at which students persist (return to or continue) in their educational program at an institution, expressed as a percentage. For four-year institutions, this is the percentage of first-time bachelor's (or equivalent) degree-seeking undergraduates from the previous fall who are again enrolled in the current fall. For all other institutions, this is the percentage of first-time degree/certificate-seeking students from the previous fall who either re-enrolled or completed their program by the current fall (IPEDS Glossary, 2023-2024). One of a college and university's stated student success outcomes for improvement and measurement of institutional success, especially in reports for consumers and state/federal policymakers (Archibald & Feldman, 2014; Davidson, Reason & Braxton, 2023).

Student Success Outcomes: Sometimes also referred to as educational outcomes, the accreditation body for colleges and universities, the Higher Learning Commission (HLC) looks at three specific outcomes from NCES and IPEDS: fall-to-fall retention rates of first-time students, graduation rates within 150% of normal time (six-year graduation rates), and outcome measures at eight years after entry (eight-year graduation rates) (Higher Learning Commission, 2023). Student retention is often seen as the first important student success outcome, or measurement, of a college's institutional success.

Public institution: An educational institution whose programs and activities are operated by publicly elected or appointed school officials, and which is supported primarily by public funds. The opposite would be a privately controlled/operated institution (IPEDS Glossary, 2023-2024).

Four-year institution: A postsecondary institution that offers programs of at least 4 years duration or one that offers programs at or above the baccalaureate level (IPEDS Glossary, 2023-

2024). For this study, our definition of four-year institutions excludes community colleges that provide bachelor's degrees.

In-State versus Out-of-State Designation: An in-state student who is a legal resident of the state in which he/she attends school and is deemed eligible for the in-state rate for tuition and/or fees by the college or university. Typically, those students deemed out-of-state or international to the United States pay a higher rate of tuition, fees, and cost of attendance than in-state students, whose costs are being subsidized by the taxpayers of that given state (IPEDS Glossary, 2023-2024; Kelchen, 2016).

Carnegie Classification: An institutional classification coding structure developed by the Andrew W. Carnegie Foundation for the Advancement of Teaching based on the function and/or type of highest-level degree offered. The 2000 Carnegie Classification categorizes selected institutions with such classifications as Doctoral/Research Universities-Extensive, Doctoral/Research Universities-Intensive, Master's Colleges and Universities, Master's Colleges and Universities II, Baccalaureate Colleges-Liberal Arts, Baccalaureate Colleges-General (IPEDS Glossary, 2023-2024).

NCES: National Center for Education Statistics (NCES): Federal agency, established in 1974, with the primary responsibility for collecting and disseminating statistics and other data related to education in the United States. NCES became part of the Office of Educational Research and Improvement when the current Department of Education was established in 1979 and was incorporated into the Institute of Education Sciences by way of The Education Sciences Reform Act of 2002 (Aliyeva et al., 2018).

IPEDS: The Integrated Postsecondary Education Data System (IPEDS) is the Department of Education's National Center for Education Statistics' (NCES) core postsecondary education

data collection program. Information is collected annually from all providers of postsecondary education in fundamental areas such as enrollment, program completion and graduation rates, institutional costs, student financial aid, and human resources (IPEDS Manual, 2015).

Higher Education Act of 1965: Federal law signed by President Lydon Johnson intended to increase federal monies to colleges and universities to provide financial assistance to students seeking postsecondary education. Title IV of the HEA established the precursors to what we know now as federal financial aid and the Free Application for Student Financial Aid (FAFSA) process. HEA, importantly, codified the collection of required educational data and statistics through IPEDS and several reauthorizations (1968, 1972, 1976, 1980, 1986, 1992, 1998, and 2008) and updated the methods and requirements associated with said data collection. The current iteration of IPEDS, coordinated by NCES, is a direct byproduct of the legislative code found in the amendments and reauthorizations of the HEA of 1965 (Aliyeva et al., 2018).

College Access: Increasing participation in higher education, specifically four-year, bachelor's degree-granting institutions by larger portions of the US population. Stated the public-policy goal of higher education in the federal government and many state governments including Texas (Altbach, 2014; Black & Taylor, 2018, Davidson, 2022; THECB, 2022).

College Affordability: Interest in college and university participation cost being kept at the lowest possible student charge to increase or incentivize maximum participation in the enterprise (Archibald & Feldman, 2014; Davidson, 2022)

Social Mobility: One of the key outcomes of higher education at the state and federal levels. Participation and completion of post-secondary education in the US is a predictor of social mobility. Economically disadvantaged individuals who attend university are more likely to become socially mobile and move into a higher income bracket. Additionally, income gaps are

lower between college graduates from economically disadvantaged backgrounds and their peers compared to non-graduates (Archibald & Feldman, 2014; Altbach, 2014; Davidson, 2022, THECB, 2022).

Performance Based Funding (PBF): state or federal policies that link appropriations of taxpayer money to outcomes, such as credit hours earned, graduation rates, and educational attainment among specific college student participants (Ortagus et al., 2020).

Texas Higher Education Coordinating Board (THECB): state agency within Texas responsible for governance and coordination of state postsecondary policy and finances as well as state workforce development (THECB, 2022).

Building a Talent Strong Texas (BTST): The 2022 strategic plan updated and expanded the postsecondary goals for the state of Texas that were articulated in the 2015 Strategic Plan, *60x30*. The *BTST* Plan specifically outlines expanded postsecondary goals for college access, outcome attainment, and cost affordability and containment within the state of Texas (THECB, 2022).

Conclusion: Organization of the Study

This initial chapter laid out the case for studying the rising cost of college, specifically student fees. I explored the background, provided the rationale of context – the state of Texas, stated the problem, provided a theoretical perspective, outlined our study procedures, and explained its usefulness/significance. Chapter 2 examines the research and literature on mandatory/required student fees, provides an explanation of the theoretical perspective, and greater rationale for our specific studied context within the State of Texas. Chapter 3 provides an overview of the methodical approach, explanation of panel analysis, as well as the study's delimitations and limitations. Chapter 4 will articulate the study's results and Chapter 5 will discuss will provide a discussion of the implications found.

Chapter 2: Literature Review

Higher Education Finance – A Quick Overview

The US Department of Education mandates that colleges and universities produce and publish a 'sticker price' called the Cost of Attendance (COA). Within IPEDS, the COA is created as a Price of Attendance (POA). Kelchen, Goldrick-Rab, and Hosch (2017) explain that COA is made up of tuition and fees as well as "cost of book supplies and a living cost allowance designed to cover room, board, and other expenses such as transportation, entertainment, and cleaning supplies" (p. 947-948). As for the cost of attendance, many lawmakers, students, and families understand the cost of tuition (Black & Taylor, 2018; Kelchen, 2016). Other areas of POA, such as mandatory student fees and living expenses, could be more difficult to understand (Black & Taylor, 2016; Kelchen et al., 2017). In other words, consumers (and probably most lawmakers) do not know what the price for attending college entails.

We owe much of our understanding of college costs to 1992 and 1998 amendments to legislative requirements within the Higher Education Act of 1965 (Aliyeva et al., 2018; Kelchen, 2016). The 1992 amendments helped make participation with the Integrated Postsecondary Education Data System (IPEDS) a contingent factor for colleges and universities' eligibility to receive Federal Financial Aid funds and the 1998 amendments made important changes to the electronic administration of the survey to make it more timely for students and families to search data to compare institutions (Aliyeva et al., 2018) Indeed, with the significant implementation redesign of IPEDS, items such as mandatory student fees were split out as items that could be reviewed and studied by researchers (Kelchen, 2016).

Middaugh (2005) summarized the findings of several studies by the US Department of Education on the costs of higher education that were commissioned after the 1998

reauthorization of the Higher Education Act. The Department of Education was interested in knowing whether it complied with its legislative mandate to better educate parents and families about college costs. Middaugh (2005) makes an important distinction between sticker price, what a university publishes in its catalog, and net price, what a student pays after financial aid is disbursed. In many cases, students receive grant money, such as the Pell Grant, which is not owed back. Middaugh (2005) found no difference in net tuition paid for a student from 1992-1993 to 1999-2000 school years despite annual rises in college costs. Additional financial aid in the form of grants helps cover the tuition costs. It, however, did not cover the rise in fees and cost of living expenses, except for those in the lowest socioeconomic status (Middaugh, 2005). Most importantly, Middaugh (2005) notes, "students in higher income brackets borrowed to meet the increase" (p. 629). Decades later, the picture is not better. Ma and Pender (2022) note, "In 2022-23, the average published tuition and fee price is 1.65 times as high as it was 30 years ago at public two-year colleges, 2.25 times as high as it was 30 years ago at public four-year institutions, and 1.8 times as high as it was 30 years ago at private nonprofit four-year institutions, after adjusting for inflation" (p. 12). Notice the greatest increase in cost was shown at public four-year institutions – the ones focused on the average family's goal of a bachelor's degree. Not everyone attending college is affected by its costs in the same way. Since few individuals understand what they are paying and not everyone pays the same amount, consumers are challenged by the ambiguous ways universities list college prices (Black & Taylor, 2018; Davidson, 2022; Reinagel & Cooper, 2019). Few families are armed with the resources to understand why mandated fees may be negatively impacting their price of attendance (Davidson, 2022; Black & Taylor, 2018).

Even though many individuals compare colleges and universities to traditional business enterprises and markets, Casse and Manno (1998) help us further understand that colleges and universities cannot and do not act like any other economic industry due to the extensive subsidy support. “All postsecondary institutions sell their services for far less than the cost of production…The not-for-profit model on which most universities operate is based on the fact that a majority of their income comes from sources other than tuition paid by the student” (Casse & Manno, 1998, p. 42). The authors explain much of a college’s budget is subsidized by things like government aid (state and federal), research grants, charitable gifts and donor money, and interest from university endowments help subsidize the significant cost of college for many, if not most, of those attending college. Archibald and Feldman (2014) concur, “The vast majority of institutions of higher education are not profit-making in the usual business sense” and “not-for-profit institutions are highly subsidized, which allows them to charge a price (tuition) that does not cover full costs.” (p. 140). Public universities, due to their mission and public support, are not supposed to be run like traditional corporate businesses. Researchers from a 1995 study note, “the average postsecondary school sold an $11,967 education for $3,700 – a subsidy of over $8000. These subsidies are given not only to ‘needy’ students” (Casse & Manno, 1998, p. 42). Colleges and universities do not sell their ‘goods and services’ at or above cost. Due to the complex nature of how education receives funding, universities often obfuscate the true cost of attendance. Because of the history of large subsidies from government entities and charitable organizations, budget planning is made more challenging on the cost side of the equation. “As federal and state budgets tighten, one might argue, more of the cost is shifted to families” (Casse & Manno, 1998, p. 43). Government subsidies continue to be a lifeline, particularly for many public, state-assisted universities. The amount of aid or subsidy to each student varies greatly.

“Because (college) administrators can control the amount of institutional aid available to each student, some end up paying virtually the sticker price while others receive their education at practically no out-of-pocket expense” (Casse & Manno, 1998, p. 43). On the cost side, the amount paid by a student varies greatly based on a variety of factors. Archibald and Feldman (2014) identify four factors: (1) tuition and mandatory fees, 2) institutional subsidies from government or private donations, 3) institutional-funded student grants, and 4) student grants funded outside the institution (i.e., federal financial aid). It is important to consider the aid or subsidy side of higher education costs.

Dynarksi and Scott-Clayton (2013) documented the expansion of student financial assistance programs across the United States. Stemming originally from the Higher Education Act of 1965, college aid programs have gone through transformations both in types of students served (eligibility) as well as aid programs provided (tax credits in addition to loans and grants) (Dynarski & Scott-Clayton, 2013). “With dozens of tax and aid programs available, two-thirds of students are now eligible for some sort of discount on their college costs. For these students, the net price of college (tuition and fees less any grant aid) differs from the sticker price” (Dynarksi & Scott-Clayton, 2013, p. 101). Subsidies, in the form of tax credits, grants, and loans, further complicate the real costs associated with going to college. It is no wonder why students and families are confused about or do not know what parts of the college costs they bear. These families are then surprised when they are financially responsible for hidden student fees not covered by grant or aid programs. It is not until this happens that students and families begin to research where and why a student fee may exist (Davidson, 2022).

Theoretical Construct: Cost Disease & The Bowen Effect

Archibald and Feldman (2014) articulate a theoretical framework that is helpful for our understanding of rising college costs, Baumol and Bowen's (1965) concept of 'cost disease.' Cost disease applies to industries – particularly service-oriented industries such as higher education – where the productivity of their workforce or technological advances cannot create efficiencies that drive down the cost of producing the goods or services. Archibald and Feldman (2014) explain, "The only requirement for an industry to experience cost disease is that its productivity growth over some specified time period has to be slower than the average level of productivity growth for the economy as a whole" (p. 40). Baumol and Bowen provided the most explicit example in the entertainment industry of a string quartet. No matter the advances in technology or skill of the musicians, the product – a symphonic piece, is likely going to take an equal amount of time (say 40 minutes) to produce based on the 'product' (music) being provided. The argument is that some industries, due to their specialized goods or services produced, will be less efficient and thus cost more ('cost disease') to produce (Baumol & Bowen, 1965).

Credited more specifically with cost disease and education, Baumol (1967) famously applied this concept of cost disease to the profession of teaching and its output of quality. "Teaching is a clear-cut example, where class size (number of teaching hours expended per student) is often taken as a critical index of quality. Here, despite the invention of teaching machines and the use of closed-circuit television and a variety of other innovations, there still seem to be fairly firm limits to class size" (Baumol, 1967, p. 416). In this example, Baumol has articulated the sunk costs associated with quality teaching within higher education. While advances in online education can expand who and when students can take a course, there are limits to quality instruction and facetime a highly skilled instructor and professor can spend with

her students. Archibald and Feldman (2014) also further explain that service industries such as healthcare, education, and law are provided with a highly skilled workforce that commands a higher salary based on the education and specialized service they provide. A college or university may be able to increase the number of courses each instructor teaches annually, but those decisions will likely have negative consequences on other faculty outputs the university requires, such as research and/or public service. Thus, productivity enhancements in these specialized fields such as education or healthcare have been situated in terms of the consumers' views about the quality of service being produced. "Often slow productivity growth in personal-service industries is a choice, one that is driven by the desires of the service producer and his or her customers. The key consideration is the quality of the service" (Archibald & Feldman, 2014, p. 41). Many colleges and universities can articulate that their quality of instruction and overall 'college experience' will be negatively impacted by efficiency or productivity gains, such as increased class size or program participation. The argument goes that the service or experience cannot be standardized and often engagement involves greater individualized assistance by the service provider. The exclusivity or facetime provided by specialized employees – highly trained faculty and specialized student affairs staff such as advisors, career counselors, and mental health psychologists with advanced degrees – provides built-in high costs associated with the service being produced. These 'specialists' create a service that commands a higher cost. Archibald and Feldman (2008), in their study of higher education costs from 1929-1995, identified "cost per student in higher education follows a time path very similar to the time path of other personal service industries that rely on highly educated labor. This is entirely consistent with the cost disease explanation of the rise in cost of higher education" (p. 289). In other words, in their review of costs, higher education as an industry acted similarly to other service industries that

experienced limited productivity and relied heavily on a highly educated workforce. With higher education, it is easy to see how these higher costs produce higher tuition and fees if providers buy in to the concept of cost disease as a baked-in characteristic of their industry. However, other scholars have argued that institutional actions outweighed Baumol's cost disease in the determination of rising costs (Cooper, 2017; Kelchen, 2016; Martin & Hill, 2014).

An alternative to Baumol's cost disease, the Bowen effect, or revenue theory of cost, explains "the idea that colleges and universities exploit all sources of revenue made available to them, and bump up spending to match whatever funds they can raise" (Cooper, 2017, para. 7). Bowen's (1980) revenue theory of cost argues not only are costs determined by revenue, but higher education institutions are predisposed towards higher costs. Bowen (1980) lays out four principles of higher education institutions utilizing the revenue theory of cost: "1) the dominant goals of institutions are educational excellence, prestige, and influence; 2) there is virtually no limit to the amount of money an institution could spend for to accomplish these goals; 3) each university raises all the money it can; and 4) each university spends all it raises" (p. 19-20). Increasing institutional expenditure (or cost for the consumer), thus, becomes the cumulative effect of these four principles. While Archibald and Feldman (2008) advocated that rising costs of college could best be explained through Baumol's cost disease in the previous several decades of higher education costs leading up to 1995, Martin and Hill (2014) studied higher education expenditures in a more recent time frame from 1987 to 2005 (pre-2008 economic crash) and 2008 to 2011 (post-crash) and came to the opposite conclusion, particularly in loose constraint budget periods and more so for private universities versus public universities. Martin and Hill (2014) found that "Baumol effects account for 23 percent of total change during the loose constraint period and 32 percent during the tight revenue period for public universities" (p. 17) versus the

Bowen effect described 29 percent of the cost change during the tight constraint period and 51 percent of the change during the loose constraint period for public universities. While Martin and Hill (2014) advocated that the revenue theory of cost (Bowen) explained a greater amount of cost change for public universities than Baumol's cost disease when studied separately, importantly the cumulative effect of both (Bowen & Baumol) explained 61 percent of the public university change in the tight revenue constraint and "74 percent of the public university change during the loose revenue period" (p. 17). While Archibald and Feldman (2008, 2014) might advocate that these theoretical frameworks be used separately, Martin and Hill's (2014) more recent scholarly work have demonstrated that both theories work together to demonstrate how university cost increases can be accounted for. Since it is difficult to show how increases in teaching costs alone (i.e., instructional staff salaries) have amounted to the significant cost changes in higher education, using Baumol's cost disease and Bowen's revenue theory of cost accounts for the more holistic rises in costs for higher education staffing that may be non-instructional (student services or other administrative staff who are also causing institutional costs to rise). This combined theory also better accounts for the rise in student mandatory or required fees, because these fees are less likely to be expended on instructional staff and more on the rising expenditures by higher education institutions on everything else. Researchers using these theoretical frameworks have accounted for the rise in higher education costs and provided a roadmap for why it is important to study the different components of higher education finance – specifically fees – to understand what areas are causing the overall costs to rise.

Required Fees: Historical Developments

Unlike many parts of higher education, the study and history of mandatory fees is not a long one. Indeed, there is limited literature on student fees or mandatory student fees (Arnott,

2012; Black & Taylor, 2018; Kelchen, 2016; Reinagel & Cooper, 2020; Sterritt, 2011). While institutional student fees have probably existed for as long as higher education, the ability to study fees as a national United States education phenomenon separate from tuition did not occur until very recently by higher education history standards. Scholars have noted that the US Department of Education (DOE) began requiring colleges to report fees separately from tuition starting in 1999 (Black & Taylor, 2018; Kelchen, 2016). Some reasons may include the 1998 Reauthorization of the Higher Education Act, which included mandating the agency to create reports evaluating the costs and expenditures of colleges and universities (Aliyeva et al., 2018; Casse & Manno, 1998; Middaugh, 2005). Additionally, during this same period, a pair of student mandatory fee cases made its way before the US Supreme Court: *Board of Regents of the University of Wisconsin v. Southworth (2000)* and *Amidon. V. Student Association of the State University of New York NYPIRG (2007)* (Strerritt, 2011). The *Southworth* case held that student fees must be allocated on a viewpoint-neutral basis. Lorence (2003) explains, that viewpoint neutrality "stands for the idea that when government actions implicate the speech rights of groups and individuals, those actions must be done in an even-handed way. They may not discriminate based on the message advocated" (p. 10). The courts clarified, importantly, that colleges and universities, through their student fees, could not discriminate in their allocation of fees based on the message or speech topic being advocated (i.e., controversial, or unpopular opinions or speech being shared). This precedent would be upheld a short time later in another student fees case before the Supreme Court: *Amidon. V. Student Association of the State University of New York NYPIRG (2007)* (Strerritt, 2011). The increased interest in student fees made it possible for researchers to begin comprehensively looking at this topic; however, the

first mention in the literature on student fees seems to have started in the 1970s and 1980s with several empirical studies of student perceptions of student fees.

Student Perceptions of Fees

Four empirical studies of student attitudes toward service fees exist from 1975-1980, the most cited of which are Weichselbaum and McClelland (1978) at the University of Colorado Boulder (Kelchen, 2016; Reinagel & Cooper, 2020). The rigor of the methodological study and the high response rate with a stratified sample (80%) is why Weichselbaum and McClelland are cited so often. Two additional studies from the University of Minnesota (Matross, et al., 1979; Matross, et al., 1975) exist, and the oldest study is from the University of Washington (Fiedler, 1975). Based on reviewing these four studies, it appears campuses were all employing one student service fee split across several areas instead of separate segregated fees. The studies indicate a consensus that Student Government groups at each institution form a committee that reviews, approves, and recommends adoption to the Board of Trustees of the institution or system of schools. In all four studies, the Student Government and Student Affairs apparatus survey currently enrolled students' opinions around 1) awareness of the fees, 2) funding or defunding specific programs, and 3) use of student services.

A common finding among all four surveys is that students wanted most of the fee allocated to services or programs that they utilize most often (Fiedler, 1975; Matross et al., 1979; Matross, et al., 1975; Weichselbaum & McClelland, 1978). This same group of studies also found congruence among the student respondents around agreement to fund programs or services that they may never utilize during their student careers. Additionally, the four surveys give common insights into what types of services were funded, which services were popular, and which ones were less popular in terms of both funding and use. Surveys indicated that service

fees were being used to fund student unions, student recreation centers, student health centers, student activities and/or clubs, student government/student associations, and student newspapers. There were some differences in services related to cultural or ethnic support and programs, ombudsperson support, and childcare facilities. One striking commonality among the three institution's survey results was that students "gave low marks to their respective student governments," who were the major backers of two of the three studies (Weichselbaum & McClelland, 1978, p. 252). Students' confidence in their elected student government leadership has not changed a great deal over time and continues to be a problem. The literature demonstrates much has changed since the 1970s regarding the work student government groups need to do on continually educating their student body about a) student fees and b) the student government's role in the shared governance process for student fees.

The four surveys also addressed students' perceptions or options related to program cuts or reducing funding within fee-funded programs and services. While students in all surveys agreed that funding could be lowered in some cases, the student respondents rarely agreed to entirely cut or remove a program or service (Fiedler, 1975; Matross et al., 1979; Matross et al., 1975; Weichselbaum & McClelland, 1978). This consensus among students also seems congruent with the approach student affairs professionals and leaders are taking toward budget decision-making at colleges and universities (Cage, 1992; Keppler, 2010; Levy, 1995, Trow, 1995). The University of Minnesota students responded that they would rather fund all programs and services at the current rate, even if it meant a reduction in overall service to all programs due to inflationary cost growth (Matross et al., 1979; Matross et al., 1975). Although in the first survey from 1972-1973, the same Minnesota survey, most respondents seem to also favor raising fees for some current programs and some potential new services or projects (Matross et al.,

1975). The University of Colorado respondents concurrently responded to raising current fees to add select new programs or services (i.e., legal services), but only 14% of respondents in the University of Washington favored raising student fees (Fiedler, 1975; Weichselbaum & McClelland, 1978).

These early empirical studies qualitatively inform some of the issues and concerns around mandatory student fees today or foretold some of the trends that would come to fruition as student fees have proliferated on college campuses. In these earliest studies, the University of Washington found that student respondents believed that athletics should be funded exclusively through user fees instead of additional student service fees (Fielder, 1975). Additionally, a supermajority of respondents (75%) at the University of Minnesota opposed the creation of a telecommunications fee despite 40% of respondents saying they would use some type of telecommunication service provided by the university (Matross et al., 1975). This telecommunications fee seems to replicate the idea of a technology fee, which current scholars refer to as one of the most common in higher education today (Reinagel & Cooper, 2020). Casse and Manno (1998) found that as technology, such as the computer and Internet became more popular, colleges and universities began designing "amortization plans for computer acquisitions" (p. 47). Scholars have more recently discussed how the technology fee impacted or dove-tailed into how universities wrestled with how to fund libraries at Research Universities (Cuillier & Stoffle, 2011; Jones, 2018). Casse and Manno (1998) also discuss the increasing costs of deferred maintenance to the university's physical plant and buildings. The 1972/1973 Minnesota survey demonstrated that students were also opposed to using student fees for renovations or building projects (Matross et al., 1975). Again, these early perception surveys

seem to foretell the coming challenges for colleges related to investments in technology and building renovation and construction.

Finally, the University of Colorado Boulder survey displayed exactly how unaware student respondents seem to be about how much they pay in mandatory fees (Weischselbaum & McClelland, 1978). Indeed, only a third of the respondents could estimate their fees within five dollars with a similar result when asked about the cost of tuition. Only 33% could not even come up with an answer when asked, "*How much did you pay in fees this semester?*" (Weischselbaum & McClelland, 1978, p. 246). Over 50% of the remaining 67% provided responses that were categorized as either incorrect or impossible (Weischselbaum & McClelland, 1978). These finding illuminates to sheer lack of knowledge in higher education costs and pricing by college students and their families that would be documented later in the literature (Black & Taylor, 2018; Davidson, 2022; Kelchen, 2016). Interestingly, when you disaggregate graduate student respondents in the Colorado survey, that group was much more likely to favor reducing fees and indicated they were likely financially responsible for paying their fees. This preference may come from additional life experience and knowledge accumulated while attending college. All Colorado student respondents indicated that they do care how fees are spent and disagreed that fees are too high or should be cut back even if means a reduction in programs or services. Respondents favored mandatory student fees as the preferred method of funding for all services, except student organizations (groups), which ironically is the one area that is universally funded by such fees currently in higher education.

Increased Use of Mandatory Student Fees

At the other end of the literature is a discussion of how student mandatory fees are being utilized by the administrators – in both academic and student affairs organizations – to maintain

critical programs and services at universities. This literature explains some of the potential causes for the increase in fees and presents several case studies on how institutions or specific departments are handling budget concerns. I have divided this literature into three areas: increased fee uses and administrator budget strategy, institutional, department-specific case study analysis, and more comprehensive, cross-institutional forms of study.

Cage (1992) documents what appears to be a modern inflection point in student mandatory fees at colleges and universities. The *Chronicle of Higher Education* article appears to be one of the first public acknowledgments by national student affairs associations, in this case, the executive director of the National Association of Student Affairs Personnel (NASPA), that fee-for-service models are becoming commonplace as universities deal the looming reduction of state appropriations and reduce the share of tuition dollars away from direct non-instructional purposes (Cage, 1992). The article provides some institutional-specific examples of two trends in the literature: an institutional-specific $25 technology fee being levied at the University of Arizona and an institution now using student service fees to support the library, once considered a core instructional property, at Townson University (Cage, 1992). The trend to identify and levy more fees by administrators to make up for budget pitfalls by reducing tuition revenue to non-instructional, core university functions will continue throughout the literature (Cage, 1992; Keppler 2010; Levy, 1995; Rames, 2000; Trow, 1995).

A quartet of practitioner-based articles begins to illuminate the types of fees being created and the move toward college programs and services to self-supporting status (Keppler 2010; Levy, 1995; Rames, 2000; Trow, 1995). Levy (1995) is probably the first to acknowledge that fees have been assessed by colleges and universities since the beginning of higher education, but that a changing philosophy that “users of a service should pay the entire cost for that service”

(p. 41). Levy (1995) acknowledges, “In the college of the future, more direct charges for even the most basic student services will be assessed” (p. 42). Levy (1995) begins to numerate the types of programs and services that are moving from partially to fully fee funded including student activities, counseling and health centers, and campus technology. Levy (1995) also articulates the new use of mandatory student fees to pay for capital construction and bond redemption across the university community. Most importantly, Levy (1995) explains, “Unless prohibited by state law, a mandatory fee to costs for the entire student affairs program may arise. Such a posture removes some costs from competition with the overall instruction budget but may impact the cost of college attendance” (p. 43). This prediction has become a reality on college campuses across the US.

Trow (1995) echoes similar sentiments of Levy (1995) and goes a step further identifying several of the campus operations traditionally supported by tuition and instructional costs that are being transferred to self-supporting status. “More institutions will find themselves looking not only to additional self-support operations such as counseling, career services, and orientation but to outsourcing or contracting” (p. 22). Both Levy (1995) and Trow (1995) extensively discuss the move to outsource major campus operations including dining services, housing and residence life, custodial services, health services, and management of physical plant and/or utilities as a major cost-saving measure designed to take the pressure off instructional cost-center budget of a university. Both scholars also acknowledge the rise in the necessity of sophisticated fund-raising arms of student affairs and library administrations of colleges as a necessary way to contain increasing mandatory student fees (Levy, 1995; Trow, 1995).

While most studies have outlined that the entirety of student services and programs are being moved to user fees or mandatory fees due to financial constraints (Cage, 1992; Levy,

1995; Trow, 1995; Keppler, 2010), Rames (2000) found that services were not being reduced or eliminated or being moved to a fee-based model. A less acknowledged limitation of Rames's (2000) study is the narrow institutional cross-section studied. She surveyed public institutions with NASPA membership with student enrollments between 5,000 and 11,000 students – or what one might call mid-sized, public comprehensive universities. While it is important to that acknowledge this contribution to the literature contradicts the literature's common trend, Trow (1995) would counter this claim by explaining, "Doctoral granting universities and research universities are more likely to levy new fees and re-organize student services as a cost-cutting measure" (p. 18). In other words, public comprehensive universities may have been able to resist budget constraints toward increased mandatory fee use in student services in a way that large research universities and small, private universities have not. This trend is further validated by Keppler (2010) almost ten years later.

