COMMUNITY COLLEGE STUDENT FEES:

WHAT THEY PAY FOR, WHY THEY GROW, AND HOW THEY AFFECT STUDENTS

by

STEPHEN DANIEL MAYFIELD

(Under the Direction of Robert k. Toutkoushian)

ABSTRACT

Mandatory community college student fees have risen steadily over the past 20 years, outpacing the growth of tuition by a substantial margin. To date, research on postsecondary fees has been limited to public four-year colleges and universities, even as community college fees are growing faster and affecting students who are likely more price sensitive. As such, this dissertation aims to uncover what community college student fees pay for, why they are growing, and how they might impact students. These ideas frame the research questions of three studies. The first study collects data on individual student fees from a purposive sample of 96 community college websites to illustrate the types of student fees that are most common and expensive, how they are presented to students, and how these data differ across colleges that charge a greater or lesser proportion of their price as fees. The second study borrows from the insights of behavioral industrial organization, which suggests that heightened levels of competition within an oligopolistic market can increase the incentive of firms to obfuscate their total price by relying more on fees. This study uses an eleven-year panel dataset to test whether the opening of a new nearby college leads community colleges to increase the proportion of their price charged as student fees. The third and final study is rooted in the findings of the price framing literature,

which have shown that consumers often under-react to the added costs of fees. This study uses an eleven-year panel dataset to determine whether student fee increases have a smaller negative impact on community college enrollment than tuition increases. This is accomplished by comparing the estimated tuition and fee elasticities of demand. Altogether, these three studies are the first to explore student fees in the American community college sector. The findings are relevant to policymaking, tuition and fee setting, financial aid and free college program design, and future scholarly research on both postsecondary student fees and price framing more generally.

INDEX WORDS: Student fees; College pricing; Higher education finance; Community colleges; Partitioned pricing; Drip pricing

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DEDICATION

To my cousin Mark Robert, whose memory reminds me every day that life is better lived with a big heart, an open mind, and the courage to be yourself.

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CHAPTER 1

INTRODUCTION

Higher education is one of the largest financial investments many people will ever make, and the cost of that investment has been steadily rising. Over the past 30 years, inflation-adjusted tuition and fee prices increased 65% at public community colleges[1] and 158% at public four-year colleges (Ma & Pender, 2021). Scholars have long debated the causes of rising college prices (Archibald & Feldman, 2008, 2011; Baumol & Blackman, 1995; Bowen, 1980; Ehrenberg, 2002) and their effects on students (Goldrick-Rab, 2016; Hahn & Price, 2008; Heller, 1997; Jackson & Weathersby, 1975; Leslie & Brinkman, 1987). Yet while these works exhibit an array of research methods and theoretical perspectives, they almost unanimously view college price in terms of combined tuition and fees. The comingling of tuition and fees masks significant differences between them, including what they pay for, why they grow, and how they might affect students. In recent years, a handful of scholars have taken notice of this issue and have investigated student fees separately from tuition in America's public four-year college sector, but no similar scholarship exists for community college fees. As such, this chapter outlines the compelling reasons to study America's community college student fees and proposes five research questions to that end.

The central argument for studying postsecondary student fees is that they are fundamentally different than tuition. Tuition and fees differ in how their prices are set, how their

[1] Throughout this dissertation, I refer to colleges in the public two-year college sector as community colleges. While many higher education scholars would also include colleges that offer community college baccalaureate (CCB) degrees, including these colleges might bias the results of this dissertation given the financial implications of baccalaureate-degree adoption (see Ortagus and Hu (2020) for further research on this topic).

funds are managed, and how they impact students. Concerning their prices, state higher education governing boards usually have the primary authority to set tuition, but individual institutions usually hold more autonomy over fees (Armstrong et al., 2017; Carlson, 2013). Their prices are also growing at different speeds. As Figure 1.1 illustrates, mandatory fees have grown faster than tuition in both the public two and four-year college sectors since data first became available.

Once the money is collected, tuition and fee money is also managed and spent differently. Tuition revenue is unrestricted, which means it may be used for any legal educational purpose, but fees are restricted to be spent according to their designated purpose (Mullin et al., 2015). This restriction is not merely superficial, as evidenced by recent state audits concerned with the misuse of student fee funds (California State Auditor, 2020; Georgia Department of Audits and Accounts, 2016; State of Arizona, 2018; State of New Jersey, 2016; State of Utah, 2020; State of Wisconsin, 2017). Fees also differ from tuition in how they affect students both financially and psychologically. For example, student fees have been dropped from several financial aid programs that once covered them, such as Louisiana's TOPS program in 2014 and Georgia's HOPE program in 2011 (H.B. 326, 2011; LAC 28:IV.Chapter 3, 2021). Tuition is either largely or completely covered under these programs, but students must pay the mandatory fees. On a psychological level, research shows that consumers often do not accurately estimate the total cost of a good or service when the price is broken into multiple pieces ("partitioned pricing") or when fees are presented late in the purchasing process ("drip pricing") (Abraham & Hamilton, 2018; Greenleaf et al., 2016; Morwitz et al., 1996; Voester et al., 2017). The National Economic Council and the Federal Trade Commission have both used postsecondary fees as examples of these two pricing strategies (Leibowitz, 2012; National Economic Council, 2016).

Student fees are particularly concerning in the community college sector, where they are increasing the fastest. As Figure 1.2 shows, inflation-adjusted student fees have grown over the past twenty years from comprising 11.2% to 14.4% of the average tuition and fee bill in public two-year colleges. This growth is due to simultaneously faster fee increases and slower tuition increases compared with the four-year college sector (see Figure 1.1). In addition, multiple active and proposed state free college programs, which are concentrated in the community college sector, have no provision for student fees (Jones & Berger, 2018; Jones et al., 2020). In these cases, students attending a "free college" are still responsible for paying student fees, and colleges may be further incentivized to increase fees to lower the cost of the policy (Kelchen, 2017). Finally, research suggests that community college students are more sensitive to the price of college than their four-year counterparts (Heller, 1997). Considering the rapid growth of community college fees, it is important to understand how they might be affecting higher education's most price-sensitive students.

Community college policymakers, administrators, and students are currently navigating important decisions without a clear understanding of what student fees pay for, why they grow, or how they affect students. However, a few scholars have already begun searching for these answers in the four-year college sector. For example, several scholars have collected detailed data on student fees from four-year college websites to clarify what they pay for. Using this data, they summarized which fees were most expensive and most common; how fees were charged to students of different programs, residency status, and grade level; and whether the number and magnitude of fees were correlated with state or institutional factors (Arnott, 2012a; Reinagel & Cooper, 2019). Other scholars have studied why four-year college fees grow. This includes research on which factors might be correlated with fee increases (Arnott, 2012b; Kelchen, 2016),

and whether fees are being used to offset the restrictions of guaranteed tuition policies (Delaney & Kearney, 2016). Finally, while there is no scholarship on whether American tuition and fees have different effects on students, evidence from Germany suggests that they might. Bruckmeier, Fischer, and Wigger (2013) found that increases in tuition at German universities reduced enrollments while fee increases did not affect them. The question remains as to whether this heterogeneous effect is more widespread.

In contrast to the short supply of student fee scholarship, there is an abundance of public criticism regarding fees and the administrators who set them. These complaints include using fees to fund amenity arms races and top-tier athletic programs (Enright et al., 2020; Gose, 2006; Selingo, 2017), supplant services once covered by tuition (Douglass-Gabriel, 2016; Young, 1997), shield from visible and politically divisive tuition increases (Marcus, 2017; Vedder, 2011; Wang, 2013), or circumvent state control of tuition dollars or declining appropriations (Glater, 2007; Pickert, 2008; Reis, 2012; Shackford, 2014; Sharpe, 2016). More recently, complaints have arisen in the wake of the coronavirus pandemic as students question the need to pay fees to support amenities that they no longer have access to (Anderson, 2020; Dickler, 2020a; Kerr, 2020; Munk, 2020). While some institutions have partially refunded student fees, others have added new fees to mitigate the costs of coronavirus testing and additional precautions on campus (Carrns, 2020; Dickler, 2020b).

In summary, postsecondary student fees are fundamentally different than tuition, even as they are often lumped together by scholars and the public. Fees and tuition adhere to different price-setting processes and expenditure rules, they are growing and being covered by financial aid in different ways, and students may not be accounting for their costs to the same degree. While scholarship on student fees is beginning to take root in the four-year college sector,

community college fees have been left unaddressed, even as their students are the most price sensitive and their fees are growing the fastest. Finally, in the absence of scholarly attention, the public at large has shown a willingness to ascribe ulterior explanations to the growth and use of student fees. In an effort to address these issues, I conducted three studies, each with its own research question(s), to better understand what community college fees pay for, why they grow, and how they affect students.

The first study aims to uncover what community college fees pay for and how they are being presented to students. Because student fees are restricted revenues, they tend to be named according to the function they fund (e.g., parking fees usually pay for parking lots). However, the Department of Education's IPEDS survey only collects the total cost of all mandatory fees charged to students (IPEDS, 2019). This total price of fees lacks details on the number, magnitude, or types of individual fees that colleges charge. In addition, no information is collected on how fees are presented to students - an important factor if colleges are indeed using fees strategically due to their relatively low salience. As such, this descriptive study collects and summarizes a cross-section of student fee data from a sample of 96 community college websites (two per state, where applicable) to answer the following research questions:

RQ 3.1: What are the types, frequencies, and magnitudes of mandatory fees typically charged in America's public two-year community colleges?

RQ 3.2: How are student fees presented on public two-year community college websites?

RQ 3.3: How do the answers to RQ 3.1 and RQ 3.2 differ across colleges that charge a greater or lesser proportion of their price as fees?

The second study examines one potential driver of student fee increases – price competition. In their review of higher education markets, Toutkoushian and Paulson (2016)

concluded that two-year college markets are most appropriately categorized as a combination of oligopolies and monopolistic competition. Scholars of oligopolies have theorized that firms are incentivized to further obfuscate their prices (i.e., increase fees) in response to increased competition (Carlin, 2009; Chioveanu & Zhou, 2013; Chioveanu, 2020; Spiegler, 2006). Carlin (2009) explains the rationale as follows: as supplier competition increases, the likelihood that any given firm will win the business of expert consumers (those who accurately assess total price) decreases. Firms are therefore incentivized to add complexity to their prices to increase their profits from uninformed consumers (those who do not account for the added price of fees). This is referred to as strategic price obfuscation.

Using strategic price obfuscation as a conceptual guide, I hypothesize that the opening of a new college within the commuting zone of a community college will lead the latter to increase the proportion of its price charged as fees. Because this hypothesis considers effects over time, multiple years of data are needed for the analysis. The IPEDS annual survey is well suited to this task because it has collected an aggregated price for mandatory fees in a consistent manner for 20 years. In addition, including other variables on local demographic, economic, and college-specific conditions can help control for alternative explanations of fee increases. Specifically, this study addresses the following research question:

RQ 4.1: Does increased market competition encourage community colleges to increase the proportion of their price charged as student fees?

The third and final study investigates whether prospective students account for the added cost of student fees differently than they account for tuition. This analysis is rooted in the law of demand from classical economics, which states that “a higher price for a good, other things equal, leads people to demand a smaller quantity of the good” (Krugman & Wells, 2006, p. 59).

According to this law, the quantity of education that students demand should decrease as the price of college increases. The ratio of the percent change in quantity demanded to a percent change in price is called the own-price elasticity of demand; the larger the elasticity, the more responsive consumers are to changes in price (Krugman & Wells, 2006, p. 111).

Measuring own-price elasticity of demand is notoriously challenging. Early studies in higher education used either time-series or cross-sectional datasets, which are often limited by insufficient observations or inadequate price variation, respectively (Toutkoushian & Paulson, 2016). In addition, changes in demand could occur for reasons other than changes in price, such as changes in household incomes or the price of other colleges. To mitigate the effects of these external factors, this study uses an eleven-year panel dataset of state, county, and institutional variables to analyze a fixed-effects model of the price sensitivity of community college students. A double-log functional form will be used to obtain elasticity measurements, and extensive control variables will be employed to control for non-price factors that could affect demand.

There is a long history of price elasticity studies in higher education (Chisholm & Cohen, 1982; Gallet, 2007; Havranek et al., 2018; Heller, 1997; Jackson & Weathersby, 1975; Leslie & Brinkman, 1987). However, they have all considered the price of college to be the sum of tuition and fees. The price of college is not homogenous, however. Each semester students are presented one base price (tuition) and multiple surcharges (student fees), begging the question of whether students are equally sensitive to tuition and fee increases. Research on fees in other industries suggests that consumers systematically undervalue the cost of add-on fees (Abraham & Hamilton, 2018; Greenleaf et al., 2016; Morwitz et al., 1998; Voester et al., 2017). Thus, evidence from other industries consistently shows fee elasticities of demand to be lower than

base-price elasticities of demand. This paper seeks to test whether this difference holds between community college tuition and fees. Specifically, it addresses the following research question:

RQ 5.1: Do public two-year college enrollments respond less to changes in mandatory student fee prices than to changes in tuition?

In conclusion, the average total community college student fee charge of $663 per academic year should not be considered a negligible cost to students. Originally intended to cover non-instructional incidental expenses, fees now commonly support international student exchanges, large construction debts, student activity groups, and more. As funding for higher education is constrained on all sides, student fees are both a politically expedient and controllable source of revenue for college leaders. There is even reason to believe that students might not notice fee increases as much as tuition. Yet little is known with certainty regarding these issues, especially in the community college sector. In response, this dissertation is composed of three studies to unearth what community college fees pay for, why they grow, and how they affect students. By moving away from the monolithic notion of "tuition and fees," it is hoped that this work will shed light on the important differences between these two revenue streams.

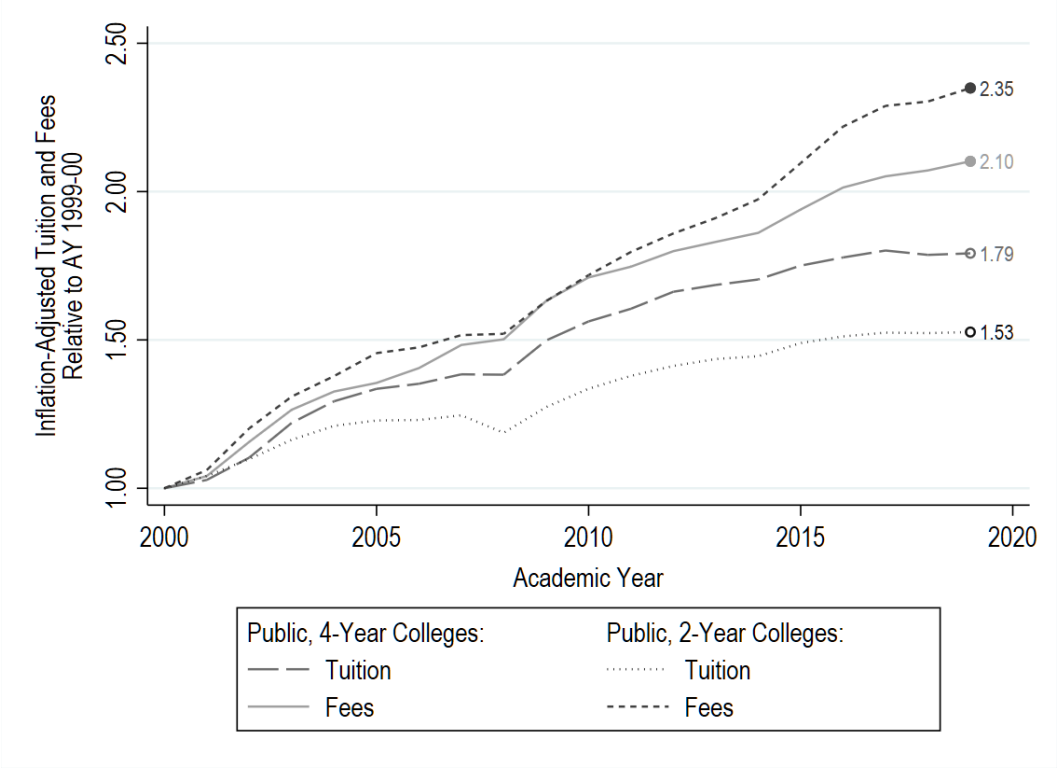

Figure 1.1. Inflation-Adjusted In-State Tuition and Fees Relative to Academic Year 2000-01

Note. Inflation adjusted to July 2019 dollars using CPI-U. Panel is balanced by year and sector and excludes four-year colleges that swapped (reset) their tuition and fees by $500 and two-year colleges that swapped (reset) their tuition and fees by $300.