Keppler (2010) most recently updated the work of several scholars (Levy, 1995; Trow, 1995) in documenting the proliferation of mandatory student fees to cover the cost of student services programs. Keppler provides further evidence of the cyclical nature of budgeting of higher education and acknowledges in specific examples how student affairs leaders are having to move services from state appropriation dollars to mandatory fees in years of significant financial constraint, such as state budget recessions. Keppler's specific examples of moving a student activities director to student union funding from the state appropriation budget funding and moving more student fee-funded operations such as health operations under auxiliary-funded operations such as Housing & Residence Life illuminates the lengths at which Senior Student Affairs Officers (SSAOs) are creating cost containment that may still, in fact, raise costs for specific student fees. The shell game of how necessary student services are paid for will undoubtedly affect the end user,

college students. “Dealing with the reduced sources of revenue means increased costs will be passed along not only to the users of university services – the students – but many to faculty and staff who will face furloughs and job loss, which will together create the type of unhappiness and unrest that typically gets passed along to student affairs divisions” (Keppler, 2010, p. 30). Keppler does a nice job of explaining not only the primary stakeholders being impacted – the student users – as well as articulating the secondary impact that will be felt by university staff and administrators who will likely see reductions in staff and services due as a secondary way of reduced funding by the university. This quote exemplifies why so many college leaders have adopted the strategy of increasing student fees rather than seeing services or staff cuts due to the increased costs but lack of additional tuition funding support.

In addition to Keppler’s institutional-specific examples at Valdosta State University, several research studies provide institutional case studies of how mandatory fees (or in one specific case other alternative revenue sources) are being used to fund what was previously considered for state appropriations, programs which directly related to the core academic mission (Cullier & Stoffle, 2011; Dworkin & Lyddon, 1991; Scott & Bischoff, 2000; Webster & Middleton, 1999).

Scott and Bischoff's (2000) study articulate the same strategies for cost containment and creative book-keeping that Keppler (2010) articulates almost a decade later at Valdosta State. The former president and current Vice President at Ramapo College in New Jersey outlines the many departmental mergers, elimination of a collegiate sport (football), and increased reliance on fees from health services and residence life was used to keep the Student Affairs division from being insolvent at the small college (Scott & Bischoff, 2000). Additional reliance on grant funding to supply core services like disability student support, substance abuse programs, and service-learning was identified (Scott & Bischoff, 2000). In an increasingly budget-constrained

environment, the study demonstrates the very difficult decisions about what the core business and services provided that senior leaders of colleges must make. Scott and Bischoff (2000) provide an example of how leaders reduced the total footprint of student affairs services rather than levying substantial increases in mandatory student fees.

Middleton and Webster (1999) provide an institutional example of how decision-makers would make best use of the Technology Resources (TR) fees that had been levied as a mandatory student fee at Oregon State University in the late 1990s. This study illustrates a case study example of what other research explained would occur related to institutional funding of technology-related expenditures (Casse & Manno, 1998; Levy, 1995, Trow, 1995). Middleton and Webster (1999) utilized institutional benchmarking and student perception surveys to be useful tools in determining how levied fees should be utilized to benefit students. Importantly, the authors noted, "exploring student perceptions helped identify highly used and beneficial services that needed continual funding as well as the less used ones that are candidates for discontinuation or funding from outside TR fees" (Middleton & Webster, 1999, p. 468). Extending the previous research findings of Weichselbaum and McClelland (1978) about students' lack of knowledge of their mandatory student fees, two decades later Middleton and Webster (1999) found that only one-third of survey respondents were aware that they were paying mandatory student fee related to technology resources. Even as campus leaders shift the burden from state appropriations to student fee-supported programs, it is incumbent that colleges continue to educate students and be more transparent on how vital programs and services are being financially supported (Keppler, 2010; Levy, 1995; Rames, 2000; Scott & Bischoff, 2000; Trow, 1995). More recent scholar-practitioners have outlined specific strategies academic units and university leaders have implemented activities that generate alternative revenue sources (Cullier & Stoffle, 2011).

More recent literature from scholar-practitioners have provided "how-to" guides on how institutions have either implemented new student fees, tried to enhance their support or portion of existing mandatory fees, or implemented other creative alternative sources of revenue (Cullier & Stoffle, 2011; Jones, 2018). Cullier and Stoffle (2011) provide an illuminating and relevant case study of how the research libraries at the University of Arizona continued to have an increase in costs and expenditures but no additional fee or revenue support from the university. As a result, the staff had to engage in more creative ways to close the budget gaps including external fundraising and capital campaigns, user fees, implementing vendor food cafes for which they could take a revenue cut, and teaching academic courses that generated program revenue. Specifically, the authors articulate that securing a greater percentage of the existing mandatory student fees or levying a library-specific mandatory fee provided one of the few stable forms of revenue in comparison to the litany of alternative revenue sources that the library had tried to implement. The Arizona study provides an excellent example of the phenomenon of how core academic services, such as library funding, have moved from tuition support and on to user and student-fee-funded models as university budgets have gone through a historical transformation. Jones (2018) builds upon the work of Cullier and Stoffle (2011) in providing survey data that supports that library administrators are quickly learning that implementing a mandatory student fee for libraries may be the only sustainable budget path forward for Research Universities. I will return to Jones' (2018) observations and their connections to causes and increases in overall student fee usage within the literature.

The final case study from Colorado State University provides a historical explanation of how the college's counseling center moved from declining state appropriations to a specific student fee-funded program through a student government referendum of its entire student body in

1986. Ironically, the article is more about the ways the leadership team manages the operations of heavily utilized campus service at a college. However, it provides a useful institutional conversation about what college students believe about mandatory fees versus user fees. In this case, the students initiated both a mandatory fee and an additional $15 individual session fee for those exceeding five sessions per semester (Dworkin & Lyddon, 1991). Core to fee-funding, the authors note that student buy-in and consultation on creating mandatory student fees – particularly those that are designated for a specific service – engender a great deal more support when students are proactively consulted (Dworkin & Lyddon, 1991). Again, this seems to support the assertions made in the rest of the research (Cullier & Stoffle, 2011; Keppler, 2010, Levy, 1995; Trow, 1995).

The discussion of counseling centers transitions us into the last part of the research: cross-institutional study of mandatory fees. Gallagher (1992, 2005) is one of the few researchers who have studied the use of mandatory fees across institutions within the bounds of a single department: counseling centers. His study in 2005 found that of the 360 responding counseling centers across the United States, 17% were solely funded by mandatory student fees, and another 26% were partially funded by mandatory fees. When accounting for institutional size, 58% of counseling centers were either fully or in part funded by mandatory fees for institutions with enrollment greater than 15,000 students (Gallagher, 2005). Of note, this is a 27 percent increase from the same counseling centers from a similar survey 13 years earlier (Gallagher, 1992). Moving from institutional case studies to cross-institutional investigations net the same result; colleges are becoming more reliant on mandatory student fees to support campus services previously covered by state funding (Cullier & Stoffle, 2011; Gallagher, 2005; Keppler, 2010).

The most comprehensive study of mandatory student fees to date was conducted by Meabon, et al. (1996) in *Financing Campus Activities* from the National Association of Campus

Activities (NACA). The study collected data from multiple institutions over fifteen years from the fiscal years 1975-1976 to 1991-1992. Despite the limitation in the age of the study, the authors uncover many of the current trends discussed in the literature about mandatory fees including an increase in the amount and types of fees being levied, expanded use of student fees to cover academic and administrative functions previous covered by state appropriations, and fees now being used to cover debt service for facilities (Meabon et al., 1996). Meabon and his colleagues also foretell another strand of research in the current literature, articulating who has primary authority to determine/establish mandatory fees and appropriate fees between students, institutional officials, and regents/local control boards (Meabon et al., 1996). Finally, Meabon et al. (1996) identified some key limitations placed on mandatory fee expenditures including, importantly, the payment of professional staff positions. This clearly shows the age of the survey as many current student affairs and student life offices now use mandatory student fees to fund all or most of their staff's salaries and fringe benefits (Strerritt, 2011). Based on the comprehensive nature of the studies and breadth of the topics covered, current research that replicates the approach Meabon and his colleagues attempted is desperately needed.

Current State of Student Fee Research

Current literature on mandatory fees paints the phenomenon as both hidden or obfuscated from the student users (Black & Taylor, 2016; Sharpe, 2016; Sterritt, 2011; Wang, 2013) and now ubiquitous in use by institutions of higher education in the United States (Arnott, 2012; Black & Taylor, 2018; Glater, 2017; Kelchen, 2016; Reinagel & Cooper, 2020; Sharpe, 2016; Wang, 2013). Methods of study are diverse and add to the current understanding of the increased use of student fees, how and what mandatory fees are levied, what factors impact mandatory fees being created, and the causes and consequences for the proliferation of mandatory student fees.

The historical literature around student fees focused on answering the question of "what," as in what student fees are and how they are evolving. The current literature is focused more on answering the "So, what?" and "Now, what" questions related to student fees. In other words, this current literature focuses more on what is causing the shift for colleges to greater reliance on mandatory student fees and what that means for college attendance. Seemingly missing from this conversation is additional research on how these fees may be impacting student outcomes, such as student retention and graduation rates. Despite additional newer annual data available from the Integrated Postsecondary Education Data System (IPEDS), there continues to be a limited amount of research being conducted on the topic of mandatory student fees. This is likely due to the lagging reporting function of both student retention rates as well as four-, six-, and eight-year graduation rates.

Sterritt's (2011) dissertation study of the University of Georgia system and its use of an institutional instruction fee provides an excellent case study in the current literature. Sterritt (2011) found that a special instructional fee, known on many campuses as a student success fee, was levied by the Georgia Board of Regents without consultation with students within the university system. The fee increased from $75 in Spring 2009 to $250 per semester at most Georgia institutions to up to $450 per semester in the 2014 spring semester (Sterritt, 2011). Sterritt examined this fee because he was interested in providing an additional case study on how state public higher education systems were essentially shifting the associated with college tuition to the use of "temporary" student fees without the input of college students.

Wang (2013) and Sharpe (2016) documented that this additional use of hidden institutional fees to fund has traditionally been covered by state appropriations and tuition costs. Amplifying the findings of Sterritt (2011), Wang (2013) was able to get the spokesman for the

Georgia State Board of Regents to explain, “The special institutional fee goes to the exact same things your tuition goes to” (para. 19) The spokesperson explained that the charges are mandatory fees, because the Regents and public institutions in Georgia could not break a pledge to the state legislature for no tuition increases. Sharpe (2016) found a similar sentiment three years later from the director of the Center for College Affordability and Productivity who explained, “So with tuition unable to cover the costs thanks to (tuition) freezes and budget cuts by state legislators, many public colleges are using fees to help pay for core instruction (p. B18). The article goes on to cite several very specific institutional case studies including at California Polytechnic State, Rutgers University (NJ), University of Arizona, University of Massachusetts Amherst, University of Oklahoma Norman, and University of Wisconsin Madison. The institutions vary greatly geographically and represent a large cross-section of the United States. This increase in fees appears endemic to the entire higher education enterprise in the United States.

Arnott (2012) initiated the only study to that date to examine the relationship between state appropriations and student fees. The researcher grounded her approach in Slaughter and Leslie’s (1997) theory of Academic Capitalism, which explains that “American society has shifted its focus toward the success of the individual through entrepreneurialism, innovation, and the market” (Arnott, 2012, p. 17). Ultimately, in addition to documenting what she viewed as the embrace of university leadership toward a culture of academic capitalism, Arnott (2012) identified that fees appear to be the most cogent way that colleges and universities are fighting decreases in state appropriation revenue.

Building on the empirical studies of Sterritt (2011) and Arnott (2012), Robert Kelchen (2016) analyzed specific institutional factors and state-level factors that may impact the cost of

mandatory student fees at public universities using IPEDS data from 2010-2012. The researcher not only illuminates an average student fee paid by students (more than $1000 per year) but also provides a list of factors that help affect fee levels, including state economic conditions (lower fees in states with higher unemployment rates) as well as characteristics of state higher education funding (those with tuition caps had higher student fees), political characteristics (politicians being responsible for fees meant likely higher student mandatory fees) and state-level policy (Kelchen, 2016). To date, this study represents the only longitudinal review of student fees in the US. Additionally, Kelchen (2016) advocates for "a census of how frequently fees are dedicated toward these sorts of non-academic pursuits" concerning his finding about college athletics having little to no relationship with student fee levels (p. 614). He would not have to wait long for his request.

Reinagel and Cooper (2020) present a census or catalog of "every university fee at every US public college and university during the academic year 2014-2015 and conduct a multivariate analysis to determine the conditions under which institutions assess more and higher fees" (p. 427). Despite foreshadowing the need for such research, Kelchen (2016) does not appear cited in the 2020 study. Reinagel and Cooper collected publicly available institutional data from 604 universities, merged it with IPEDS national data, and standardized it to full-time equivalent students and semester-based academic calendars. Reinagel and Cooper found similar findings to Kelchen (2016) with the average student paying an average of $825 per year. More importantly, Reinagel and Cooper (2020) were able to document the range of student fees at colleges and universities differed "from $0 to $7300 per student" (p. 432). The researchers also discovered the frequency of college fees (90% of colleges have fees) and sorted the types of fees into 194 individual fees into 10 separate categories ('technology, recreation/wellness, academic

support/improvement, support services, extra-curricular activities, facilities/capital, health, administrative/business services, media, cultural/performing/fine arts, and generic") (Reinagel & Cooper, 2020, p. 433). The researchers also note regional geographic differences, university-level characteristics, and whether students have a voice in determining fees all have effects on the type and amount of mandatory student fees being levied (Reinagel & Cooper, 2020).

The most recent student fee literature has also focused on the implications for university administrator decision-making. Davidson (2021) specifically focused on university leadership student fee subsidies to the athletic enterprise to bolster institutional prestige and student recruitment. Davidson wanted to test the hypothesis that plugging more student fees into athletic teams had a positive correlation with winning percentages by revenue-generating college athletic teams. If this was the case, then university administrators could justify the increased reliance on student fees to prop up the athletic enterprise. Conversely, the author found little to no correlation for football and a slight correlation for men's basketball (Davidson, 2021). Importantly, the author has noted his study could help prevent cost escalation for students in student fees to support the university's athletic enterprise. Ultimately, this discussion of student fee usage for athletics comes down to the tenuous relationship that exists between college athletics and improvement in student recruitment efforts (Davidson, 2021; Pope & Pope, 2009). The author extends a previous study by Kelchen (2016) on whether athletics was a reason or cause for the increase in student fees. Additionally, the study begins to examine what are the possible implications for student outcomes, such as student recruitment by student fees. Another study by Black and Taylor (2018) similarly explores the impact of fees on college attendance.

Like Davidson, Black and Taylor (2018) sought to extend the work of Kelchen (2016) to examine the growth of mandatory student fees in Texas for the 2016-2017 academic year. The

authors also sought to determine whether the publication and explanation of fees by colleges and universities was appropriate for the audience of students and family members that they reported to serve. As with Kelchen (2016), Black and Taylor observed an increase in the usage of fees within Texas higher education institutions with huge variation across public and private institutions. Linguistically speaking, colleges and universities did an inferior job at composing their fee explanations at the reading levels of the target audience (families). "Although this study found great variance in word count from institution to institution, both public and private institutions composed their explanation of fees at roughly the 12th-grade reading comprehension level" (Black & Taylor, 2018, p. 10). The authors explain this is far above the average US adult reading level (7th grade) and reading comprehension level (only 63% at the 12th-grade comprehension), even for high school graduates. In other words, universities in Texas in 2016-2017 increased their reliance on student fee revenue and did a subpar job in describing what these fees covered to their consumer audience paying for them. Black and Taylor's study further identifies the need for continued monitoring of this fee increase trend and its impact on college attendance in Texas. The study leaves a gap in the literature to explore what has happened in public four-year institutional mandatory fee rates in Texas and how these impact key student measures in Texas, especially student retention rates.

Summation of the Fees Literature

The trend toward utilization of student fees is now well-documented. While the historical research on modern mandatory student fees is relatively scant, their use has proliferated all public higher education in the United States (Arnott, 2012; Black & Taylor, 2018; Davidson, 2021; Kelchen, 2016; Reinagel & Cooper, 2020). Current research on the factors impacting the

types and amounts of mandatory fees remains scarce. There is a need to replicate studies of the factors affecting the use of mandatory fees such as Arnott (2012), Kelchen (2016), and Reinagel and Cooper (2020). These studies provide cross-institutional analysis of factors that lead to college costs being shifted to mandatory fees and away from state appropriations and tuition. However, the seminal researcher in mandatory student fees, Robert Kelchen has acknowledged this research is difficult due to the extreme variation among states and institutions in the reporting of mandatory student fees longitudinally. He acknowledges that several states have engaged in fee rollbacks that make this longitudinal study almost impossible.

Just as valuable are the case study examples littered throughout the literature. Sterritt's (2011) case study of the use of a fee across the entirety of the University of Georgia system provided a cross-comparison example between institutions within the same state. Similar studies could replicate these results in states with expansive public college higher education systems such as California, New York, Pennsylvania, Texas, and Wisconsin. Similar studies would 'validate' or illuminate whether findings hold concerning different states and localities. These studies might also be used to evaluate the findings from Arnott (2012), Kelchen (2016), and Reinagel and Cooper (2020) who found that state political and policy differences impact the levying of mandatory student fees. More importantly, a case study within the state of Texas could further illuminate the work on student outcomes and fee increases documented by Davidson (2021) and Black and Taylor (2018). I would propose to continue the efforts of Kelchen (2016) in longitudinally tracking a specific state with the expressed purpose of inventorying the continued use of mandatory student fees. The study could also uncover whether the fees that are levied to create services that support retention and graduation are affecting these rates as reported by institutions using the same IPEDS tracking system for which they account

for their tuition and mandatory fees. Such a study would not only expose a blind spot in longitudinal data about student fees in Texas for lawmakers and public policymakers; it could also have implications for future trends in how the Texas state legislature continues to financially support higher education in an increasing era of performance-based funding (PBF).

Fees, Finances, and Students Finishing: Why This Matters

Higher education has long been accused of failing to be the kind of social-mobility-enhancing vehicle it purports to be for society (Davidson, 2022; Li, 2018; Ortagus et al., 2020; Sawhill, 2016). “Currently the United States ranks number one in the world in the percentage of students it sends to college – a high rank it has helped for decades. However, we hover somewhere between number seventeen and nineteen in college completion rates” (Davidson, 2022, p. 166). US higher education is doing an excellent job of enticing students to participate in college, but a lousy job at retaining or graduating those who enter. Kantrowitz (2021) has documented that more than one million US college students drop out of college annually explaining that “more than two-thirds of college dropouts are low-income students with family adjusted group income (AGI) under $50,000” and “three-quarters are first-generation college students” (para. 5-6). Thus, the students who are least likely to be able to afford college are the ones dropping out and least likely to be able to be able to pay off the debt they accrued. Scholars have also noted institutions, such as HSIs, which provide educational opportunities to greater portion of low-income and minoritzed students are the most susceptible to tuition and fees increases as an alternative to generating revenue because they receive less funding per student when compared with non-HSIs (Flores & Leal, 2023; Nellum & Valle, 2015; Núñez & Bowers, 2011). Thus, minority serving institutions, especially HSIs, funding models may be more susceptible to tuition and student fee increases to cover college basic operations. If these students are also dropping out, they are more likely to accrue student debt.

College is a good financial proposition, if one can graduate and get a decent job. “The 2015 figures from the US Department of Education National Center for Educational Statistics (NCES) shows that adults with a bachelor’s degree earn approximately $48,500 a year, while the earnings for those with only a high school diploma averaged $23,900” (Davidson, 2022, p. 167). The cost of college and whether one can attend and graduate from an institution of higher education has huge quality of life implications for the US society. A direct reaction to this mixed bag of results on educational outcomes and attainment by colleges and universities has been the adoption by state legislatures of Performance Based Funding (PBF) or the tying of funding to specific measurable student outcomes (Archibald & Feldman, 2014; Li, 2018; Ortagus et al., 2020; Sawhill, 2016;).

Despite almost universal agreement that access to educational opportunity is a direct path to social mobility, Sawmill (2016) articulates a poor picture of educational attainment and outcomes that higher education policymakers are having to swallow. “Almost half of all college students and much higher proportions of poor and minority students drop out before they complete a degree. Community colleges…have experienced staggering dropout rates. About 54% of their students do not complete a degree, receive a certificate, or transfer to a four-year institution within six years” (Sawhill, 2016, para 3). With low outcomes for graduation, this explains the reason that, as of 2020, 41 states have adopted some form of performance-based funding (PBF) to cajole better outcomes from universities (Ortagus et al., 2020).

Federal policymakers must wrestle with what kind of outcomes and return on investment (ROI) they are receiving for upwards of $140 billion that is allocated to higher education annually. Higher education access policies, such as the Pell program, were designed to spur enrollments and participation by poor and minoritized populations. However, Sawhill (2016) explains, “There is no evidence that Pell grants have increased graduation rates, as opposed to enrollments. A higher level of assistance for low-income students but one also tied more closely to performance might help to level the playing field in a more cost-effective way while simultaneously providing stronger

incentives for better preparation at the K–12 level" (para 12). Sawhill's assertion summarizes the sentiments and conclusions of state legislatures and federal policymakers, and why more states are adopting and forwarding PBF policy solutions. Li (2018) explains how PBF shifts how colleges and universities which were previously funded from state tax dollars per student enrolled to a "portion of these dollars from an enrollment-based model to an outcomes-based model. Commonly used outcomes include student retention rates, transfer rates from two- to four-year institutions, credit hours earned, graduation rates, degrees conferred, and job placement rates" (para 2). Indeed, a college earns funding by retaining and graduating students versus enrolling them and are measured in terms of the states' goals of increasing college attainment outputs. Legislators seem to also agree with Sawhill's (2016) assertion that, "the U.S. is falling behind in international rankings of what students know and how many graduate from college, and it is not clear that we can continue to compete using our current 'open-access' model" (para 15). Financial pressures come from being viewed as successful and being able to exclude less prepared individuals from the college process to be viewed as more prestigious. PBF seems to support the notion of exclusion version inclusion and student success. Noteworthy, however, is that PBF does not appear to be having the intended outcomes for which it was designed. Ortagus et al. (2020) in their systematic review of 50 studies of PBF across the United States over a 20-year period found that "[t]his robust body of evidence regarding PBF typically reveals the limitations of such policies in meeting their intended outcomes—improving degree completion—and demonstrates that PBF systems may exacerbate inequalities facing historically underrepresented student groups and already-underfunded institution types" (p. 542). The researchers additionally found that PBF policies appear to incentivize more selective colleges to enroll fewer underrepresented and disadvantaged students to help pad their graduation rates. This seems to forward a system that is further inequal and creates greater barriers for the students that PBF is targeting colleges to better serve. In other words, research seems to currently bear out that Performance-Based Funding in higher education is widening the educational

opportunity gap not closing it (Ortagus et al., 2020). Despite mixed results, the State of Texas had moved in the direction of supporting performance-based funding, at least at the community college level, and adopting greater assessment and tracking of student outcomes-based measures.

Building a Talent Strong Texas (that graduates and has no college debt)

The state of Texas, through its Texas Higher Education Coordinating Board (THECB), adopted a strategic plan that articulated ambitious goals the educational attainment and workforce development. The 2022-2030 Higher Education Coordinating Board strategic plan trumpets, "Entering the middle of the 21st Century, Texas has the ninth-largest economy in the world… Texans have earned more degrees, certificates, and credentials over the past decade than at any time in history, and Texas has outpaced every other state in growing our undergraduate and graduate student enrollment" (THECB, 2022, p. 3). The state of Texas and its higher education stakeholders expect to be a global powerhouse and world influencer. While many states are making scaled cutbacks in higher education financing due to state budget difficulties, the THECB articulates this vision and specific strategies the board intends to enact to be a major player in the global economy. The strategic plan further explains, "The state must lead the nation in awarding credentials of value that offer purpose in the economy, value in the labor market, and opportunities for good jobs and meaningful careers. That's the Texas way" (THECB, 2022, p. 3). In other words, elected government leaders, through their appointed THECB Commissioner and Board of Governors, see the path to state prosperity through higher education awarded credentials and extensions of research activities being delivered through the state's research universities, four-year regional universities, and community colleges.

The THECB 2022-2030 Strategic Plan, *Building a Talent Strong Texas* (BTST), is an ambitious plan that expands an already resolute set of goals outlined in the 2015 THECB strategic plan, *60x30TX*. The 2015 plan called for higher education degrees or certificates to be

granted to 60% of Texans aged 25-44 by 2030. *BTST* expanded this goal to higher education credentialing to 60% of all Texas aged 25-64 by 2030. The plan also expands the number of individuals graduating from Texas higher education institutions (HEIs) annually, sets a ceiling for higher education student debt upon graduation (95% with no or manageable debt), increases the amount of research and development dollar expenditures at universities and community colleges ($1 billion increase, and sets a goal for the number of doctoral degrees granted annually by Texas HEIs (7500). The focus on research at universities, regional comprehensive colleges, and community colleges is noteworthy. Community colleges are not typically engaged in research and this plan discusses a more intentional connection to industry and economic development for vocational education. This expanded research agenda across all sectors of higher education, coupled with graduate degree state attainment goals, indicates that THECB and its stakeholders have been supported in setting tangible oversight goals for graduate education as well as research and development in a large, decentralized state such as Texas. The plan is endorsed by the sitting Republic Governor, Greg Abbott, who is quoted and photographically depicted on page 6 of this new strategic plan (to give his endorsement). In a word, these strategic plans *challenge* the goals previously set in Texas as not expansive or inclusive enough.

Explicitly, the *Building a Talent Strong Texas* strategic plan aims appear directed at including more Texans in the attainment of a postsecondary credential. There is a specific passage that explains why a refreshed strategic plan for higher education was initiated by the THECB.

> "[T]he pace of change in the Texas economy is accelerating, and the COVID-19 pandemic brought new disruptions to the workforce while changing expectations for the future. In response, state officials led by Commissioner of Higher Education Harrison Keller have determined that *60x30TX* should be refreshed as it nears its halfway mark in 2022 and that Texas should accelerate its national leadership and renewed focus on

students completing degrees with purpose and value." (THECB, 2022, p. 14)

The higher education commissioner appears to have received additional pressure from state officials to accelerate the pace of higher education participation after seeing the impact of what a health pandemic can do to its state workforce in the ninth-largest economy in the world. It appears that feedback from taxpayers to their state elected officials may have been that they needed to be trained or supported by more education in order not to be left behind economically. While the state government in Texas has been dominated by the Republican party for the last twenty to twenty-five years, the *Building a Talent Strong Texas* plan seems to overtly explain that communities of color, low-income individuals, and those who have not experienced college (first-generation) are being disproportionately affected by not attending or attaining postsecondary credentials. The strategic plan advocates for greater use and allocation of higher education resources to historically disenfranchised groups (THECB, 2022). This seems like, at least, promising rhetoric, a coordinating board appointed by a political party whose policies have not always benefited these groups.

In summary, the state of Texas provides an excellent case study to study higher education because of increasing demographic population diversity as well as its publicly stated higher education goals to increase participation (enrollment and retention) and completion (graduation) for college credentials with the least possible accumulation of personal debt (higher education finance policy). The THECB strategic plan lays out why policymakers and families will continue to hyper-focused on the costs and outcomes associated with higher education.

Moving to PBF at Two-Year Higher Education Institutions in Texas

The focus of Texas higher education finance policymaking has shifted to community college costs. Indeed, community college leadership and administrators believe that PBF may be

the answer to their institutional financial challenges. Community college leaders have successfully lobbied the state legislature to tie college funding (and feel confident it will expand) to performance in student success measures including credits toward bachelor's degree transfer, credentials of high value, and associates or certificate degrees completed in high need fields within the state (Nations, 2023; Osborn, 2023; Perez, 2023). Community colleges across the US are facing challenges with resources because of their inability to hit some of these benchmarks; however, Texas community college leaders asked and received support from the state legislature to judge them on these success measures.

The most recent Texas state legislative session represented a significant windfall for both the El Paso community and the regional higher education institutions (Blanco, 2023; Perez, 2022; Nations, 2023; Osborn, 2023). Local leaders have specifically highlighted the additional $35 million in additional funding to higher education institutions and change in performance outcomes-based funding for community colleges as huge wins for El Paso Community College (Blanco, 2023; Perez, 2022). Nations (2023) explains, "Variables like shifting populations meant for years that the state's portion of the money sent to community colleges was receding, and declining tax bases meant there was less money from the community to go around" (para. 9). This new performance-based model rewards a college for students earning 15 hours of transfer credit (retention) or credential of value (graduation), and rewards community colleges for helping students be successful instead of just enrolling more students in seats. El Paso businessman Woody Hunt, who was chosen to lead Governor Abbott's commission on changing community college funding, explained the aim of changes accepted by the Texas legislature and signed by the governor, "Our commission believes the new funding model must do three things: reward colleges for positive outcomes…, ensure equitable access through financial aid, and help

community colleges increase capacity to meet rapidly changing workforce needs…" (Perez, 2022, para. 13). The commission wants to see more students complete their intended goals at community college and there appears to be a strong correlation between a student's well-being and their achievement of student success goals.

Summary of Chapter

With the adoption of performance-based funding (PBF) for two-year institutions in Texas, the use of student fees at public, four-year colleges and universities is likely to receive increased scrutiny. The Texas Legislature allowed each institution in Texas to set its tuition and fees through 2003's Texas H.B. 3015 (Black & Taylor, 2018). The focus on more tangible student success outcomes in the THECB strategic plan as well as the legislature approval of using such student success outcomes as a way of determining two-year college and university funding (PBF) foreshadows a similar oversight that may affect four-year colleges and universities in Texas. With such a focus on college costs, college debt, and student success outcomes (enrollment, retention, and graduation rates), there exists a need to determine whether required (mandatory) fees are increasing and to determine what percentage of the price of college these fees account for. Related and, potentially more important, policymakers and families will be interested in whether these specific costs are contributing negatively or positively to important student success outcomes (retention and graduation). This study sought to evaluate the increasing student fee costs in the state of Texas in the first longitudinal study in over a decade. The literature overwhelmingly supports the proposition that mandatory student fees are increasing. This study sought to evaluate the magnitude of this phenomenon in a core sector of Texas higher education: four-year, public universities. Secondly, no study of student fees has explored whether these fees – which function to financially support institutional departments and units

whose purpose is student engagement, retention, and graduation – are affecting the sector's institutional student retention rates. I sought to fill this gap in the literature.

Chapter 3: Research Design & Methodology

Introduction

This longitudinal quantitative project used publicly available secondary panel data from a national database to examine how student fees linked to the price of attendance, and their relationship to student retention rates for four-year public institutions in the state of Texas. The study evaluated the relationship between student retention and the predictor variable of the rate term of student fees for two separate variables: in-state rate term fees and out-of-state rate term fees. While it can be articulated the increase in student fees and their proportionality of the price of attendance using descriptive statistics, the study will use a fixed-term regression to determine the relationship between student fee rates and student retention rates in Texas. This can be accomplished because, using the national database, we can identify all public, four-year institutions (the total population) for this study. My work will expand on previous studies that discuss impact of the increase in student fees (Arnott, 2012; Black & Taylor, 2018; Davidson, 2021; Kelchen, 2016; Reinagel & Cooper, 2020; Sterritt, 2011) and serve to inform higher education administrators and policy-makers on the impact of student fees on institutional student retention rates at it relates to the state's goals of greater access, affordability, and student debt reduction (THECB, 2022).

This panel data study used academic year data between 2017-2018 and 2022-2023 from IPEDS related to student fees and the price of attendance. Student retention rate data, due to reporting lag time for outcome variables (Aliyeva et al., 2018; IPEDS Manual, 2015; Jaquette & Parra, 2014), is only available for five academic years (2017-2022). Thus, the author imputed data to create a six year of data – standard practice in quantitative research methods (Creswell, 2015; Field, 2018; Tabachnick & Fidell, 2013). This chapter outlines the research methods and

plan for gathering data, defines the variables and model adopted, and describes procedures for setting up the data. The chapter concludes with a discussion of the delimitations and possible limitations of the study.

As previously discussed, the questions developed for this study are:

1) From 2017-2018 to 2022-2023, are the average amount of required (mandatory) student fees increasing at four-year, public universities in Texas?
2) From 2017-2018 to 2022-2023, are student fees becoming a greater percentage (proportion) of the overall price of attendance at four-year, public universities in Texas?
3) During the period studied (2017-2023), do mandatory student fees have any relationship with student retention at four-year, public universities in Texas?

Design of the Study

Examining questions about student retention rates, student fees, and the price of attendance lends itself to making observations or conclusions through quantitative study, which is the approach to answering research questions about what predictor(s) influence student retention rates (Creswell, 2015; Menard, 2002). Quantitative analysis uses numerical data and applies statistical analysis to draw inferences or conclusions (Creswell, 2015; Field, 2018; Tabachnick & Fidell, 2013). Using a quantitative approach will allow the researcher to study multiple intuitions across various variables (Creswell, 2015; Field, 2018; Tabachnick & Fidell, 2013). Quantitative methods, especially when using panel data to evaluate and assess rates and trends, can help explain the story of what is occurring over a period (Jacquette & Parra, 2014; Menard, 2002; Xu et al., 2007; Yaffee, 2003). This study will examine student fee and price of attendance data over selected four-year public universities in Texas over a time dimension making it best suited for

panel analysis (Menard, 2002; Yaffee, 2003). Using sampling panel data with multiple variables over four or five years, panel data regression can support looking at the differences among and between institutions to explain how variables change over time (Menard, 2002; Xu et al., 2007; Yaffee, 2003). For a research project to determine the relationship between the term rate of student fees and institutional student retention rates, panel data regression will be best suited to understand four-year, public institutions for the six-year period.

A quantitative panel data regression also connects well to the theoretical perspective described in chapter two, which uses two economic models – Baumol's cost disease and Bowen's revenue theory of cost (Archibald & Feldman, 2014; Baumol & Bowen, 1965; Baumol, 1967). The author adopted Baumol's cost disease and Bowen's revenue theory of cost because these two combined theories help explain or postulate why institutions appear to need to increase the charges to their student populations despite the possible negative consequence of driving away the very consumers of their higher education product. These two theories appeared to me to explain the paradox of increasing student fees that support student success while potentially negatively impacting outcomes institutions use to measure student success. This paradox helped guide my research questions not only about how fees might be increasing, but over what period, to what student groups, and with what impact on retention.

Student enrollment, retention, and student charge financial data are well-suited for a quantitative study using theories about revenue and gaining resources to assist with desired outcomes (retention). Panel regression is often used with econometrics for educational research (Xu et al., 2007), thus the author adopted this standard approach. The data obtained by the author is described in detail in the research plan below, with most coming from IPEDS or calculated using IPEDS data. The panel data set supports the demands of panel data regressions, which

need point-in-time observations (Jacquette & Parra, 2014; Menard, 2002; Xu et al., 2007; Yaffee, 2003).

Data Collection and Sample Selection

Research projects are only successful if a research plan includes adequate time to access data and conduct statistical analysis. A common practice in econometrics of educational research is to use existing secondary data sets (Jacquette & Para, 2014; Xu, et al., 2007). This section outlines my research plan including participating institutions of higher education, data collection methods, data selection, and timeline.

This study used the institution as a level of analysis. IPEDS data is not collected at the individual student level, so discussion of the data relates to how the entire cohort of undergraduate students at the institution are paying the student fee. Previous research on student fees has included both private and public institutions (Black & Taylor, 2018; Kelchen 2016; Reinagel & Cooper, 2020); however, these same studies have articulated the vast differences between how public and private colleges and universities administer fees (Black & Taylor, 2018; Reinagel & Cooper, 2020). I made a strategic decision based on past literature to only include public institutions. First, these institutions have a greater focus on access, affordability, and social mobility than their private counterparts (Black & Taylor, 2016; Li, 2018, Sawmill, 2016). Second, these institutions typically have greater transparency about their costs (Black & Taylor, 2018; Kelchen 2016; Reinagel & Cooper, 2020; Sterritt, 2011). The researcher also determined that undergraduate students at these public institutions – most students enrolled at each university – would constitute the target student population. This mirrors all previous student research on the topic (Arnott, 2012; Black & Taylor, 2018; Davidson, 2021; Kelchen 2016;

Reinagel & Cooper, 2020; Sterritt, 2011). For IPEDS, the author used the following inclusion method when identifying public, four-year colleges and universities in the state of Texas:

- state or jurisdiction = **Texas**;
- sector = **Public, 4-year and above**,
- highest degree offered = **Master's degree, Doctor's degree - research/scholarship and professional practice, Doctor's degree - research/scholarship, Doctor's degree - professional practice, and Doctor's degree – other**
- Has first-time, full-time undergraduates = **Yes**

The first criterion limited the search to public and private institutions in the state of Texas. The next eliminated two-year and vocational institutions not awarding a bachelor's degree. The last two criteria narrowed the institutions in Texas from containing bachelor's degree-granting two-year institutions or community colleges as well as seven Health Science colleges or universities that primarily function for graduate and professional degrees. Thus, the IPEDS database produced a result of 35 higher education institutions meeting these four criteria. Figure 3.1 provides a table of the institutions selected.

Table 1: Current Study's Institutional Sample (N= 35)

HEI	Unique Id	Institution Name	Year	Undergraduate Total	All Student Total
1	222831	Angelo State University	2021	9121	10826
2	226091	Lamar University	2021	8377	16320
3	226833	Midwestern State University	2021	5041	5797
4	227526	Prairie View A & M University	2021	8444	9400
5	227881	Sam Houston State University	2021	18288	21612
6	228431	Stephen F Austin State University	2021	10353	12000
7	228501	Sul Ross State University	2021	1608	2100
8	228529	Tarleton State University	2021	11666	13995
9	224147	Texas A&M University-Corpus Christi	2021	8027	10762
10	226152	Texas A&M International University	2021	6890	8455
11	483036	Texas A&M University-Central Texas	2021	1774	2219

12	228723	Texas A&M University-College Station	2021	56723	72530
13	224554	Texas A&M University-Commerce	2021	7584	11504
14	228705	Texas A&M University-Kingsville	2021	5085	6405
15	459949	Texas A&M University-San Antonio	2021	6404	6893
16	224545	Texas A&M University-Texarkana	2021	1769	2112
17	229063	Texas Southern University	2021	5726	7524
18	228459	Texas State University	2021	33175	37864
19	229115	Texas Tech University	2021	33132	40542
20	229179	Texas Woman's University	2021	10290	16338
21	228769	The University of Texas at Arlington	2021	32962	45949
22	228778	The University of Texas at Austin	2021	40916	51991
23	228787	The University of Texas at Dallas	2021	21446	29696
24	228796	The University of Texas at El Paso	2021	20065	24003
25	229027	The University of Texas at San Antonio	2021	29801	34734
26	228802	The University of Texas at Tyler	2021	7185	9687
27	229018	The University of Texas Permian Basin	2021	4249	5534
28	227368	The University of Texas Rio Grande Valley	2021	26405	31940
29	225511	University of Houston	2021	16320	47031
30	225414	University of Houston-Clear Lake	2021	6764	9279
31	225432	University of Houston-Downtown	2021	13612	15077
32	225502	University of Houston-Victoria	2021	3037	4189
33	227216	University of North Texas	2021	32590	42441
34	484905	University of North Texas at Dallas	2021	3368	4120
35	229814	West Texas A&M University	2021	7083	9602

Data Collection

The primary data source for this project will be survey data collected through the Integrated Postsecondary Education Data System (IPEDS) from the National Center for Education Statistics (NCES). IPEDS collects characteristics, enrollments, and outcomes to categorize colleges and universities. These labels and characteristics allow researchers to narrow their research based on the questions they developed for this study (Aliyeva, et al.,2018; IPEDS Data Center Manual, 2015; Jaquette & Parra, 2014). Higher education institutions participating in Title IV programs (student financial aid) are solicited annually by NCIS to submit information through IPEDS self-reported surveys (Aliyeva, et al., 2018; *IPEDS Survey Methodology*, n.d.).

The IPEDS data collection process is web-based and has colleges and universities submit IPEDS data annually through 12 interrelated survey components. Results in the annual cycle are collected and reported in 3 periods (fall, winter, and spring) (*IPEDS Survey Methodology*, n.d.). IPEDS identifies responding institutions based on an assigned identification number (IPEDS Data Center Manual, 2015). This data collection process allows researchers to connect multiple data tables to create their panel dataset for their research needs.

When implementing a quantitative research study, careful data collection helps reduce issues during analysis (Creswell, 2015; Field 2013). Finding a single source for a majority or all the data would be preferrable. To answer the three separate research questions, this study required multiple institutions' student charges, enrollment characteristics, and student success outcome results in multiple academic years. While one could glean data from publicly available university websites or institutional surveys designed by the researcher, solicitation of all this information could be time-intensive, costly, and complicated. Thus, the secondary data collected through IPEDS is a much more preferred data source. IPEDS is a required annual institutional survey rooted in the Higher Education Act of 1965 and is compelled by institutions wanting to stay eligible for Title IV monies for student financial aid (Aliyeva et al., 2018; IPEDS Data Center Manual, 2015; Jaquette & Parra, 2014). Jaquette and Parra (2014) explain that IPEDS and its previous iteration, the Higher Education General Information Survey (HEGIS), have been the primary sources of panel data to examine and analyze trends and higher education financial, student, and other data changes for decades. Indeed, changes and adaptations in IPEDs have allowed for additional research as items like tuition and fees were disaggregated as a survey reporting function (Black & Taylor, 2018; Kelchen, 2016). In reviewing the IPEDS Data Center Users' Manual (2015) and utilizing the Data Center custom data sets online tool, the author

gleaned that IPEDS has longitudinal, institutional data related to student charges as well as student success outcomes data such as student retention and graduation rates. The IPEDS Data Center Users' Manual describes what is available:

> Data collected through IPEDS is publicly released and can be accessed through the IPEDS Data Center by postsecondary education institutions and the general public. The IPEDS Data Center is designed as a centralized, web-based tool for the retrieval and analysis of IPEDS data, and the system allows users to access and evaluate institutional data using a wide range of analytical features that include the ability to construct 49 customized data sets, download full data files, and create statistical and trend analyses reports. (IPEDS Data Center Manual, 2015, p. 1)

The IPEDS survey components gather annual aggregate data on institutional characteristics, student charges, enrollment, and student success outcomes. While the NCES does make some tweaks, the annual survey format gives consistency and structure to the data collection and makes the results more reliable for comparisons across institutions over the years (IPEDS Data Center Manual, 2015; Jaquette & Parra, 2014).

IPEDS data are the source of the dependent and independent variables. The dependent variable is student retention rates, available from existing IPEDS panel data from the Fall Enrollment (FE) survey component (IPEDS Data Center Manual, 2015; Jaquette & Parra, 2014). Proponents of mandatory fees, which financially support such items as libraries, sports or athletics, student services, and student health centers, argue these services and facilities provide additional support or experiences for students (Black & Taylor, 2018; Davidson, 2021; Cuillier & Stoffle, 2011; Kelchen, 2016) in service to institutional retention goals. This study sought to examine this possible relationship (fees and student retention). Thus, the independent variable – term rate of student fees as part of the institutional price of attendance – will be calculated using two IPEDS data fields from the student charges section of the Institutional Characteristics survey component (IPEDS Data Center Manual, 2015). To determine Fixed Effects, Allison (2009) articulates "measurements must be directly comparable, that is, they must have the same

meaning and metric" (p. 2). Thus, the author converted the student fee and price of attendance variables into a term rate to create an opportunity to consider possible fixed effects between the dependent and independent variables. The independent variable – term rate of fees – will be calculated by separate in-state and out-of-state variables because of how IPEDS and institutions report the data. This is also how student charges work at institutions. Students from inside a state are charged a rate that is subsidized by the taxpayers of the state for which they are local citizens. Those students who are international or from other states are usually charged a higher rate to account for a lack of taxpayers providing the subsidy (Archibald & Feldman, 2014).

Additional covariate variables related to undergraduate enrollment (institutional size) and enrollment of specific populations (student populations), such as how many Hispanic or African American students can be gleaned directly as continuous variables that are reported within the IPEDs system. To calculate whether an institution serves enough students to be considered a Hispanic Serving Institution (HSI), the author can divide the total Hispanic undergraduate enrollment reported by an institution by the total undergraduate enrollment report. This will create a continuous rate variable known as percent Hispanic or percent HSI.

The additional variables using institutional characteristics were created to provide a greater possible explanation of the relationship between the variables, specifically harkening to the research literature on college costs and student fees based on institutional type (Carnegie Classification) and student population served (Hispanic Serving Institutions, Historically Black Colleges & Universities – HBCUS, and Tribal Colleges) (Cage, 1992; Davidson, 2022; Jones, 2018; Keppler, 2010; Rames, 2000; Reinagel & Cooper, 2020; Scott & Bischoff, 2000; Sawmill, 2016; Trow, 1995). First, a dummy variable describing whether and institution is minority-serving in their student population can be designed by the author using three data existing from

the IPEDS survey components: IPEDS characteristics results for whether an institution is a 1) a Tribal College and 2) Historically Black Colleges and Universities (HBCU), and 3) calculations from IPEDS on whether an institution serves at least 25% of Hispanic students in its undergraduate enrollment (IPEDS Data Center Manual, 2015). Each minoritized student population could be coded a zero (no) or one (yes) as could one omnibus dummy code for institutions that were minority serving if they met the coded definition of 1 on any of the minority student population data (HBCU, HIS, or Tribal College). The Texas Higher Education Coordinating Board (THECB) articulates clear goals for greater racial minority enrollment and retention within Texas higher education as part of the state's 2015 and 2022 strategic plans (THECB, 2022). Extensive literature on the challenges of non-majority students being underserved in areas of access and affordability, as well as the unmet goal of social mobility (Altbach, 2014; Davidson, 2022; Li, 2018, Ortagus et al., 2020; Sawmill, 2016; THECB, 2022), support the creation of a variable to determine whether minority-serving institutions and non-minority-serving institutions' student retention are impacted at similar or differing rates. This variable would help with further disaggregating the results for policymakers to explore the results of financial decision-making on specific student populations. Further research on institutional size and type (Carnegie classification) is supported by extensive research on student fees being levied based on the type of the institution (Cage, 1992; Jones, 2018; Keppler, 2010; Rames, 2000; Reinagel & Cooper, 2020; Scott & Bischoff, 2000; Trow, 1995). Particularly of interest, the research proposes that doctoral research universities are more likely to be reliant on student fees than master's or comprehensive universities (Jones, 2018; Keppler, 2010; Rames, 2000; Scott & Bischoff, 2000; Trow, 1995). Creating variables on type can help the author corroborate whether this pattern exists for our institutional sample in Texas. All data sources

were available from existing secondary data or were able to be calculated quickly using that existing data. The existing data was used to create the study's dataset for analysis and results.

Variables & Model

Variables

This quantitative, longitudinal study has dependent, independent, co-variates, and dummy-coded variables for statistical analysis. Early questions related to student fees and their relationship with the price of attendance will be analyzed using descriptive statistics. The author can use the dummy-coded variables to also assist in patterns related to specific student populations-served or institutional types (Carnegie classification). Covariate variables, such institutional enrollment (size) and specific student population (variables) can be used to determine whether those variables produce additional results in the variation between the dependent and independent variable The following section describes the variables selected (or constructed) and their data source.

Student Fees

In-state required fees for full-time undergraduates: Charges to full-time undergraduate students for the full academic year for those students who meet the state's or institution's residency requirements. Fees are a fixed sum charged to students for items not covered by tuition and required of such a large proportion of all students that the student who does NOT pay the charge is an exception. The academic year constitutes the period generally extending from September to June; usually equated to 2 semesters or trimesters or 3 quarters. The researcher extracted the academic years 2017-2018, 2018-2019, 2019-2020, 2020-2021, 2021-2022, and 2022-2023 from the student charges

section of the Institutional Characteristics component of IPEDS (IPEDS Glossary, 2023-2024).

Out-of-state required fees for full-time undergraduates: Similar definition as in-state fees except charged to students who do not meet the state's or institution's residency definitions and/or who are international. The author extracted the academic years 2017-2018, 2018-2019, 2019-2020, 2020-2021, 2021-2022, and 2022-2023 from the student charges section of the Institutional Characteristics component of IPEDS (IPEDS Glossary, 2023-2024).

Price of Attendance

The price of attendance will be used as the denominator in the student fee rate term variable being constructed. The price of attendance is desegregated over the housing accommodation of the student. I made a conscious decision to take what averaged to the highest charged amount – which in most cases was the total price for in-state or out-of-state students living without their family; however, to determine this the researcher had to review the data to make comparisons and determine which variable would likely cover the most students and be most representative. Six variables were divided into in-state and out-of-state charges. 210 cases of each in-state and out-of-state were evaluated with the researcher selecting living off-campus without one's family as the most representative value for institutions within the study. Since each variable was needed for the comparison, all six are defined below.

Total price for in-state students living on campus: Cost of attendance for full-time, first-time degree/certificate-seeking in-state undergraduate students living on campus for an academic year. It includes in-state tuition and fees, books and supplies, on-campus room and board, and other on-campus expenses. The author extracted the academic years

for the period studied from the student charges section of the Institutional Characteristics component of IPEDS (IPEDS Glossary, 2023-2024).

***Total price for in-state students living off campus (not with family)**: Cost of attendance for full-time, first-time degree/certificate-seeking in-state undergraduate students living off campus (not with family) for an academic year. It includes in-state tuition and fees, books and supplies, off-campus (not with family) room and board, and other off-campus (not with family) expenses. The author extracted the academic years for the period studied from the student charges section of the Institutional Characteristics component of IPEDS (IPEDS Glossary, 2023-2024). *Price of Attendance variable selected for final analysis for in-state fee formula.

Total price for in-state students living off campus (with family): Cost of attendance for full-time, first-time degree/certificate-seeking in-state undergraduate students living off campus (with family) for an academic year. It includes in-state tuition and fees, books and supplies, and other off-campus (with family) expenses. The author extracted the academic years for the period studied from the student charges section of the Institutional Characteristics component of IPEDS (IPEDS Glossary, 2023-2024).

Total price for out-of-state students living on campus 2022-23: Cost of attendance for full-time, first-time degree/certificate-seeking out-of-state undergraduate students living on campus for an academic year. It includes in-out-of-state tuition and fees, books and supplies, on-campus room and board, and other on-campus expenses. The author extracted the academic years for the period studied from the student charges section of the Institutional Characteristics component of IPEDS (IPEDS Glossary, 2023-2024).

***Total price for out-of-state students living off campus (not with family)**: Cost of

attendance for full-time, first-time degree/certificate-seeking out-of-state undergraduate students living off campus (not with family) for an academic year. It includes out-of-state tuition and fees, books and supplies, off-campus (not with family) room and board, and other off-campus (not with family) expenses. The author extracted the academic years for the period studied from the student charges section of the Institutional Characteristics component of IPEDS (IPEDS Glossary, 2023-2024). *Price of Attendance variable selected for final analysis for out-of-state fee formula.

Total price for out-of-state students living off campus (with family): Cost of attendance for full-time, first-time degree/certificate-seeking out-of-state undergraduate students living off campus (with family) for an academic year. It includes out-of-state tuition and fees, books and supplies, and other off-campus (with family) expenses. The author extracted the academic years for the period studied from the student charges section of the Institutional Characteristics component of IPEDS (IPEDS Glossary, 2023-2024).

Student Retention

Full-time retention rate (year of study): The full-time retention rate is the percent of the (fall full-time cohort from the prior year minus exclusions from the fall full-time cohort) that re-enrolled at the institution as either full- or part-time in the current year. The author was able to glean five years of data – the academic year 2017-2018, 2018-2019, 2019-2020, 2020-2021, and 2021-2022 – from the Fall Enrollment component of IPEDs (IPEDS Glossary, 2023-2024). The author then imputed the previous five years of data to create a mean average used for the 2022-2023 retention rate for each institution of the study.

Covariates

(Grand) **Total Enrollment:** Grand total men and women enrolled for credit during the 12-month reporting period with credit meaning recognition of attendance or performance in an instructional activity (course or program) that can be applied by a recipient toward the requirements for a degree, diploma, certificate, or other formal award. The Grant Total enrollment variable can and will be sorted by level of student – in this case, sort out only the undergraduate population (IPEDS Glossary, 2023-2024). The author was able to glean six years of data – the academic year 2017-2018, 2018-2019, 2019-2020, 2020-2021, 2021-2022, and 2022-2023.

Total Undergraduate Enrollment: Using a filter by graduate and undergraduate, the author was then able to extract the undergraduate enrollment by years from 12-Month Enrollment survey component of IPEDS. Since the study's target population is undergraduate students, the author will use this variable as a proxy for institutional size.

Total Enrollment – Undergraduate by specific race: Using the first filer, undergraduate, and adding a second filter by race, the author then extracted undergraduate enrollments by three specific races: African American/black, Hispanic, and white/Caucasian by years from 12-Month Enrollment survey component of IPEDS. The total undergraduate Hispanic student population is important because it can be used along with the total undergraduate enrollment to determine if an institution has hit the 25% enrollment threshold that the US Department of Education uses to designate an institution Hispanic Serving (HSI)

Constructed Variables

Student fee rate term: The author constructed this variable by taking the in-state or out-of-state required fees of an academic year as the numerator and dividing it by the denominator of the in-state or out-of-state price of attendance for students living off-

campus without their families. This student fee rate term will allow the author to answer questions about the percentage of student fees that make up the price of attendance for four-year, public institutions in Texas as well as whether this value is increasing, decreasing, or staying flat over time. Secondly, this rate term allows for a later comparison in the relationship between student retention (rate) and student fees (converted from nominal to rate term variable). Two rate term variables will be created – one for in-state and one for out-of-state student fees. Student fee rate terms were constructed for all six years extracted – 2017-2023.

Institutional Characteristic Variable (D1) - Minority-Serving Institutions: The first dummy variable will compare institutions that are minority-serving (coded as 1) and non-minority-serving (coded as 0). Data will be extracted for each institution over the years being studied: 2017-2018 to 2022-2023. The author will construct this from three existing variables in IPEDS:

Tribal college: A code to indicate whether the institution is one of the Tribal Colleges and Universities. These institutions, with few exceptions, are tribally controlled and located on reservations. They are all members of the American Indian Higher Education Consortium. The information can be pulled for all six years of the study 2017-2023 and is part of the Institutional Characteristics component of the IPEDs survey in the Institutional Classifications section (IPEDS Glossary, 2023-2024).

. The variable is coded as follows:

- 1 = Yes
- 2 = No

The author included any institutions with 2 in the non-minority-serving institutions and any institution coded as 1 in the minority-serving institution variable.

Historically Black College or University (HBCU): A code to indicate whether the institution is one of the Historically Black College or University (HBCU) institutions. Historically Black Colleges and Universities (HBCU) - The Higher Education Act of 1965, as amended, defines an HBCU as: "...any historically black college or university that was established prior to 1964, whose principal mission was, and is, the education of black Americans, and that are accredited by a nationally recognized accrediting agency or association determined by the Secretary [of Education] to be a reliable authority as to the quality of training offered or is, according to such an agency or association, making reasonable progress toward accreditation." Federal regulations (20 USC 1061 (2)) allow for certain exceptions to the founding date (IPEDS Glossary, 2023-2024). The variable is coded as follows:

- 1 = Yes
- 2 = No

The author included any institutions with 2 in the non-minority-serving institutions and any institution coded as 1 in the minority-serving institution variable.

Hispanic-Serving Institution (HSI) - Hispanic Enrollment/Total Enrollment by Undergraduate Level of Student: IPEDS does not collect data on institutions classified as Hispanic-Serving Institutions (HSIs). To determine this institutional classification, the final variable construct used the Total Enrollment and Hispanic Total Enrollment for undergraduate students – both reported in the 12-Month Enrollment survey component of IPEDS – to determine whether that ratio value is greater than 25%.

Institutions with greater than 25% undergraduate Hispanic students are classified as Hispanic-serving institutions. The author will code the institutions with less than 25% as non-minority-serving institutions and those with 25% of greater Hispanic enrollment as minority-serving institutions for the author-constructed variable. A dummy coded variable HSI will be created with 0 being non-HSI and 1 being HIS.

Dummy-Coded Variable #2 (D2) – Carnegie Classification (0,1): Finally, the author will dummy code existing institutions in the study using one final existing IPEDS variable - Carnegie Classification 2018: Basic. This uses self-reported institutional classification using the Carnegie classification system designed to best describe the institutional primary mission. The author examined the existing five codes and collapsed them into a dichotomy of regional comprehensives (masters colleges and universities) and doctoral universities (inclusive of research universities).

Carnegie Classification 2018: Basic: Taken from the institutional classification section of the Institutional Characteristics component in IPEDS, the Basic Classification is an update of the traditional classification framework developed by the Carnegie Commission on Higher Education in 1970 to support its research program. The Basic Classification was originally published for public use in 1973 and subsequently updated in 1976, 1987, 1994, 2000, 2005, 2010, 2015, 2018, and 2021. In the 2018 update, the Doctoral Universities have been reshaped to better accommodate ‘Doctor's degree–professional practice’ within our methodology. Please see the Basic Classification Methodology for details regarding how this classification is calculated. The variable has 32 code classifications from Associate’s to Doctoral degree-granting institutions. The

author will recode these existing classifications into two dummy codes using existing defined categories. Authors dummy coding was as follows:

- 0 = Master's Colleges & Universities or Regional Comprehensives
- 1 = Doctoral Universities including Research Universities

The author does not anticipate many other institutional types being present based on how the institutional sample population of four-year public institutions was created. These two to three dummy variables were used to create greater contrasts in the relationship between the rate term of student fees and student retention rates with the sample population. These variables were also used for categorical analysis with the descriptive statistics being reported to answer question 1 about student fee rates and question 2 about student fee ratio of price of attendance.

Table 2: Summary of Variables

Variable Type	*Variable Name*
Panel Variable	*Institution*
Time Variable	*Year (2017-2023)*
Selection Criteria Variable(s)	*Four-Year, Public Institutions in Texas*
Dependent Variable	*Student Retention Rates*
Predictor Variables	*Rate Term of Student Fees In-State (constructed)* *Rate Term of Student Fees Out-of-State (constructed)*
Co-Variate Variables	*Institutional Size – Undergraduate Enrollment* *Percent Hispanic Institution (constructed)*
Dummy-coded Variables	*Minority-Serving Institutions (constructed)* *Tribal College* *Historically Black College or University (HBCU)* *Hispanic Serving Institution (HSI or non-HSI) (constructed)* *Carnegie Classification – Basic 18 (recoded 0,1)*

Model

For the fixed effects regression procedure (Crowson, 2021), we want to estimate β_1. Thus, the author has adopted the following models:

$$Y_1 = \beta_{0it1} + \beta_{it11}X_{it11} + \beta_{it12}X_{it12} + \beta_{it13}X_{it13} + \gamma_{i11}D_{i11} + \gamma_{i12}D_{i12} + u_{it1}$$

$$Y_2 = \beta_{0it2} + \beta_{it21}X_{it21} + \beta_{it22}X_{it22} + \beta_{it23}X_{it23} + \gamma_{i21}D_{i21} + \gamma_{i22}D_{i22} + u_{it2}$$

Y_{itk} = Student fall-to-fall retention rate across models (percentage/ratio value)
X_{it11} = Rate Term - In-state Required Fees/In-State Price of Attendance (percentage of fees within PoA)
X_{it21} = Rate Term - Out of State Required Fees/Out-of-State Price of Attendance (% of fees within PoA)
X_{it12} or X_{it22} = Undergraduate Enrollment
X_{it13} or X_{it23} = Percent Hispanic Enrollment (HSI)
β = regression weight of constant variables
γ = regression weight of dummy (discrete) variables
u = Error term
i = institution *(each college or university because institution is the level of measurement)*
t = time (each year being measured 2017-18 to 2022-23).

+Dummy Variables:
D_{11} or D_{21} = Minority-Serving Institutions (0,1) or Hispanic Serving Institution (HSI) (0,1)
D_{21} or D_{22} = Carnegie Classification (0,1)

Data Analysis Methodology

Upon extraction and preparation of the data from IPEDs, the author analyzed the data to answer the research questions posed. Descriptive statistics using the Explore function in SPSS 29 assisted the author in adequately evaluating the data for questions 1 (student fees) and question 2 (student fees as a proportion of price of attendance). Utilizing the previous work of Crowson (2021) related to Fixed Effects Panel Analysis, the Ordinary Least Squares regression using Dummy Variable Coding (LSDV) approach was adopted. The LSDV approach allowed the author to determine whether the model previously proposed explained any of the variance in the student retention rates across institutions and the period investigated.