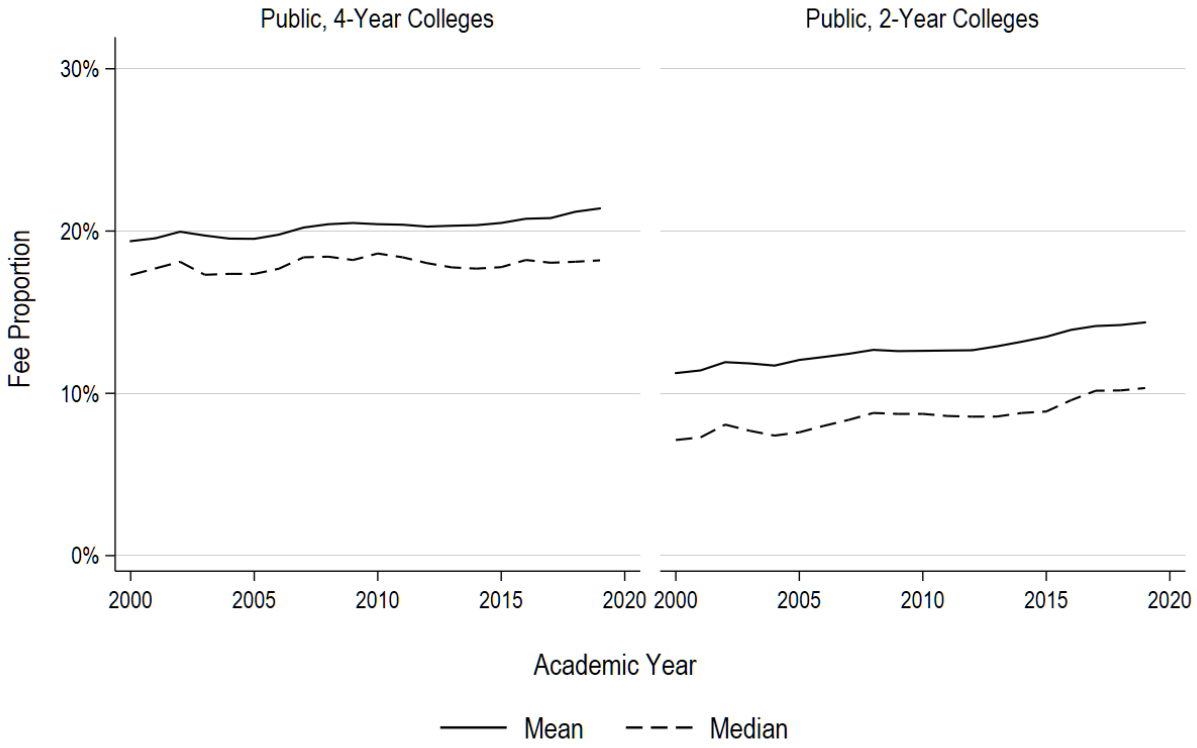

Figure 1.2. Mandatory Fees as a Proportion of Total Tuition and Fees, Academic Year 2000-01 to 2018-19

Note. Panel is balanced by year and sector and excludes four-year colleges that swapped (reset) their tuition and fees by $500 and two-year colleges that swapped (reset) their tuition and fees by $300.

CHAPTER 2

LITERATURE REVIEW

Despite the many reasons to study community college student fees, there is currently no published research on the topic. Research on postsecondary student fees exists, but it is limited to the public four-year college sector. Similarly, research on community college finance exists, but makes only passing mention of student fees. Given this paucity of research, it is especially important to situate community college fees in their proper context. The following chapter reviews a range of topics that are pertinent to understanding community college student fees, beginning with the attributes of the community college sector and concluding with a review of student fees across historical and political contexts.

Community Colleges

Community colleges originated at the turn of the twentieth century, a time of rapidly expanding high school enrollments and increased demand for higher education. University leaders, keen to relinquish general education instruction in favor of higher-order scholarship, proposed the development of "junior colleges" to provide general and vocational education to students (Cohen et al., 2014). Community colleges flourished over the ensuing century, expanding in both mission and share of postsecondary enrollments. Today, public two-year colleges enroll one-third of all postsecondary undergraduates in the United States (De Bray et al., 2021) in institutions that uniquely balance being openly accessible, comprehensive in their curricular offerings, accommodating to lifelong learning, centered on community needs, and focused on teaching (Bahr & Gross, 2016).

The operating principals of community colleges give rise to some unique characteristics that shape and define the sector. These characteristics might be grouped into three themes. First, community colleges are unique in their service delivery, including where, how, and whom they serve. Second, community college revenues and expenditures reveal both their unique financial constraints and priorities for spending. Finally, community colleges share a common set of public policy issues such as calls to increase college completion, fund institutions based on performance, and make college tuition free. These three themes – service delivery, revenues and expenditures, and public policy - are crucial to understanding the contexts of community college leaders and policymakers as they negotiate tuition and fee prices. The following sections are organized accordingly.

Service Delivery

Community colleges are differentiated from other postsecondary institutions across multiple service delivery factors, including their geographic concentration, student bodies, faculty and staff, governance, and curriculum. Geographically, community colleges are heavily concentrated in relatively few states. California, which is home to the largest number of public colleges, boasts 12% of public community colleges in the nation and is home to 22% of community college students (De Bray et al., 2021). One-fifth of four-year college students are enrolled in California or Florida, but a full one-third of two-year college students study in either California or Texas (De Bray et al., 2021). This concentration of two-year college students in relatively few states complicates analyses of the sector because national statistics are heavily biased towards students and institutions in these few large states. This large-state bias was an important factor in deciding to use a balanced purposive sample (two colleges per state) for the first study of this dissertation.

Community colleges are also distinguished by their student diversity, owing in large part to their open access mission, low prices, and flexible course scheduling (Bahr & Gross, 2016). Community colleges enroll one-third (33.4%) of all undergraduates in the United States, but they enroll a disproportionate share of Hispanics (43%), students under 18 years old (61%), and part-time students (57%) (De Bray et al., 2021). In addition, a meaningful share of community college students are first-generation college students (29%), disabled (20%), or single parents (15%), and one in five full-time students also works a full-time job (American Association of Community Colleges, 2020). According to Cohen, Brawer, and Kisker (2014), these additional responsibilities, "complicate educational progress for even the most committed students and are often cited as the primary reasons that community college students are less likely than their four-year counterparts to persist to a degree or certificate" (pp. 53-54). The sensitivity of community college students to price is relevant for the third study of this dissertation, where the tuition and fee elasticities of demand are estimated separately.

Community college faculty and staff also share distinctive qualities, especially in comparison to the four-year college sector. The proportion of community college faculty employed full time has steadily declined from 66% in 1968 to 33% in 2018 (Cohen et al., 2014; De Bray et al., 2021). Thus, while community colleges and four-year colleges operate with about the same full-time equivalent (FTE) faculty per student, community college faculty are about half as likely to be employed full-time (De Bray et al., 2021). Differences between the sectors are even more apparent when considering non-faculty staff. Community colleges operate with nearly half the FTE staff per student as four-year colleges (De Bray et al., 2021). These statistics on faculty and staff employment illustrate community colleges' predominant cost-cutting efforts

since the turn of the century; namely, substituting low-cost part-time faculty for full-time faculty, increasing class sizes, and keeping a minimum staff (Romano & Palmer, 2016a).

The majority of states also organize and govern community colleges under a separate statewide board from four-year colleges (Fletcher & Friedel, 2017). Historically, the modal state governed community colleges under the state board of education, a status quo which began to shift between 1963 and 1989 when the number of states with separate community college boards increased from 6 to 22 (Tollefson, 1996). A 2015 survey of state-level community college directors found that most states still have a separate community college board, and over half of the respondents indicated their governing board had "a great deal" of authority (Fletcher & Friedel, 2017). The separated governance of community colleges from public universities is also mirrored in other related organizations, such as state associations for community college presidents and the national Association of Community College Trustees (ACCT) (Cohen et al., 2014). Because governing boards often hold the primary responsibility to propose and set tuition and fee rates (Armstrong et al., 2017), the fact that most community colleges and four-year colleges operate under separate governing boards means that they negotiate their prices independently of one another.

A final topic that differentiates public community colleges is the curriculum. Bahr and Gross (2016) consolidate the offerings at community colleges into four areas: academic, occupational, remedial, and community education. Academic education, which consists of the traditional academic disciplines, "has been the primary focus of community colleges from the beginning" (Bahr & Gross, 2016, p. 477). Many community colleges aim to prepare their academically oriented students for transfer to four-year institutions, which incentivizes them to mirror their liberal arts courses with those offered in universities (Cohen et al., 2014, p. 267).

Occupational education, or career and technical education (CTE), prepares students for a career. While universities willingly educate professionals (bankers, lawyers, etc.), their reluctance to train auxiliary/support occupations has left a gap for community colleges to fill (Cohen et al., 2014). Remedial education is meant to advance students' skills up to the level needed for college coursework (Bahr & Gross, 2016). Remediation comprises a large portion of community college education; more than two-thirds of community college students enroll in at least one remedial course within six years (Bahr & Gross, 2016). Finally, community education envelops a range of noncredit educational activities that differ from the other educational areas in terms of funding and organization (Bahr & Gross, 2016). Forty percent of community college enrollment is concentrated in community education, often through contracts with businesses and the government to provide employee skills training (Bahr & Gross, 2016). While community colleges are unencumbered by the costly missions of research and graduate education in traditional universities, they have adopted at least three additional branches of education – those of occupational, remedial, and community education. Therefore, the costs of instruction at two-year and four-year colleges are not directly comparable. With these distinctive attributes of community college service delivery in mind, I next turn to a brief review their finances.

Revenues and Expenditures

Community colleges collectively receive revenues in excess of 55 billion dollars per year (De Bray et al., 2021). While a sizeable sum, this figure represents only 14% of total public postsecondary revenues. This is partially a result of the community college sector's size, but the picture is not much improved on a per-student basis. Removing two major revenue streams that only four-year colleges benefit from (university-affiliated hospitals and federally funded research centers), total community college revenues per FTE student still comprise less than half of those

collected at public four-year colleges (De Bray et al., 2021). Even more striking is the difference in revenues collected directly from students. Community colleges earn an average of $2,714 in tuition and fees per FTE student, while four-year colleges earn $9,912 (De Bray et al., 2021).

Community colleges rely on one revenue source that is noticeably absent from other sectors – local government appropriations. In 2018, community colleges received an average of $3,587 per FTE student from local government appropriations while public four-year institutions received only $234 (De Bray et al., 2021). It is important to note that this local support of community colleges varies widely by state; only 29 states have any local appropriations to higher education (State Higher Education Executive Officers Association, 2020).

Just as community college revenues illustrate the relative importance of funders, community college expenses reveal the relative priorities of their leaders. For example, community colleges spend essentially no money on research, college-affiliated hospitals, or research centers (De Bray et al., 2021). They also devote a higher proportion of their spending towards student services, institutional support, and grants to students than public four-year colleges (De Bray et al., 2021). Alternatively, community colleges spend proportionally less than four-year colleges on public service, academic support, and auxiliary enterprises. While these proportions illustrate the relative priorities of community college leaders, it is important to note that four-year colleges outspend community colleges across every category on a per FTE student basis (De Bray et al., 2021). In fact, community colleges spend the least per student on education and related (E&R) expenditures of any institutional type, public or private (Hillman, 2020; Desrochers & Hurlburt, 2016).

Trends in community college spending also reveal shifts in priorities over time. Between 2010 and 2018, community colleges lowered their proportion of expenditures on instructional

salaries by six percent (De Bray et al., 2021). This supports Romano and Palmer's (2016a) conclusion that "community colleges have clearly performed most ably among higher education institutions in keeping compensation costs under control" (p. 30). Alternatively, student services appears to be a "cost pusher" for community colleges, growing 33% per FTE student between 2010 and 2018 (De Bray et al., 2021). Student services spending includes expenses for admissions, the registrar, and student activities and organizations, including their information technology resources. The increase in student services spending points to a broader growing cost of community college administration.

The revenue sources and spending priorities of community colleges are important to understanding the contexts of tuition and fee setting, which will be discussed later. For now, it is important to note that community colleges operate with significantly fewer resources per student than their four-year counterparts and have generally made up for revenue shortages by cutting costs rather than raising prices. The counter-cyclical relationship between enrollments and the economy produced significant revenue constraints for community colleges following the 2008 Great Recession, but in recent years slowing or even declining enrollments have improved their financial position. Finally, while community colleges operate with roughly half the non-instructional staff per student, they have recently shifted their spending towards student services and institutional support. This shift may indicate a renewed prioritization of professional staffing.

Public Policy

Postsecondary pricing is heavily influenced by the tides of national policy. In modern times, four policies stand out as having particular relevance to community colleges. First, the "completion agenda" aims to increase the graduation and completion rates of community college students. Second, state performance-based funding (PBF) policies lend financial incentives

toward achieving institutional efficiency and equity goals. Third, the "promise program" movement advocates for tuition-free community colleges. Finally, while not a public policy per se, troubling trends in community college enrollments portend a looming crisis for the sector. These four issues have garnered significant attention over the preceding decade and continue to be at the heart of community college policymaking. This section briefly summarizes the policies and explores the problems they are designed to solve.

In their review of community college trends, Bahr and Gross (2016) note that, "the period of 2000 to 2020 undoubtedly will be known as the era of performance accountability and competition for community colleges" (pp. 470-471). They go on to assert that there has been a "re-envisioning of access to higher education as including student success" (p. 471). This shift in the fundamental ethos of community colleges originated in the early 2000s as worries grew over increased global competition and changes in the domestic economy that prioritized college-educated workers (Baldwin, 2017; Carnevale, Smith, & Strohl, 2010). In 2006, the Commission on the Future of Higher Education (commonly known as the Spellings Commission) gave voice to these fears by highlighting how America was falling behind other industrialized nations in the share of college-educated citizens (U.S. Department of Education, 2006). President Obama would later use this point to justify his American Graduation Initiative (AGI) with a goal to have America rank first in the world in the proportion of college graduates by 2020 (The White House, 2009a; The White House, 2009b).

Calls to increase college completion in America were heavily focused on the community college sector due to their poor completion rates in comparison with other sectors (Baldwin, 2017). Improving these poor outcomes was thought to be an efficient path to increase America's college completion rate. Several major philanthropic foundations and intermediary organizations

took up this mission and formed a variety of college completion initiatives aimed at assisting community colleges in their efforts to improve college completion (Baldwin, 2017). Taken together, these initiatives comprise the "completion agenda," a somewhat amorphous term to describe the whole community college completion movement. The key elements of these initiatives were to initiate institution-wide reform, enhance the collection and use of data, improve college readiness, target adults with some college but no degree, focus on nonacademic risk factors and underrepresented groups, influence institutional leaders, and shape public policy (Baldwin, 2017).

After more than a decade, what progress has the community college completion agenda achieved? From the standpoint of stated goals, the results are underwhelming. The Obama administration's goal to have the highest proportion of college graduates in the world by 2020 has fallen short (Kelderman, 2020). At the time when Obama first announced the goal, the United States ranked 14th among OECD countries in the proportion of 25-34 year-olds with tertiary education (OECD, 2021). As of 2019, it has only improved to 11th place. Alternatively, the Lumina Foundation set a goal to have 60% of Americans hold a postsecondary degree by 2025. The foundation tracks this number annually from 2008-2018, showing an improvement from 37.9% to 51.3% (Lumina Foundation, 2021). At first glance this 13.4 percentage-point increase looks promising, but most of this growth stems from shifting definitions of what is counted as a postsecondary credential. The inclusion of workforce-relevant certificates in the data in 2014 and other certifications in 2018 make up 8.1 of the 13.4 percentage-point increase (Lumina Foundation, 2021).

In spite of the completion agenda's failure to meet intended goals, the movement has spurred fundamental innovation both within community colleges and in public policies that

affect them. One such policy with particular relevance for community college finance is performance-based funding (PBF). Traditionally, state appropriations to community colleges were based on enrollment (Mullin et al., 2015), a dynamic that has changed for community colleges in 27 states due to the adoption of performance-based funding policies that "directly tie at least a portion of a college's appropriations to outcomes" (Kelchen, 2018, p. 84; Rosinger et al., 2020). The concept of performance funding did not originate from the completion agenda; Tennessee's 1979 program predates the completion agenda by several decades (Alshehri, 2016). But PBF policies underwent a change starting in 2007, attributable in large part to normative pressure and funding from the foundations involved in the completion agenda (Dougherty & Natow, 2015; Miller & Morphew, 2017; Hearn, 2015). These newer PBF 2.0 policies affect the state's base higher education appropriations rather than simply offering a bonus, they include intermediate outcomes that focus on student progression rather than just completion, and they tend to comprise a larger proportion of funding than earlier PBF programs (Dougherty & Natow, 2015). Ohio's program is an excellent example for community colleges, where all base funding from the state is allocated based on course completions (50%), progression milestones (25%), and degree/certificate completions (25%) (Ohio Department of Higher Education, 2019). A meta-analysis of research on PBF policies has found that their adoption is "associated with null or modest positive effects on the intended outcomes of retention and graduation," but the policies might also lead to the unintended consequences of, "restricting access, gaming the PBF system, and disadvantages for underserved student groups and under-resourced institution types" (Ortagus et al., 2020, p. 520).

A second policy that has gained traction following the completion agenda is the free college "promise" program. The completion agenda's ambitious goals were "subject to a

problematic mathematical fact: there are simply not enough traditionally-aged high school and college students" (Pingel, Parker, & Sisneros, 2016, p. 1). Initially, the "promise" label was used to identify local or institutional scholarships that covered at least the full cost of tuition, but the idea quickly spread to the state and federal levels (Pierce, 2015). One of the earliest adoptions of a statewide policy was the Tennessee Promise program in 2014, which credited its inception to the completion agenda's Complete College initiative (Tennessee Higher Education Commission & Tennessee Student Assistance Corporation, 2017; Tennessee Promise Scholarship Act of 2014, 2014). Then in January 2015, President Obama called for free community college at a national scale through his America's College Promise proposal (The White House, 2015). While this policy was never adopted, President Joe Biden has committed to pursuing the proposal in his own administration (Biden for President, n.d.). As of 2020, 19 states have a total of 23 active statewide free college programs (Jones et al., 2020).

Free college programs have been the subject of intense debate in terms of their design, cost, and outcomes. Concerning program design, the Education Trust found that while all promise programs cover tuition, only about two-thirds cover fees and fewer than half address living costs (Jones et al., 2020). These additional costs are gaining scrutiny in the public discourse (e.g., Goldrick-Rab & Kendall, 2016; Jones, 2019). Many programs also do not cover part-time students or adult/returning students, among other student types (Jones et al., 2020). Concerning costs, many worry about the regressive nature of free college programs, in which the poorest students will receive the smallest benefit (DiMartino, 2018; Ison, 2020; McMahon, 2019; Perna et al., 2018; Romano, 2005). This argument is mirrored in debates over federal proposals, where critics argue that states which invest the least in their higher education systems would be rewarded with the greatest federal funding (Carey, 2019; Newfield, 2020; Startz, 2019).