For questions one and two, the data were gathered through the IPEDS custom data center and organized into a panel data set (observations = 210 based on institutions =35 across 6 academic years) using the variables previously described. Data screening was conducted before running frequency and descriptive statistics on the nominal variables for student fees and price of attendance. Descriptive statistics can adequately provide trend patterns and analysis for nominal-related variables (Creswell, 2015; Field, 2018; Menard, 2002). While it is a federal requirement to submit data to IPEDS for Title IV federal funding, issues with missing or incomplete data can still occur (Black & Taylor, 2018; Jaquette & Parra, 2014; Kelchen, 2016; Kelchen et al., 2017). If data could not be located or an explanation secured, the institution or institutions were dropped for the study. Three institutions were eliminated from the dataset due to incomplete information – Texas A&M University Central Texas, The University of Texas at Austin, and The University of Texas at Dallas. This meant the final panel data contained 192 observations for 32 institutions over the six years evaluated. The comparisons and trend data produced to answer questions 1 and 2 allowed the author to construct a rate term variable of student fees that could be used to conduct the Fixed effect panel regression analysis necessary to answer question three (Alison, 2009; Crowson, 2021; Pike & Graunke, 2015; Menard, 2002; Sanford & Hunter, 2011; Yaffee, 2005).

For question three, data were gathered through existing data from IPEDS (12-month enrollment component) for student retention and then constructed variables created from two existing data sets from a different IPEDS Component (Institutional Characteristics). The data panel set was organized into observations (N = 192) based on institutions selected n=32 and years t = 6 years based on the data screening for question 1 and 2. Using a general, flexible approach works best to model linear regression when variables occur in set data points such as

the ones in this panel (Pike & Graunke, 2015; Shek & Ma, 2011; Yaffee, 2005). Previous researchers who have analyzed the effects of institutional characteristics on student retention rates have adopted "fixed-effect regression models in conjunction with longitudinal panel data to account for unobserved heterogeneity. Panel data consists of a set of outcomes and explanatory variables (panels), each measured at multiple points in time for the same units" (Pike & Graunke, 2015, p. 2015). Since all our variables are known (all institutions in the population selected), the author elected to follow Crowson's (2021) Least Squares Dummy Variable to simulate a Fixed Panel Regression analysis in SPSS 29. Crowson (2021) demonstrates how this approach simulates a Fixed Effects Panel Analysis which is not a function of the SPSS software package. The author is choosing to use dummy variables for this regression model because the panel has between-groups factors that the author is hoping to incorporate to explain variation in institutional student retention rates (dependent variable). For this study, institutions are clustering variables by way of dummy coding. The dummy coded variables can be used as a form of hierarchical regression. They allowed the author to test the increment in R-square for student retention rates as a function of the time-varying predictors (rate-term student fees, enrollment, percent Hispanic enrollment) after accounting for all between-institution variation associated with the predictors as well as any other unmeasured variables that may be associated with this dependent variable (student retention rate). Thus, the author used institutions (minus one reference institution – UTEP) in block one of the regression to simulate model 1 and included the time-varying predictors and years of the study (minus the reference year of 2017-2018) to create model 2. R square change (delta) was used to determine variation being explained by the second model (or the model capturing the specified variables proposed by the author in this study).

Data Accuracy and Consistency

The data organization process for data protocols was made substantially easier by utilizing secondary data from a nationally recognized public database. Significant data entry protocols and a rigorous and layered review process within a prepopulated web-based survey ensure data submitted within institutional survey responses are complete and thorough (IPEDS Methodology, n.d.). The author's data panel was collected using the custom data portal of the IPEDS Data Center for the years 2017-2023. The author utilized panel data from data tables that were already screened and reviewed by data scientists within IPEDS and the NCES (IPEDS Manual, 2015; Jaquette & Parra, 2014). All constructed variables were created utilizing existing variables created within IPEDs to ensure greater reliability of the data. In the case of student retention data for 2022-2023, the data was imputed using the existing five years of student retention reported by institutions and using the mean average. Ultimately, three IPED survey component tables, Institutional Characteristics (IC), Fall Enrollment, and 12-Month Enrollment, were used to collect the variables (IPEDS Data Center Manual, 2015).

While this project probably did not need Institutional Review Board (IRB) approval through The University of Texas at El Paso's Human Subjects program, the Doctoral program required the author to renew his previous training on the topic to ensure ethical research practices and procedures were being followed. The project was submitted for review; however, the data from IPEDS does not meet the human subject's definition because student data are only available in summarized categories and only identifiable information is at the institutional level. As a result, the project was designated exempt, and no further action was required after the preliminary IRB review.

Assumptions, Limitations & Delimitations

The results and conclusions of this study should be evaluated considering the following assumptions, limitations, and delimitations.

The author made the following assumptions regarding the data reported to the IPEDS database by the selected institutions of this study (Black & Taylor, 2018; Jaquette & Parra, 2014; Kelchen, 2016; Kelchen et al., 2017; Miller, 2014):

1. The data collected is the most relevant for this study.
2. The data collected is consistent with the reporting requirements established by IPEDS data definitions and collection protocols.
3. The data are fairly and reliably reported, and accurately reflect current institutional circumstances.
4. Sufficient protections exist within the IPEDS data collection process to provide appropriate anonymity to students, faculty, and other human subjects, but not institutions involved in the study.

The project contained the following limitations related to data collection techniques and procedures employed by the IPEDS database for responding institutions (Black & Taylor, 2018; Jaquette & Parra, 2014; Kelchen, 2016; Kelchen et al., 2017; Kelchen et al., 2019; Miller, 2014):

1. “IPEDS cannot be used to address research questions that require detailed information about organizational subunits” since the primary level of analysis is at the institutional level (Jaquette & Parra, 2014, p. 529). Thus, conclusions can be drawn about a cohort experience but not necessarily can be generalized to individual students.

2. IPEDS data is subject to all limitations associated with self-reported data.
3. The data only includes institutions that chose to report to IPEDS for Title IV funding.
4. Despite federal funding requirements with reporting, some data are incomplete or missing for some institutions' responses.
5. IPEDS data may not accurately reflect the impact of the COVID-19 pandemic on institutional finances in the medium or long term (Kelchen et al., 2019).

The author made the following strategic delimitations when conducting this project and examining data reported within the IPEDS database by selected institutions:

1. *Delimited Subject:* The researcher purposely delimited the study of college costs to the study of mandatory fees to understand this factor's implication on the overall price of college and student retention rates. If institutions do not charge mandatory fees, this study may have significant limitations in relevance.
2. *Delimited Context*: While using secondary data from IPEDS presents an opportunity to use a national dataset with college cost variables from institutions representing all 50 states and the District of Columbia, the researcher intentionally narrowed the focus of this study's scope to public colleges and universities within Texas. Previous researchers who studied the national dataset articulated challenges across the longitudinal data being reported across all fifty states and DC (Kelchen, 2017). Texas was not represented in the states with issues presenting in their longitudinal reporting to IPEDS. The researcher has also identified that Texas represents a demographically representative state for the United States and has a state government that has indicated a high level of interest in higher education public policy as evidenced by

updating their 2015 higher education strategic plan in 2022 with newer, more ambiguous goals.

3. *Delimited institutional participants*: The project was delimited to four-year, public, institutions' undergraduate populations in Texas reporting into the IPEDS database. Undergraduate students pay more consistent fees across institutions and reporting across this larger student population presented fewer confounding variables both in terms of how institutions classified graduate students but also the types of tuition and fees being charged to various graduate student populations. The researcher identified public institutions as opposed to private institutions because of the uniformity of the information being provided by these institutions for a closer "apples to apples" comparison data set. Characteristics and data provided by private institutions present increased variability in the results. Public institutions – and those who provide a four-year degree bachelor's degree and not associate or certificates (i.e., community colleges) represent the general US public's understanding of what a college or university is.

   3. *Delimited variable*: With the price of attendance, institutions report the variable as disaggregated across the living arrangements of students classified as coming from both in-state and out-of-state. To simplify the correlational analysis, the researcher made a strategic decision to use only the cost of attendance for individuals living off-campus without their families. This may not be the best variable across all institutions but represented the best option for a majority of those participating.

Conclusion

This chapter has outlined the author's research plan including a more in-depth discussion of the quantitative methodological approach as well as the use of publicly available national longitudinal panel data. The author explained how a complete data set could be configured and obtained from IPEDS for four-year public institutions in Texas related to their fees, price of attendance, student retention rates, and associated constructed variables used for comparison purposes. Finally, the author described how the methods and statistical tools aligned with the research questions being posed in this study. As with any research study, assumptions, limitations, and delimitations were delineated.

Chapter 4 – Results

Introduction

This chapter provides the results of the longitudinal quantitative analysis outlined in the previous chapter. This panel data study used IPEDS academic year data between 2017-2018 and 2022- 2023, including imputing the retention rate for Fall 2023 (2022-2023 academic year) to match the number of years of data for the dependent variable with what was publicly available for the predictor variables. Selection criteria for institutions listed included being within Texas (state), public, four-year, and above (sector), master's degree and doctoral degrees (highest degree offered), and yes (having first-time, full-time undergraduates. After removing three institutions that were missing data during the selection six-year time frame, the institutions (n = 32) created 192 observations (N) over six (6) years (T). The data were organized and had descriptive (question 1 and 2) and inferential statistics (question 3) run in SPSS 29.

First, descriptive statistics of the variables were summarized to understand to possible increases in in-state student fees, out-of-state student fees, price of attendance of in-state students living off-campus without family, and price of attendance of out-of-state students living off campus without family. During this descriptive statistics analysis, time-invariant dummy coded variables were employed and determined to be less useful for the final regression model being proposed. Consequently, dummy variables for student populations (minority serving, dummy-coded) and institutional type (Carnegie classification Basic 18) were removed from the final panel analysis regression conducted. A more detailed explanation of removal of these dummy-coded variables is provided later. Second, descriptive statistics on rate term student fees for both in-state and out-state terms to determine if student fees were rising as a portion of either in-state or out-of-state price of attendance. Finally, inferential statistics, in this case a Least Squares

regression with Dummy Variables (LSDV) was conducted to determine if there was any relationship across the six-year period studied between institutional retention rates and rate term student fees including some additional covariates. The next sections are divided into subsections based on answering the three questions posed:

- R1: From 2017-2018 to 2022-2023, are the average amount of required (mandatory) student fees increasing at four-year, public universities in Texas?
- R2: From 2017-2018 to 2022-2023, are student fees becoming a greater percentage (proportion) of the overall price of attendance at four-year, public universities in Texas?
- R3: During the period studied (2017-2023), do mandatory student fees have any relationship with student retention at four-year, public universities in Texas?

Research Question 1: Student Fee Growth?

This first research question can be answered through descriptive statistics. For this study's models, both in-state and out-of-state mandatory student fee data was collected, so there are two questions embedded within the first research question if you desegregate by the two different types of fees. Due to their relevance to the second research question, I also examined the growth in price of attendance for in-state students living off-campus without a family as well as the price of attendance for out-of-state students living off-campus without a family.

R1a) In-State Fees

The average institution had in-state mandatory fees from academic years 2017-18 to 2022-2023 of $2689 (SD = $1006.00). The minimum mean was $1004 (just less than the standard deviation), and the maximum mean was $4547. The average change in mandatory in-state fees was $488 – just shy of $500. Table 3 demonstrates the annual change in in-state mandatory student fees over the six years examined. The number of observations was N = 192,

the number of institutions was n = 32, and the number of years was T=6. Not surprisingly, in-state mandatory student fees minimum and maximum all grew from the first year of the study to the last year, and the mean increased in the first five of six years and then dropped by approximately $100. Thus, the descriptive statistics support the research question assertion that in-state mandatory student fees are increasing (Black & Taylor, 2018; Glater, 2007; Kelchen, 2016; Sharpe, 2016; Wang, 2013) but at a more modest pace than anticipated from the research literature. This modest effect is best illustrated in Figure 1.

Table 3: *Descriptive Statistics for Mandatory In-State Student Fees (in $US) by Year Across Institutions*

Year	M	SD	Min	Max
2017-2018	$2390	$941.55	$300	$4096
2018-2019	$2548	$936.34	$1002	$4366
2019-2020	$2638	$962.40	$1002	$4533
2020-2021	$2804	$1038.34	$1008	$5030
2021-2022	$2979	$1061.77	$1014	$5236
2022-2023	$2878	$1066.39	$1014	$5236

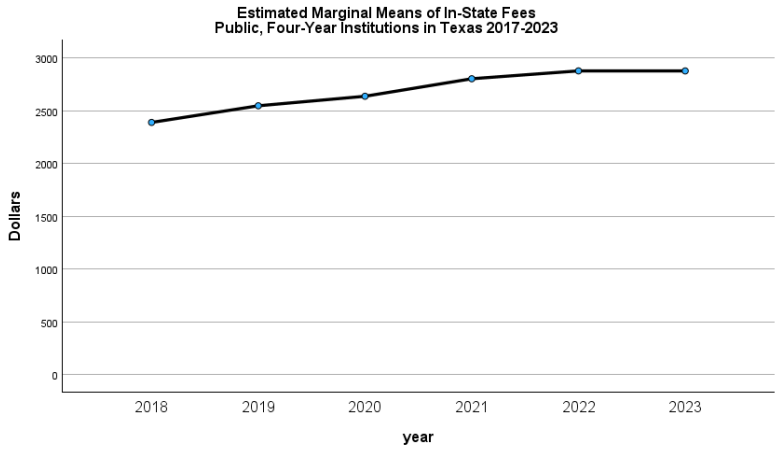

Figure 1: *Institutional Mean Average in Dollars for In-State Fees across years of the study (2017-2023)*

The variability of in-state fees between four-year, public institutions within Texas across all years of the study appears to corroborate the research literature assertion that greater freedom exists at the institutional-level on fees versus tuition (Armstrong et al., 2017; Reingel & Cooper, 2020). Three example institutions depicted in Figure 2 help demonstrate this phenomenon: the University of North Texas at Dallas (UNT Dallas), The University of Texas at El Paso (UTEP), and Texas A&M University at Commerce (TAMU Commerce). UNT Dallas represented the lowest fee rate in 2017-2018 at $300 but advanced rapidly to a final rate of $1678 in 2022-2023.

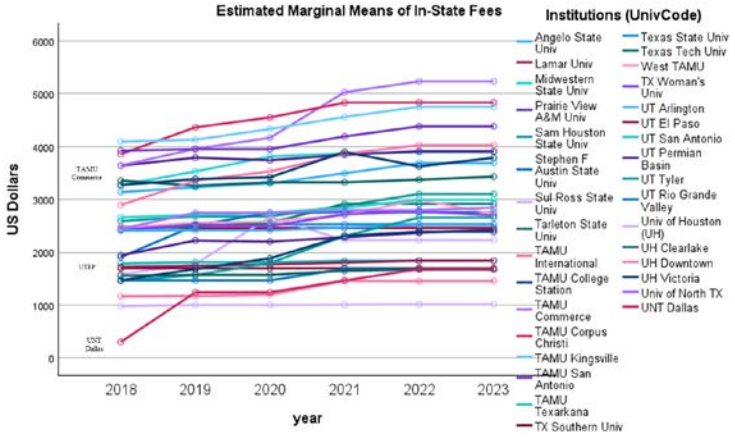

Figure 2: *Institutional Means in Dollars of In-state Mandatory Student Fees by Year*

While the mean student fee rate for UNT Dallas represented $1267 – on the low end of the final mean rates of the 32 sampled institutions – the six-year growth in fees represented a 459% increase. This outlier case appears to provide a test case in why some stakeholders are alarmed at the rise. The second institution, UTEP, which the researcher used as a reference point in later analysis due to his familiarity with the school, represents a case study in almost complete stability of student fees over the period examined. UTEP's in-state fees of $1720 in 2017-2018 was almost identical to its 2022-2023 fee of $1840. This increase of 7% basically equates to just over a percentage increase in each year. The third institution, TAMU Commerce, represents something in-between the two previous institutions. TAMU Commerce student fees in 2017-2018 of $3644 represented some of the highest in-state fees levied across the state of Texas. Only sister system institutions TAMU Corpus Christi, TAMU San Antonio, and TAMU Kingsville had higher in-state student fees in 2017-2018. TAMU Commerce finished the period examined with the highest in-state student fees levied at $5236. While the 44% increase over six years seems modest in comparison to the increases in UNT-Dallas, the increase at TAMU Commerce of $1592 over the six years is only $86 shy of the total final fee charge being levied in total by UNT-Dallas in 2022-2023 ($1678). In other words, the TAMU Commerce raised their in-state student fees, during the period examined, by the same dollar magnitude as the entirety of fees being charged at UNT-Dallas in 2022-2023. Again, the TAMU Commerce example appears to corroborate the research literature's alarm bells about institutions raising their mandatory fee rates rapidly. Table 4 depicts the wide variability presented in student fees across all 32 institutions within the population. Mean and standard deviation are provided across all six years, while means are provided in each of the years within the examined period. There is a stark

contrast for the academic year 2017-2018 of The University of Housing (UH) charging $982 or UNT-Dallas charging $300 for total in-state mandatory fees versus more than $3800 each for TAMU Corpus Christi, TAMU Kingsville, and TAMU San Antonio. The range is almost $3800 between the institution with the lowest and highest fees. These differences persist in the six years of the period examined with a range of greater range of $4232 between the $1004 charged by UH and the $5236 charged by TAMU Commerce.

Table 4: *Mean Averages for Mandatory In-State Student Fees (in $US) by Institution across period examined (2017-2023) and by individual year*

	M	*SD*	*M*	*M*	*M*	*M*	*M*	*M*
TX Instituition (n = 32)	**6YRS**	**6YRS**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**
Angelo State Univ	$3,426	$236.50	$3,140	$3,231	$3,305	$3,495	$3,691	$3,691
Lamar Univ	$2,465	$8.17	$2,482	$2,462	$2,462	$2,462	$2,462	$2,462
Midwestern State Univ	$3,714	$258.66	$3,270	$3,530	$3,813	$3,873	$3,899	$3,899
Prairie View A&M Univ	$3,808	$105.31	$3,641	$3,792	$3,743	$3,846	$3,912	$3,912
Sam Houston State Univ	$2,840	$225.70	$2,590	$2,680	$2,680	$2,880	$3,104	$3,104
Stephen F Austin State Univ	$2,573	$340.51	$1,908	$2,508	$2,748	$2,758	$2,758	$2,758
Sul Ross State Univ	$2,120	$384.54	$1,584	$1,777	$2,666	$2,230	$2,230	$2,230
Tarleton State Univ	$3,346	$57.67	$3,359	$3,260	$3,325	$3,325	$3,374	$3,432
TAMU International	$3,617	$446.30	$2,894	$3,358	$3,530	$3,865	$4,027	$4,028
TAMU College Station	$3,566	$247.69	$3,271	$3,386	$3,420	$3,901	$3,626	$3,790
TAMU Commerce	$4,545	$705.51	$3,644	$3,958	$4,168	$5,030	$5,236	$5,236
TAMU Corpus Christi	$4,547	$388.08	$3,860	$4,366	$4,553	$4,834	$4,835	$4,835
TAMU Kingsville	$4,439	$296.03	$4,096	$4,131	$4,335	$4,562	$4,755	$4,755
TAMU San Antonio	$4,132	$218.67	$3,924	$3,953	$3,953	$4,193	$4,385	$4,385
TAMU Texarkana	$1,822	$22.54	$1,785	$1,812	$1,812	$1,840	$1,840	$1,840
TX Southern Univ	$1,696	$0.00	$1,696	$1,696	$1,696	$1,696	$1,696	$1,696
Texas State Univ	$2,509	$37.01	$2,437	$2,501	$2,529	$2,529	$2,529	$2,529
Texas Tech Univ	$2,707	$234.16	$2,428	$2,504	$2,556	$2,917	$2,917	$2,917
West TAMU	$2,673	$183.17	$2,471	$2,559	$2,581	$2,708	$2,991	$2,729
TX Woman's Univ	$2,606	$143.41	$2,420	$2,528	$2,496	$2,718	$2,778	$2,695
UT Arlington	$2,459	$52.66	$2,410	$2,416	$2,416	$2,468	$2,521	$2,521
UT El Paso	$1,786	$50.20	$1,720	$1,744	$1,768	$1,804	$1,840	$1,840
UT San Antonio	$2,825	$144.08	$2,661	$2,706	$2,752	$2,842	$2,994	$2,994
UT Permian Basin	$2,240	$169.65	$1,942	$2,222	$2,202	$2,280	$2,368	$2,428
UT Tyler	$2,075	$537.00	$1,462	$1,566	$1,799	$2,306	$2,657	$2,657
UT Rio Grande Valley	$1,576	$118.31	$1,468	$1,468	$1,468	$1,684	$1,684	$1,684
Univ of Houston (UH)	$1,004	$11.89	$982	$1,002	$1,002	$1,008	$1,014	$1,014
UH Clearlake	$1,616	$55.40	$1,558	$1,570	$1,570	$1,648	$1,674	$1,674
UH Downtown	$1,317	$152.60	$1,166	$1,172	$1,196	$1,456	$1,456	$1,456
UH Victoria	$2,021	$397.79	$1,470	$1,681	$1,885	$2,311	$2,388	$2,388
Univ of North TX	$2,729	$145.54	$2,441	$2,749	$2,749	$2,795	$2,795	$2,845
UNT Dallas	$1,267	$512.64	$300	$1,240	$1,240	$1,466	$1,678	$1,678
All Institutions (Total)	**$2,689**	**$1,006.00**	**$2,390**	**$2,548**	**$2,638**	**$2,804**	**$2,879**	**$2,878**

Within in-state fees, the author also examined the mean averages across years and student populations served (Hispanic serving institutions versus non-Hispanic serving institutions).

Figure 3 represents a graphic depiction of how the mean scores of these institutions serving different student populations converge in year six of the period examined. The mean for non-Hispanic serving institutions (non-HSI) is $2669, HSI mean is $2223, and all institutions is in the middle at $2390 in 2017-2018. The difference in means represents $446 or 17% difference favoring lower costs at HSI institutions. By 2022-2023, this advantage of lower fees at HSI is erased. The 22-23 mean for in-state mandatory fees is $2857 at non-HSIs, $2884 at HSIs and $2878 at all institutions. The number of institutions becoming HSIs from non-HSI in Texas during this period affected the mandatory fees being attributed to HSI institutions (n = 20 in 17-18 versus n = 25 in 22-23). However, the fees at HSIs were also increasing. It appears this differentiation across student population served is probably less predictive in our model and the time-invariant dummy-coded variable for HSI vs. Non-HSI will be dropped for the analysis in the third question.

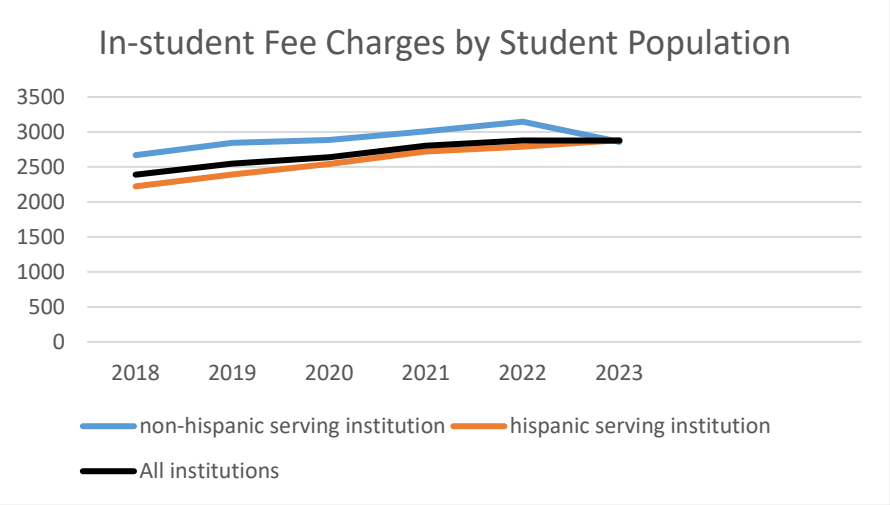

Figure 3: *Plotted Mean Averages in Dollars of In-State Fee Charges Across Years Desegregated by the Dummy Variable Hispanic Serving Institution (HSI) or Non-HSI and Across All Institutions*

The final dummy coded variable to review is Carnegie Classification 2018 which helped differentiate between types of institutions (master's level or regional comprehensives versus those who are primarily doctoral degree granting and research universities. Carnegie

classification mean score provided even less differentiation than institutions with student populations of non-HSI versus HSI. The 2017-2018 average mean for in-state mandatory student fees was $2287 at master's level/comprehensive universities versus $2470 at doctoral level institutions. This represents a $183 difference in mean scores. By 2021-2022, the mean scores difference was $12, or essentially same between comprehensive universities (M = $2872) and doctoral universities (M=$2884). This difference persists in the final year of the study with comprehensive universities mean of $2857 and doctoral universities mean in-state mandatory fees of $2894, or a difference in means of $37. This is a negligible difference and is a reason to remove this additional dummy coded, time-invariant variable from the originally proposed model for the third question analysis. Figure 4 depicts the average means by dummy-coded Carnegie Classification 2018 designation of master's level/comprehensive universities (n=14) or doctoral universities (n=18) across the six-year period examined.

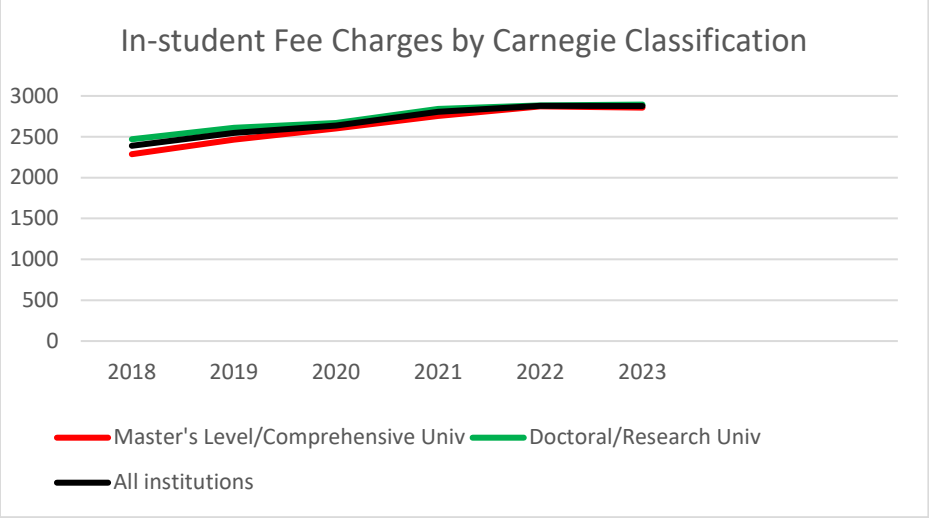

Figure 4: *Plotted Mean Averages in Dollars of In-State Fee Charges Across Years Desegregated by the Dummy Variable Carnegie Classification (Masters or Doctoral Universities) and Across All Institutions*

R1b) Out-of-State Fees

The average institution had out-of-state mandatory fees from academic years 2017-18 to 2022-2023 of $2821 (M = $2821.00, SD = $1277.46), or $132 more than the in-state mandatory fee average at these same institutions. The minimum mean was $1004, as it was with in-state fees, and the maximum mean was $6677 or approximately $2100 more than the average maximum for in-state mandatory fees. The average change in mandatory out-of-state fees was $591 – just shy of $600. This represents only a $100 average difference between the mean change between in state and out-of-state mandatory fees. The average belies the great deal of variability within institutions. Table 5 demonstrates the annual change in out-of-state mandatory student fees over the six years examined. The number of observations was N = 192, the number of institutions was n = 32, and the number of years was T=6. More importantly, Figure 5 depicts the modest change in out of state student fees across institutions and years during the period examined. There is remarkable similarity between the graphs depicting the relatively flat line showing in-state mandatory fee increases and the relatively flat line showing out-of-state mandatory student fee increases.

Table 5: *Descriptive Statistics for Mandatory Out-of-State Student Fees (in $US) by Year Across Institutions*

Year	M	SD	Min	Max
2017-2018	$2,466	$1,048.17	$300	$5,286
2018-2019	$2,645	$1,134.99	$1,002	$5,945
2019-2020	$2,767	$1,229.67	$1,002	$6,496

2020-2021	$2,941	$1,328.25	$1,008	$7,108
2021-2022	$3,049	$1,428.34	$1,014	$7,613
2022-2023	$3,057	$1,435.22	$1,014	$7,613

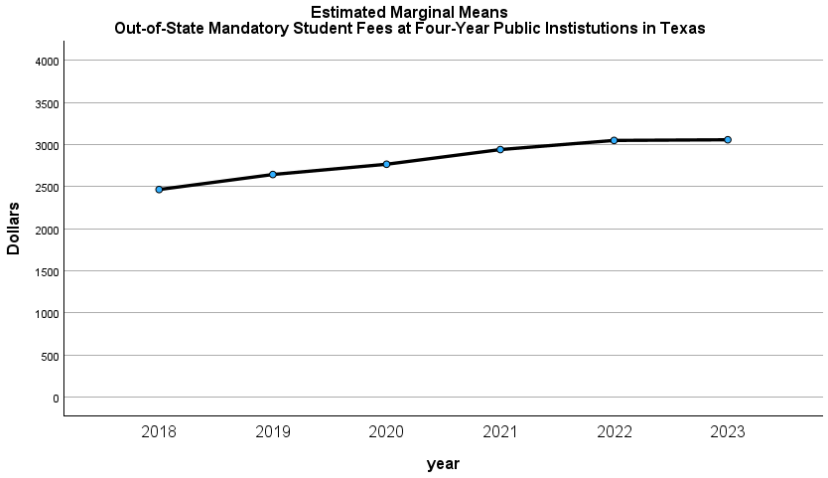

Figure 5: *Mandatory Out-of-State Student Fees (in $US) by Year Across Institutions*

Again, the variability in out-ot-state fees between four, year public institutions within Texas across all years of the study corroborated insights from the literature that greater freedoms seem to exist at the institutional-level related to student fee charges (Armstrong et al., 2017; Black & Taylor, 2017; Kelchen, 2016; Reingel & Cooper, 2020). We see even greater variability in the maximums charged by institutions in a similar three school example. The University of Houston, a flagship institution, had reasonably stable, low out-of-state fees across the years of the study – averaging around $1000. UTEP, previously used as a reference institution and in our institutional example of in-state fees, charged the out-of-state students the same fee charges as in-state students and only increased by $50 over the course of the six years examined. Finally, Texas A&M University Kingsville charged out-of-state students between $5200 (2017-2018) and $7600 (2022-2023) during the period evaluated. Figure 6 depicts the difference in means by

institutions across the six years. It also helps visualize the differences between the three specific example institutions.

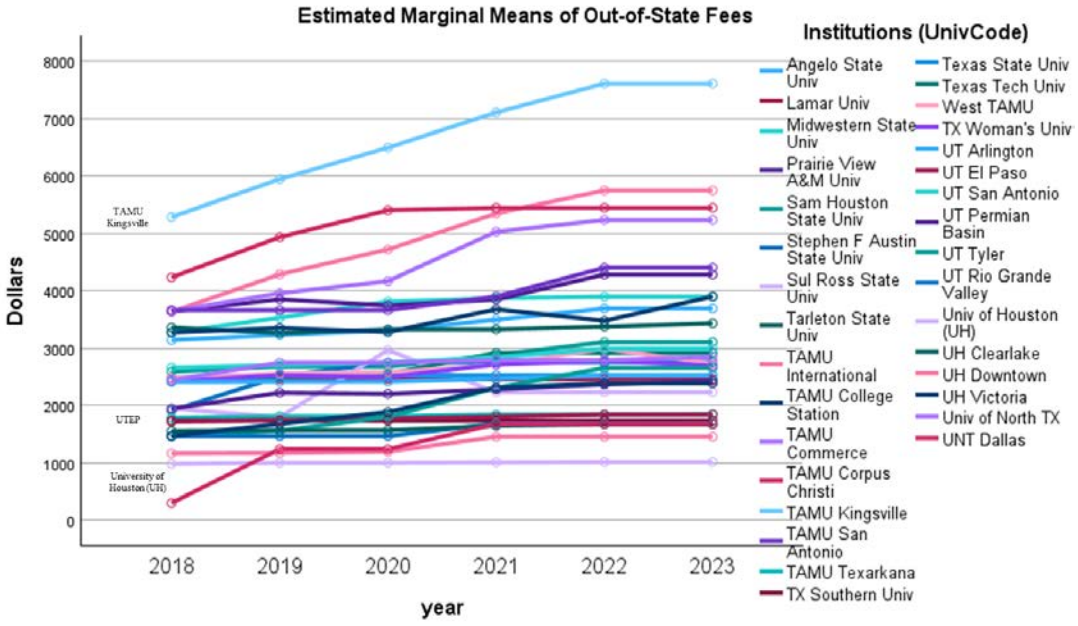

Figure 6: *Institutional Means in Dollars of Out-of-state Mandatory Student Fees by Year*

While TAMU Kingsville appears to be an outlier across the whole four-year public institution population, the rest of the TAMU system schools represented the high end of out-of-state student fees. TAMU San Antonio, TAMU Commerce, TAMU International, and TAMU Corpus Christi with fees greater than $4400 per out-of-state student to end the period examined (2022-2023). Even the flagship of this system, TAMU College Station charged out-of-state students $3900 in 2022-2023. Again, this $3900 compares to the University of Houston's $1014 per out-of-state student, or a $2886 difference at comparably sized, large universities with similar doctoral, high research missions. Table 6 provides greater detail on the mean differences across institutions over the entire six-year period evaluated as well as individual year means to visualize the changes between years at the same institution. Again, the institutional variance

within these institutions might help explain the greater emphasis in the literature about rising fees when those researchers looked across the US versus focusing on the state of Texas.

Table 6: *Descriptive Statistics for Mandatory Out-of-State Student Fees Across Years and Institutions*

	M	*SD*	*M*	*M*	*M*	*M*	*M*	*M*
TX Institution (n = 32)	**6YRS**	**6YRS**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**
Angelo State Univ	$3,426	$236.50	$3,140	$3,231	$3,305	$3,495	$3,691	$3,691
Lamar Univ	$2,465	$8.17	$2,482	$2,462	$2,462	$2,462	$2,462	$2,462
Midwestern State Univ	$3,714	$258.66	$3,270	$3,530	$3,813	$3,873	$3,899	$3,899
Prairie View A&M Univ	$3,942	$276.27	$3,641	$3,851	$3,743	$3,846	$4,284	$4,284
Sam Houston State Univ	$2,840	$225.70	$2,590	$2,680	$2,680	$2,880	$3,104	$3,104
Stephen F Austin State Univ	$2,573	$340.51	$1,908	$2,508	$2,748	$2,758	$2,758	$2,758
Sul Ross State Univ	$2,233	$403.16	$1,945	$1,796	$2,967	$2,230	$2,230	$2,230
Tarleton State Univ	$3,346	$57.67	$3,359	$3,260	$3,325	$3,325	$3,374	$3,432
TAMU International	$4,914	$854.79	$3,633	$4,286	$4,720	$5,349	$5,748	$5,748
TAMU College Station	$3,493	$250.83	$3,271	$3,351	$3,280	$3,677	$3,477	$3,900
TAMU Commerce	$4,545	$705.51	$3,644	$3,958	$4,168	$5,030	$5,236	$5,236
TAMU Corpus Christi	$5,152	$493.05	$4,233	$4,935	$5,406	$5,446	$5,446	$5,446
TAMU Kingsville	$6,677	$942.49	$5,286	$5,945	$6,496	$7,108	$7,613	$7,613
TAMU San Antonio	$3,948	$362.25	$3,662	$3,662	$3,662	$3,902	$4,400	$4,400
TAMU Texarkana	$1,823	$24.04	$1,785	$1,812	$1,812	$1,840	$1,840	$1,848
TX Southern Univ	$1,736	$0.00	$1,736	$1,736	$1,736	$1,736	$1,736	$1,736
Texas State Univ	$2,509	$37.01	$2,437	$2,501	$2,529	$2,529	$2,529	$2,529
Texas Tech Univ	$2,707	$234.16	$2,428	$2,504	$2,556	$2,917	$2,917	$2,917
West TAMU	$2,673	$183.17	$2,471	$2,559	$2,581	$2,708	$2,991	$2,729
TX Woman's Univ	$2,606	$143.41	$2,420	$2,528	$2,496	$2,718	$2,778	$2,695
UT Arlington	$2,459	$52.66	$2,410	$2,416	$2,416	$2,468	$2,521	$2,521
UT El Paso	$1,786	$50.20	$1,720	$1,744	$1,768	$1,804	$1,840	$1,840
UT San Antonio	$2,825	$144.08	$2,661	$2,706	$2,752	$2,842	$2,994	$2,994
UT Permian Basin	$2,240	$169.65	$1,942	$2,222	$2,202	$2,280	$2,368	$2,428
UT Tyler	$2,075	$537.08	$1,462	$1,566	$1,799	$2,307	$2,657	$2,657
UT Rio Grande Valley	$1,576	$118.31	$1,468	$1,468	$1,468	$1,684	$1,684	$1,684
Univ of Houston (UH)	$1,004	$11.89	$982	$1,002	$1,002	$1,008	$1,014	$1,014
UH Clearlake	$1,616	$55.40	$1,558	$1,570	$1,570	$1,648	$1,674	$1,674
UH Downtown	$1,317	$152.60	$1,166	$1,172	$1,196	$1,456	$1,456	$1,456
UH Victoria	$2,021	$397.79	$1,470	$1,681	$1,885	$2,311	$2,388	$2,388
Univ of North TX	$2,729	$145.54	$2,441	$2,749	$2,749	$2,795	$2,795	$2,845
UNT Dallas	$1,302	$535.88	$300	$1,240	$1,240	$1,678	$1,678	$1,678
Total	$2,821	$1,277.46	$2,466	$2,645	$2,767	$2,941	$3,049	$3,057

As with in-state fees, the author once again examined mean averages across years and student populations served (Hispanic serving institutions versus non-Hispanic serving institutions) as well as type of institution (Carnegie Classification 2018). The author used the two dummy-coded variables to evaluate whether a similar pattern emerged as did with in-state fees where these two variables became irrelevant to the model originally proposed. Figure 7 represents a graphic depiction of how the mean scores across years and student populations served (Hispanic serving institutions versus non-Hispanic serving institutions) cross in year six of the period examined. For out-of-state mandatory student fees, the mean for non-Hispanic serving institutions (non-HSI) is $2672, HSI mean is $2342, and all institutions is in the middle at $2466 in 2017-2018. The difference in means represents $330 or 14% difference favoring lower costs at HSI institutions (and representing less difference for HSI institutions than in-state fees). By 2022-2023, HSI have higher out-of-state mandatory fees than non-HSI institutions with the mean average of $2917 and $3097 at HSIs. HSI's now have a $180 mean average score than non-HSIs. Again, the number of institutions in Texas that started the survey as non-HSI and became HSI (n=5) affected this score; however, many existing HSIs also appear to have been increasing their out of state student fees. What is more helpful to the author in identifying a similar trend that will make the variable useful for the model is the mean average across both types of institutions with the total mean starting at $2466 and ending at $3057. The negligible difference in mean score indicates it is good to drop this variable (HSI) from our Out-of-State model. A line depicting the essential flatness across years within institutions serving both populations is seen in the dark black line in Figure 7 as another visualization of the lack of change within these fees across populations served.

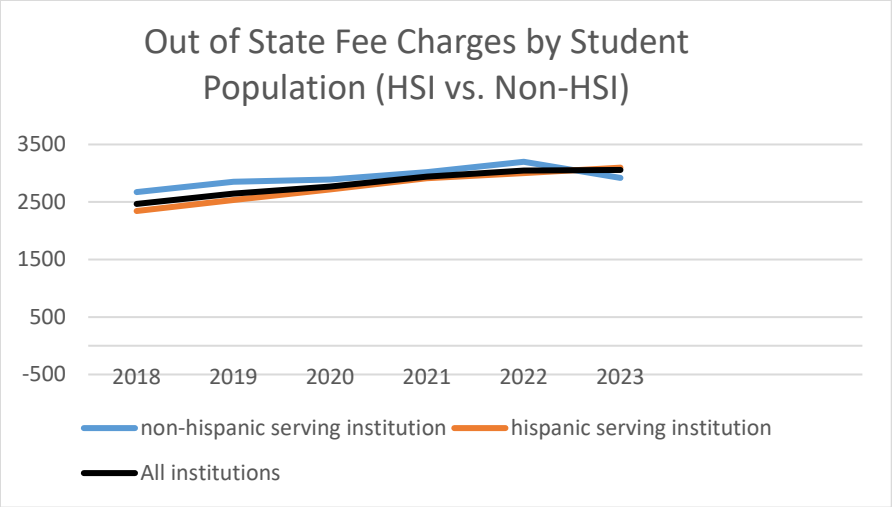

Figure 7: *Plotted Mean Averages in Dollars of Out-of-State Fee Charges Across Years Desegregated by the Dummy Variable Hispanic Serving Institution (HSI) or Non-HSI and Across All Institutions*

Carnegie Classification 2018, the dummy coded variable which helped differentiate between types of institutions, also produced little variation in mean scores for out-of-state mandatory student fees and followed similar pattern of narrowing between the institutional types by the end of the six-year period evaluated. The 2017-2018 average mean for out-of-state mandatory student fees was $2347 at master's level/comprehensive universities versus $2559 at doctoral level institutions. This represents a $212 difference in mean scores. By 2021-2022, the mean scores difference was $49, or essentially same between comprehensive universities (M = $3022) and doctoral universities (M=$3071). Again, similar with in-state fees, the slight difference persists in the final year of the study with comprehensive universities mean of $3008 and doctoral universities mean in-state mandatory fees of $3096, or a difference in means of $88. The mean score of comprehensive universities increases in five of the six years and six out of six years for doctoral universities; however, there is a negligible difference between the two types, and is a reason to remove this additional dummy coded, time-invariant variable from the originally proposed model for the third question analysis. Figure 8 depicts the average means by dummy-coded Carnegie Classification 2018 designation of master's level/comprehensive

universities (n=14) or doctoral universities (n=18) for out-of-state fees across the six-year period examined.

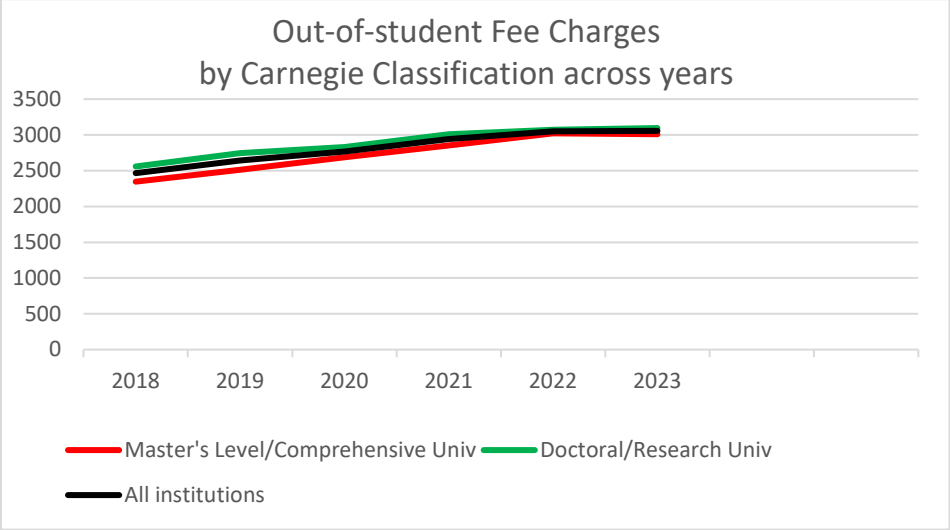

Figure 8: *Plotted Mean Averages in Dollars of In-State Fee Charges Across Years Desegregated by the Dummy Variable Carnegie Classification (Masters or Doctoral Universities) and Across All Institutions*

R1c & d Price of Attendance In-State and Price of Attendance Out-of-State

To compare a variable with a similar ratio metric to retention rate percentages, the study proposed the two models adjust the in-state and out-of-state fees dollars amounts into a rate term (ratio) by taking these fees divided by the price of attendance. The author reviewed the changes in these two variables – price of attendance in-state students living off-campus without family and price of attendance out-of-state students living off campus without family to demonstrate that, in addition to student fee charges increases, price of attendance is also increasing within both price of attendance charges. As with student fee charges, both in-state and out-of-state, the mean across institution and years was increasing but slightly and extremely stable. The variability occurred between institutions.

For price of attendance in-state students living off campus without family, the average mean across institutions was $22,558 in 2017-2018. Six years later, this same mean was

$24,129. This change represents a $1571 increase, or 7% increase over six years. While any increase in the price of attending college is difficult for consumers, 7% represents a modest increase during the period evaluated. Figure 9 illustrates this mean change over time across the universities.

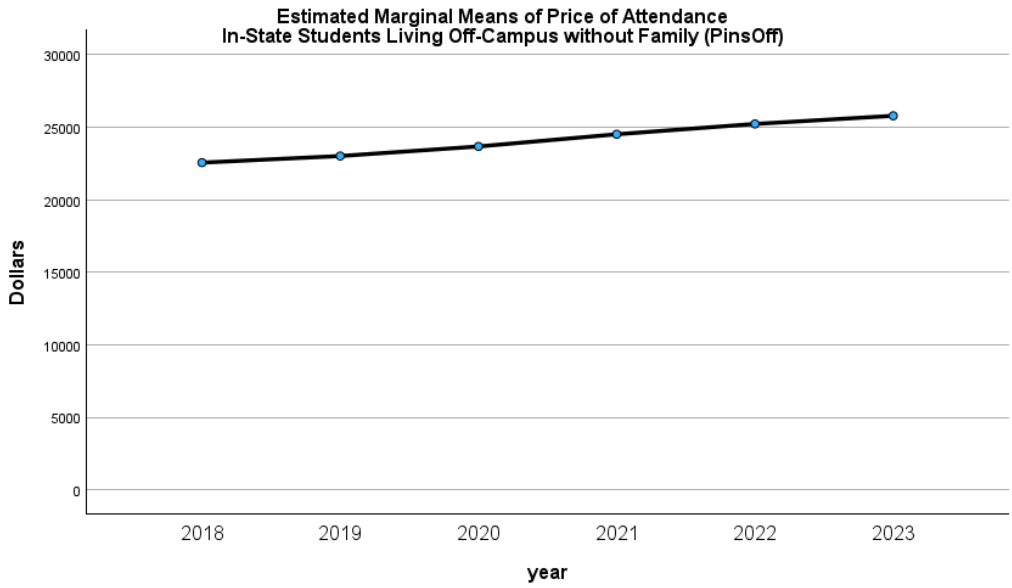

Figure 9: *Average Mean in Dollars for In-State Price of Attendance for Students Living Off Campus without family across years and institutions*

Variance in price of attendance occurs much between universities, where in 2017 the lowest mean price of attendance in 2017-2018 was $17,997 (~$18,000) at Texas A&M University International and highest was Texas Southern University at $29,320. The variability within the universities themselves varies considerably as well. Figure xx demonstrates the difference over time between all institutions, but specifically calls our attention to four case study institutions that show very different paths of price of attendance over the period studies compared to other institutions: Texas A&M International, The University of Texas at El Paso (UTEP), the University of Houston (UH), and Texas A&M University College Station. The University of Texas at El Paso demonstrates an example of a university in the middle to low end

of price of attendance at the beginning of the period (2018 M = $23,210) but mean price of attendance by 2023 was $27,962. This 20% increase of $4752 could have been caused by the rise in housing, books, travel, or other expenses to the institution. Regardless, it was considerable. A similar trend can be seen at Texas A&M International which boasts the least expensive price of attendance of any four-year public institution in Texas for five out of six years evaluated. However, TAMU International also saw a 20% increase in the period evaluated, or $3625 in the price of attendance over the six-year period. For both UTEP and TAMU International, who cater or attempt to attract students with less financial means, these increases surely affected the students attending these universities. While the price of attendance likely increased these students' borrowing ability for student financial aid, it likely means more borrowing of loans to cover these expenses. On the opposite end of the institutional spectrum, the University of Houston (UH) and Texas A&M University College Station both represent large, flagship universities who work to attract the best and brightest college students. In 2017-2018, the mean price of attendance for in-state students was at the high end for both institutions (UH, *M* = $27,581; TAMU College Station *M* = $28,476). University of Houston reported a drop and then leveling off its in-state price of attendance in 2023 with a mean of $26,725, or a 3% decrease in its in-state price of attendance. TAMU College Station reported the opposite trend seeing steady increases each year which made it the most expensive college to attend in Texas in the last five of the six years evaluated. TAMU College Station had a mean average price of attendance in 2022-2023 of $32,253, or $3,777, representing a 13% increase from six years earlier. While a smaller percentage increase than at TAMU International or UTEP, the increase represented a greater real dollar increase during the period and, again, cemented TAMU College Station as the institution in Texas with the highest price of attendance. TAMU College Station as a case study

is important because this institution has the largest enrollment in Texas at close to 70,000 students. Thus, with a larger number of students attending this institution, the price of attendance has implications for enrollment and college student debt for a greater number of Texas residents attending TAMU College Station. Figure 10 depicts this variation in mean averages in price of attendance in-state by institution across years.

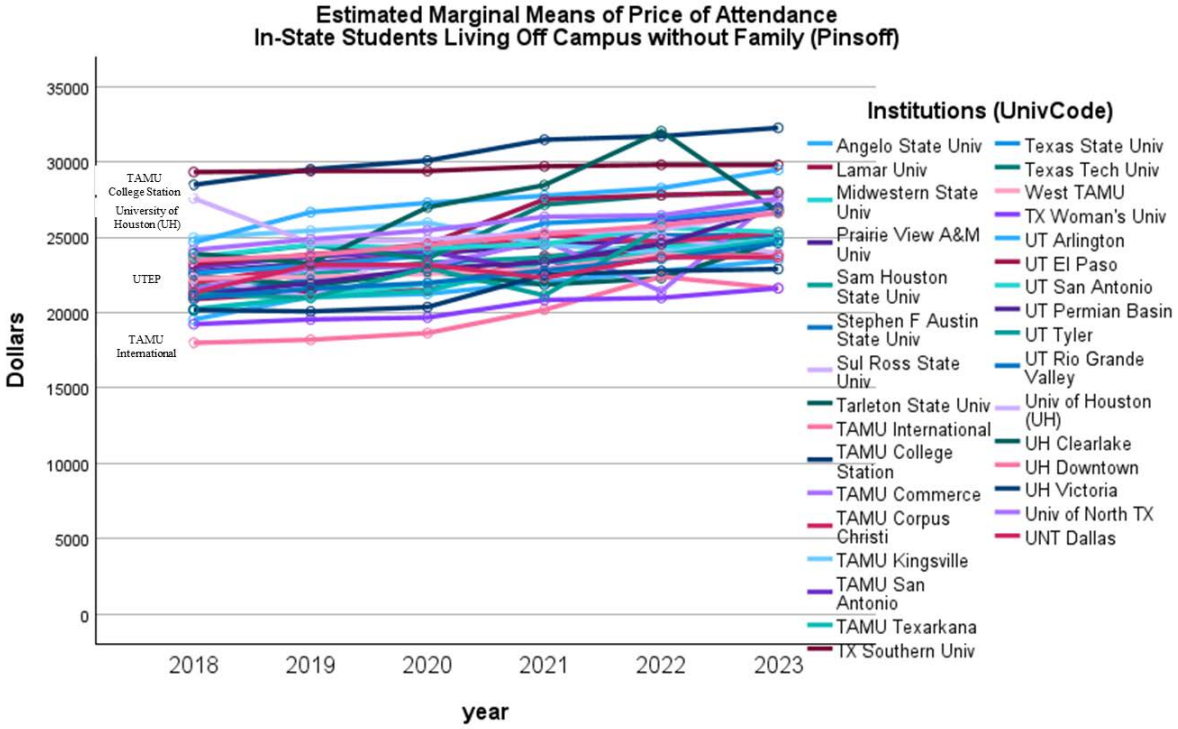

Figure 10: *Institutional Means in Dollars of In-State Price of Attendance by Year*

Finally, Table 7 provides an overall picture of price of attendance for in-state students living off-campus without family. A six-year average by institution as well as by each year is provided.

Table 7: *Descriptive Statistics for Price of Attendance for In-State Students Living Off Campus without Family (Pinsoff) across institutions by six-year average and each individual year.*

	M	*SD*	*M*	*M*	*M*	*M*	*M*	*M*
TX Institution (n = 32)	**6YRS**	**6YRS**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**
Angelo State Univ	$21,682	$1,387.22	$19,547	$21,046	$21,247	$22,017	$22,766	$23,466
Lamar Univ	$22,533	$1,429.30	$20,894	$21,353	$21,474	$23,759	$23,858	$23,858
Midwestern State Univ	$22,429	$1,814.09	$20,146	$21,069	$21,911	$22,336	$24,354	$24,755
Prairie View A&M Univ	$24,088	$985.38	$22,703	$23,277	$23,904	$24,476	$24,849	$25,319
Sam Houston State Univ	$23,492	$1,267.57	$21,702	$22,548	$23,326	$23,652	$24,612	$25,114
Stephen F Austin State Univ	$23,586	$1,740.77	$21,276	$22,156	$22,732	$25,118	$25,118	$25,118
Sul Ross State Univ	$23,728	$1,715.29	$22,282	$21,026	$24,806	$25,303	$25,004	$23,948
Tarleton State Univ	$22,651	$1,098.71	$22,477	$21,795	$22,730	$21,849	$22,286	$24,770
TAMU International	$19,840	$1,858.16	$17,997	$18,202	$18,645	$20,192	$22,381	$21,622
TAMU College Station	$30,581	$1,461.10	$28,476	$29,506	$30,083	$31,467	$31,703	$32,253
TAMU Commerce	$23,583	$2,370.36	$21,552	$22,941	$23,088	$24,753	$21,424	$27,740
TAMU Corpus Christi	$24,030	$1,297.39	$21,973	$23,146	$23,893	$25,171	$24,673	$25,322
TAMU Kingsville	$24,962	$684.27	$24,972	$25,432	$25,962	$24,515	$24,006	$24,882
TAMU San Antonio	$24,400	$1,691.01	$22,996	$23,712	$24,046	$22,703	$26,107	$26,836
TAMU Texarkana	$22,441	$1,803.02	$20,254	$20,994	$21,434	$23,344	$23,780	$24,840
TX Southern Univ	$29,567	$223.09	$29,320	$29,391	$29,391	$29,702	$29,799	$29,799
Texas State Univ	$24,792	$1,834.07	$22,625	$23,130	$23,791	$25,935	$26,275	$26,995
Texas Tech Univ	$25,776	$2,099.73	$23,633	$24,472	$23,590	$27,156	$27,782	$28,022
West TAMU	$22,949	$683.57	$22,282	$22,371	$22,571	$22,892	$23,838	$23,737
TX Woman's Univ	$20,318	$957.39	$19,237	$19,547	$19,677	$20,843	$20,982	$21,619
UT Arlington	$27,348	$1,626.17	$24,660	$26,660	$27,280	$27,754	$28,259	$29,475
UT El Paso	$25,807	$2,179.83	$23,210	$23,843	$24,521	$27,506	$27,800	$27,962
UT San Antonio	$24,664	$713.61	$23,693	$24,496	$24,257	$24,561	$25,631	$25,345
UT Permian Basin	$23,465	$2,053.82	$21,120	$21,958	$22,910	$23,352	$24,545	$26,905
UT Tyler	$23,109	$2,502.27	$21,212	$20,990	$22,969	$21,140	$25,644	$26,700
UT Rio Grande Valley	$22,585	$1,346.39	$20,983	$21,583	$21,968	$22,803	$23,563	$24,612
Univ of Houston (UH)	$25,770	$1,150.74	$27,581	$24,617	$24,854	$25,327	$25,516	$26,725
UH Clearlake	$26,894	$3,187.83	$23,918	$23,276	$26,986	$28,456	$32,030	$26,699
UH Downtown	$24,892	$1,195.64	$23,474	$23,808	$24,484	$25,208	$25,782	$26,596
UH Victoria	$21,468	$1,385.94	$20,179	$20,081	$20,371	$22,523	$22,761	$22,893
Univ of North TX	$25,811	$1,228.43	$24,162	$24,868	$25,454	$26,358	$26,456	$27,570
UNT Dallas	$22,886	$914.11	$21,328	$23,165	$23,166	$22,303	$23,678	$23,678
Total	**$24,129**	**$2,722.81**	**$22,558**	**$23,014**	**$23,673**	**$24,515**	**$25,227**	**$25,787**

A similar pattern emerges with Price of Attendance for out-of-state students living off campus without family. Again, the overall out-of-state price of attendance across institutions and

years was increasing but slightly and extremely stable (*M* = $35,596, *SD* = $6,217.19). The variability occurred between institutions. For price of attendance out-of-state students living off campus without family, the average mean across institution was $33,500 in 2017-2018. Six years later, this same mean was $37,627. This change represents a $4,127 increase, or 12% increase over six years. The change was greater by percentage and real dollars than the in-state price of attendance increase, but relatively modest across the period evaluated. Figure 11 provides a visualization of the mean score trend for out-of-state price of attendance.

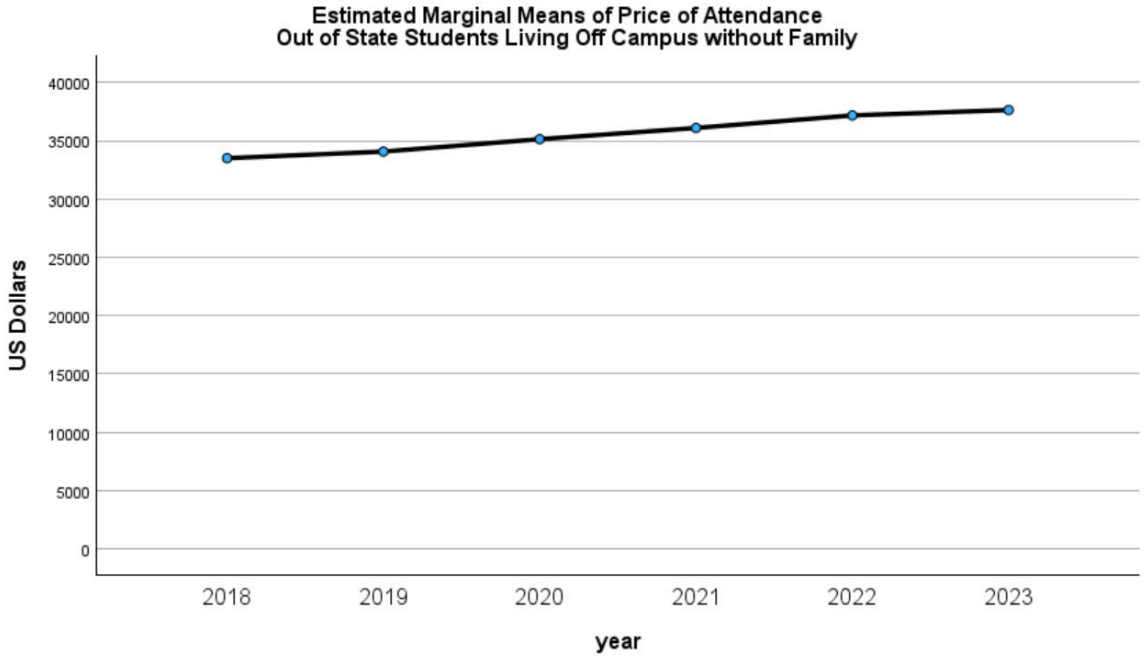

Figure 11: *Average Mean in Dollars for Out-of-State Price of Attendance for Students Living Off Campus without family across years and institutions*

Again, significant variance in out-of-state price of attendance occurs much between universities, where in 2017 the lowest mean price of attendance in 2017-2018 was $22,052 (~$22,000) at The University of Texas at Tyler (UT Tyler) and highest was Texas A&M University College Station at $53,848 (~$54,000). The difference at the extremes of $32,000 in out-of-state price of attendance is considerable in 2017 and widens slightly over the six-year period to approximately

$33,500 in 2023 (West TAMU, *M* = $25,632; TAMU College Station *M* = $59,153). The variability within the universities themselves varies considerably as well. Figure xx demonstrates the difference over time between all institutions, but also highlights three case study institutions that show very different paths of out-of-state price of attendance over the period studies compared to other institutions: UT Tyler, UTEP, and TAMU College Station. All three of these institutions saw increases in out-of-state price of attendance but by different magnitudes.