Concerning outcomes, there are worries that free college programs divert students away from bachelor's degrees and may do little to boost new enrollments (Ison, 2020; Perna et al., 2018; Romano & Palmer, 2016a). Research on the enrollment effects of promise programs is only just beginning, but most studies so far confirm that they increase postsecondary applications and enrollments (Castillo et al., 2020; Gándara & Li, 2020; Nguyen, 2019, 2020; Swanson et al., 2020).

The need to increase community college enrollment goes beyond the completion agenda's postsecondary attainment goals. Indeed, enrollment is quickly becoming the foremost threat for the community college sector. Community college enrollments are usually countercyclical to the business cycle (Mullin et al., 2015; Romano & Palmer, 2016a), so reductions in enrollment were to be expected as the economy recovered from the 2008 Great Recession. However, community college enrollment losses were intensified by the length and strength of the economic recovery, a flat population of high school completers, and a loss of market share to the four-year college sector (Garrett, 2019; Hickman, 2017; Koenig, 2019; Nadworny & Larkin, 2019; Smith, 2018). Declining enrollments became so worrisome that the American Association of Community Colleges titled their 2019 report on the topic *Community College Enrollment Crisis?* which reviewed the 14.4% drop in community college enrollments between 2010 and 2017 (American Association of Community Colleges, 2019).

Enrollment concerns prior to 2020 were suddenly and drastically worsened by the COVID-19 pandemic, which saw community college enrollments fall 10.1% from fall 2019 to fall 2020, a far greater drop than the average of all postsecondary sectors of 2.5% (National Student Clearinghouse, 2020). Early in the pandemic, some community college leaders were anticipating higher fall enrollments due to the traditional counter-cyclical relationship between

community college enrollment and unemployment (Gardner, 2020; Nadworny, 2020). However, this relationship was undermined by the unique circumstances of the pandemic. Cited reasons include the difficulty of attending while caring for children at home, the inability to afford classes, a lack of broadband to enroll online, a concern that campuses were not safe, programs that are difficult to teach online, and the fact that the demographic groups most affected by the pandemic are the same as those who disproportionately attend community colleges (Berrett, 2020; Douglass-Gabriel, 2020; June, 2020, 2021; Korn, 2020; Nadworny, 2020; Nierenberg & Pasick, 2020). Unfortunately for community colleges, the pandemic-induced enrollment crisis coincides with a previously predicted enrollment decline due to a "birth dearth" during the 2008 Great Recession (Conley, 2019; Grawe, 2018). In his 2018 book on demographics and the demand for higher education, Nathan Grawe predicted a 16% drop in two-year college enrollments in the four years between 2025 and 2029, concluding that, "the primary challenge for the two-year sector in the next 15 years is clear: dramatically reduced enrollments" (p. 66).

All told, the past decade has seen community colleges being asked to do more with less. They have been pressured to get more students in their doors and a higher proportion out, all while facing demographic and financial headwinds. These forces are important to consider when analyzing community colleges prices because they inform the choices of the price-setters and the needs and goals of the college. While antithetical to the access mission of community colleges, higher tuition and fees might be seen as necessary to keep institutions afloat during enrollment crises. In addition, higher prices could be viewed as an avenue to increase student outcomes by investing in educational resources or pricing out the poorest and most academically underprepared students. Finally, while free college programs offer a remedy for tuition increases, they often do not cover fees and might thereby incentivize institutions to raise them further.

Student Fees

Although research on student fees in the public four-year college sector has grown over the past two decades, it has primarily focused on the types and amounts of fees that colleges and universities charge. Aside from one historical review of student fee lawsuits (Wallace, 2005), no academic work has explored student fees across historical and geopolitical contexts. As such, the following sections summarize the historical development of student fees, how they are perceived in a national context, and how they are managed across states.

History

Postsecondary student fees have existed for as long as the university itself. In the medieval era, fees were required both to matriculate and graduate from the university, which together comprised the most profitable revenues of the university (Cobban, 1988; Ridder-Symoens, 1992, 1996). Next in importance was the revenue from graces, which were "dispensations from the statutory conditions for degrees, either by the omission or by the abridgement of requirements" (Cobban, 1988, p. 85). Just as modern students might test out of introductory courses, the medieval student could pay a fee to skip required coursework. At Cambridge, students were required to pay a deposit, or "caution," which would be forfeited if the student did not complete his degree (Cobban, 1988). And in universities across Europe, numerous fines were imposed for offences such as speaking too loudly or in the common language, tardiness, trampling plants, eating from the university garden, gambling, keeping pets, washing hands in the well-bucket, or swordplay (Cobban, 1988; Rait, 1912/1969).

Medieval students would not have viewed fines and fees as add-ons to the base price of tuition but would have instead understood tuition as just another fee. Tuition was considered the fee for instruction, usually paid directly to professors, while other fees supported the university

staff and general operations (Ridder-Symoens, 1996). A professor's income was therefore directly proportional to the number of students attending his lectures. In *The Wealth of Nations*, Adam Smith (1776/2003) argued in favor of this student fee-based system of tuition and against salaries for professors, asserting that, "in every profession, the exertion of the greater part of those who exercise it, is always in proportion to the necessity they are under of making that exertion" (p. 963). Smith (1776/2003) went on to claim that, in those few endowment-rich universities that supported professors through salaries:

> [the professor's] interest is, in this case, set as directly in opposition to his duty as it is possible to set it… if his emoluments are to be precisely the same, whether he does, or does not perform some very laborious duty, it is certainly in his interest…to neglect it altogether, or… to perform it in as careless and slovenly a manner as that authority will permit. (p. 964)

The University of Oxford was one example of a salaried institution whose professors, Smith (1776/2003) argued, had "given up altogether even the pretense of teaching" (p. 965).

The perspective of tuition as a fee for instruction was carried to American colleges. The College of William and Mary's 1836-37 catalogue shows the cost of "Fees to three Professors" alongside other fees for matriculation and room and board (College of William and Mary, 1837). Similarly, Brown University's 1860-61 catalogue lists the term "tuition" alongside fees for matriculation, servants, the library, registrar, maintenance repairs, and fuel for lighting, and later uses the term "tuition" and "fee for instruction" interchangeably (Brown University, 1860). Finally, the University of Pennsylvania's medical school charged students "fees for lectures in the university" (University of Pennsylvania, 1849). While the term "tuition fee" rings dissonant to modern American ears, it remains the common phrasing in the United Kingdom and Canada.

The uniquely American rift between "tuition" and "fees" likely surfaced as a result of prolific litigation on college prices in early 20th century.

On the heels of the free public K-12 common school movement, state legislatures in the late 19th and early 20th century frequently required state colleges and universities to be free of tuition (Elliott & Chambers, 1936). However, the notion that these institutions were truly free "in many cases appear[ed] to be a sort of fiction" (Thurber, 1924, p. 25). As explained by Eells (1931) in *The Junior College*:

> To keep within the letter of the law various 'fees' are charged instead. In one, for example, there is a janitor fee of $50. In another each student pays a fee of $5 per month for heating the classrooms. Education is free – but the student should pay roundly for having it delivered to him properly swept, dusted, and heated. (p. 535)

Frustrated by these fees, many students took their colleges to court. The courts overwhelmingly sided with the colleges, deciding that a charge for tuition is specifically charge for instruction and therefore excludes other charges for incidental expenses (Chambers, 1932; Shelburne, 1939). Thus, colleges that were prohibited from charging a "fee for tuition" were nevertheless allowed to charge an assortment of incidental fees, setting a precedent for the legal and cultural distinction between tuition and fees in the United States.

The right of colleges to charge student fees was questioned again in the mid-20th century stemming from the politicization of student activity fees. In the 1960s, student political discontent grew into active unrest, rooted in the issue of "students' rights of self-determination in hosting campus speakers and in simply speaking out on political issues" (Thelin, 2011, p. 307). Campus leaders initially resisted students' calls for change, but "as campus administrators imposed restrictions, students showed organized resistance" (Thelin, 2011, p. 307). This

resistance took the form of independent and elaborate student associations that often ran their own newspapers, hosted campus speakers, ran the student union, and collected mandatory student fees (Thelin, 2011). This last point, the collection of student activity fees to fund political activities, instigated 30 years of student fee litigation that would twice find its way before the United States Supreme Court.

Two questions were at the core of most student activity fee lawsuits between 1970-2000. First, could colleges and universities compel students to pay fees in support of groups or activities that they are philosophically opposed to? Second, could a college or university deny student activity fee funding to groups or activities promoting controversial or religious perspectives? These two questions, which one author quipped as "the right to associate and not to associate" (Bauer, 1983, p. 153), were argued in multiple courts and led to a variety of conflicting rulings, gaining the attention of the broader legal community (Antonini, 1988; Bauer, 1983; Chambers, 1976; Gibbs & Crisp, 1979; Steele, 1987; Wallace, 2005; Wells, 1988; Young, 1974).

One organization caught in the middle of student fee legality debates was the Public Interest Research Group (PIRG). PIRGs were non-profit, nonpartisan, independent organizations that sought funding through campus activity fees to lobby on behalf of generally left-leaning political issues (Jaschik, 2007; Lorence, 2003; Ott, 2009). Their lobbying led some students to oppose paying mandatory fees to support them, while their independent status and lack of educational mission caused some to question whether colleges and universities should deny them access to fee funds (Bauer, 1983; Fishbein, 1973; Lorence, 2003; Ott, 2009; Wells, 1988). Two remedies were advocated by PIRG leaders to circumvent these issues: allow students an option to opt-out of paying the fee and grant the PIRG access to funding if students passed a referendum

(Bauer, 1983; Fishbein, 1973; Lorence, 2003; Ott, 2009; Wells, 1988). The substantial influence of PIRGs and the level of controversy over their funding led to a Senate hearing on whether to adopt a student fee amendment to the Higher Education Act of 1976, but the amendment never passed (Collection and Distribution of Student Fees, 1976).

Given the lack of legislative clarification and persistent disagreements between court rulings, two student fee cases eventually made their way before the United States Supreme Court: *Rosenberger v. Rectors and Visitors of the University of Virginia* (1995) and *Board of Regents of the University of Wisconsin System v. Southworth* (2000) (hereafter *Rosenberger* and *Southworth*, respectively). The *Rosenberger* case questioned whether a public university could deny funding to a religious student newspaper on the grounds that such funding would violate the First Amendment's establishment clause (Lassner, 1997; *Rosenberger v. Rectors and Visitors of the University of Virginia*, 1995). Meanwhile, the *Southworth* case asked whether a university could require students to pay mandatory fees to fund organizations that espoused views contrary to their own (*Board of Regents of the University of Wisconsin System v. Southworth*, 2000). The Court used the same legal mechanism to answer both questions – viewpoint neutrality. The unanimous *Southworth* opinion explained how viewpoint neutrality resolved both student fee questions:

> When a university requires its students to pay fees to support the extracurricular speech of other students, all in the interest of open discussion, it may not prefer some viewpoints to others. There is symmetry then in our holding here and in Rosenberger: Viewpoint neutrality is the justification for requiring the student to pay the fee in the first instance and for ensuring the integrity of the program's operation once the funds have been

> collected. (*Board of Regents of the University of Wisconsin System v. Southworth*, 2000, pp. 8-9)

The Supreme Court's *Rosenberger* and *Southworth* decisions clarified and reinforced the authority of postsecondary institutions to collect and distribute student fee funding. So long as fee funds are provided to student organizations on a viewpoint-neutral basis, colleges can require all students to pay mandatory fees. On the other hand, colleges infringe upon student's First Amendment rights when they practice viewpoint discrimination by withholding funds to a student group on the basis of its ideology. In addition, the *Southworth* opinion provided guidance concerning the aforementioned PIRG-suggested remedies of student fee referendums and opt-out programs. The opinion suggests that referendums on student fees likely infringe on viewpoint neutrality, but that opt-in or opt-out systems were acceptable (*Board of Regents of the University of Wisconsin System v. Southworth*, 2000, pp. 56 & 60).

In the fall semester of academic year 1999-2000, just prior to the *Southworth* decision, the U.S. Department of Education collected student fee data from colleges for the first time at a national scale through their IPEDS survey. Prior to this, only a few attempts had been made to broadly survey student fees at colleges and universities, most notably by the National Association for Campus Activities in the turbulent litigation period from 1970-2000 (see Meabon et al., 1979, 1985, 1996). However, these surveys were focused on student activity fees and did not collect data on other types of fees. Other surveys gathered student opinions on college fees but were limited to single college campuses (see Fiedler, 1975; Matross et al., 1975, 1979; Weichselbaum & McClelland, 1978).

While data on student fees does not exist at a national level predating the turn of the century, some colleges and universities have published their own historical tuition and fee

charges extending for decades. These data provide the only clues to student fee trends prior to the 21st century. Figure 2.1 shows the fees as a percentage total tuition and fees for six universities between the academic years ending in 1948-2020. In general, the data from these institutions illustrate how fees at four-year public universities have largely kept the same pace with tuition, have narrowed in variability since the turn of the century, and do not appear to have gone through clear periods of growth or decline. On the other hand, data from the University of Massachusetts Amherst shows a striking growth and sharp collapse in fees in the year 2015-16. This is an example of a "fee reset," in which a large portion of fees was re-categorized as tuition – an issue that complicates analyses of student fees (Kelchen, 2016).

National Context

In April 2016, President Obama signed an executive order seeking input and action from federal agencies to increase American economic competition and help consumers and workers make better informed decisions (Exec. Order No. 13,725, 2016). In response, the National Economic Council (NEC) issued a summary report in December 2016 entitled *The Competition Initiative and Hidden Fees* which, according to one senior NEC advisor, was necessary because "the massive revenue collected through hidden fees and their clouding effect on pricing have become a matter of broader economic concern" (Anderson, 2016, para. 4). The NEC's report implicated seven fee-heavy industries, one of which was higher education, claiming that "over the last decade, colleges and universities have often increased student fees as an alternative to increasing tuition" (National Economic Council, 2016, p. 13).

Concern over the growing use of fees is not limited to the federal government. In 2010, Consumer Reports published national survey results on what bugs Americans the most ("Top gripes", 2010). Respondents ranked 21 everyday complaints by their level of annoyance, from

checkout lines and traffic jams to drivers on cell phones and dog poop. Yet the complaint that took the prize of being America's "top gripe" was hidden fees. The situation has not improved in the interim. A 2018 Consumer Reports follow-up survey found that nearly two-thirds of respondents thought they paid more in fees than five years prior, and 28% of respondents reported hidden fees being on their college tuition bill (Consumer Reports, 2019). Based off these findings, Consumer Reports created their "What The Fee?!" campaign, which seeks to "raise consumer voices and compel lawmakers and companies to embrace honest and transparent pricing" (Tellado, 2019, p. 6).

Frustration over fees has also entered the literary world. In 2017, reporter Bob Sullivan published the second edition of his book *Gotcha Capitalism: How Hidden Fees Rip You Off Every Day and What You Can Do About It*, in which he asserts that there has been a "fundamental shift in the foundation of America's economic system… [in which] companies find themselves fighting to keep prices low like never before. Their response, almost universally, has been to compensate by lying about the true price of things" (p. 301). Then in 2018, Devin Fergus, the Arvarh E. Strickland Distinguished Professor of History, Black Studies, and Public Affairs at the University of Missouri published *Land of the Fee: Hidden Costs and the Decline of the American Middle Class*, where he argued that deregulation has led to a rapid expansion of fees which, until the political landscape changes, "will be our future – transferring wealth, chocking off mobility, and raising barriers of entry to the American dream" (p. 174). While both authors mentioned higher education as a fee-heavy industry, Fergus (2018) directly rebuked American higher education, saying:

> Perhaps the most glaring example of these revenue-generating, no-option charges can be found in the world of higher education, where all institutions – public four-year

> universities and two-year community colleges, private four-year colleges and universities, for-profit technical schools and universities – encumber students with a bevy of fees… In sum, fees boost school revenue without sparking the student or public backlash often engendered by unpopular tuition hikes or additional taxes earmarked for higher education. (p. 7)

The suggestion that fees are used in place of more salient and controversial tuition increases has also been put forward by news and opinion writers (Glater, 2007; Marcus, 2017; Pickert, 2008; Selingo, 2017; Shackford, 2014; Sharpe, 2016; Vedder, 2011; Wang, 2013) and some higher education scholars (Thelin, 2013, p. 58; Weisbrod et al., 2008, p. 79).

Lastly, students across the nation grew agitated at paying fees for services that they no longer had access to during the COVID-19 pandemic. Students in universities across the United States started petitions or sued for partial tuition and fee refunds as their coursework moved online and their access to fee-funded amenities such as student activities, campus transportation, libraries, labs, and athletic events was limited or nonexistent (Anderson, 2020; Associated Press, 2020; Dickler, 2020a; Jewell, 2020; Kerr, 2020; News Service of Florida staff, 2020; Olthoff & Marden, 2020; Perez, 2020; Stirgus, 2020). Universities showed mixed reactions to these calls by either fighting any refunds, proactively offering partial refunds, discounting tuition, or skipping scheduled tuition increases (Bauer-Wolf, 2020; Bloomberg, 2020; Burke, 2020; Chen, 2020; Dickler, 2020c; Ellis, 2020; Harris, 2020; Kumar, 2020; McElhinny, 2020; Munk, 2020; Nova, 2020; Pohle, 2020; Stauffer, 2020). Meanwhile, a few colleges and universities created new student fees meant to cover the costs of virus surveillance testing and enhanced campus cleaning (Dickler, 2020b; Carrns, 2020).

State Context

Public college student fees are set in an environment that involves many actors including students; college, local, and statewide boards; state legislatures; and governors (Armstrong et al., 2017; Carlson, 2013). In most states the official authority to set both tuition and fees is vested by legislative statute in a postsecondary board (either college, local, or statewide), but state governments maintain considerable influence on tuition and fee rates due to their power over appropriations (Armstrong et al., 2017; Pingel, 2018). As an example of this dynamic, a 2017 SHEEO report on tuition and fee policies noted that:

> While the statutory authority for tuition setting may rest with one actor, the tuition and fee setting process in many states reflects a much more complicated set of interaction between multiple entities, sometimes with competing interests. (Armstrong et al., 2017, p. 22)

Although the processes for setting tuition and fees are often lumped together as one and the same, there are significant differences between them. In fact, a 2013 SHEEO report found that only seven states link tuition and fees together as part of an overall pricing strategy (Carlson, 2013). The report also noted that fees tend to be institutionally controlled, with statewide boards usually playing an oversight and approval role (Carlson, 2013). While never directly mentioned in the research, it is often suggested that tuition is primarily negotiated between the board and the state government while fees are primarily negotiated between the board and individual institutions. This interpretation is bolstered by survey results showing 62% of state higher education executive officers strongly agreeing that tuition is extremely important to state policymakers and only 26% strongly agreeing that fees garner policymaker attention (Armstrong et al., 2017).

Tuition and fees are also related in less visible ways. For example, when states limit or freeze tuition increases, they sometimes neglect to incorporate student fees. As a result, studies have indicated that tuition caps and guaranteed tuition can lead to statistically significant fee increases (Delaney & Kearney, 2016; Kelchen, 2016). Similarly, tuition and fees are also connected through financial aid policies, some of which pay for tuition but not fees. For example, student fees have recently been dropped from several financial aid programs that once covered them, including Louisiana's TOPS program in 2014 and Georgia's HOPE program in 2011 (H.B. 326, 2011; LAC 28:IV.Chapter 3, 2021). As mentioned earlier, many state-level free college "promise" programs cover fees but not tuition (Jones et al., 2020). Finally, graduate students often receive tuition waivers but must still pay hefty mandatory and departmental fees (Arnott, 2012a), leading to recent protests at several universities (Langin, 2019; Lewis, 2020; Marcus, 2019; Smith, 2019).

Tuition and fees are sometimes connected through historical policies, leading to odd relationships between them. As noted earlier, many public universities were required to be free of tuition at their founding. Some states, such as California and Idaho, continued this policy into the 21st century. Rather than charging tuition, California state universities charged an educational fee until the Board of Regents changed its name to tuition effective July 1, 2011 (Regents of the University of California, 2010; U.C. Commission on the Future, 2010). As Figure 2.2 shows, this name change caused a sharp decrease in fees as a proportion of tuition and fees in California's four-year college IPEDS data (such a reversal in tuition and fees was coined a "fee reset" by Kelchen (2016)). California's community colleges were unaffected by this name change and still use the educational fee term (Cal. Educ. Code § 76300, 1993/2020), but unlike their four-year counterparts they have always reported this fee as tuition in their IPEDS surveys. In a similar

case, Idaho required a statutory amendment in 2005 to allow tuition to be charged at state colleges and universities (H.B. 231, 2005), and constitutional amendment in 2009 to allow the University of Idaho to charge tuition (J.R. 101, 2009). As Figure 2.2 shows, these terminology changes caused a fee reset for the state. Finally, fee resets have also occurred in other states like Massachusetts and South Dakota,when tuition was allowed to be retained by the University of Massachusetts in 2015 (H.B. 3650, 2015) and South Dakota's University Support Fee (USF) was combined with tuition for academic year 2017 (H.B. 1203, 2016). Similar figures for the remaining states are provided in Appendix A.

Student fees are also commonly subjected to state-level monitoring through performance audits. I have found twelve state or legislative audits specifically focused on public postsecondary student fees since the turn of the century, with several more focused on single institutions or with a broader scope than just fees. In general, these audits found that fee setting, accounting, and spending practices lacked clear processes and accountability (California State Auditor, 2020; Commonwealth of Virginia, 2014; Georgia Department of Audits and Accounts, 2010, 2016; Michigan Office of the Auditor General, 2007; Office of Missouri State Auditor, 2016; State Auditor's Office, 2008; State of Arizona, 2018; State of Colorado, 2010; State of Florida Auditor General, 2002; State of New Jersey, 2016; State of North Dakota, 2012; State of Utah, 2011, 2020; State of Wisconsin, 2017). Common complaints include a lack of specificity in fee policies, accumulated account balances, comingled funds, unapproved purchases, students excluded from the fee-setting process, a lack of institutional monitoring, and a too little guidance from state higher education agencies. The tone of these audits sometimes borders on being overtly oppositional, as evidenced by a 2020 audit of California entitled *California State University: The Mandatory Fees Its Campuses Charge Receive Little Oversight Yet They*

Represent an Increasing Financial Burden to Students (California State Auditor, 2020). In response to these concerns, legislators are also proposing policy remedies to provide more transparency, student voice, and restrictions on fee growth (Dunkelberger, 2017; Shastri, 2019; State of Oregon, 2017; Swaim, 2018).

In conclusion, there are a number of factors that complicate analyses of student fees across states. While these factors can cause certain states to be outliers in terms of fees, the problem is not limited to just a few states. Nearly two-thirds (64%) of states have experienced a higher rate of growth in fees than tuition between academic year 2000-01 and 2019-20 (author's calculations of data from IPEDS (n.d.)). Put another way, in academic year 2000-01 well over half of all public community colleges charged a total of less than $250 in mandatory student fees in constant 2019 dollars (see Figure 2.3). Nineteen years later, only about a third of community colleges charge that little. Thus, while community college fee prices are decided within unique state contexts, the problem of their ever-increasing prices extends beyond any one state.

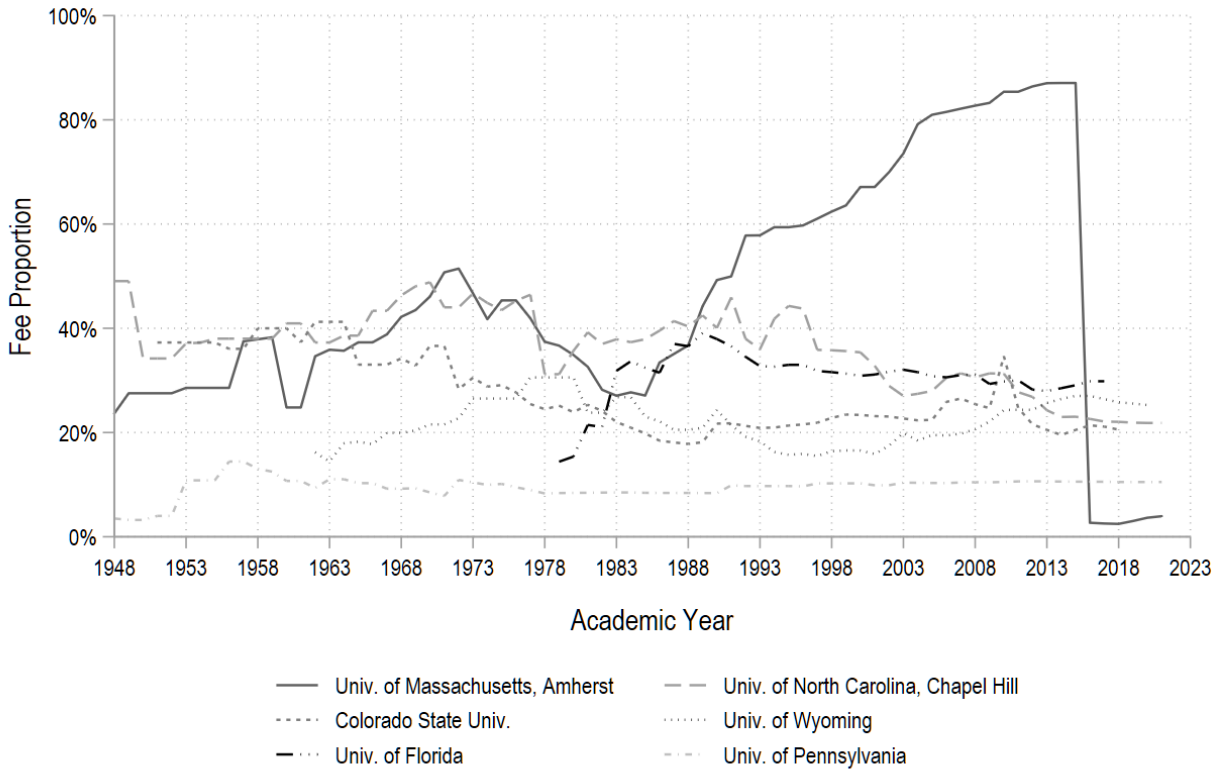

Figure 2.1. Mandatory Fees as a Proportion of Total Tuition and Fees at Six Postsecondary Institutions, Academic Year 1947-48 to 2019-20

Note. Figure was adapted from the following sources: Colorado State University (n.d.), State University System of Florida (n.d.), University of Massachusetts Amherst (2019), University of North Carolina (2021), University of Pennsylvania (n.d.), and University of Wyoming (2019)

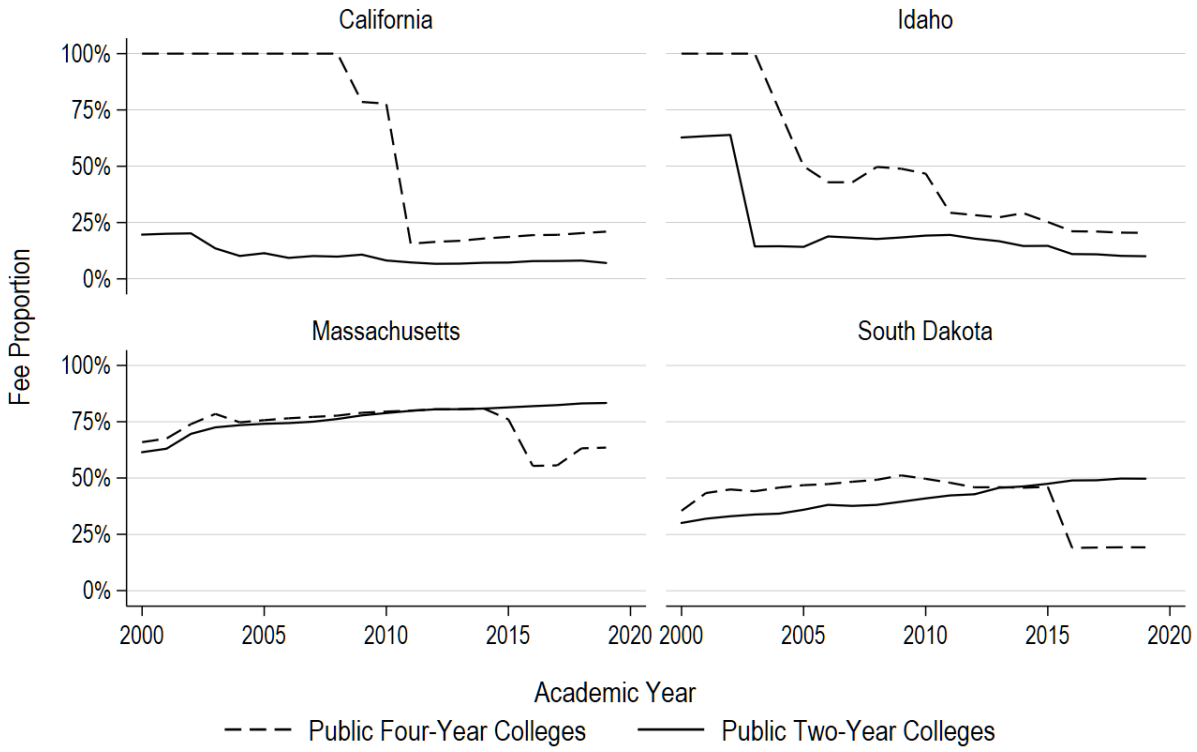

Figure 2.2. Mandatory Fees as a Proportion of Total Tuition and Fees in Four Selected States, Academic Year 2000-01 to 2018-19

Note. Panel is balanced by year and sector. Data sourced from IPEDS (n.d.).

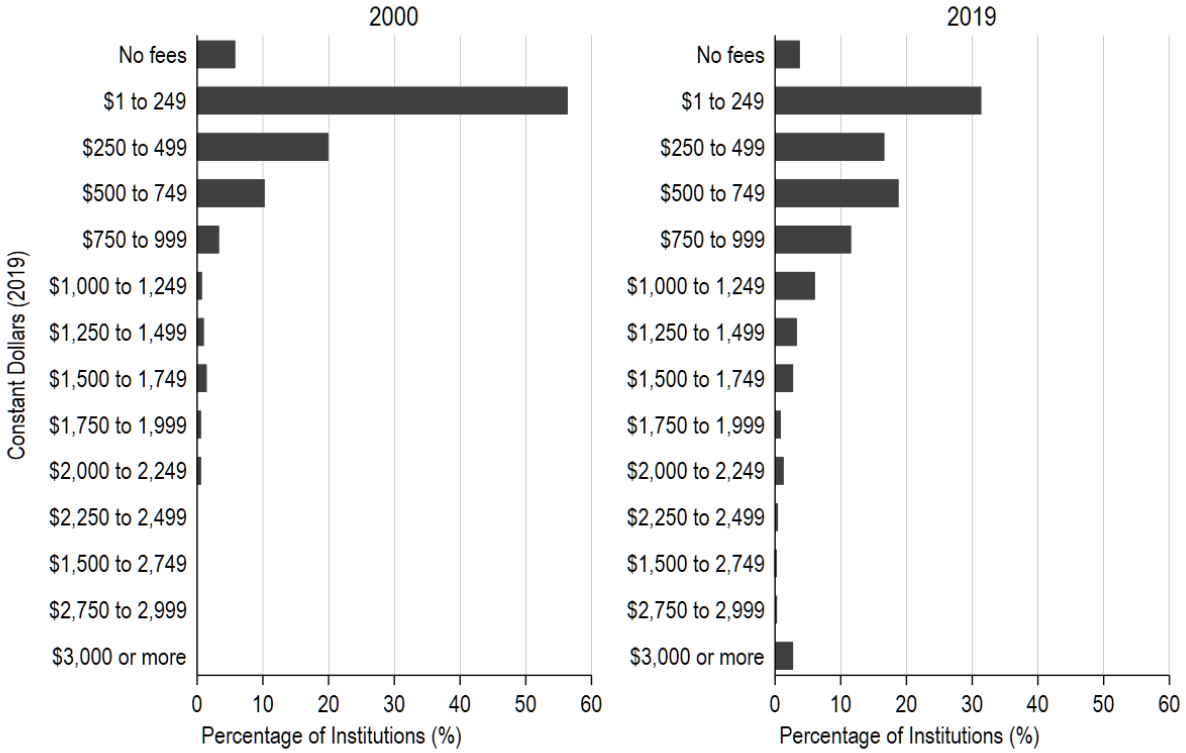

Figure 2.3. Percentage of Public Two-Year Colleges Charging Mandatory Fee Prices, Academic Years 2000-01 and 2019-20

Note. Panel is balanced by year and sector. Data sourced from IPEDS (n.d.).

CHAPTER 3

WHAT MANDATORY COMMUNITY COLLEGE FEES PAY FOR [2]

[2] Mayfield, S.D. To be submitted to *Journal of Education Finance*.

Abstract

Student fees are ubiquitous across America's community colleges, funding a variety of campus services and activities through relatively inconspicuous charges. In an era of hotly contested tuition charges, mandatory student fees have grown at a faster pace than tuition. Yet almost nothing is known about student fees. The Department of Education's IPEDS survey only collects a single total mandatory student fee price from each college, providing no information on individual fees. The purpose of this descriptive study is to collect data on the types, frequencies, magnitudes, and presentation formats of mandatory community college student fees from a purposive sample of 96 individual college websites (two per state, where applicable). The fees are then grouped into 20 categories and tabulated with special care to disaggregate the findings between colleges that charge a relatively higher or lower proportion of their price as fees. The results suggest that these two groups charge certain fees in different proportions and magnitudes, most notably generic fees, and that technology fees are most common across all community colleges. In addition, community colleges overwhelmingly show their mandatory student fees on the same webpage as tuition, but most do not provide a description of the intended use of the fees. The prevalent use of generic student fees and the lack of fee descriptions suggests that community colleges might be resisting the traditionally restricted use of fee funds.

Introduction

In the summer 1995 edition of *New Directions for Student Services*, Stanley Levy offered his vision of the future. He predicted that demand for student services would continue to grow in concert with ever-tightening tuition budgets, leading colleges to rely more and more on student fees to fund them. As he put it, "in the college of the future, more direct charges for even the most basic student services will be assessed" (p. 42). A quarter century later, mandatory student fees have indeed grown at a faster pace than tuition in both public two-year and four-year colleges (see Figure 1.1). Op-ed pieces routinely accuse colleges of charging fees to cover "every imaginable service" (Glater, 2007) and using them "as a kind of stealth, second tuition imposed on unsuspecting families" (Wang, 2013). A 2016 report published by the National Economic Council listed postsecondary student fees as one of seven major examples of hidden fees in the U.S. economy (National Economic Council, 2016). These concerns raise empirical questions over whether and how colleges might be using student fees in a strategic manner. For example, have colleges expanded the scope of their student fees beyond their traditional purposes? And could colleges be using fees to shroud their true price?