As has been the case in our previous examples, UTEP started and ended in the middle of the pack of institutions with an out-of-state price of attendance. UTEP had a mean of $36,955 in 2017 and $43,370 in 2023. The change over the six-year period represents $6,415, or a 17% increase. This is a substantial increase at an Access institution with an open admissions policy. In comparison, UT Tyler, a University of Texas system sister institution of UTEP, started at the bottom of the institutional grouping with a mean of $22,052 in 2017 and increased 77% (or $16,888) to $38,940. There appears to be some corrections to price of attendance happening with UT Tyler as its price of attendance reported climbs to a much closer number to other UT system schools, including UTEP. This institutional variance at UT Tyler moved the institution from the lowest price of attendance in 2017 to closer to the median across institutions in 2023. Our final example, Texas A&M College Station again finds itself at the top of college costs – this time the price of attendance. TAMU College Station kept itself as the highest out-of-state price of attendance by far of any public institution in Texas. The six-year mean change for TAMU College Station (2017 *M*= $53,848; 2023 *M* = $59,153) represented a modest 10% increase (or $5,305) by comparison to UTEP (17%, $6,415) and UT Tyler (77%, $16,888). However, with a mean of $59,153 in 2023, TAMU College Station's out-of-state price of attendance represented over a $12,000 increase from the next nearest institution, UT- Arlington (*M* = $ 47,047) as the

second highest out-of-state price of attendance. TAMU College Station is the largest public, four-year institution in the state of Texas. Reporting the highest price of attendance has implications for access and student debt for non-Texas college students. High out-of-state price of attendance is also relevant to UT Arlington that boasted an enrollment of over 41,000 students in 2023. This significant out-of-state price of attendance may be a policy lever that institutional leaders are using to combat higher price of attendance for in-state students. This does not appear to be true for TAMU College Station, which appears at the top of price of attendance for both in-state and out-of-state students. Figure 12 provides a strong visualization of the variance between and within institutions related to mean averages for out-of-state price of attendance. Table 8 provides the mean averages across institutions and across time as well as each individual year of the period examined.

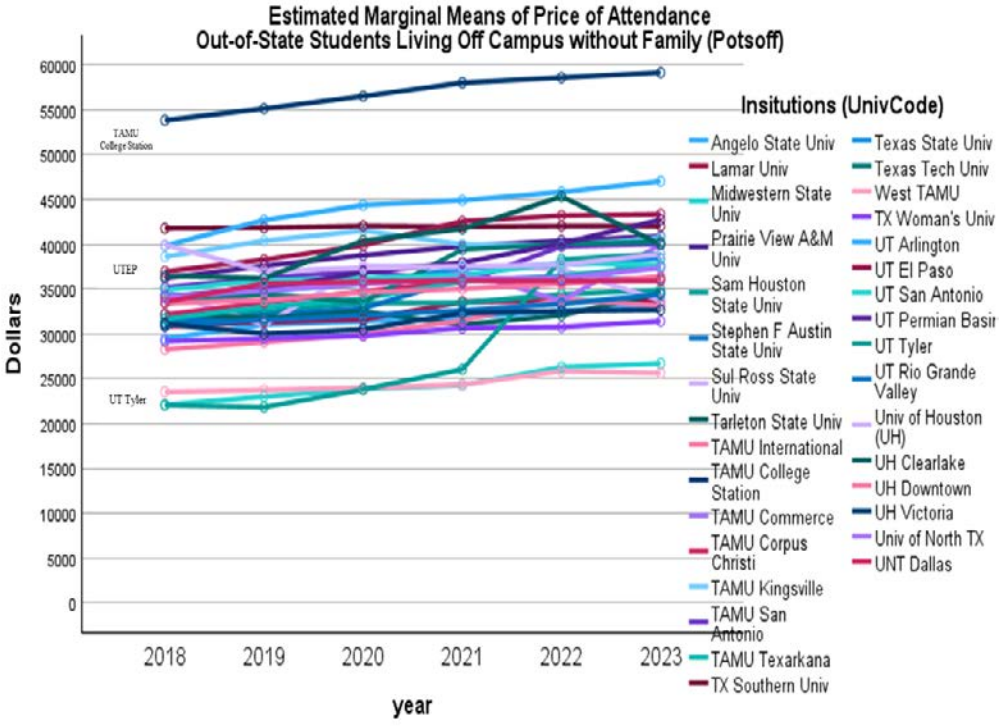

Figure 12: *Institutional Means in Dollars of Out-of-State Price of Attendance by Year*

Table 8: *Descriptive Statistics for Price of Attendance for Out-of-State Students Living Off Campus without Family (Potsoff) across institutions by six-year average and each individual year*

	M	*SD*	*M*	*M*	*M*	*M*	*M*	*M*
TX Institution (n = 32)	**6YRS**	**6YRS**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**
Angelo State Univ	$31,590	$1,304.18	$29,507	$31,006	$31,375	$31,833	$32,558	$33,258
Lamar Univ	$32,441	$1,319.41	$30,854	$31,313	$31,602	$33,575	$33,650	$33,650
Midwestern State Univ	$24,379	$1,814.09	$22,096	$23,019	$23,861	$24,286	$26,304	$26,705
Prairie View A&M Univ	$38,947	$1,783.78	$36,232	$37,587	$38,772	$39,775	$40,424	$40,894
Sam Houston State Univ	$33,400	$1,191.63	$31,662	$32,508	$33,454	$33,468	$34,404	$34,906
Stephen F Austin State Univ	$34,102	$2,284.20	$31,236	$32,116	$32,860	$36,134	$36,134	$36,134
Sul Ross State Univ	$35,305	$2,661.07	$34,732	$30,986	$37,557	$37,573	$37,244	$33,740
Tarleton State Univ	$32,356	$1,193.83	$32,221	$31,755	$32,500	$31,021	$32,078	$34,562
TAMU International	$30,977	$2,257.20	$28,265	$29,090	$29,963	$31,492	$33,894	$33,158
TAMU College Station	$56,881	$2,088.06	$53,848	$55,131	$56,532	$58,024	$58,598	$59,153
TAMU Commerce	$35,970	$2,313.43	$34,002	$35,391	$35,758	$37,023	$33,664	$39,980
TAMU Corpus Christi	$34,724	$1,615.38	$32,148	$33,523	$34,722	$35,961	$35,670	$36,319
TAMU Kingsville	$40,189	$972.70	$38,612	$40,409	$41,513	$40,002	$39,860	$40,736
TAMU San Antonio	$37,331	$2,097.02	$35,184	$36,215	$37,059	$35,698	$39,778	$40,052
TAMU Texarkana	$34,757	$2,255.42	$31,666	$33,023	$33,923	$35,853	$36,509	$37,569
TX Southern Univ	$41,952	$118.98	$41,770	$41,841	$42,051	$41,972	$42,039	$42,039
Texas State Univ	$36,351	$1,715.75	$34,245	$34,750	$35,607	$37,387	$37,699	$38,419
Texas Tech Univ	$36,863	$3,382.38	$33,425	$34,432	$33,550	$39,426	$40,052	$40,292
West TAMU	$24,514	$985.94	$23,553	$23,740	$23,977	$24,339	$25,844	$25,632
TX Woman's Univ	$30,226	$853.72	$29,197	$29,507	$29,806	$30,659	$30,774	$31,411
UT Arlington	$44,117	$2,543.14	$39,860	$42,697	$44,369	$44,900	$45,831	$47,047
UT El Paso	$40,711	$2,738.58	$36,955	$38,274	$39,884	$42,572	$43,208	$43,370
UT San Antonio	$36,547	$1,119.75	$34,892	$35,985	$36,258	$36,567	$37,928	$37,653
UT Permian Basin	$37,802	$3,218.30	$34,170	$34,948	$36,920	$37,942	$40,091	$42,743
UT Tyler	$28,496	$7,988.46	$22,052	$21,830	$23,809	$26,048	$38,298	$38,940
UT Rio Grande Valley	$32,494	$1,255.78	$30,943	$31,543	$32,096	$32,619	$33,355	$34,407
Univ of Houston (UH)	$38,078	$1,122.00	$39,941	$36,977	$37,382	$37,543	$37,708	$38,917
UH Clearlake	$40,024	$3,409.79	$36,470	$36,228	$40,422	$41,704	$45,326	$39,995
UH Downtown	$34,808	$1,118.17	$33,434	$33,768	$34,612	$35,024	$35,598	$36,412
UH Victoria	$31,540	$1,138.36	$31,124	$30,041	$30,499	$32,339	$32,553	$32,685
Univ of North TX	$35,723	$1,146.75	$34,122	$34,828	$35,582	$36,174	$36,272	$37,362
UNT Dallas	$35,467	$938.32	$33,568	$35,615	$35,837	$35,947	$35,918	$35,918
Total	$35,596	$6,217.19	$33,500	$34,065	$35,129	$36,090	$37,164	$37,627

Research Question 2: Rate Fee Term - Student Fee Growth as a proportion of Price of Attendance

R2a) Rate Term In-State Fees

Changing our student fees and price of attendance, which are collected in dollars, to a term rate percentage, allows us to compare a similar metric of percent rate Fall to Fall retention rate for four-year public institutions in Texas. The creation of this rate term variable allows us to answer the second research question, are mandatory student fees – in-state or out-of-state – becoming a greater proportion of the price of attendance? While the rate-term in-state fees increased slightly, the overall answer is that mandatory student fees for in-state students living off campus without family does not become a greater percentage of the price of attendance and trend line stays remarkably flat during the period evaluated.

In 2017-2018, the average four-year public institution in Texas had in-state mandatory fees that represented approximately 10.7%, or 11% of the price of attendance for in-state students living off campus without family (M = 10.7, SD = 4.35). The minimum mean was only 1.4% rate term versus the maximum rate term was 17.6 or mandatory in-state fees representing almost 18% of the in-state price of attendance. By 2022-2023, the average mean had risen to 11.3% with a standard deviation of 4.29% with a minimum mean of 3.8% and a maximum mean of 19.1%. Thus, the average mean masked the institutional variability that appears to be happening among public, four-year universities. One witnesses this variability most in academic year 2021-2022, where the highest institution's rate in-state fees was over 24% (M = 24.4) and the institution with the lowest rate term was less than 4% (M = 3.9) representing an almost 20% reported difference in rate terms between institutions. Despite this institutional variability, the overall trend demonstrates very little change over time in rate term in-state fees across period evaluated. There is only a .6 percent difference, or less than 1% change across in-state rate terms across institutions and over the six-year period. In other words, fees appear to be staying at approximately 10-11% of the price of attendance across institutions and over the period. Thus, the answer to question

two, for in-state fees, appears to be that in-state mandatory student fees did increase as a proportion of in-state price of attendance for students living off campus without families. However, this change of less than 1% for the period evaluated does not appear significant. Table 9 demonstrates stable change for rate term in-state student fees across institutions over the six years examined. The number of observations was N = 192, the number of institutions was n = 32, and the time, t = 6 years. Figure XX depicts the same trend in a graph.

Table 9: *Descriptive Statistics for In-State Fees Rate Term across institutions and years*

Year	M	SD	Min	Max
2017-2018	10.7	4.35	1.4	17.6
2018-2019	11.2	4.20	4.1	18.9
2019-2020	11.3	4.29	4.0	19.1
2020-2021	11.6	4.56	4.0	20.3
2021-2022	11.6	4.81	3.9	24.4
2022-2023	11.3	4.29	3.8	19.1

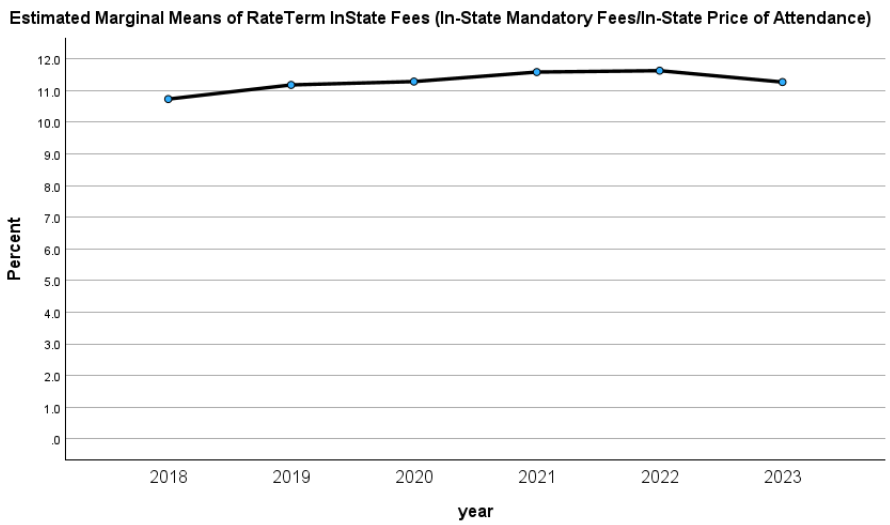

Figure 13: *Average Mean in Percent for Rate Term In-State Fees across years and institutions*

While the average mean across institutions and years showed remarkable stability, the mean averages within the institutions demonstrated some of the greater variability. Figure 14 allows us to show three case studies in rate term fees: Houston, UTEP, and TAMU Commerce. UTEP and the University of Houston show the trend across many of the institutions with University of Houston trending as the lowest mean percent of instate fees rate term of 3.9%. The institution had less deviation and stayed to in-state fees being approximately 4% of the in-state price of attendance over period evaluated. Similarly, UTEP was in the middle or lower half of the institutions evaluated at approximately 7% of instate fees as a percentage of in-state price of attendance. This institution again showed reliable stability with less than 1% change over the six years evaluated. As with other examples provided, institutions with the Texas A&M system provided case studies in variability. TAMU Commerce had an average mean in-state rate of 19.3% over the six-year period but peaked 24.4% in-state rate term in 2021-2022. The institution had the greatest variability at almost 3% (SD = 2.77) over the period evaluated. This institutional variability seems to support the insights within the literature about universities have a great deal of flexibility in setting their own in-state fees (Black & Taylor, 2018; Kelchen, 2016) as well as price of attendance (Kelchen, et al., 2017). The great deal of variability also appears to happen after the COVID-19 pandemic and thus could be more a product of the lingering financial difficulties that impacted institutions very differently across size, type, and geography (Kelchen, et al., 2019). Figure 13 provides a visualization of the variability among institutions in rate term in-state fees across the period. Table 9 provides an overall summary of the descriptive statistics of the in-state rate terms across institutions and years evaluated.

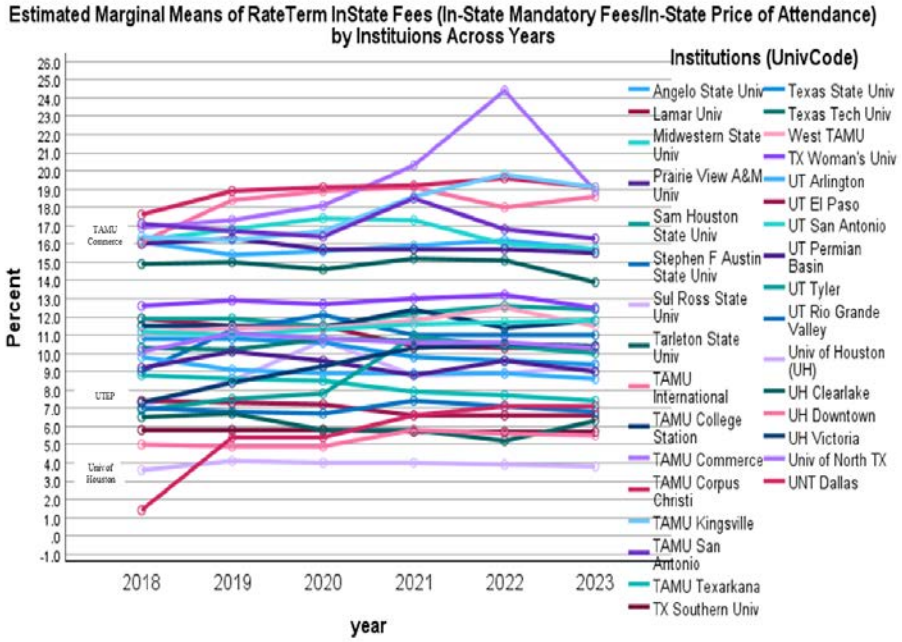

Figure 14: *Institutional Means in Percent of Rate Term In-State Fees by Year*

Table 10: *Descriptive Statistics for Rate Term In-State Fees across institutions by six-year average and each individual year*

	M	*SD*	*M*	*M*	*M*	*M*	*M*	*M*
TX Institution (n = 32)	**6YRS**	**6YRS**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**
Angelo State Univ	15.8	0.31	16.1	15.4	15.6	15.9	16.2	15.7
Lamar Univ	11.0	0.73	11.9	11.5	11.5	10.4	10.3	10.3
Midwestern State Univ	16.6	0.71	16.2	16.8	17.4	17.3	16.0	15.7
Prairie View A&M Univ	15.8	0.29	16.0	16.3	15.7	15.7	15.7	15.5
Sam Houston State Univ	12.1	0.40	11.9	11.9	11.5	12.2	12.6	12.4
Stephen F Austin State Univ	10.9	1.02	9.0	11.3	12.1	11.0	11.0	11.0
Sul Ross State Univ	8.9	1.17	7.1	8.5	10.7	8.8	8.9	9.3
Tarleton State Univ	14.8	0.48	14.9	15.0	14.6	15.2	15.1	13.9
TAMU International	18.2	1.09	16.1	18.4	18.9	19.1	18.0	18.6
TAMU College Station	11.7	0.39	11.5	11.5	11.4	12.4	11.4	11.8
TAMU Commerce	19.3	2.77	16.9	17.3	18.1	20.3	24.4	18.9
TAMU Corpus Christi	18.9	0.69	17.6	18.9	19.1	19.2	19.6	19.1
TAMU Kingsville	17.8	1.55	16.4	16.2	16.7	18.6	19.8	19.1
TAMU San Antonio	17.0	0.80	17.1	16.7	16.4	18.5	16.8	16.3
TAMU Texarkana	8.2	0.56	8.8	8.6	8.5	7.9	7.7	7.4
TX Southern Univ	5.8	0.05	5.8	5.8	5.8	5.7	5.7	5.7
Texas State Univ	10.2	0.64	10.8	10.8	10.6	9.8	9.6	9.4
Texas Tech Univ	10.5	0.23	10.3	10.2	10.8	10.7	10.5	10.4
West TAMU	11.6	0.49	11.1	11.4	11.4	11.8	12.5	11.5

TX Woman's Univ	12.8	0.26	12.6	12.9	12.7	13.0	13.2	12.5
UT Arlington	9.0	0.41	9.8	9.1	8.9	8.9	8.9	8.6
UT El Paso	7.0	0.39	7.4	7.3	7.2	6.6	6.6	6.6
UT San Antonio	11.4	0.31	11.2	11.0	11.3	11.6	11.7	11.8
UT Permian Basin	9.4	0.48	9.2	10.1	9.6	8.8	9.6	9.0
UT Tyler	8.9	1.71	6.9	7.5	7.8	10.9	10.4	10.0
UT Rio Grande Valley	7.0	0.26	7.0	6.8	6.7	7.4	7.1	6.8
Univ of Houston (UH)	3.9	0.18	3.6	4.1	4.0	4.0	3.9	3.8
UH Clearlake	6.1	0.55	6.5	6.7	5.8	5.8	5.2	6.3
UH Downtown	5.3	0.40	5.0	4.9	4.9	5.8	5.6	5.5
UH Victoria	9.4	1.30	7.3	8.4	9.3	10.3	10.5	10.4
Univ of North TX	10.6	0.35	10.1	11.1	10.8	10.6	10.6	10.3
UNT Dallas	5.5	2.15	1.4	5.4	5.4	6.6	7.1	7.1
Total	11.3	4.37	10.7	11.2	11.3	11.6	11.6	11.3

R2b) Rate Term Out-of-State Fees

To answer our first question about rising rates of student fees, the author learned that some institutions are charging the same mandatory student rate fee for both in-state and out of state students. Conversely, the mean average out of state price of attendance at all four-year public institutions (*M*=$35,596) was almost $11,400 greater than the mean average in-state price of attendance (*M=$24,129*). Thus, the author expected the rate terms for out-of-state fees to be a smaller proportion of out-of-state price of attendance. This was true as the average mean out-of-state fees rate term across institutions and years was. 8.1 (SD = 3.77) versus the in-state fee rate term was 11.3 (SD = 4.37). The over 3% less average mean difference for out-of-state fee rate term can be attributed to the higher out-of-state price of attendance reported across institutions.

The author noted the same trend across out-of-state fees rate terms mean average as was demonstrated in-state fees rate term: a 1% increase over a five-year period (2017-18 to 2021-2022) before ending slightly less than 1% in the sixth year of the period (2022-2023). In 2017-2018, the average four-year public institution in Texas had an out-of-state mandatory fees rate term that represented approximately 7.6, or 7.6% of the price of attendance for out-of-state students living off campus without family (*M* = 7.6, *SD* = 3.38). The minimum mean was only

.9% (or less than 1%) rate term versus the maximum rate term was 14.8 or mandatory in-state fees representing almost 15% of the in-state price of attendance. By 2022-2023, the average mean had risen to 8.3% with a standard deviation of 3.99% with a minimum mean of 2.6% and a maximum mean of 18.7%. Interestingly, the average mean and standard deviation crept upward in each of the previous four years (2018-2019 to 2021-2022) due to the average maximum mean changing by almost 4% (M=15.3, M=19.1). Both the average minimum and maximum average mean for out-of-state rate term ticked down in the academic year 2022-2023 contributing the .7% mean average difference across the six years versus a full 1% change present in the academic year 2021-2022. Table 11 provides descriptive statics for the out-of-state rate terms across institutions and the six-year period evaluated. Figure 15 depicts the very slight increase change in out-of-state fee rate term over time and across institutions. The change does not appear to be significant.

Table 11: *Descriptive Statistics for Out-of-State Fees Rate Term across institutions and years*

Year	M	SD	Min	Max
2017-2018	7.6	3.38	.9	14.8
2018-2019	8.0	3.49	2.7	15.3
2019-2020	8.1	3.73	2.7	16.0
2020-2021	8.4	3.98	2.7	17.8
2021-2022	8.5	4.20	2.7	19.1
2022-2023	8.3	3.99	2.6	18.7

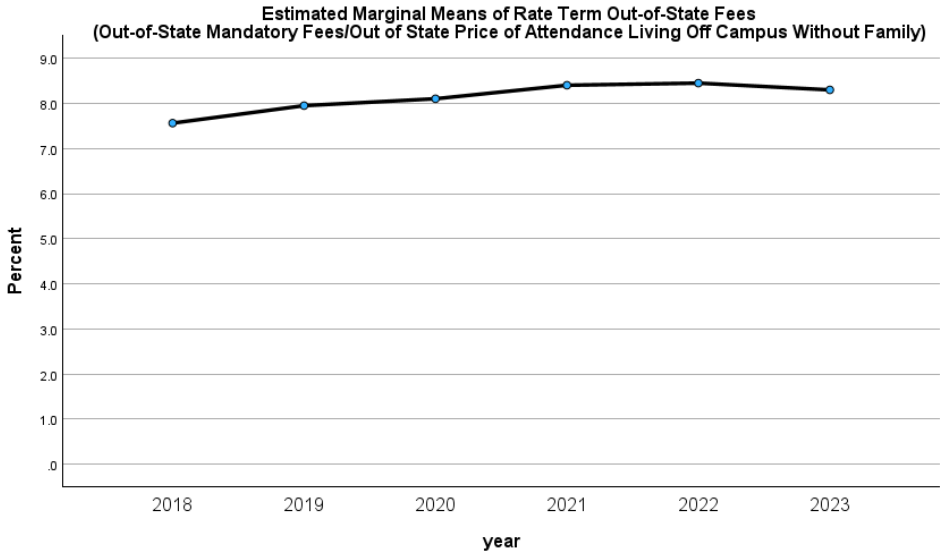

Figure 15: *Average Mean in Percent for Rate Term Out-of-State Fees across years and institutions*

The answer to question two, for out-of-state fees, appears to be that out-of-state mandatory student fees did increase as a proportion of out-of-state price of attendance for students living off campus without families. However, this change of less than 1% for the period evaluated does not appear significant. Figure xx demonstrates stable change for rate term in-state student fees across institutions over the six years examined. The number of observations was N = 192, the number of institutions was n = 32, and the time, t = 6 years. In other words, the proportion increased for out-of-state fees rate term, but it does not amount to a lot of difference across this segment of four-year, public higher education.

As was true with the institutional variability in-state rate term fees, out-of-state fees rate term continued to demonstrate the vast differences in rates charged across public, four-year universities in Texas. Figure 16 depicts the in-between institutional difference that shows the variability and showcases our three institutions of note: UTEP, TAMU Commerce, and TAMU Kingsville.

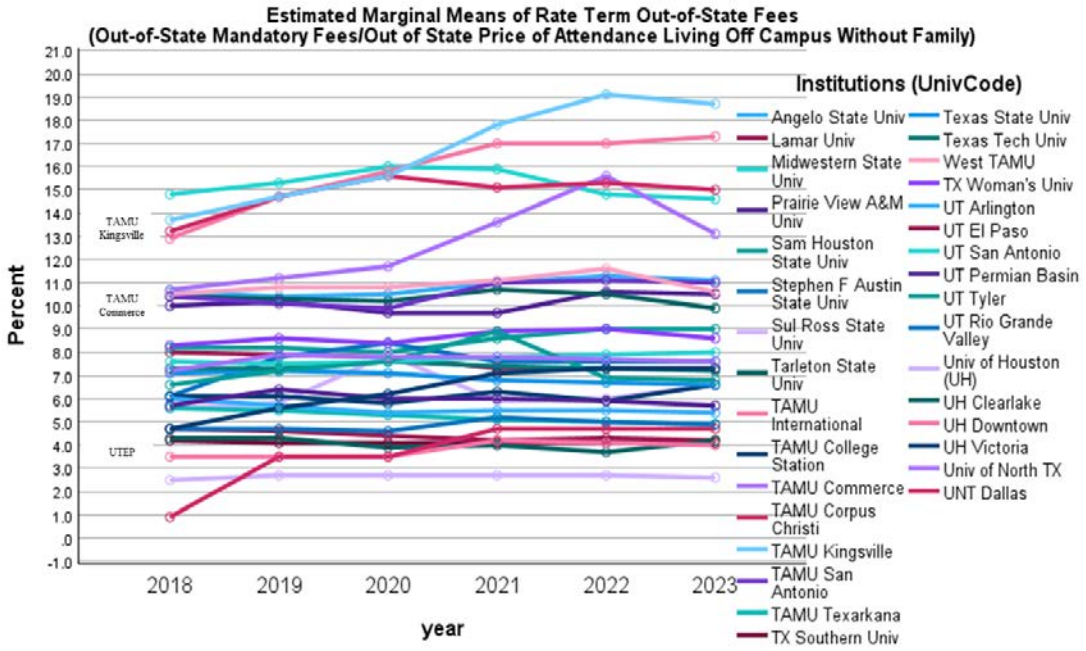

Figure 16: *Institutional Means in Percent of Rate Term Out-of-State Fees by Year*

UTEP provides an example of stable institutional variability in out-of-state rate term. The mean average in 2017-2018 was 4.7 compared to its mean average of 4.2 in 2022-2023. This demonstrates a half a percentage point decrease in the six-year period, but also points to incredibly stability in institutional rates across the period evaluated. This compares with TAMU Commerce and TAMU Kingsville that 2.4% and 5% increases over the same period. As with previous statistical analysis, the TAMU system appears to allow greater flexibility among its institutions and between the same institution from year to year. TAMU Commerce had an average mean out-of-state fees rate term of 10.7 in 2017-2018 and 15.6 in 2021-2022 – an almost 5% increase in the rate term over the five years – before dropping to mean average of 13.1 for academic year 2022-2023. TAMU Kingsville did not see as great a retreat in rate term fees in the six years of the period. Instead, this institution's mean score steadily increases from 2017-2018 (*M*= 13.7) to 2022-2023 (M = 18.7). Table 12 provides descriptive statistics of all the institutions across the period evaluated and at each individual year for out-of-state rate term.

Table 12: *Descriptive Statistics for Rate Term Out-of-State Fees across institutions by six-year average and each individual year*

TX Institution (n = 32)	*M* 6YRS	*SD* 6YRS	*M* 2017-18	*M* 2018-19	*M* 2019-20	*M* 2020-21	*M* 2021-22	*M* 2022-23
Angelo State Univ	10.8	0.37	10.6	10.4	10.5	11.0	11.3	11.1
Lamar Univ	7.6	0.33	8.0	7.9	7.8	7.3	7.3	7.3
Midwestern State Univ	15.2	0.60	14.8	15.3	16.0	15.9	14.8	14.6
Prairie View A&M Univ	10.1	0.39	10.0	10.2	9.7	9.7	10.6	10.5
Sam Houston State Univ	8.5	0.43	8.2	8.2	8.0	8.6	9.0	9.0
Stephen F Austin State Univ	7.5	0.76	6.1	7.8	8.4	7.6	7.6	7.6
Sul Ross State Univ	6.3	0.85	5.6	5.8	7.9	5.9	6.0	6.6
Tarleton State Univ	10.3	0.27	10.4	10.3	10.2	10.7	10.5	9.9
TAMU International	15.8	1.72	12.9	14.7	15.8	17.0	17.0	17.3
TAMU College Station	6.1	0.29	6.1	6.1	5.8	6.3	5.9	6.6
TAMU Commerce	12.7	1.82	10.7	11.2	11.7	13.6	15.6	13.1
TAMU Corpus Christi	14.8	0.85	13.2	14.7	15.6	15.1	15.3	15.0
TAMU Kingsville	16.6	2.24	13.7	14.7	15.6	17.8	19.1	18.7
TAMU San Antonio	10.6	0.52	10.4	10.1	9.9	11.0	11.1	11.0
TAMU Texarkana	5.2	0.28	5.6	5.5	5.3	5.1	5.0	4.9
TX Southern Univ	4.1	0.04	4.2	4.1	4.1	4.1	4.1	4.1
Texas State Univ	6.9	0.25	7.1	7.2	7.1	6.8	6.7	6.6
Texas Tech Univ	7.4	0.14	7.3	7.3	7.6	7.4	7.3	7.2
West TAMU	10.9	0.40	10.5	10.8	10.8	11.1	11.6	10.6
TX Woman's Univ	8.6	0.27	8.3	8.6	8.4	8.9	9.0	8.6
UT Arlington	5.6	0.23	6.0	5.7	5.4	5.5	5.5	5.4
UT El Paso	4.4	0.21	4.7	4.6	4.4	4.2	4.3	4.2
UT San Antonio	7.7	0.20	7.6	7.5	7.6	7.8	7.9	8.0
UT Permian Basin	6.0	0.26	5.7	6.4	6.0	6.0	5.9	5.7
UT Tyler	7.3	0.84	6.6	7.2	7.6	8.9	6.9	6.8
UT Rio Grande Valley	4.9	0.23	4.7	4.7	4.6	5.2	5.0	4.9
Univ of Houston (UH)	2.7	0.08	2.5	2.7	2.7	2.7	2.7	2.6
UH Clearlake	4.1	0.24	4.3	4.3	3.9	4.0	3.7	4.2
UH Downtown	3.8	0.33	3.5	3.5	3.5	4.2	4.1	4.0
UH Victoria	6.4	1.07	4.7	5.6	6.2	7.1	7.3	7.3
Univ of North TX	7.7	0.25	7.2	7.9	7.8	7.8	7.7	7.6
UNT Dallas	3.7	1.48	0.9	3.5	3.5	4.7	4.7	4.7
Total	8.1	3.77	7.6	8.0	8.1	8.4	8.5	8.3

Research Question 3: Over time and across selected institutions, what is the relationship of full-time retention rate relationship with rate term of fees (in-state or out-of-state), undergraduate enrollment, and percent Hispanic enrollment?

To answer question three, the author needed to employ inferential statistics using a variation on the models proposed in Chapter Three of this study. The author wanted to know is there a relationship between student retention rates and the rate term of student fees with factors along institutional size or types of student populations served? Crowson (2021) provides an outline of how to use an Ordinary Least Squares Regression with Dummy Coding to receive results of a Fixed Effects Panel Analysis Regression in SPSS 29. The author selected the dependent variable of Percent Retention and used a two-step entering method into SPSS for the predictor variables. For box to capture a model 1 that only accounted for the dummy coded institutions, the author selected all the institutional dummy-coded variables minus the one reference institution – institution #25 – The University of Texas at El Paso – for which the author could later compare institutional change. For the second box, the author entered the model years minus the reference year of 2017-2018 as comparison as well as three proposed predictor variables of rate term fees (in-state rate term or out-of-state rate term), undergraduate enrollment (to capture institutional size differences), and percent Hispanic student enrollment (to capture student population served differences). The author conducted this Fixed Effect Panel Regression analysis twice to answer the two separate questions – whether a correlation or relationship between student retention percentage and in-state rate term fees and between student retention percentage and out-of-state fees rate term.

R3a) Student Retention Percentage & In-State Fee Rate Term with Covariates

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.951[a]	.905	.887	3.175	.905	49.136	31	160	<.001
2	.957[b]	.916	.895	3.058	.011	2.565	8	152	.012

a. Predictors: (Constant), UnivCode=35.0, UnivCode=34.0, UnivCode=33.0, UnivCode=32.0, UnivCode=31.0, UnivCode=30.0, UnivCode=29.0, UnivCode=28.0, UnivCode=27.0, UnivCode=26.0, UnivCode=22.0, UnivCode=21.0, UnivCode=20.0, UnivCode=19.0, UnivCode=18.0, UnivCode=17.0, UnivCode=16.0, UnivCode=15.0, UnivCode=13.0, UnivCode=12.0, UnivCode=11.0, UnivCode=10.0, UnivCode=9.0, UnivCode=8.0, UnivCode=7.0, UnivCode=6.0, UnivCode=5.0, UnivCode=4.0, UnivCode=3.0, UnivCode=2.0, UnivCode=1.0

b. Predictors: (Constant), UnivCode=35.0, UnivCode=34.0, UnivCode=33.0, UnivCode=32.0, UnivCode=31.0, UnivCode=30.0, UnivCode=29.0, UnivCode=28.0, UnivCode=27.0, UnivCode=26.0, UnivCode=22.0, UnivCode=21.0, UnivCode=20.0, UnivCode=19.0, UnivCode=18.0, UnivCode=17.0, UnivCode=16.0, UnivCode=15.0, UnivCode=13.0, UnivCode=12.0, UnivCode=11.0, UnivCode=10.0, UnivCode=9.0, UnivCode=8.0, UnivCode=7.0, UnivCode=6.0, UnivCode=5.0, UnivCode=4.0, UnivCode=3.0, UnivCode=2.0, UnivCode=1.0, year=2023.0, year=2022.0, year=2021.0, year=2020.0, year=2019.0, insRTfees, PCT_UGHISP, UG_ENROL

Figure 17: *Model Summary LSDV Regression for Student Retention with In-State Rate Term as well as covariable variables (R-square values highlighted)*

The R square valued for Model 1, which includes all the institutions in our study, accounted for .905, or 90% of the total variation in the student retention rates. It appears most of the variability in student retention can be attributed to differences between institutions. More importantly, the R-square for the second model is .916, indicating that the set of dummy variables (institutions and time) and the time-varying predictors (in-state rate terms, undergraduate enrollment, and percent Hispanic enrollment) accounted for 91.6% of the total variation in the student retention rate dependent variable.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.951[a]	.905	.887	3.175	.905	49.136	31	160	<.001
2	.957[b]	.916	.895	3.058	.011	2.565	8	152	.012

a. Predictors: (Constant), UnivCode=35.0, UnivCode=34.0, UnivCode=33.0, UnivCode=32.0, UnivCode=31.0, UnivCode=30.0, UnivCode=29.0, UnivCode=28.0, UnivCode=27.0, UnivCode=26.0, UnivCode=22.0, UnivCode=21.0, UnivCode=20.0, UnivCode=19.0, UnivCode=18.0, UnivCode=17.0, UnivCode=16.0, UnivCode=15.0, UnivCode=13.0, UnivCode=12.0, UnivCode=11.0, UnivCode=10.0, UnivCode=9.0, UnivCode=8.0, UnivCode=7.0, UnivCode=6.0, UnivCode=5.0, UnivCode=4.0, UnivCode=3.0, UnivCode=2.0, UnivCode=1.0

b. Predictors: (Constant), UnivCode=35.0, UnivCode=34.0, UnivCode=33.0, UnivCode=32.0, UnivCode=31.0, UnivCode=30.0, UnivCode=29.0, UnivCode=28.0, UnivCode=27.0, UnivCode=26.0, UnivCode=22.0, UnivCode=21.0, UnivCode=20.0, UnivCode=19.0, UnivCode=18.0, UnivCode=17.0, UnivCode=16.0, UnivCode=15.0, UnivCode=13.0, UnivCode=12.0, UnivCode=11.0, UnivCode=10.0, UnivCode=9.0, UnivCode=8.0, UnivCode=7.0, UnivCode=6.0, UnivCode=5.0, UnivCode=4.0, UnivCode=3.0, UnivCode=2.0, UnivCode=1.0, year=2023.0, year=2022.0, year=2021.0, year=2020.0, year=2019.0, insRTfees, PCT_UGHISP, UG_ENROL

Figure 18: *Model Summary LSDV Regression for Student Retention with In-State Rate Term as well as covariable variables (Change Statistics values highlighted)*

The R-square change from the first to the second model is .011 and it is slightly greater than zero [F(8,152) = 2.565, p=.012. The R-square change indicates that the addition of the time-varying predictors resulted in an increase in the percentage of total variation accounted for in the student retention rate (after accounting for between institution differences) of 1.1%. While very small, this

result is statistically significant. Importantly, the squared multiple partial R for our model indicates the time-varying predictors, which can be calculated from the R square change in model 2 divided by 1 – the R square value for model 1, account for 11.6% of the unexplained variation in student retention rate after residualizing for the dummy institution variables (model 1).

While the overall model 2 was significant for in-state fees rate terms, none of the time-varying predictors (in-state fees rate term, institutional size – undergraduate enrollment, or student population type - percent Hispanic undergraduate enrollment) displayed as significant in either a positive or negative direction related to student retention rates. The author does note that there is a statistical significance between positive results in the year 2017-2018 as intercept as compared to the results of the year 2019-2020 (b=2.849, s.e.=.848, p<.001) as it relates to student retention. It is possible student retention may have been positively assisted in 2019-2020 by the on-going pandemic when students stayed enrolled in institutions instead of departing for another pursuit because many alternative options to higher education may have been unavailable because of shutdowns in other sectors within the United States.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
2								
	year=2019.0	0.97	0.794	0.038	1.221	0.224	-0.6	2.54
	year=2020.0	2.849	0.848	0.113	3.36	<.001	1.174	4.524
	year=2021.0	-0.16	0.938	-0.006	-0.171	0.865	-2.013	1.692
	year=2022.0	1.149	0.917	0.046	1.253	0.212	-0.663	2.961
	year=2023.0	1.225	0.961	0.049	1.274	0.205	-0.675	3.124
	insRTfees	0.002	0.285	0.001	0.005	0.996	-0.561	0.564
	UG_ENROL	0	0	-0.25	-0.521	0.603	-0.001	0.001
	PCT_UGHISP	-0.141	0.139	-0.352	-1.016	0.311	-0.415	0.133

Figure 19: *Model Output Coefficients for LSDV Regression for Student Retention with In-State Rate Term as well as covariable variables (Time-Varying Predictors Highlighted)*

The model does also show differences across the institutional retention rates comparing the dummy coded institutions against the reference institution the author chose to leave out of the model (#25 = UTEP). The rest of the output table provides a summary of the results.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
2								
	UnivCode=1.0	-13.069	8.079	-0.242	-1.618	0.108	-29.031	2.893
	UnivCode=2.0	-22.339	10.225	-0.413	-2.185	0.03	-42.541	-2.137
	UnivCode=3.0	-21.035	10.641	-0.389	-1.977	0.05	-42.059	-0.012
	UnivCode=4.0	-14.472	11.663	-0.268	-1.241	0.217	-37.515	8.571
	UnivCode=5.0	-7.593	8.412	-0.141	-0.903	0.368	-24.212	9.026
	UnivCode=6.0	-11.706	9.965	-0.217	-1.175	0.242	-31.393	7.981
	UnivCode=7.0	-29.682	7.445	-0.549	-3.987	<.001	-44.391	-14.972
	UnivCode=8.0	-15.872	9.561	-0.294	-1.66	0.099	-34.762	3.019
	UnivCode=9.0	1.371	5.915	0.025	0.232	0.817	-10.315	13.057
	UnivCode=10.0	16.934	13.957	0.313	1.213	0.227	-10.64	44.509
	UnivCode=11.0	-22.893	10.031	-0.424	-2.282	0.024	-42.711	-3.074
	UnivCode=12.0	-22.293	6.825	-0.413	-3.266	0.001	-35.777	-8.809
	UnivCode=13.0	-11.404	6.098	-0.211	-1.87	0.063	-23.451	0.643
	UnivCode=15.0	-11.1	5.968	-0.205	-1.86	0.065	-22.89	0.691
	UnivCode=16.0	-28.586	12.301	-0.529	-2.324	0.021	-52.888	-4.283
	UnivCode=17.0	-31.37	12.544	-0.581	-2.501	0.013	-56.152	-6.587
	UnivCode=18.0	-0.74	7.47	-0.014	-0.099	0.921	-15.499	14.019
	UnivCode=19.0	6.158	8.422	0.114	0.731	0.466	-10.481	22.797
	UnivCode=20.0	-15.431	9.189	-0.286	-1.679	0.095	-33.585	2.723
	UnivCode=21.0	-9.837	8.542	-0.182	-1.152	0.251	-26.713	7.039
	UnivCode=22.0	-5.325	8.403	-0.099	-0.634	0.527	-21.926	11.276
	UnivCode=26.0	-0.097	4.76	-0.002	-0.02	0.984	-9.501	9.307
	UnivCode=27.0	-21.301	10.309	-0.394	-2.066	0.041	-41.668	-0.933
	UnivCode=28.0	-16.431	8.147	-0.304	-2.017	0.045	-32.527	-0.336
	UnivCode=29.0	4.018	2.655	0.074	1.514	0.132	-1.227	9.263
	UnivCode=30.0	7.342	8.975	0.136	0.818	0.415	-10.39	25.073
	UnivCode=31.0	-8.154	8.309	-0.151	-0.981	0.328	-24.571	8.263
	UnivCode=32.0	-12.145	6.039	-0.225	-2.011	0.046	-24.076	-0.213
	UnivCode=33.0	-22.869	8.979	-0.423	-2.547	0.012	-40.609	-5.129
	UnivCode=34.0	-0.131	8.788	-0.002	-0.015	0.988	-17.494	17.232
	UnivCode=35.0	-11.327	8.23	-0.21	-1.376	0.171	-27.588	4.934

Figure 20: *Model Output Coefficients for LSDV Regression for Student Retention with In-State Rate Term as well as covariable variables (Institutional Difference Highlighted)*

UTEP had a reported mean average student retention percentage of 74% (SD = 2.37) across the six years (including the imputed 2022-2023 rate created by the author). This means this institution as the reference institution has a higher student retention rate than eleven (11) institutions that reported a negative correlation with the reference institution. These eleven (11) institutions included Lamar University (*M* = 63, *SD* = 4.43, b=-28.68, s.e.=7.45, p=.03), Midwestern State University (*M* = 64.8, *SD* = 1.6, b=-21.04, s.e.=10.64, p=.05), Sul Ross University (*M* = 50, *SD* = 1.63, b=-28.68, s.e.=7.45, p<.001), TAMU Commerce (*M* = 62.3, *SD* = 3.01, b=-22.89, s.e.=10.03, p=.024), TAMU Corpus Christi (*M* = 58.7, *SD* = 2.73, b=-22.29, s.e.=6.83, p=.001), TAMU Texarkana (*M* = 58.7, *SD* = 5.01, b=-28.59, s.e.=12.30, p=.021), Texas Southern University (*M* = 56.2, *SD* = 6.05, b=-31.37, s.e.=12.54, p=.013), UT Permian Basin (*M* = 64, *SD* = 3.63, b=-21.30, s.e.=10.31, p=.041), UT Tyler (*M* = 65.8, *SD* = 1.72, b=-16.43, s.e.=8.15, p=.045), University of Houston (UH) Downtown (*M* = 68, *SD* = 3.46, b=-12.15, s.e.=6.04, p=.046), and UH Victoria (*M* = 60.3, *SD* = 3.27, b=-22.87, s.e.=8.98, p=.012). Had the researcher chosen TAMU College Station, a flagship research university, and the largest public institution in Texas – with an average

mean retention rate of over 93%, then all other institutions would have correlated negatively with this institution's average mean retention rate. Table 13 provides descriptive statistics for retention rates across institutions, the six-year period, and by individual year.

Table 13: *Descriptive Statistics for Student Retention Rates across institutions by six-year average and each individual year*

	M	*SD*	*M*	*M*	*M*	*M*	*M*	*M*
TX Institution (n = 32)	**6YRS**	**6YRS**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**
Angelo State Univ	69.8	2.04	67.0	69.0	71.0	69.0	73.0	70.0
Lamar Univ	63.0	4.43	64.0	66.0	69.0	57.0	59.0	63.0
Midwestern State Univ	64.8	1.60	65.0	67.0	66.0	63.0	63.0	65.0
Prairie View A&M Univ	72.7	3.33	74.0	66.0	74.0	75.0	73.0	74.0
Sam Houston State Univ	75.3	2.07	76.0	75.0	79.0	73.0	74.0	75.0
Stephen F Austin State Univ	73.3	2.73	71.0	70.0	77.0	76.0	73.0	73.0
Sul Ross State Univ	50.3	1.63	48.0	52.0	52.0	51.0	49.0	50.0
Tarleton State Univ	68.8	1.94	70.0	65.0	69.0	70.0	70.0	69.0
TAMU International	76.7	2.25	77.0	79.0	74.0	74.0	79.0	77.0
TAMU College Station	93.3	1.03	92.0	93.0	94.0	93.0	95.0	93.0
TAMU Commerce	62.3	3.01	66.0	63.0	58.0	60.0	65.0	62.0
TAMU Corpus Christi	58.7	2.73	58.0	60.0	57.0	55.0	63.0	59.0
TAMU Kingsville	66.8	2.79	67.0	65.0	72.0	66.0	64.0	67.0
TAMU San Antonio	67.0	4.34	59.0	69.0	68.0	67.0	72.0	67.0
TAMU Texarkana	58.7	5.01	57.0	59.0	64.0	50.0	63.0	59.0
TX Southern Univ	56.2	6.05	54.0	53.0	51.0	68.0	55.0	56.0
Texas State Univ	77.3	1.37	77.0	76.0	77.0	77.0	80.0	77.0
Texas Tech Univ	86.0	0.89	85.0	87.0	87.0	85.0	86.0	86.0
West TAMU	68.7	7.69	67.0	68.0	82.0	58.0	68.0	69.0
TX Woman's Univ	73.7	1.75	73.0	73.0	77.0	72.0	73.0	74.0
UT Arlington	74.0	1.67	74.0	75.0	76.0	71.0	74.0	74.0
UT El Paso	74.0	2.37	73.0	75.0	77.0	70.0	75.0	74.0
UT San Antonio	76.3	2.88	73.0	73.0	78.0	78.0	80.0	76.0
UT Permian Basin	64.0	3.63	62.0	71.0	64.0	62.0	61.0	64.0
UT Tyler	65.8	1.72	68.0	63.0	65.0	67.0	66.0	66.0
UT Rio Grande Valley	76.2	2.86	76.0	76.0	81.0	72.0	76.0	76.0
Univ of Houston (UH)	85.2	0.41	85.0	85.0	86.0	85.0	85.0	85.0
UH Clearlake	74.3	4.32	74.0	80.0	77.0	74.0	67.0	74.0
UH Downtown	68.0	3.46	71.0	73.0	67.0	64.0	65.0	68.0
UH Victoria	60.3	3.27	56.0	61.0	66.0	59.0	60.0	60.0
Univ of North TX	80.2	2.48	78.0	79.0	85.0	79.0	80.0	80.0
UNT Dallas	70.3	1.63	73.0	70.0	71.0	70.0	68.0	70.0
Total	70.4	9.43	69.7	70.5	72.2	69.1	70.4	70.4

R3b) Student Retention Percentage & Out-of-State Fee Rate Term with Covariates

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.951[a]	.905	.887	3.175	.905	49.136	31	160	<.001
2	.957[b]	.916	.895	3.056	.011	2.588	8	152	.011

a. Predictors: (Constant), UnivCode=35.0, UnivCode=34.0, UnivCode=33.0, UnivCode=32.0, UnivCode=31.0, UnivCode=30.0, UnivCode=29.0, UnivCode=28.0, UnivCode=27.0, UnivCode=26.0, UnivCode=22.0, UnivCode=21.0, UnivCode=20.0, UnivCode=19.0, UnivCode=18.0, UnivCode=17.0, UnivCode=16.0, UnivCode=15.0, UnivCode=13.0, UnivCode=12.0, UnivCode=11.0, UnivCode=10.0, UnivCode=9.0, UnivCode=8.0, UnivCode=7.0, UnivCode=6.0, UnivCode=5.0, UnivCode=4.0, UnivCode=3.0, UnivCode=2.0, UnivCode=1.0

b. Predictors: (Constant), UnivCode=35.0, UnivCode=34.0, UnivCode=33.0, UnivCode=32.0, UnivCode=31.0, UnivCode=30.0, UnivCode=29.0, UnivCode=28.0, UnivCode=27.0, UnivCode=26.0, UnivCode=22.0, UnivCode=21.0, UnivCode=20.0, UnivCode=19.0, UnivCode=18.0, UnivCode=17.0, UnivCode=16.0, UnivCode=15.0, UnivCode=13.0, UnivCode=12.0, UnivCode=11.0, UnivCode=10.0, UnivCode=9.0, UnivCode=8.0, UnivCode=7.0, UnivCode=6.0, UnivCode=5.0, UnivCode=4.0, UnivCode=3.0, UnivCode=2.0, UnivCode=1.0, year=2023.0, year=2022.0, year=2021.0, year=2020.0, year=2019.0, otsRTfees, PCT_UGHISP, UG_ENROL

Figure 21: *Model Summary LSDV Regression for Student Retention with Out-of-State Rate Term as well as covariable variables (R-square values & change statics highlighted)*

With the similarities between the in-state and out-of-state rate term data, it should come as no surprise that new model 2, which incorporated out-of-state rate term data along with the other time-varying predictor variables, produced eerily similar results. Only the F change value and statistical significance changed in this new model 2. The R-square change from the first to the second model is .011 and it is slightly greater than zero [F(3,152) = 2.588, p=.011. The R-square change indicates that the addition of the time-varying predictors resulted in an increase in the percentage of total variation accounted for in the student retention rate (after accounting for between institution differences) of 1.1%. While very small, this result is statistically significant. Importantly, the squared multiple partial R for our model indicates the time-varying predictors, which can be calculated from the R square change in model 2 divided by 1 – the R square value for model 1, account for 11.6% of the unexplained variation in student retention rate after residualizing for the dummy institution variables (model 1).

Coefficients[a]								
		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
2								
	year=2019.0	1.039	0.795	0.041	1.307	0.193	-0.531	2.608
	year=2020.0	2.952	0.852	0.117	3.464	<.001	1.268	4.635
	year=2021.0	-0.003	0.949	0	-0.003	0.998	-1.878	1.872
	year=2022.0	1.306	0.93	0.052	1.404	0.162	-0.531	3.144
	year=2023.0	1.369	0.984	0.054	1.391	0.166	-0.576	3.314
	otsRTfees	-0.141	0.351	-0.056	-0.403	0.688	-0.834	0.552
	UG_ENROL	0	0	-0.28	-0.583	0.561	-0.001	0
	PCT_UGHISP	-0.151	0.137	-0.378	-1.106	0.27	-0.421	0.119

Figure 22: *Model Output Coefficients for LSDV Regression for Student Retention with Out-of-State Rate Term as well as covariable variables (Time-Varying Predictors Highlighted)*

Again, while the overall model 2 was significant for out-of-state fees rate terms, none of the time-varying predictors (in-state fees rate term, institutional size – undergraduate enrollment, or student population type - percent Hispanic undergraduate enrollment) displayed as significant in either a positive or negative direction related to student retention rates. The author does note that there is a statistical significance between positive results in the year 2017-2018 as intercept as compared to the results of the year 2019-2020 ($b=2.952$, s.e.=.852, $p<.001$) as it relates to student retention. It is possible student retention may have been positively assisted in 2019-2020 by the on-going pandemic when students stayed enrolled in institutions instead of departing for another pursuit because many alternative options to higher education may have been unavailable because of shutdowns in other sectors within the United States.

The model does also show differences across the institutional retention rates comparing the dummy coded institutions against the reference institution the author chose to leave out of the model (#25 = UTEP). The rest of the output table provides a summary of the results. For this model, one less institution showed a significant negative correlation with UTEP, Midwestern State University. In the last model, the Midwestern State University result had just reached .05 statistical significance. With this model, MSU has a negative correlation value, but it is not statistically significant ($p=.058$). Ten of the eleven other institutions do continue to present a

negative correlational relationship to the reference institution of UTEP: Lamar University (b=-22.82, s.e.=10.16, p=.026), Sul Ross University (b=-30.02, s.e.=7.43, p<.001), TAMU Commerce (b=-22.64, s.e.=10.01, p=.025), TAMU Corpus Christi (b=-21.42, s.e.=6.95, p=.002), TAMU Texarkana (b=-29.61, s.e.=12.21, p=.016), Texas Southern University (b=-32.53, s.e.=12.32, p=.009), UT Permian Basin (b=-22.03, s.e.=10.25, p=.033), UT Tyler (b=-16.76, s.e.=8.05, p=.039), University of Houston (UH) Downtown (b=-12.75, s.e.=5.89, p=.032), and UH Victoria (b=-23.42, s.e.=8.94, p=.01). Figure 23 depicts these specific changes.

The answer to question 3 is that there is a statistically significant relationship between retention rate and rate term of student fees, but it appears mostly linked to the difference that occurs between institutions and years. Since the model presented explained very little of the variance beyond the institution and years, the author acknowledges that this relationship might be statistically insignificant for the period selected. Further research using all the data available on student fees since 1999 to present for the same institutions in Texas would likely net more robust correlational results.

Conclusion

This chapter provided statistical analyses of the research questions regarding the relationship between student retention rates and their rate term of student fees (in-state and out-of-state) at four-year, public institutions in Texas using panel data from the academic years 2017-2018 to 2022-2023. Descriptive statistics for in-state and out-of-state fees, in-state and out-of-state price of attendance, their subsequent combining to create the rate term for both in-state and out-of-state fees, and other covariates helped to frame the final analysis to answer question three. Through fixed effect panel regression models, both the models for in-state rate term with covariates of undergraduate enrollment and percent Hispanic enrollment and for out-of-state rate

term with covariates of undergraduate enrollment and percent Hispanic enrollment were statistically significant. However, upon further inspection of individual variables, no specific variables rose to statistical significance from the model. One time contrast and several institutional contrasts between model 1 and model 2 were detected and discussed. The final chapter discusses the interpretation of the result findings, limitations to the results, implications for practice, and future research recommendations.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
2								
	(Constant)	90.671	14.526		6.242	<.001	61.973	119.37
	UnivCode=1.0	-12.906	8.077	-0.239	-1.598	0.112	-28.864	3.052
	UnivCode=2.0	-22.818	10.158	-0.422	-2.246	0.026	-42.888	-2.748
	UnivCode=3.0	-20.498	10.718	-0.379	-1.912	0.058	-41.673	0.678
	UnivCode=4.0	-14.724	11.654	-0.273	-1.263	0.208	-37.748	8.3
	UnivCode=5.0	-7.681	8.38	-0.142	-0.917	0.361	-24.237	8.875
	UnivCode=6.0	-12.156	9.896	-0.225	-1.228	0.221	-31.709	7.396
	UnivCode=7.0	-30.018	7.429	-0.556	-4.041	<.001	-44.695	-15.342
	UnivCode=8.0	-15.887	9.549	-0.294	-1.664	0.098	-34.753	2.979
	UnivCode=9.0	2.779	6.22	0.051	0.447	0.656	-9.509	15.068
	UnivCode=10.0	17.311	13.957	0.32	1.24	0.217	-10.264	44.886
	UnivCode=11.0	-22.642	10.014	-0.419	-2.261	0.025	-42.427	-2.858
	UnivCode=12.0	-21.417	6.946	-0.396	-3.083	0.002	-35.141	-7.693
	UnivCode=13.0	-10.106	6.572	-0.187	-1.538	0.126	-23.09	2.878
	UnivCode=15.0	-10.641	5.782	-0.197	-1.841	0.068	-22.064	0.781
	UnivCode=16.0	-29.605	12.205	-0.548	-2.426	0.016	-53.719	-5.491
	UnivCode=17.0	-32.527	12.324	-0.602	-2.639	0.009	-56.876	-8.179
	UnivCode=18.0	-0.565	7.479	-0.01	-0.076	0.94	-15.341	14.211
	UnivCode=19.0	6.252	8.411	0.116	0.743	0.458	-10.366	22.871
	UnivCode=20.0	-15.365	9.115	-0.284	-1.686	0.094	-33.373	2.643
	UnivCode=21.0	-10.018	8.524	-0.185	-1.175	0.242	-26.859	6.823
	UnivCode=22.0	-5.434	8.374	-0.101	-0.649	0.517	-21.978	11.111
	UnivCode=26.0	0.272	4.792	0.005	0.057	0.955	-9.197	9.74
	UnivCode=27.0	-22.026	10.249	-0.408	-2.149	0.033	-42.275	-1.777
	UnivCode=28.0	-16.761	8.049	-0.31	-2.082	0.039	-32.664	-0.858
	UnivCode=29.0	4.258	2.679	0.079	1.59	0.114	-1.034	9.551
	UnivCode=30.0	6.962	8.84	0.129	0.788	0.432	-10.503	24.427
	UnivCode=31.0	-8.952	8.206	-0.166	-1.091	0.277	-25.164	7.26
	UnivCode=32.0	-12.751	5.892	-0.236	-2.164	0.032	-24.393	-1.11
	UnivCode=33.0	-23.417	8.938	-0.433	-2.62	0.01	-41.075	-5.759
	UnivCode=34.0	-0.025	8.775	0	-0.003	0.998	-17.362	17.311
	UnivCode=35.0	-12.15	8.153	-0.225	-1.49	0.138	-28.257	3.957

Figure 23: *Model Output Coefficients for LSDV Regression for Student Retention with In-State Rate Term as well as covariable variables (Institutional Difference Highlighted)*

Chapter 5: Discussion & Recommendations

Introduction

The debate over the cost of college and its implication on access to higher education in the United States continues today (Archibald & Feldman, 2014; Davidson, 2022). This quantitative study sought to clarify two of the less understood parts of the college cost formula: student mandatory fees and the price of attendance (that incorporates other non-tuition related costs like housing, food, books, and supplies). The author sought to interrogate whether student fees – a growing area of cost of the college according to the research literature (Arnott, 2012; Black & Taylor, 2018; Davidson, 2021; Kelchen, 2016; Reinagel & Cooper, 2020; Strerritt, 2011) - was affecting the college costs and student retention rates in a specific location of Texas for which the author had greater familiarity. As previously discussed, using public, four-year institutions in the state of Texas presented an ideal case study for a higher education system with stated goals of increasing access to higher education for minorized students and containing costs and student debt associated with attending public higher education (THECB, 2022). The focus on more tangible student success outcomes in the THECB strategic plan as well as the legislature approval of using such student success outcomes as a way of determining two-year funding foreshadows a similar oversight that may affect four-year colleges and universities in Texas. With such a focus on college costs, college debt, and student success outcomes (enrollment, retention, and graduation rates), a need existed to determine whether required (mandatory) fees were increasing in Texas and what effect these changes might have related to price of attendance (POA) and student retention rates – or students continuing in college – vis-a-vis these stated policy goals. This quantitative study sought to fill this gap in the research and expand the

discussion of the impact of mandatory student fees for college finance policy. The author sought to answer these three key research questions:

- R1: From 2017-2018 to 2022-2023, are the average amount of required (mandatory) student fees increasing at four-year, public universities in Texas?
- R2: From 2017-2018 to 2022-2023, are student fees becoming a greater percentage (proportion) of the overall price of attendance at four-year, public universities in Texas?
- R3: During the period studied (2017-2023), do mandatory student fees have any relationship with student retention at four-year, public universities in Texas?