These questions have yet to be addressed by scholarly research, likely due to limited data. The College Board's national report of postsecondary prices does not differentiate between tuition and mandatory fees (Ma & Pender, 2021), and the Department of Education's annual IPEDS survey of colleges only collects the combined cost of mandatory fees, providing no details on their names, number, or magnitudes (IPEDS, 2019). Nevertheless, a few scholars have used the IPEDS total mandatory fee price to consider whether various state and college-level factors were correlated with charging higher fees (Arnott, 2012b; Kelchen, 2016), and how the introduction of a statewide guaranteed tuition program caused mandatory student fees to increase

(Delaney and Kearney, 2016). Other scholars have taken to collecting their own student fee data from college websites and using this data to summarize variations in the number and magnitude of individual fees across student types and other contexts (Arnott, 2012a, Reinagel & Cooper, 2019). Even in these cases, most of the data collection and analysis was limited to mandatory fees as there are potentially hundreds of program, course, or administrative fees assessed at each college and they are less likely to be disclosed on colleges' tuition and fee webpages (see Appendix B for a list of student fee categories).[3] Therefore, this study is likewise limited to mandatory student fees.

While the aforementioned studies covered several student fee topics, they all focused exclusively on public four-year colleges and universities. Meanwhile, mandatory student fees have grown at a faster pace in the public two-year community college sector (see Figure 1.1). This trend is concerning for several reasons. Students who attend community colleges are likely more sensitive to price increases than students in the four-year college sector when it comes to their decision to enroll (Heller, 1997). This topic is vitally important in the wake of the coronavirus pandemic, which saw community college enrollments drop by historic proportions (National Student Clearinghouse, 2020). In addition, many free community college "promise" programs ensure that the full cost of tuition is covered but do not cover fees (Jones & Berger, 2018; Jones et al., 2020). Similarly, several major state financial aid programs that cover the majority of tuition for associate's degree seeking students have moved to drop their coverage of student fees (H.B. 326, 2011; LAC 28:IV.Chapter 3, 2021).

Another missing topic in previous research is how fees are presented to students. Research on pricing strategies in other industries suggests that the presentation of prices can

[3] Arnott (2010) makes a case for further study of non-mandatory fees and collects a select sample of non-mandatory fees in her dissertation (2012a).

affect consumer decision making (Abraham & Hamilton, 2018; Greenleaf et al., 2016; Morwitz et al., 1998; Voester et al., 2017). This provides another more subtle means by which colleges might use their fees strategically. If prospective students primarily focus on tuition rates, then there is an opportunity for colleges to hide their total price across various fees that might be less visible or more difficult for prospective students to tally. This added complexity also makes comparisons across colleges difficult, creating what scholars sometimes refer to as a "confusopoly," as first coined by Scott Adams in his Dilbert cartoon (Adams, 2010; see Appendix C for a depiction of the cartoon). It is important for policymakers and prospective students to be conscious of the frequency with which colleges are using price frames and the potential effects they might have on enrollment decisions.

In this first descriptive study of community college student fees, I aim to fill in existing knowledge gaps regarding what community college fees pay for and how they are presented to students online. To do so, I collect line-item student fee names, magnitudes, and presentation formats from a purposive sample of 96 community college websites (two per state, where applicable). I then tabulate and summarize this data to uncover which fees are most typical and expensive at community colleges and whether they are presented in ways that lower their salience. In doing so, I aim to answer the following research questions:

RQ 3.1: What are the types, frequencies, and magnitudes of mandatory fees typically charged in America's public two-year community colleges?

RQ 3.2: How are student fees presented on public two-year community college websites?

RQ 3.3: How do the answers to RQ 3.1 and RQ 3.2 differ across colleges that charge a greater or lesser proportion of their price as fees?

Differences Between Tuition and Fees

As community colleges increase their reliance on student fees, a reasonable question to ask is whether they are being used "to *replace* tuition costs, *supplement* tuition costs, or provide functions *beyond* tuition costs" (Reinagel and Cooper, 2019, p. 3, emphasis in original). The difficulty in answering this question is that it supposes a clear distinction between activities that rightfully fall under the purview of tuition versus others that are suited to student fees.

In most English-speaking countries outside the United States, tuition and fees are not so clearly distinguishable. In these countries, tuition is commonly referred to as the "tuition fee." This usage was likewise common through antebellum America, where college catalogues used phrases such as "fees for lectures" or "fees to professors" to indicate charges that we now think of as tuition (College of William and Mary, 1837; University of Pennsylvania, 1849). The rift between tuition and fees in America appears to stem from a series a court cases in the late 19th and early 20th centuries in which students challenged the authority of colleges to charge incidental fees when they were otherwise prohibited by law from charging a tuition fee (Chambers, 1932; Shelburne, 1939). In one of the earliest cases, *State ex rel. Priest v. Regents of the University*, the judge stated that "in determining this question the meaning of the word 'tuition' has an important bearing" (1882, p. 163). Because tuition originated in the English language as a synonym for instruction, the judge ruled that the prohibition against charging a fee for tuition meant only that "no student shall be required to pay anything for instruction or teaching" (p. 163) and that this prohibition "does not include or reach the incidental expenses for heating and lighting public halls" (p. 164).

The interpretation of tuition as a charge that directly supports instructional costs continues to this day. According to Mullin, Baime, and Honeyman (2015), "Tuition and fees are

often lumped together as if they are one and the same, but they are not. Tuition is a charge for instructional purposes" (p. 59). But this definition has been problematic from the beginning. As Thurber (1924) noted:

> It is sometimes stated in the catalogues that incidental or contingent fees are used to defray the expenses of light and heat or upkeep of buildings… and that not a cent of it is used for instructional service. This seems a distinction without a difference, for, if instruction is to be offered, suitable buildings must be provided. (p. 34)

The widespread adoption of technology fees in the 1990s again brought this problem to the fore. As one editorial at the time noted, "Some critics say the fees are just thinly disguised tuition hikes. They argue that computing resources are as necessary as libraries and – like library costs – should be rolled into tuition" (Young, 1997, p. A23). Ironically, a recent survey of research university libraries found that a quarter of respondents had a dedicated library fee while another quarter had access to other fee funds, most commonly the technology fee (Jones, 2018).

The emergence of technology and library fees supports the notion that colleges are expanding the scope of student fees to cover activities more central to the instructional mission. While the boundary is not sharply defined, it is reasonable to question whether fees that directly support the educational experience in the classroom, the faculty, or the development of the curriculum are taking the place of tuition. For example, Sterritt (2011) found that the Georgia Board of Regents had implemented a Special Institutional Fee in the wake of the Great Recession which, according to one university CFO, was "developed into their general budget, directly supplanting tuition" (p. 63). Likewise, a legislative audit defined this fee as an "alternative form of tuition" (Georgia Department of Audits and Accounts, 2016, p. 10). This is an unambiguous case of strategically using a fee to replace and/or supplement tuition.

Another questionable use of student fees are those that are listed without an explicit purpose, such as generic or comprehensive fees. As Dean Smith (2019) points out, “By nature, fees pay for specific costs. Students pay a fee for a specific activity, and the university uses the fee income to support that specific activity” (p. 59). If a fee has no explicitly directed purpose, one might assume its revenue is often treated as unrestricted and the fee is therefore, in all but name only, a tuition charge. Even those fees with an explicitly directed purpose may not be used accordingly. Audits from multiple states have repeatedly discovered student fee funds that were inappropriately comingled with other fees or the college’s general unrestricted fund (California State Auditor, 2020; State of Arizona, 2018; State of New Jersey, 2016; State of Utah, 2020). Given this, there is reason to assume that vague fees are likely indicative of similarly vague use restrictions.

Conceptual Framework

To use fees as a strategic revenue stream, colleges must have power and influence over the fee setting process. But how much power do public colleges have? In contrast to private businesses, which set their own prices for goods and services, public college price setting involves multiple actors whose influence and interests vary widely (Armstrong et al., 2017; McGuiness, 2016). However, there is reason to believe that outsider influence is more relevant to tuition setting than to fees. In a recent survey, 62% of state higher education agencies strongly agreed that tuition rates were extremely important to state policymakers, while only 26% strongly agreed that student fees were similarly important to policymakers (Armstrong et al., 2017). In fact, the fee setting process appears to largely sidestep lawmakers. After multiple years of surveying state agencies, Carlson (2013) noted that, “the prevailing philosophy that

emerges…is that mandatory fees are institutionally controlled, with some sort of oversight component from a governing board" (p. 17).

Considering the substantial control that colleges appear to have over their student fees, what incentives might exist for college leaders to pursue strategies such as intentionally hiding fees on their websites, shrouding the purpose of fees, or expanding the number and/or scope of fees beyond traditional boundaries? I believe that two mechanisms could be at play: the desire to diversify institutional revenues and to frame prices in a way that lowers their salience to prospective students.

Revenue Diversification

Community colleges face a constant threat of financial uncertainty stemming from the business cycle. Economic downturns lead to a sharp increase in commuting college enrollments and a simultaneous decrease in state fiscal support as laid off workers seek retraining and the states lose potential tax revenues (Romano & Palmer, 2016a, 2016b). The Great Recession of 2008 serves as a prime example. Four years after the start of the recession, state appropriations per FTE community college student had fallen 28.7% from pre-recession levels (author's calculations using data from Snyder and Dillow (2013, table 333.10)). While enrollments and state appropriations tend to eventually level off, colleges are interested in reducing the financial volatility from these major revenue disruptions by seeking alternative forms of revenue. And they have done so, especially since the turn of the century. As Cohen, Brawer, and Kisker (2014) noted, "Community colleges have engaged in revenue generation activities with vigor over the last two decades" (p. 170).

One option to diversity college revenues is through student fees. Often thought of as a traditional revenue stream because of their long history, fees can also be used in innovative ways

to generate new net revenue for a college. Two general strategies are evident. First, colleges can expand the scope of their fees to fund temporary or ad-hoc projects (Keppler, 2010). For example, several colleges charged student fees to cover the cost of COVID-19 surveillance testing early in the Coronavirus pandemic (Carns, 2020). Other colleges weighed whether to charge fees to students who were unvaccinated (Adedoyin, 2021).

Second, colleges can use fees to fund educational expenses as a workaround for less flexible tuition increases. As described previously, tuition is traditionally a charge for educational expenses, but has come under increasing political pressure as the cost of college continues to rise. In many cases, colleges are restricted from increasing tuition but not fees due to tuition caps, curbs, or freezes. A 2013 survey of state higher education agencies found that 15 states had a cap, curb, or freeze placed on tuition in the preceding three years, but only 8 states indicated a similar limit placed on fees (Carlson, 2013). It would make logical sense that colleges would turn to increasing fees, if possible, when tuition was frozen. Recent studies have found evidence that tuition restrictions are indeed related to subsequent fee increases (Delaney & Kearney, 2016; Kelchen, 2016).

Price Framing

Another strategic use of student fees might involve price framing, or "the 'design' of the price… [that] marketers can tactically manipulate… to influence buyers' perceptions and purchase decisions" (Ahmetoglu et al., 2014, p. 696). Price frames have become prevalent in everyday life, including bundling strategies of "buy one, get one half off," reference pricing where a discount is shown in reference to the MSRP, or time-limited pricing offers. Research has shown that price frames can influence consumer behavior separately from the total price charged

for a product or service (see Abraham & Hamilton (2018), DellaVigna (2009), Greenleaf et al. (2016), and Voester et al. (2017) for reviews of this literature).

Two price frames with particular relevance to college prices are partitioned pricing and drip pricing. Partitioned pricing occurs when a total price for a product or service is separated into a base price and additional required surcharges. In the case of higher education, the base price is tuition, mandatory student fees are additional surcharges, and the sum of tuition and fees comprise the total direct price that colleges charge. Early experiments on price framing revealed that consumers tend to underestimate the total cost of a product when the price is partitioned (Morwitz et al., 1998), a phenomenon that has subsequently been confirmed across a wide range of experiments and real-world purchase decisions (see Greenleaf et al., 2016; Voester et al., 2017). Much of this research investigates potential moderating factors, including the type of surcharge, its perceived reasonableness, the seller's reputation, and situational/market characteristics (Voester et al., 2017).

Drip pricing sometimes co-exists along with partitioned pricing. Ahmetoglu, Furnham, and Fagan (2014) define drip pricing as "temporal price separation," (p. 697) where consumers are shown only a part of the price upfront with surcharges dripped in later in the purchasing process. In May 2012, the Federal Trade Commission (FTC) held a conference on the topic of drip pricing in which the opening remarks mentioned higher education:

> We asked FTC employees to share their personal experiences with drip pricing and I'll share just a few of them with you… One staffer recalled that when her son started college, she attended orientation and was given information about tuition and housing costs, but when the tuition bill arrived, there were additional mandatory, undisclosed fees that totaled about $2,000. (Leibowitz, 2012, p. 5)

Little research has been conducted to date on the effects of drip pricing, with experimental evidence showing mixed findings as to whether drip pricing has a larger effect (Blake et al., 2021; Huck & Wallace, 2010; Santana et al., 2020) or smaller effect (Robbert, 2015; Robbert & Roth, 2014) on purchasing intentions in comparison to partitioned pricing that is not dripped. Whatever the case, studies agree that drip pricing leads consumers to underestimate the total price of the product or service.

Data and Methods

This study involved an in-depth collection of community college charges and the formats in which they were presented to students online. To help standardize this collection, I created a Microsoft Access data entry form and tested the form on 20 colleges before revising and finalizing its format (see Appendix D for a copy of the form). Once data collection was complete, I then ran descriptive analyses aimed at answering the research questions. Tabulation tables and frequency charts are used throughout to illustrate the prevalence of fee types, their magnitudes, and their presentation formats.

Sample

There is some debate over what constitutes an American community college. While community colleges were established to grant associate degrees and sub-baccalaureate certificates, there is a growing trend of community colleges that offer bachelor's degrees as well. As of 2020, 23 states allowed community colleges to award bachelor's degrees and about 133 colleges did so (American Association of Community Colleges, 2020; Fulton, 2020). There is evidence that bachelor degree adoption changes the revenue patterns of community colleges; in particular, they increase their reliance on tuition and fees (Ortagus & Hu, 2020). I therefore limit

my sample to public colleges whose highest award is the associate's degree to ensure that changes in tuition and fees are not affected by changes in degree levels awarded.

It would be costly to collect a census dataset of student fees across America's 853 public two-year colleges. In similar circumstances, researchers often survey a simple random sample (SRS) of the population because its attributes are easily generalizable. This would indeed be ideal if the goal of this study were to estimate parameters of student fees charged at all American community colleges, but this is not the goal. Instead, purposive sampling is better suited to address the proposed research questions. Purposive sampling "describes population samples used for research that have been deliberately chosen to reflect a specific characteristic... The term is meant to describe a premeditated, or purposive, intent in picking individuals who will comprise the study sample" (Bullard, 2020, p.1).

The current study benefits from a purposive sample in several ways. First, because the study is descriptive, its main objective is not to generalize its findings. It instead aims to illustrate typical cases of fees across various dimensions. Second, because community colleges are heavily concentrated in a few large states, it is necessary to stratify the sample by state to ensure adequate geographic representation. Third, because IPEDS collects data on fees separately from tuition, I was able to use this data to select colleges that had a relatively low or high proportion of fees compared to total tuition and fees. This enabled me to compare fees at colleges that charge a relatively low and high proportion of their price as fees.

In light of these characteristics, I collected tuition and fee data from two community colleges within each state, where possible. The two institutions were selected according to their relative fee proportion, which I defined as the percentage of IPEDS-reported total fees to tuition and fees charged. Those institutions closest to the 25^{th} and 75^{th} percentile fee proportion within

each state were selected into the sample. While the total sampling frame is 100 community colleges (two colleges per 50 states), three states did not have any public two-year colleges listed in IPEDS, and five states had only one. In these cases, I investigated the state by hand and expanded the sampling frame to include public, four-year colleges that were predominantly associate's degree granting or two-year tribal colleges. The final analytic sample included 96 colleges, with four states having only one college and one state having two colleges with identical fee proportions. Therefore, comparisons between fee dependency groups include only 90 colleges while total values include 96 colleges.

Data

All of the sampled colleges had a home webpage listed in IPEDS, which was my starting place for finding where each college presented its tuition and fee charges. All colleges had a dedicated webpage for their tuition and fees, although in some cases the lack of detail led me to search their student catalogs or to email the institution for clarification. Because charges can vary by enrollment status, program, and semester, I collected the total tuition and mandatory fees charged in the fall and spring semesters to a full-time student. Mandatory fees were defined as any recurring non-tuition charges that were required of the majority of students (similar to the IPEDS definition). In cases such as parking fees required to park on campus, I inferred that the majority of students would likely pay this fee.

Multiple variables were collected on each student fee using a Microsoft Access data entry form (see Appendix D). There variables include the fee's name, whether it had a description, to whom it was applicable, its magnitude, how it was charged (e.g., per semester, credit hour, etc.), whether there was a cap or limit on its maximum value, where it was listed in relation to tuition, whether it was listed as mandatory, and the description of the fee if one was provided. One-time

fees for diplomas, graduation, new students, or ID cards were also collected but were not considered mandatory fees (they were collected and analyzed separately). A binary "yes/no" indicator variable was also used for whether lab, course, or program fees and/or online course fees were clearly visible, but no further information was gathered on these fees that apply to only a subset of students. I also made notes of my perceptions of the student charges webpage and any caveats discovered for any particular fee.

I also gathered information on how fees were presented to students more broadly at the college level. This included whether individual fee charges were presented to students, whether tuition and fees were listed in the same table/text and whether they were on the same webpage, how charges were presented (i.e., one total charge, two charges for tuition and total fees, or multiple charges with line-item fees), whether and where fee descriptions were provided, and the primary source of data (e.g., college website, student handbook, email, etc.).

Once all the data was collected, the fee names and descriptions were used to assign fees into one of several categories. This was necessary because student fee names are not standardized; some colleges charge "technology fees" while others charge "technology support fees" or "technology services fees." In total, I collected 382 mandatory fees that the majority of students must pay (including duplicates), and 44 mandatory one-time fees that I assess separately (e.g., new student or graduation fees). I then removed duplicate fee names to reduce the list of mandatory fees from 382 to 201. From there, I used the primary identifying word(s) of the fee to create 118 fee groups (e.g., the word "capital" was used to group the following fees: capital assessment fee, capital fee, and capital improvement fee). These groups were then sorted into 20 fee categories using notes and descriptions of the fees to guide my category assignments. To add further clarity, most of the names of the 20 fee groups list their primary sub-groups with

forward-slashes (e.g., the "Technology/Computer/Internet" fee group). The assignment decisions for all 201 unique mandatory fee names can be found in Appendix E.

This study also includes descriptive information about the sample colleges and their students. These variables can help inform the types of institutions that rely more or less heavily on student fees. For example, data on the colleges' urbanicity, student demographics, and revenue/expenditure patterns can offer insights as to whether such characteristics are related to a greater or lesser proportion of price charged as fees. While descriptive statistics cannot answer for the cause-effect relationship between institutional characteristics and fees, it is helpful to check whether there are notable relationships between them.

Results

Table 3.1 provides summary statistics of the colleges in the sample, including a comparison between those that had a relatively lower or higher proportion of fees relative to price. Overall, there are few notable differences. Colleges in the sample that relied less on fees tended to be located in cities, be transfer-oriented, have a higher proportion of white and in-state students, have higher revenues per student and share of revenues from local appropriations, and spent a greater proportion of their budget on institutional support and less on other core expenses. Of these differences, only the proportion of in-state students and the spending on institutional support showed any statistical significance, although this likely stems from the low statistical power inherent in the small samples.

Table 3.2 compares the total price for tuition and fees as given by my data collection and IPEDS. Using the data collected through this study, the average college charged about four mandatory fees, with higher fee-dependent colleges charging about one fee more than low fee-dependent colleges on average. Tuition was slightly higher ($158.69) at low fee-dependent

colleges while fees were significantly lower (-$385.21), suggesting that tuition and fees might be substitutable charges (note that Kelchen (2016) also found tuition and fees to be marginally substitutable). Fees as a proportion of tuition and fees was eight percentage-points lower at low fee dependent colleges. Overall, the data collected from this study matched well with IPEDS-reported data, with IPEDS tending to report a higher price for tuition and fees. There were 16 colleges with a notable price difference between my findings and IPEDS, which I re-assessed for quality control. Reasons for differences varied but included colleges that reported prices for 15 credit hours (rather than 12), included only one semester of fees, had a substantial price change in the time between the collection of IPEDS data and this study, or had incorrect quarter-to-semester pricing adjustments.

Types, Frequencies, and Magnitudes of Student Fees

Turning to individual fees charged, Figure 3.1 shows the percentage of colleges charging one or more fees within each fee group. More than half of the sampled colleges charged a technology fee, while over a quarter charged fees for student activities, generic fees, facilities fees, and/or access and parking fees. While technology fees were the most common, Figure 3.2 shows that they were only the fifth most expensive fee when charged. Meanwhile the least common fee (residency) was the most expensive when charged. To balance the likelihood of a fee being charged with its typical cost, Figure 3.3 shows the expected fee charge. This is calculated as the percent of colleges charging the fee multiplied by the fee's average magnitude when charged.

Figures 3.4-3.6 show the same information as the previous three figures, but with the data disaggregated by fee proportion group. Figure 3.4 illustrates how some fees are charged at roughly the same proportion of colleges across both the high and low fee dependent groups, such

as student activities, registration, and student government. Meanwhile, other fees are much more common in high fee dependent colleges. These include student support/services fees (20 pts. more common), technology fees (15.6 pts. more common), generic fees (15.6 pts. more common), and facilities fees (8.9 pts more common).

Figure 3.5 disaggregates the average fee charge between low and high fee proportion colleges. While course/department fees and accident insurance stand out as fees with large price differences, they are so uncommon that these differences could simply be a result of excessively small sample sizes. Of the fees more commonly charged, the biggest price difference between the groups are student support/services fees ($22 difference), generic fees ($15 difference), and registration fees ($16 difference). Registration fees buck the trend in being more expensive when charged at low fee dependent colleges.

Finally, Figure 3.6 shows the average expected price by fee proportion group. The biggest differences between the groups are generic fees ($13 difference), technology fees ($8 difference), student support/services fees ($8 difference), and facilities fees ($7 difference). Two results merit attention. First, the expected value of student support/services fees is over 10 times greater at colleges that charge a high proportion of their price through fees than those where the proportion is low. Second, registration fees are noteworthy because their average expected price is higher at low fee dependent colleges ($5 difference) - it is the only commonly charged fee to do so.

Presentation of Student Fees

Tables 3.3 and 3.4 detail how fees are presented to students online. Table 3.3 treats the college as the unit of analysis, offering a high-level perspective of how prices are presented to students. Most colleges in the sample (84%) presented their student fees on the same webpage as

tuition, with a substantial portion (60%) showing tuition and fees in the same text or table. However, sometimes fees would be bundled together in this table, with individual fee prices only given further down the webpage in a second table (31%). A majority of colleges did not give any description of their fees (63%). Using the forward-slashes in the tuition and fee web address as an indicator of distance from the college homepage, most colleges showed their prices two webpages distant from their homepage. Online course fees were somewhat common on tuition and fee webpages (41%) while lab, course, and program fees were very common (84%).

Turning to individual fees as the unit of analysis, only about a third (34%) of the fees collected had a readily apparent description of their use. Most fees were charged per credit hour (59%) or per semester (40%), which stands in contrast to the 83% of colleges which charge tuition in a per credit hour basis (see Table 3.3). Individual fees were usually shown in the same text or table as tuition (44%) or in a different text/table from tuition on the same webpage (37%). Tuition was almost always presented visually on the webpage prior to fees. Finally, most fees applied to all students (93%) with a small proportion applying only to full-time students (6%). None of the data on fee presentation, whether at the institution level or at the individual fee level, indicates systematic differences between low and high fee dependent colleges.

Discussion

The data collected through this study provides a glimpse into what community college student fees are charged for and how they are presented to students across the United States. Because student fees must be coded by hand into categories, it can be problematic to compare the results of this study to other studies on four-year college student fees. With this caution in mind, however, there are interesting overarching differences in the findings of this study and Reinagel and Cooper's (2019) study on four-year college fees. First, the results from Reinagel

and Cooper (2019) indicate that four-year colleges charge roughly two more fees on average than the community colleges in this study (5.88 versus 3.98 fees, on average). Academic support improvement fees were the most common fees in four-year colleges, while academic/learning support fees ranked as the 10th most common fee in this study. Other fees such as those for technology, student activities, facilities, support services, and generic fees ranked as common in both studies.

Two community college fees stand out as especially common and relatively costly: technology fees and generic fees. Both of these fees are 15.6 percentage points more common in high fee dependent colleges than low fee dependent colleges, but the difference in the price of these fees is noteworthy. Generic fees average $15.18 higher in high fee dependent colleges while the technology fees average only $4.58 higher. The stark difference in the average price of generic fees supports the notion that some community colleges might be using them as a revenue-generating strategy. As noted in the conceptual framework, generic fees are by their very nature a nontraditional fee because tradition dictates that student fees should be restricted to a defined purpose. Creating ambiguous student fees may be a convenient way for colleges to shroud the purpose of their fee revenues. As Thelin (2013) notes, vague mentions of student fees can be "a deliberate act that is disingenuous because it allows a college to mask certain kinds of expenses being passed on to students as consumers" (p. 58).

There are fewer significant differences between low and high fee dependent colleges in how they present their student fee charges online. But this does not mean that community colleges are not strategically shrouding their fees via their presentation format. In fact, the results show that only a third of fees had a readily available description of their intended use, fewer than half were shown in the same text or table as tuition, and nearly one in five fees can only be found

on a different webpage than tuition or in the student catalog. Looking at the college as a unit of analysis, only about a quarter of colleges housed fee descriptions on the same webpage as their prices.

Finally, why do 84% of the sampled colleges show individual fee prices somewhere on their website, but only 37% describe what these fees pay for? Perhaps the colleges assume that the name of a fee is sufficient description of its intended purposes. But frequent complaints in state audits of student fee funds being mixed with other budgetary items (California State Auditor, 2020; State of Arizona, 2018; State of New Jersey, 2016; State of Utah, 2020) might lead one to reasonably question whether a lack of description enables a laxer accounting of fee dollars.

Limitations

This study was limited in several ways. First, the sample size of 96 public two-year colleges represents only about 11.2% of all such colleges in the United States. A purposive sampling design was used to avoid sampling colleges with extremities in tuition and fee pricing; however, a larger sample would provide more certain data on the typicality of community college student fees.

Second, this was the first study to collect data on the presentation format of student fees or, to my knowledge, the presentation of college prices more generally. Capturing this data is inevitably complicated. In some cases, fees were shown in multiple places and in differing formats (for example, some colleges listed just one price for bundled “mandatory fees” in one table, only to then provide a second table with a breakdown of each individual fee). I attempted to mitigate these effects by capturing variables at the institution level for a general sense of

presentation format and again at the individual fee level for specifics on how each individual fee was presented. The risk herein is that these data can sometimes appear contradictory.

Finally, assigning 382 fees into categories is fraught with subjectivity. Previous studies of four-year college fees grouped fees into either one of five categories (e.g., Arnott, 2012a) or one of eleven categories (Reinagel & Cooper, 2019) with no discernible reason for the number of categories. I decided to sort fees into twenty categories, which is the point at which I felt collapsing any further would cause a loss of specificity greater than any gain in generalizability.

Conclusion

In summary, both the frequency and price of generic fees and the low prevalence of fee descriptions support the notion that community colleges seek strategic ambiguity in their student fee revenues. Generic and loosely defined fees can be used to decouple fees from supporting a single direct cost, which can free these funds to be used as if they were unrestricted revenues. Doing so, however, might burden students with additional costs because several financial aid and free college programs are more likely to cover tuition than fees. Therefore, community colleges should carefully consider the potential consequences of charging generic or ambiguously defined student fees on their open-access missions.

Table 3.1.

Descriptive Statistics of Colleges by Fee Proportion

Variable	Low Fee Proportion		High Fee Proportion		Difference (Low-High)		Total	
	M	*SD*	*M*	*SD*	*Diff.*	*t*	*M*	*SD*
College characteristics (pct. of total):								
Locale: city	0.38	(0.49)	0.29	(0.46)	0.09	(0.89)	0.35	(0.48)
Locale: suburb	0.16	(0.37)	0.27	(0.45)	-0.11	(-1.29)	0.20	(0.40)
Locale: town	0.24	(0.43)	0.27	(0.45)	-0.02	(-0.24)	0.24	(0.43)
Locale: rural	0.22	(0.42)	0.18	(0.39)	0.04	(0.52)	0.21	(0.41)
Athletic assoc. member	0.51	(0.51)	0.53	(0.50)	-0.02	(-0.21)	0.51	(0.50)
Graduation rate[a]	0.33	(0.14)	0.33	(0.10)	0.01	(0.25)	0.33	(0.12)
Student/faculty ratio	16.53	(4.72)	16.80	(5.08)	-0.27	(-0.26)	16.56	(4.85)
FTE staff	421.77	(346.35)	444.96	(412.53)	-23.18	(-0.29)	441.23	(381.43)
Enrollment[b] (pct. of total):								
Race: White	0.62	(0.21)	0.56	(0.23)	0.06	(1.36)	0.59	(0.22)
Race: Hispanic	0.12	(0.11)	0.14	(0.15)	-0.02	(-0.82)	0.13	(0.13)
Race: Black	0.11	(0.12)	0.11	(0.13)	-0.01	(-0.30)	0.11	(0.12)
Age: under 18	0.18	(0.11)	0.17	(0.12)	0.01	(0.25)	0.17	(0.11)
Age: 18-24	0.52	(0.12)	0.53	(0.10)	-0.00	(-0.10)	0.52	(0.11)
Age: over 25	0.30	(0.10)	0.30	(0.10)	-0.00	(-0.23)	0.30	(0.10)
Gender: female	0.57	(0.07)	0.59	(0.07)	-0.01	(-0.81)	0.58	(0.07)
Enrolled only online	0.15	(0.09)	0.14	(0.08)	0.01	(0.56)	0.15	(0.09)
Enrolled full-time	0.40	(0.13)	0.39	(0.14)	0.01	(0.44)	0.39	(0.14)
Enrolled in-state	0.96	(0.05)	0.91	(0.11)	0.05*	(2.33)	0.94	(0.08)
Pell grant recipient	0.52	(0.13)	0.52	(0.14)	-0.00	(-0.13)	0.52	(0.14)

Variable	Low Fee Proportion		High Fee Proportion		Difference (Low-High)		Total	
	M	*SD*	*M*	*SD*	*Diff.*	*t*	*M*	*SD*
12-month enrollment	8,297.80	(8,289.57)	8,987.75	(9,994.85)	-689.95	(-0.35)	8,781.76	(9,030.75)
Revenues[b] (pct. of total):								
State appropriations	0.32	(0.15)	0.31	(0.15)	0.00	(0.16)	0.31	(0.15)
Local appropriations.	0.13	(0.17)	0.09	(0.12)	0.04	(1.45)	0.11	(0.15)
Gov. grants/contracts	0.27	(0.17)	0.29	(0.12)	-0.02	(-0.64)	0.28	(0.14)
Tuition and fees	0.19	(0.09)	0.20	(0.11)	-0.01	(-0.54)	0.20	(0.10)
Revenues per FTE	17,826.34	(9,117.57)	17,598.51	(8,529.48)	227.83	(0.12)	17,507.95	(8,610.49)
Expenditures[b] (pct. of total):								
Instruction	0.43	(0.09)	0.43	(0.10)	0.00	(0.14)	0.43	(0.10)
Institutional support	0.18	(0.05)	0.16	(0.05)	0.02*	(2.25)	0.17	(0.05)
Student services	0.12	(0.04)	0.12	(0.04)	0.00	(0.06)	0.12	(0.04)
Other core expenses	0.16	(0.10)	0.19	(0.11)	-0.03	(-1.42)	0.17	(0.11)
Expenditures per FTE	17,017.50	(8,296.22)	16,693.87	(8,656.85)	323.63	(0.18)	16,610.64	(8,289.75)
N	45		45		90		96	

Note. Ivy Tech Community College is excluded from enrollment variables due to its outlier size. Ilisagvik College is excluded from total revenue per FTE student due to outlier values. Four colleges are the only community college in their state, and two colleges in one state have the same fee dependence. These six colleges are not included in a fee dependency group but are included in the grand total.