This final chapter will identify five key findings in interpreting the study's results. Next, the author will discuss the limitations of this study and how its findings have implications for continued research on college costs and student required fees as well as policy and practice for college campuses as well as the THECB.

Findings

The study's research questions produced descriptive and inferential results, when combined with the literature review, produced several significant findings:

1. During the period, mandatory student fees increased for in-state and out-of-state students in Texas confirming the research literature assertions.
2. Growth in both student fees and the price of attendance meant that student fees are not growing as a percentage or portion of price of attendance for four-year public institutions in Texas. However, both costs are going up which means the costs to college students to attend a four-year institution in Texas continues to rise.

3. A previous cost gap in both student fees and price of attendance for Hispanic Serving Institutions (HSI) versus non-HSIs as well as doctoral universities versus comprehensive universities has closed also confirming previous scholarship that HSIs are more susceptible to increases in tuition and fees.
4. The models proposed by the author for rate term student fees (along with some specific covariates) does appear to explain slightly statistically significant variability in student retention rates, but not as greatly as the institutional difference between retention rates.
5. Increases in cost of college in Texas, especially in student fees, appear to have been mitigated by an unexplained event around budget cycles of 2020-2021 or 2021-2022 –which the author would ascribe to the COVID-19 pandemic impacting the next two budget cycles after the pandemic occurred in the United States.

Key Finding #1: During the period, mandatory/required student fees increased for in-state and out-of-state students in Texas confirming the research literature assertions.

Mandatory in-state required fees increased by $488 or approximately $500 over a six-year period from an institutional mean average of $2390 in 2017-2018 to $2878 in 2022-2023 at four-year, public institutions in the state of Texas. During this same period, out-of-state mandatory student fees grew by $591, or approximately $600 from an institutional mean average of $2466 in 2017-2018 to $3057 in 2022-2023. While average growth of less than $82 per year and less than $99 per year for out-of-state fee growth seems modest, these increases represent 20% (in-state fees) and 24% (out-of-state) increases over a six-year period evaluated. The mean averages also bely how much institutional variability exists even with the homogenous college

fee structures reported by public institutions in Texas. The study's results for Texas public, four-year institutions seem to confirm that institutions are increasing fees to fund the basic operations of the college (Black & Taylor, 2018; Glater, 2007; Kelchen, 2016; Sharpe, 2016; Wang, 2013) and the institutional flexibility around mandatory fee setting (Armstrong et al., 2017; Reingel & Cooper, 2020). A 20 or 24% increase in these student mandatory fees appears to support the idea of greater institutional reliance on this type of funding mechanism when one compares it to the overall price of attendance rising by approximately 7% for the same evaluated period. The author maintains that these mandatory service fees – now separately reported from institutional tuition – remain ambiguous and hidden from consumers as a cost of attending college. This study's use of secondary data from IPEDS demonstrates the limitations of these fees being reported as one lump sum and not desegregated for their purpose to track how institutions are using these fees for specific operational functions. Regardless of their overall purpose, this study provides additional evidence of the variability and differences between institutions in the state of Texas related to the use and amount of student fees charged per student both in-state and out-of-state. With thousands of dollars in differences in student fees by institution within a single state of Texas and only public institutions, the data on student fees is rich for additional study on why these significant institutional variances exist. Most importantly, the study demonstrates continued importance to have institutions, particularly state, public four-year institutions report the same type of annual data to national databases (IPEDS) to provides researchers and policymakers the opportunity to track between and within institutional changes in college costs across the same metrics (tuition, fees, price of attendance).

Key Finding #2: Growth in both student fees and the price of attendance meant that student fees are not growing as a percentage or portion of price of attendance.

To make a comparison between student fees and student retention rates, the author had to create a new variable rate term student fee both in-state and out-of-state costs. The result meant the study had to evaluate in-state and out-of-state fees as percentage or proportion of the in-state and out-of-state price of attendance for college students living off-campus without their families. The author found that the price of attendance for in-state students at public, four-year institutions only rose by approximately $1571 over the six years or a 7% increase from $22,558 in 2017-2018 to $24,1229 for 2022-23. During the same period, out-of-state price of attendance grew by $4127, or a 12% increase from $35,596 in 2017-18 to $37,627 in 2022-2023. While the author has previous articulated that student fee rates were increasing more rapidly, the overall percentage or proportion of the cost that these fees played in the price of attendance stayed relatively stable, accounting for the fact that costs for college went up overall during the period evaluated.

In 2017-2018, the average four-year public institution in Texas had in-state mandatory fees that represented approximately 10.7%, or 11% of the price of attendance for in-state students living off campus without family (M = 10.7, SD = 4.35). By 2022-2023, the average mean had risen to 11.3% (M = 11.3, SD = 4.29%). The study best demonstrated the immense institutional variability during academic year 2021-2022, where the highest institution's rate in-state fees was over 24% (M = 24.4) and the institution with the lowest rate term was less than 4% (M = 3.9) representing an almost 20% reported difference in rate terms between institutions. Despite this institutional variability, the overall trend demonstrates very little change over time in rate term in-state fees across period evaluated. There is only a .6 percent difference, or less than 1% change across in-state rate terms across institutions and over the six-year period. In other

words, fees appear to be staying at approximately 10-11% of the price of attendance across institutions and over the period.

The out-of-state rate term was even smaller than the in-state rate term as the average mean out-of-state fees rate term across institutions and years was. 8.1 (SD = 3.77) versus the in-state fee rate term was 11.3 (SD = 4.37). The over 3% less average mean difference for out-of-state fee rate term can be attributed to the higher out-of-state price of attendance reported across institutions. A similar trend to in-state rate term emerged for out-of-state rate term mean change: a 1% increase over a five-year period (2017-18 to 2021-2022) before ending slightly less than 1% in the sixth year of the period (2022-2023). In 2017-2018, the average four-year public institution in Texas had an out-of-state mandatory fees rate term that represented approximately 7.6, or 7.6% of the price of attendance for out-of-state students living off campus without family (M = 7.6, SD = 3.38). By 2022-2023, the average mean had risen to 8.3% with a standard deviation of 3.99% with a minimum mean of 2.6% and a maximum mean of 18.7%. Interestingly, the average mean and standard deviation crept upward in each of the previous four years (2018-2019 to 2021-2022) due to the average maximum mean changing by almost 4% (M=15.3, M=19.1). Both the average minimum and maximum average mean for out-of-state rate term ticked down in the academic year 2022-2023 contributing the .7% mean average difference across the six years versus a full 1% change present in the academic year 2021-2022.

The student fee rate term – both in-state and out-of-state rate term fees – do not support the authors original hypothesis that fees appear to be the insidious growth factor within the overall rising price of attendance for both in-state and out-of-state students living off campus without families at four-year public universities in Texas. While fees appear to be growth at a double-digit growth rate compared with single-digit growth rates for price of attendance, student

fees still appear to a smaller amount of the costs factored within the price of attendance compared to a) tuition and b) other related costs like housing, food, books, travel, and supplies. The latter of these costs appears to outweigh the overall increases in student fees. Thus, while the other assertion that fees should be a growing proportion of the price of attendance, the author's adoption of theoretical models of Baumol & Bowen's (1967) cost disease and Bowen's (1980) revenue theory of cost are validated. The overall price of attendance does seem to be increasing as institutions need to spend every dollar for which is raised supporting Bowen's (1980) revenue theory of costs. Despite college costs causing apparent public outrage, higher education at Texas four-year public institutions reported price increases throughout most of this time study and cost rises across the entire sector despite technological advances during this period further supporting Baumol and Bowen's (1967) cost disease. Most importantly, though, the cost of attending higher education at Texas four-year public institutions continues to increase or flatten – not decrease – despite public pressure to alleviate ever increasing costs. The multiple descriptive statistics tables in this study show no decrease but – at best – a flattening of fees or price of attendance costs to address outside forces that may have impacted later years of study (i.e. reaction to COVID-19 pandemic). In this way, this study validates Bowen's revenue theory of cost that explains that higher education is predisposed to higher costs (Bowen, 1980, Cooper, 2017). Whether four-year public institutions want to be seen as spending every dollar they collect, this study demonstrates they continue to increase the price of attendance and student fees regardless of institutional size, type, or student population served.

Key Finding #3: The gap or difference between HSI and non-HSI institutions as well as doctoral and comprehensive universities has closed in Texas.

One of the key reasons for the author's adoption of co-variate and dummy variables related to institutional undergraduate enrollment, specific student demographics related to enrollment, and institutional type or purpose was to further desegregate the impact of student fees and increase college costs for targeted populations attending universities in Texas. This study's findings appear to bust two closely held myths around Hispanic-serving institutions and doctoral institutions spending less on student fees and having an incentive to not charge as high a student fees based on their institutional missions. The study's institutional population set also demonstrated the changing student demographics impact on definitions of Hispanic-serving institution as five (5) institutions changed from non-HSI to HSI designation during the evaluation period. Importantly, the student fees and price of attendance associated with college attendance at four-year public institutions in Texas converged along the important factors of student population (HSI vs. Non-HSI) and institutional type (Carnegie classification) during the period evaluated. This same trend emerged across both in-state and out-of-state fees. As previously discussed, the mean for non-Hispanic serving institutions (non-HSI) is $2669 and HSI mean is $2223 in 2017-2018 for in-state mandatory fees. The difference in means represents $446 or 17% difference favoring lower costs at HSI institutions. By 2022-2023, this advantage of lower fees at HSI is erased. The 22-23 mean for in-state mandatory fees is $2857 at non-HSIs, $2884 at HSIs (Hispanic Serving Institutions). For out-of-state mandatory student fees, the mean for non-HSI is $2672 and HSI mean is $2342 in 2017-2018. The difference in means represents $330 or 14% difference favoring lower costs at HSI institutions (and representing less difference for HSI institutions than in-state fees). By 2022-2023, HSI have higher out-of-state mandatory fees than non-HSI institutions with the mean average of $2917 and $3097 at HSIs. HSI's now have a $180 mean average score than non-HSIs. The change or even reversal of these trend lines

helped the author remove this dummy-coded variable from the model; however, the greater importance appears to be that HSI students are now similarly affected by fee increases as non-HSI students. And, during the period evaluated, HSI students appear to have been more impacted by institutions increasing student fees as part of price of attendance. While it appears that institutions are trying to contain costs, such as fees or price of attendance rising over the period evaluated, students at institutions considered HSIs appear to have demonstrated a greater reliance on raising fee fees in comparison with their non-HSI counterparts. The results confirm previous research scholarship that HSIs are much more susceptible to tuition and fee increases as ways to generating revenue to cover college costs (Flores & Leal, 2023; Nellum & Valle, 2015; Núñez & Bowers, 2011). This study demonstrates both HSIs and doctoral institutions are both raising their mandatory fee rates. This finding has real-world implications for the stated outcomes related to minoritized student college access and student debt by the Texas Higher Education Coordinating Board's strategic plan. Institutions which purport to focus on serving specific student populations, such as greater proportions of their undergraduate enrollment being Hispanic, appear to become similarly reliant on increased student fees as their non-HSI counterparts despite possible negative consequences to both minoritized student enrollment or student success outcomes confirming previous findings by Nellum & Valle (2015) as well as Flores & Leah (2023).

The same trend of narrowing or reversals appears to be happening to the gap in reliance on student fees at comprehensive versus doctoral universities from descriptive statistics gleaned from this study. The 2017-2018 average mean for in-state mandatory student fees was $2287 at master's level/comprehensive universities versus $2470 at doctoral level institutions. This represents a $183 difference in mean scores in favor of cheaper rates at comprehensive

universities. By 2021-2022, the mean scores difference was $12, or essentially same between comprehensive universities (M = $2872) and doctoral universities (M=$2884). This difference persists in the final year of the study with comprehensive universities mean of $2857 and doctoral universities mean in-state mandatory fees of $2894, or a difference in means of $37. The 2017-2018 average mean for out-of-state mandatory student fees was $2347 at master's level/comprehensive universities versus $2559 at doctoral level institutions. This represents a $212 difference in mean scores. By 2021-2022, the mean scores difference was $49, or essentially same between comprehensive universities (M = $3022) and doctoral universities (M=$3071). Again, similar with in-state fees, the slight difference persists in the final year of the study with comprehensive universities mean of $3008 and doctoral universities mean in-state mandatory fees of $3096, or a difference in means of $88. The mean score of comprehensive universities increases in five of the six years and six out of six years for doctoral universities. Two implications emerge for the author. First, he removed this dummy-coded variable because of the lack of variance between the two groups: comprehensive and doctoral universities for the final regression model. More importantly, the rise in reliance in student fees at comprehensive universities to match doctoral universities has implications for college costs and access to affordable education at comprehensive universities with a greater focus on access to quality undergraduate education for diverse student populations in Texas. Again, the study's uncovering of increasing student fees within types of institutions, such as comprehensive universities, demonstrates a need to pay closer attention to this college cost factor (student fees).

Key Finding #4: The models proposed by the author for rate term student fees (along with some specific covariates) does appear to explain slightly statistically significant variability

in student retention rates, but not as greatly as the institutional difference between retention rates.

Panel analysis allows us to understand the relationship between variables across a population and over time. Using a fixed effect analysis, the models proposed between in-state rate fee and out-of-state rate fee (also incorporating undergraduate enrollment, percent Hispanic enrollment, our institutions, and the six-years) both showed slight statistical significance on determining the positive relationship between the student fees and student retention; however, on closer inspection none of the individual variables – rate term student fees, undergraduate enrollment, percent Hispanic undergraduate enrollment or time, produced statistical significance. The models could predict or report 11% of the variance. There appeared a great deal of statistical significance related to student retention across institutions in both models. Thus, our study indicates that student retention appears to be much more a product of institutional type rather than student fees for the population studied in Texas. Additionally, variables not selected in this study may have a greater effect on student retention than student fees.

Key Finding #5: All increases in cost of colleges in Texas appear to have been mitigated by an unexplained event around budget cycles of 2020-2021 or 2021-2022 –which the author would ascribe to the COVID-19 pandemic impacting the next two budget cycles after the pandemic occurred in the United States.

While the relationship between student retention and student fees (rate term) seems small, but statistically significant, a greater finding may have been the multiple graphs, charts, and tables that all demonstrate the same trend – a mitigation or lessening of increasing in both student fees and price of attendance during the middle section of this period. In-state fees, out-of-state fees, in-state price of attendance, and out-of-state price of attendance all seem to be rising

until either the academic year 2020-2021 or 2021-2022. While in most cases, this change is indicated by a smaller or flatter increase in fees or price of attendance versus a decrease in fees subscribed by institutions, the flattening of this noticeable upward trend in these fees and costs appears to have been impacted by an unknown external force. While unable to directly prove this theory, the author would attribute this to cost containment strategies associated with institutions response to the COVID-19 pandemic consistent with scholarship around this topic (Kelchen et al., 2021). The author would note that it took an additional budget cycle or two after the Spring 2020 semester for some institutions to change or lessen their student fees. The study's descriptive statistics appear to point to an effort being made to address cost concerns, especially related to rising costs of student fees, in 2020-2021 and even more in 2021-2022 across the institutions within this study. All the descriptive statistics and tables provided seem to demonstrate an upward trend that would have led to increases in student fees at four-year public institutions in Texas had the US not experienced a significant world pandemic disease event. The author contends that this study demonstrates Kelchen et al's (2019) assertion that "While colleges have historically taken steps to increase revenues in response to financial challenges, we anticipate that cost-cutting measures will be the more typical response to pandemic associated financial challenges" (p. 19). During the later years of the study period, institutions appear to be appropriately responding to pandemic by flattening their fee rates and containing costs rather than increasing fees in previous years. The rate and cost flattening appears to stop in 2022-2023 as smaller increases occurred, thus further monitoring of this trend and data is needed to report a complete story. In other words, it is entirely possible that fees and price of attendance will continue to rise in the years after this study if not for some other intervening force. This trend to

increase fees and price of attendance seems consistent with Bowen's (1980) revenue theory of cost that was already also validated by results in this study.

Limitations of Study Results

This study has some limitations starting with the fact that IPEDS data cannot be generalized for a specific student experience but instead across the entire undergraduate population. Jaquette and Parra (2014) explain, "IPEDS cannot be used to address research questions that require detailed information about organizational subunits" since the primary level of analysis is at the institutional level" (p. 529). Thus, conclusions can be drawn about a cohort experience but not necessarily can be generalized to individual students. While policymakers and college consumers may want to generalize these results to their own specific experiences, this is not the purpose of this study.

Due to time constraints for this research, the author proposed to limit the number of institutions selected to four-year public institutions within the state of Texas for the period after the last research study had been conducted (2016-2017). The current six years of the study do not represent the entire trend line for student fees either in the United States or Texas, but instead a snapshot of the data collected for a specific period for the institutions that reported complete data. Secondary data is meant to be retrospective and can produce an understanding of what has previously occurred but cannot predict – with certainty – what will occur in the future (Jacquette & Taylor, 2014). Choosing a panel data set that incorporated a greater number of years for these institutions may have resulted in different findings and more robust statistically significant in the relationship between student fees and student retention rates.

Secondary data is also only as good as the institutions who report out to the national database. For this study, three institutions had to be removed from the sample due to lack of data

being reported in either student fees, student retention data, or both. Additionally, the author had to impute the sixth year of data using average means of the previous five years. While this is a common practice, the results of this imputation may have skewed or impacted the results of the study rather than being able to collect the available data from each institution for the sixth year (2022-2023) for retention.

Finally, until reviewing the data, it was unknown what the impact or effect of the COVID-19 pandemic might have had on student fee rates or price of attendance at institutions selected for this sample. Kelchen et al. (2021) explains that all the impacts of COVID-19 on college finance are yet known and probably will not be for a while. The study's author previously discussed the finding of a flattening of the trend of student fee and college cost increases that occurred in the two years of reported data after COVID-19 (2020-2021 and 2021-2022). The study's current scope does not allow us to make a connection or show effects. Being unable to control or fully understand the external factor of a worldwide pandemic may have influenced the results of this study in ways currently unknown to the author.

Recommendations for Future Research

This study examined the increases in student fees as well as their potential impact on price of attendance and student retention rates for four-year public institutions in the state of Texas. The results being small, but statistically significant may indicate a larger sample size and/or longer period of study could have produced greater results. This study demonstrated that Texas has a student population (increasing number of HSIs) that are highly researched, and worthy of further investigation given the ability to control other variables, such as higher education state governance and policy. The author would encourage additional study of the entire four-year institutional sector (public and private) over the available time frame of data (1999-

2023 or 2024). Increasing the sample size of institutions and period evaluated would likely increase the power of the results because of the greater number of observations available for the study (institutions x period). The continued study of the relationship between student fees and student retention rates has implications for student services and student affairs professionals who are supported financially by this funding mechanism. Expanding the number of institutions and time period studied may also show some additional variability within institutional retention rates that did not occur in the data set extracted for this current study.

Kelchen (2016) has identified multiple limitations with trying to examine student fees across states in the US due to how individual states report or change their student fees. However, results of this study show promise about the relationship between student fees and student retention worth extrapolating across state lines. Exploring results across a specific geographic region, such as the Southwest, may mitigate state reporting comparison issues and allow for greater between and within institutional comparisons among different states.

Student required fees continue to be an under examined college cost in United States (Arnott, 2012; Black & Taylor, 2018; Davidson, 2021; Kelchen, 2016; Reinagel & Cooper, 2020; Strerritt, 2011). While this study expanded the longitudinal time frame examined on the rise of student fees, additional national research examination of this trend is needed.

Finally, this study expanded the research of student mandatory fees by examining their relationship with a key student success measure – institutional fall-to-fall retention rates. The literature has documented the continued expansion of student fees to support the basic operations of a college (Black & Taylor, 2018; Glater, 2007; Kelchen, 2016; Sharpe, 2016; Wang, 2013). As institutional use of student fees continues to expand, this is a need to extend the research on how these two variables – fees and retention - may be linked. Examining this relationship

between fees and retention in other states may provide valuable comparison data. Such research will also have continued impact on policy and practice within higher education and on college campuses across the United States. Combining the inventory of student fees approach by Reinagel and Cooper's (2020) with connection to the study of specific student services practices such financial aid and fee disclosures in Texas as done by Black & Taylor (2018) as mixed methods could also net additional results for Texas. These additional studies would eliminate how these increased fees may be supporting specific efforts to retain or support college students. Continued research focused on student mandatory fees as an increased cost for college students can assist in monitoring and reporting which types of students can access and will be retained within higher education.

Policy & Practice Implications

This study's findings also have implications for policymakers and campus leaders within the state of Texas. If the THECB is truly interested in understanding the costs associated with college, this study provides some recent and interesting between and within college costs comparisons for public, four-year institutions across the state. Additionally, with the data about college costs compiled and easily accessible in one location, students and families can also make decisions about college choice of attendance based on the information provided.

First, it is worth noting that a $500 increase in in-state student mandatory fees over six years of college – a standard length of time for a college student in Texas to graduate - represents an additional financial barrier for the Texas residents the THECB would like to see graduate in greater numbers. The author has noted that both researchers and policymakers have expanded interest in college access and outcomes for diverse populations both federally and within Texas, especially minoritized student populations (Altbach, 2014; Davidson, 2022; Flores & Leal, 2023;

Sawmill, 2016; THECB, 2022). Enrolling and retaining a more diverse student population has meant a need for an increase in student support services and those services cost money. The question remains for how campuses pay for these increased services. Our results demonstrate a great deal of campus variability to answer this question. Some campuses are turning to greater fees while others are not. It is worth further exploration from a policy perspective to understand why such huge disparities in student fee usage and charges exists, especially highlighted in the wide institutional mean range in this four-year public institution population. The THECB has the ability not only to require a longitudinal state-wide self-study, but also to regulate the amount of student fees students pay across institutions. A proposed cap on either student fees or price of attendance would have significant implications for institutions to support their diverse student populations. However, the author believes greater intervention by the THECB to control college costs is needed based on the variability demonstrated in student fees and price of attendance costs across four-year public institutions in Texas from this study. Campus leaders need to also speak up and out, transparently, on how student fees may be used by a campus as alternative revenue sources to make up for funding shortfalls in other areas, such as state appropriations or capital expenditure support by state legislatures.

Secondly, this study found a closing of the gap around use of student fees by Hispanic Serving Institutions versus Non-Hispanic Serving Institutions. The author previously mentioned the myth in Higher Education that institutions serving more minoritized student populations would be more focused on cost containment and affordability. The study's population sample of institutions exposed the growing trend of more public institutions gaining the HSI designation of enrolling more than 25% of their undergraduate population as Hispanic. While this institutional change may have skewed some of the data, the overall trend line of greater student fees being

charged to diverse student populations remains. This is an important policy finding considering the THECB expanded focus on college access for minoritized populations, such as the growing Hispanic population in Texas as well as continued focus affordability and student debt for this same population. Recent scholarship on HSIs demonstrates the vulnerability and susceptibility of these institutions to increases to tuition and fees due to less funding from other mechanisms (Flores & Leal, 2023; Nellum & Valle, 2015; Núñez & Bowers, 2011). Recent scholarship by Flores and Leal (2023) also concluded that Texas had a growing concentration of HSI colleges and universities. This study validated Flores and Leal (2023) scholarship and further documented the changes in institutional designation from non-HSI to HSI for several universities during the period studies. This same finding about the closing of the fee gap also seemed to apply to master's level or comprehensive universities versus doctoral institutions within this study. A great deal of institutional variability in student fee charges and increases was reported through the study. What seemed important was the greater reliance (increase in student fee charges) seen over the six-year period for comprehensive universities. Where previously it looked like doctoral universities were more reliant on student fee charges, the gap essentially became nearly zero between these two types of institutions with very different institutional missions. The THECB is uniquely situated to financially support further study by educational researchers within the Texas higher education institutions to review and expand on the study of these student fee trends at each of the campuses. Commissioned study of this topic by the THECB would assist in formulating state policy for regulation or consistency of use by campuses within Texas. The implications of how costs affect which students can attend different types of higher education (HSI, non-HSI, comprehensive or doctoral universities) is at the heart of the THECB core mission. This study's consistent results on institutional variability as well as the trend line

moving toward ever-increasing student fee costs, when not intervened by a pandemic, demonstrated two specific calls to action for regulation and intervention by the THECB. The ever-increasing cost of student fees should continue to concern campus leaders and THECB policymakers interested in increasing campus access to minoritized, first-generation, and low-income students. However, campus leaders have no incentive to change their current institutional practices without leadership or intervention by the THECB.

Lastly, this study highlighted the continued need of campuses to consistently report out the costs associated with college. This study confirmed recent scholarship on the lack of transparency in student fee reporting by institutions (Black & Taylor, 2018; Kelchen 2016; Reinagel & Cooper, 2020). The state of Texas requires institutions to report on the amount of student fees being charged somewhere on a public website. This study illuminated the vast differences in the charges being levied across institutions within Texas. Similarly sized institutions and institutions within the same institutional system varied widely on the amounts charged to students for same "mandatory student fees." Just as more research is needed to inventory what these student fees are paying for, greater transparency about student fees in comparison to similar institutions may be necessary. College campuses in Texas could voluntarily lead change in this area by creating universal standards for reporting on financial costs. In the absence of institutional leadership, the Texas legislature supported by the THECB could be a leader in college cost reporting and transparency by requiring colleges to truly report regularly and publicly about their costs as well as longitudinal changes in this cost over time. This would lead to greater consumer education on college costs and the ability to continue to comparison shop across institutions of higher education in Texas. While student fees are only one part or component of the cost of college, the author would submit greater transparency and

education about what these funds are being used to accomplish is needed by institutions. The THECB should provide leadership in helping institutions design and implement standard methods of reporting these fees (and trends in increases) on their public facing websites. Campus leaders should be consulted and encouraged to create these standards within Texas as a possible model policy that could be adopted by other states in the US. Greater transparency may also lead to greater compliance by a few institutions in this study that appeared not to be reporting on any mandatory fees despite receiving federal funds.

Conclusion

The cost to participate in Higher Education in the US is getting steeper. Research and scholarship have helped quantify the impact of this by demonstrating the fact that 40 million Americans now carry approximately $1.3 billion in collective student debt with a disproportionate number being shouldered by diverse and poor families (Davidson, 2022; Ortagus et al., 2020; Sawmill, 2016). How public universities choose to fund their operations has implications on this college student debt and the future prosperity of our society.

This quantitative study examined the specific state of Texas, whose higher education coordinator board has set tangible policy goals to eliminate or significant college student debt for their graduates. Even with recent policy goals in place, the quantitative study was able to illuminate almost 20% ($488 in-state fees) and 24% ($591 out of state fees) average mean increases in student mandatory fees during the last six-year period (2017-2023) for public, four-year institutions in Texas. Despite the increases, the fees did not equate to a greater proportion of the price of attendance for either in-state or out-of-state students living off campus without their family. The student fees being a lesser portion of the price of attendance is likely a function of other college costs also increasing at similar or greater rates. Further evidence of this points to

this study reporting $1500 and $2000 average mean increases in price of attendance for in state and out-of-state costs. While a relationship between student fees and student retention was found to be statistically significant, no one specific variable seems to contribute more than institution differences. The study's results serve as a call to action for campus leaders and higher education policymakers, specifically the THECB, to review and actively intervene in disparate ways campuses use mandatory student fees to fund their operations. Without some incentive or action by state higher education leaders, one doubts any institutional reforms are likely to occur to address the consistent institutional variability around student fees as well as their increased use. The choices around college costs and how institutions chose to finance their campuses will have long-term implications on who attends and is retained within Texas higher education.

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Vita

A native of Indiana, Charles Matthew Crouse graduated in 2002 from Ball State University (IN), *magna cum laude*, with a bachelor's degree in political science. His undergraduate honors thesis focused on creative ways to zone pornography on the internet which could withstand First Amendment free speech challenges using existing US Supreme Court caselaw. Building upon his undergraduate residential leadership experiences, Crouse enrolled in a higher education master's program. In 2004, after serving two years as a graduate assistant in KU Student Housing, Crouse graduated with a Master of Science in education (M.S.Ed) from the University of Kansas.

Crouse has significant professional experience leading departments of housing & residence life in New Mexico, Ohio, Texas, and Wisconsin with more specialized expertise in living learning communities and student advising/shared governance. Contributing back to the Student Affairs profession, Crouse has presented at state, regional, national, and international conference, including serving on the conference planning committees for Association of College and University Housing Officers – International (ACUHO-I) Annual Conference and Exposition as well as the Living Learning Programs conference.

Upon transitioning to leadership roles in Student Affairs, Crouse spent several years working in student advocacy and support within Dean of Students offices in Indiana and West Texas. At the University of Texas at El Paso, as Assistant Dean, Crouse led efforts to create a student case management program, revitalize its Student Behavior intervention team, and expand access and financial support to its Food Pantry. Crouse's preliminary efforts, with tenured faculty at UTEP, to document institutional food and housing insecurity were published in the *Journal of Hunger and Environmental Nutrition* in Moya et al. (2022) *Analysis of Food and Housing Insecurity among University Students at a Public Hispanic-Serving Institution*.

Crouse's continued administrative and research agenda focuses on access to college and rising costs of college. He can be contacted at cmcrouse3@utep.edu.