[a] Graduation rates are for 200% normal time. [b] Categories under 0.10 are excluded for brevity.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3.2

Summary of College Tuition and Fees by Fee Dependency

Variable	Low Fee Proportion		High Fee Proportion		Difference (Low – High)		Total	
	M	*SD*	*M*	*SD*	*Diff.*	*t*	*M*	*SD*
Number of Fees	3.67	(3.01)	4.51	(2.55)	-0.84	(-1.44)	3.98	(2.78)
Annual Tuition ($):								
Study Collection	3,637.96	(1,632.38)	3,479.28	(1,725.34)	158.69	(0.45)	3,627.21	(1,657.97)
IPEDS	3,871.96	(1,667.52)	3,745.11	(2,035.71)	126.84	(0.32)	3,858.78	(1,815.67)
Annual Fees ($):								
Study Collection	573.96	(752.19)	959.16	(861.45)	-385.21*	(-2.26)	736.25	(809.59)
IPEDS	597.29	(765.79)	949.42	(871.26)	-352.13*	(-2.04)	743.15	(816.68)
Fee Proportion of Price:								
Study Collection	0.13	(0.15)	0.22	(0.16)	-0.08*	(-2.49)	0.17	(0.16)
IPEDS	0.13	(0.14)	0.20	(0.16)	-0.07*	(-2.27)	0.16	(0.15)
N	45		45		90		96	

Note. Four colleges are the only community college in their state, and two colleges in one state have the same fee dependence. These six colleges are not included in a fee dependency group but are included in the grand total.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

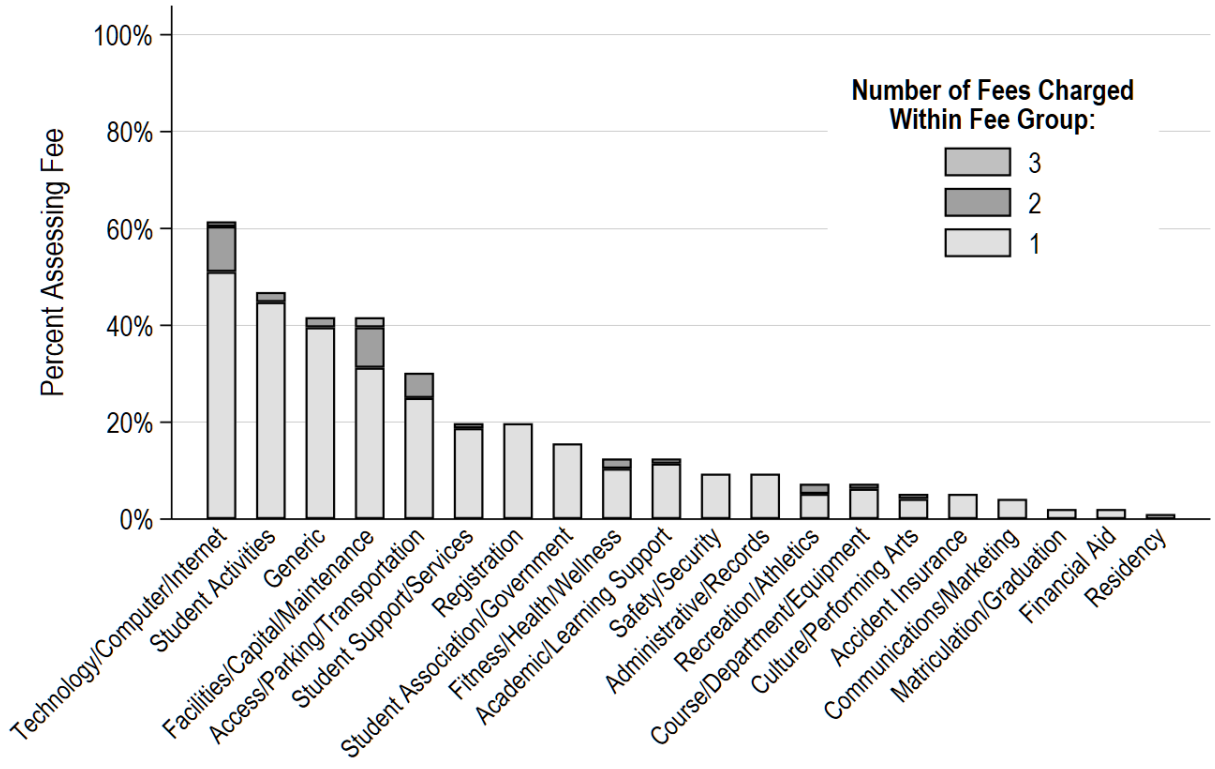

Figure 3.1. Percentage of Sample Colleges Charging Particular Fees

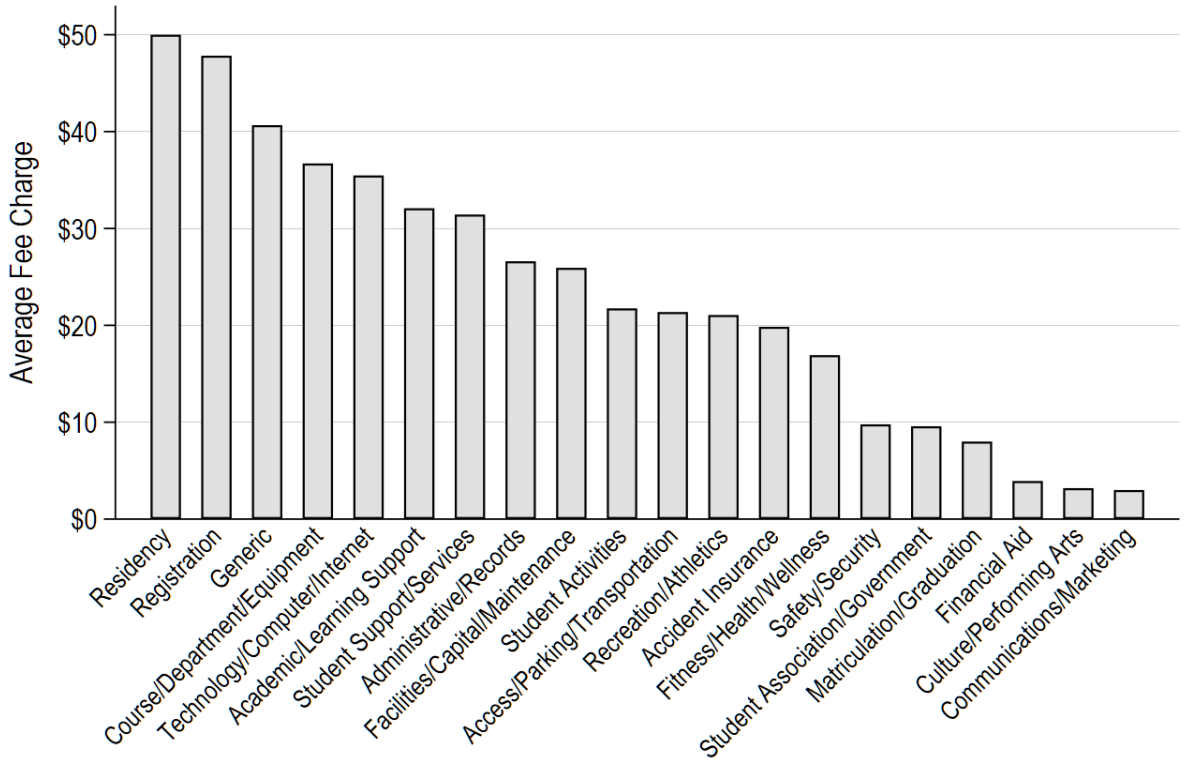

Figure 3.2. Mean Price of Particular Fees when Charged

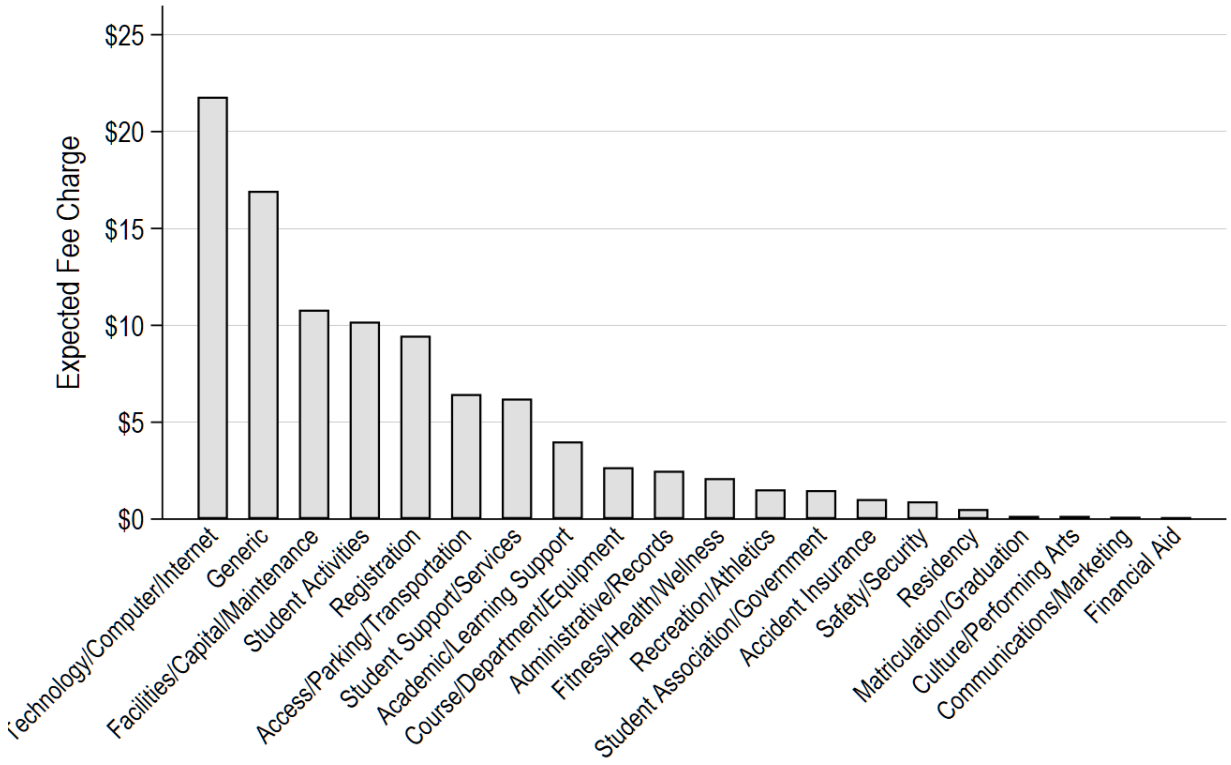

Figure 3.3. Expected Value of Particular Fees

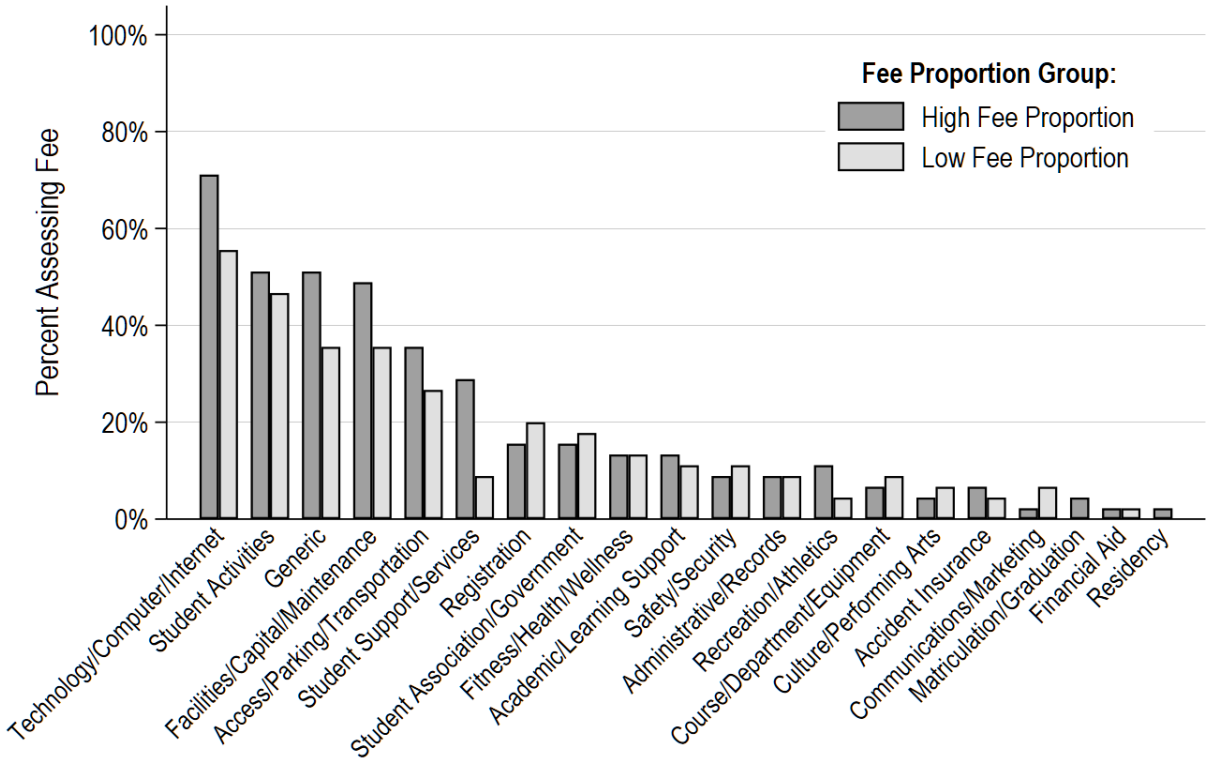

Figure 3.4. Percentage of Sample Colleges Charging Particular Fees by Fee Proportion Group

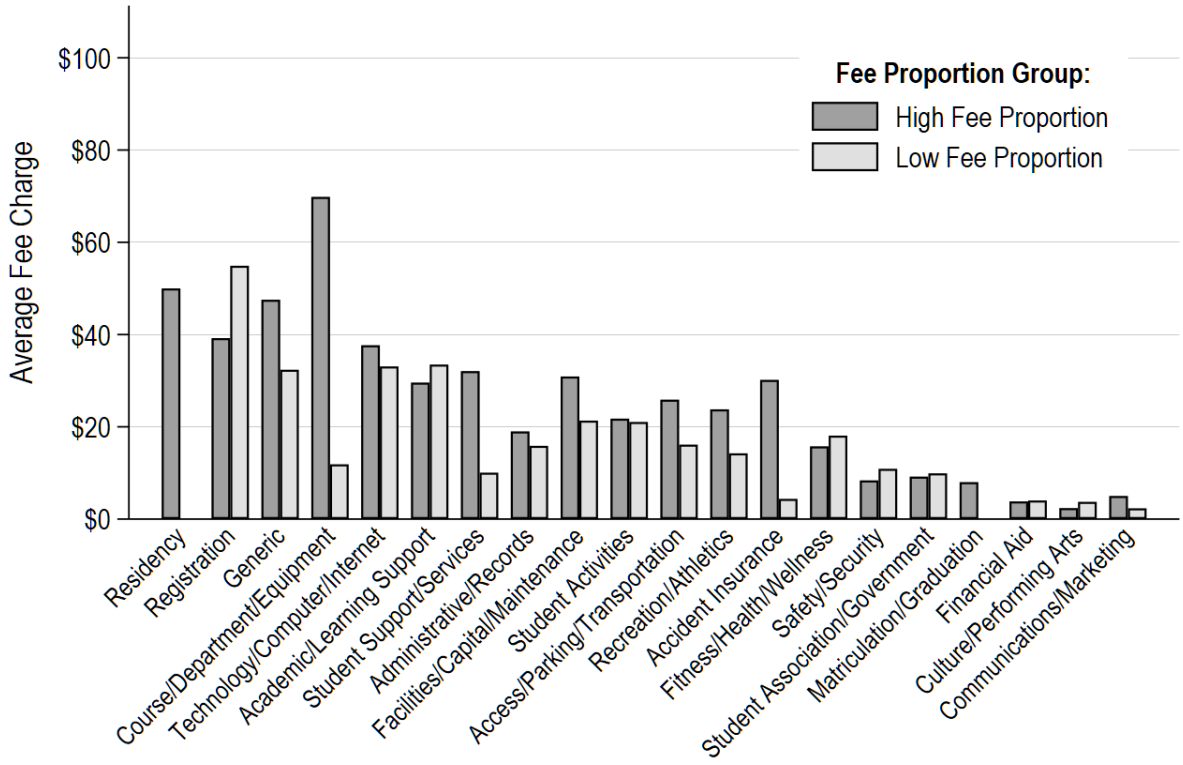

Figure 3.5. Mean Price of Particular Fees when Charged by Fee Proportion Group

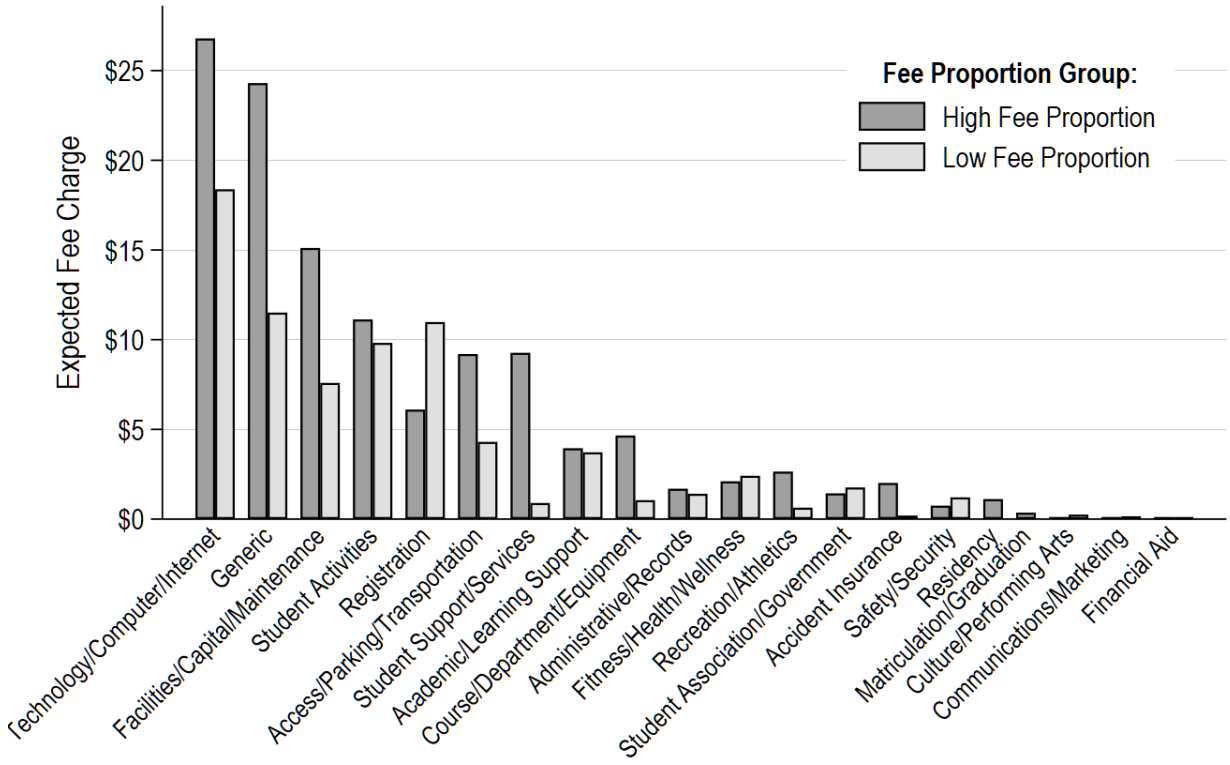

Figure 3.6. Expected Value of Particular Fees by Fee Proportion Group

Table 3.3

Presentation of Community College Fees by Fee Dependency (College-Level)

Variable	Low Fee Proportion	High Fee Proportion	Difference (Low – High)		Total
	Mean	*Mean*	*Diff.*	*t*	*Mean*
Location of tuition and fees:					
Same webpage	0.82	0.84	-0.02	(-0.28)	0.84
Same text/table	*0.53*	*0.64*	*-0.11*	*(-1.07)*	*0.60*
Different text/table	*0.29*	*0.20*	*0.09*	*(0.98)*	*0.24*
Different webpage, embedded	0.07	0.07	0.00	(0.00)	0.06
Different webpage, not embedded	0.02	0.04	-0.02	(-0.58)	0.03
No fees shown	0.09	0.04	0.04	(0.84)	0.06
Individual fee charges visible:					
Yes, main text/table	0.44	0.44	0.00	(0.00)	0.45
Yes, secondary text/table	0.29	0.31	-0.02	(-0.23)	0.31
Yes, different webpage	0.09	0.09	0.00	(0.00)	0.08
No individual fee prices visible	0.18	0.16	0.02	(0.28)	0.16
Fee descriptions visible:					
Same webpage as prices	0.22	0.27	-0.04	(-0.49)	0.26
Different webpage, embedded	0.09	0.02	0.07	(1.38)	0.06
Different webpage, not embedded	0.04	0.07	-0.02	(-0.46)	0.05
No fee descriptions visible	0.64	0.64	0.00	(0.00)	0.63
Webpage distance from homepage:					
1 webpage distant	0.13	0.24	-0.11	(-1.35)	0.19
2 webpages distant	0.58	0.40	0.18	(1.70)	0.47
3 webpages distant	0.20	0.29	-0.09	(-0.98)	0.27
4 webpages distant	0.07	0.07	0.00	(0.00)	0.06
5 webpages distant	0.02	0.00	0.02	(1.00)	0.01

Variable	Low Fee Proportion	High Fee Proportion	Difference (Low – High)		Total
	Mean	*Mean*	*Diff.*	*t*	*Mean*
Tuition charged per:					
Credit hour	0.80	0.87	-0.07	(-0.84)	0.83
Credit hour - varies	0.07	0.07	0.00	(0.00)	0.06
Contact hour	0.02	0.02	0.00	(0.00)	0.02
Semester	0.11	0.04	0.07	(1.18)	0.08
Online course fees visible	0.49	0.33	0.16	(1.50)	0.41
Lab, course, or program fees visible	0.87	0.84	0.02	(0.30)	0.84
N	45	45	45		96

Note. Four colleges are the only community college in their state, and two colleges in one state have the same fee dependence. These six colleges are not included in a fee dependency group but are included in the grand total.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3.4

Presentation of Community College Fees by Fee Dependency (Fee-Level)

Variable	Low Fee Proportion		High Fee Proportion		Difference (Low – High)		Total	
	M	*SD*	*M*	*SD*	*Diff.*	*t*	*M*	*SD*
Fee has a description	0.36	(0.48)	0.31	(0.46)	0.05	(0.95)	0.34	(0.48)
Fee charged per:								
Credit hour	0.58	(0.50)	0.63	(0.48)	-0.05	(-1.07)	0.59	(0.49)
Course	0.00	(0.00)	0.01	(0.10)	-0.01	(-1.42)	0.01	(0.07)
Semester	0.42	(0.49)	0.35	(0.48)	0.07	(1.34)	0.40	(0.49)
Year	0.01	(0.08)	0.00	(0.07)	0.00	(0.15)	0.01	(0.07)
Other/unknown	0.00	(0.00)	0.00	(0.07)	-0.00	(-1.00)	0.00	(0.05)
Fee presentation in relation to tuition:								
Same text/table	0.42	(0.49)	0.42	(0.50)	-0.01	(-0.11)	0.44	(0.50)
tuition shown first	*0.41*	*(0.49)*	*0.41*	*(0.49)*	*-0.00*	*(-0.05)*	*0.43*	*(0.50)*
Different text/table	0.39	(0.49)	0.37	(0.49)	0.01	(0.26)	0.37	(0.48)
tuition shown first	*0.39*	*(0.49)*	*0.33*	*(0.47)*	*0.06*	*(1.15)*	*0.35*	*(0.48)*
Different webpage	0.15	(0.36)	0.15	(0.36)	-0.00	(-0.03)	0.15	(0.35)
Student catalog	0.04	(0.19)	0.05	(0.22)	-0.01	(-0.61)	0.04	(0.20)
Other/unknown	0.01	(0.08)	0.00	(0.00)	0.01	(1.00)	0.00	(0.05)
Fee applies to:								
All students	0.91	(0.29)	0.95	(0.22)	-0.04	(-1.54)	0.93	(0.25)
Full-time students	0.08	(0.28)	0.04	(0.20)	0.05	(1.77)	0.06	(0.23)
Out-of-district students	0.01	(0.08)	0.01	(0.10)	-0.00	(-0.41)	0.01	(0.09)
N	165		203		368		382	

Note. Four colleges are the only community college in their state, and two colleges in one state have the same fee dependence. These six colleges are not included in a fee dependency group but are included in the grand total.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

CHAPTER 4

WHY COMMUNITY COLLEGE RELIANCE ON STUDENT FEES GROWS [4]

[4] Mayfield, S.D. To be submitted to *Community College Review*.

Abstract

Mandatory community college student fees have grown consistently faster than tuition over the past 20 years, outpacing the growth of fees in other postsecondary sectors. Yet to date, research on the causes of student fee growth have been limited to the public four-year college sector. In this first study to examine the causes of community college student fee growth, I borrow from the insights of behavioral industrial organization, which suggest that colleges might increase their use of fees to obfuscate their prices as market competition increases. Using a balanced dataset of 721 public community colleges from academic years 2009-10 through 2019-20, I examine whether the addition of a newly opened college in the vicinity of a community college is correlated with and/or causes the latter to increase its proportion of price charged as mandatory student fees. Causal results are obtained from canonical two-period, two-group differences in differences (DD) and a new multi-period two-stage DD estimation strategy that overcomes the limitations of traditional multi-period DD strategies. Contrary to expectations, the results did not indicate that increased market competition leads community colleges to increase the proportion of their price charged as student fees. Potential explanations include limited sample sizes and alternative theories of the competition-price relationship.

Introduction

Community college student fees are comprising an ever-larger share of the direct cost of attendance. Over the past 20 years, community college student fees increased by 241% while tuition grew 160% (see Figure 1.1). In their 2015 book on community college finance, Mullin, Baime, and Honeyman noted that, "The increase in the total amount of fees and the proportional share of tuition and fees coming from fees (which are… sometimes more controllable by institutions than tuition) is a trend worth watching" (p. 68). This topic is especially compelling as some state financial aid programs have dropped their coverage of student fees (H.B. 326, 2011; LAC 28:IV.Chapter 3, 2021), several active and proposed free community college "promise" programs do not cover fees (Jones & Berger, 2018; Jones et al., 2020), and there is evidence that fees might be used to skirt tuition-controlling policies such as guaranteed tuition (Delaney & Kearney, 2016) or to preserve state financial aid programs that only cover the cost of tuition (Sterritt, 2011).

We know surprisingly little about why student fees are growing so rapidly. Opinion pieces often suggest that fees are being used as a politically safe alternative to more visible tuition increases (Fergus, 2018; National Economic Council, 2016; Weisbrod et al., 2008). There is some descriptive evidence that supports this claim. Surveys of state higher education agencies have found that public/media concern about higher education costs was a more important factor for setting tuition rates than student fees (Boatman & L'Orange, 2006) and that student fee prices garner less attention from policymakers than tuition (Armstrong et al., 2017). Alternatively, fees might be increasing because colleges are becoming more market-oriented and are viewing students like customers who should pay for any added service (Arnott, 2012a). It is not uncommon to see direct comparisons of college fees to those fees charged by hotels, airlines, and

other for-profit industries (Cohen et al., 2014; Consumer Reports, 2019; National Economic Council, 2016).

Only three studies have empirically examined the root causes of student fee growth, and they were all limited in scope to public four-year colleges. These studies highlight the importance of college characteristics and surrounding political contexts, such as student demographics, student/faculty ratios, state economics, tuition and fee caps, and the responsible party for setting tuition and fee rates (Arnott, 2012b; Kelchen, 2016; Reinagel & Cooper, 2019). Fee rates also vary widely across geographies (Reinagel & Cooper, 2019). In addition, there appears to be some interaction between tuition and fee levels. Tuition increases appear to lower the price of student fees while tuition caps appear to raise them, suggesting that student fees are at least a partial substitute for tuition (Kelchen, 2016).

Scholarly research from the fields of marketing and behavioral economics has also examined how consumers react differently according to how prices are framed. One particular frame known as partitioned pricing (PP) occurs when the price for a good or service is "divided into two or more mandatory parts and presented to consumers as a base price and one or more mandatory surcharges" (Greenleaf et al., 2016, p. 106). Research has shown that, apart from a few potential moderators, partitioned pricing generally leads to higher consumer purchasing intention and willingness to pay than all-inclusive pricing (Abraham & Hamilton, 2018; Greenleaf et al., 2016; Morwitz et al., 1998; Voester et al., 2017). From the seller perspective, this allows firms to charge higher total prices even as their base prices are lower than their competitors (Voester et al., 2017). Such effects, and those of similar pricing strategies (referred to collectively as price complexity, shrouding, or obfuscation), have led to a burgeoning literature examining their advantages and disadvantages. Among the key findings is that, in

markets with a meaningful share of uninformed consumers, higher market competition only further incentivizes firms to add price complexity (Bakshi, 2020; Carlin, 2009; Chioveanu & Zhou, 2013; Gabaix.Laibson, 2006; Spiegler, 2006). As such, it is reasonable to ask whether community college fees might be increasing as a strategic response to increased competition for enrollments.

This study aims to extend the existing research on postsecondary student fees into the public two-year college sector, where fees are increasing most rapidly and are being charged to students who are likely more price sensitive than other sectors (Heller, 1997). It also seeks to connect postsecondary fees to the broader pricing literature by testing whether colleges shift their price towards student fees as a form of price obfuscation in the presence of competition. It defines increased market competition as the opening of a new undergraduate-serving college in the community college's vicinity, and a shift towards fees as an increase in the proportion of price (i.e., total tuition and fees) charged as fees. In doing so, this study seeks to answer the following research question:

RQ 4.1: Does increased market competition encourage community colleges to increase the proportion of their price charged as student fees?

Background

Most research on fees in the broader economy focuses on for-profit industries such as hotels, airlines, movie theaters, tours agencies, restaurants, online retailers, and others. In fact, while postsecondary fees have been mentioned in non-scholarly work on hidden fees (Consumer Reports, 2019; Fergus, 2018; Leibowitz, 2012; National Economic Council, 2016), no peer-reviewed research has focused on college fees from a perspective of price framing. Public higher education certainly differs from for-profit industries in ways that complicate the buyer-seller

relationship, including how prices are set and scrutinized, how the cost of college is subsidized, the difficulty in assessing the quality of the services offered, and the unique characteristics of postsecondary markets.[5] In spite of these particularities, the following review of public postsecondary pricing illustrates how student fees are not so different from those in for-profit industries and might even be an exemplar of strategic price obfuscation.

Tuition and Fee Setting

The process of setting tuition and fee prices at public colleges varies widely across states. In general, the authority to set tuition rates has trended towards deregulation, where state legislatures have granted additional authority to higher education boards or institutions (McBain, 2010; Pingel, 2018). In most states, tuition setting authority at both two and four-year colleges is formalized by statute, which in turn usually delegates the authority to a state higher education board or to individual college boards (Armstrong et al., 2017; Pingel, 2018). Community colleges differ from four-year colleges in that local district boards are also sometimes granted tuition setting authority (Mullin & Honeyman, 2008). Regardless of the party with legal tuition setting authority, governors and state legislatures hold a heavy influence over tuition through their control of state appropriations (McGuiness, 2016). In fact, surveys of state higher education agencies have repeatedly indicated that the level of state appropriations is the most influential factor to setting tuition rates (Armstrong et al., 2017; Bell et al., 2011; Boatman & L'Orange, 2006; Carlson, 2013; Rasmussen, 2003).

Even though the legal authority to set student fees largely mirrors that of tuition (Armstrong et al., 2017), there is a difference in their price-setting processes. In contrast to tuition rates that are negotiated between state politicians and higher education system boards and

[5] See Winston (1997) for further review of how colleges differ from firms.

boards of individual institutions (Armstrong et al., 2017), many state higher education agencies report that "institutions can set fees, governing boards can approve fees, or a combination of the two exists in their state" (Carlson, 2013, p. 17). Also, audits of the fee setting process in individual states often note that students are required to be involved in the fee setting process (Board of Regents, 2015; California State Auditor, 2020; State Auditor's Office, 2008; State of Arizona, 2018; State of Colorado, 2010; State of Utah, 2011; Sterritt, 2011). Tuition and fee setting also differ in the amount of policymaker attention they receive. A full 62% of state higher education agencies strongly agree that tuition rates are extremely important to policymakers while only 26% report the same attention to fees (Armstrong et al., 2017). Thus, the process for setting student fees is much more in the hands of individual colleges than is the case for tuition. As Dean Smith (2019) notes, "Usually, the governing board must approve fees, just as it must approve tuition rates… But fees seldom attract as much public attention as tuition. Thus, 'under the radar screen,' universities can assess special fees to cover extracurricular or exceptionally high curricular costs" (p. 60).

Postsecondary Markets

The term "market" is used inconsistently in discussions of higher education. Becker and Toutkoushian (2013) identify three regular conflations of the term: the deregulation of higher education industries and introduction of free market forces, the structuring of the higher education industry into distinct categories of institutions, and the ways in which colleges compete with one another. As Musselin (2010) points out, the use of "market" as a metaphor for these trends and attributes might be persuasive but is not well suited for analytical purposes. This study adopts the more traditional economic definition of "market" as described in Becker and Round (2009), who state that, "A market, then, consists of products (or services) whose prices

are tied to each other by either supply-side or demand-side arbitrage and whose prices are not directly affected by the prices of goods (or services) outside this collection of similar items" (p. 5).

Markets only exist in the presence of both competition and exchange. For example, in the market for students, colleges compete with one another for prospective students who pay a price (tuition and fees) in exchange for receiving a service (educational training). But competition also places limits on a market; the actions of one seller must place a meaningful restraint on the actions of another in order for them to be in competition with one another (Becker & Round, 2009). Community colleges on opposite sides of the country likely do not compete with one another because they do not share overlapping pools of prospective students. As Becker and Toutkoushian (2013) explain, "The institutions within a market can be thought of as the ideal collusive group… that is, in the minds of buyers, they are all essentially substitutable for each other, but products outside the group are seen to offer no relevant substitution possibilities" (p. 362).

Aside from geographic distance, competition between colleges might be limited by the homogeneity of colleges' academic offerings, the number of other colleges that a student could reasonably commute to, or the barriers for colleges to startup or begin programs that compete with those offered by others[6]. Economists have used these traits to develop distinct categories of market structures, the most well-known being perfect competition, monopolistic competition, oligopoly, and monopoly. Becker and Toutkoushian (2013) claim that higher education usually best resembles a combination of oligopoly and monopolistic competition. Oligopolies are

[6] While Becker and Toutkoushian (2013) discuss barriers to entry or exit in terms of college creation or dissolution, Rothschild and White (1993) note that "entry can occur de novo (by start-up firms) or through 'product extensions' by existing firms" (p.30).

market structures with relatively few (but more than one) suppliers who sell homogenous products or services, while monopolistic competition exists when there are many sellers and heterogeneous services sold.

Price Competition

Colleges compete for students across multiple fronts, whether it be campus amenities, the reputation of the faculty, the prestige of the institution, or the direct cost of attendance. This latter form of competition, known more generally as price competition, can be explained by the economic law of demand which states that the price and quantity demanded for a good or service are inversely related. Thus, if a college raises its price, then (holding all other factors constant) there will be fewer prospective students interested in attending due to a portion of prospective students being "priced out." When there are few suppliers in a market, as is the case with most public community colleges, the effect of a price change at any one college can create large market impacts. For example, assume there are two community colleges in a commutable area with similar degree offerings and perceived quality (i.e., their educational offerings are substitutable). A price increase at only one of the two colleges will, holding other factors constant, lead prospective students to consider the other college a relatively more attractive deal than previously, thereby shifting prospective student interest to the college that did not increase its price. This interconnectivity is why "institutions pay close attention to how their posted tuition rate (or sticker price) compares to other competitors" (Toutkoushian and Paulson, 2016, p. 295).

Price competition in higher education is particularly difficult to analyze because of the complexity of the pricing structure. Public colleges charge prices that are less than the marginal cost of production due to private and governmental subsidies, typically change their price levels

only once per year, set these prices without full autonomy, and often charge different prices depending on academic program, student level (undergraduate or graduate), or mode of delivery (online or in person). Furthermore, both internal and external financial aid can directly subsidize students or discount their tuition costs based on their athletic promise, academic merit, financial need, or some other attribute. Selective colleges carefully utilize institutional subsidies to compete for desirable students, who, as both inputs and outputs to the educational production process, can contribute beneficial peer effects that further enhance the institution's prestige (Rothschild & White, 1995; Winston, 2000, 2003; Winston & Yen, 1995; Winston & Zimmerman, 2004; Zimmerman, 2003).

Community college prices are somewhat simpler than other postsecondary institutions. First, because of their open access mission, community colleges do not strategically compete for students based on their attributes. While matriculation at a selective school can be thought of as a simultaneous transaction "in both an input market (where a wage is paid for a student's peer quality) and an output market (where a price is paid for the college's educational services)" (Winston, 2003, [abstract]), matriculation at open-access colleges is usually a single transaction in the output market. As a consequence, community colleges generally avoid the "high tuition/high aid" model of tuition discounting that makes sticker prices largely meaningless to most students in other postsecondary sectors. In 2015-16, only 15.3% of full-time, full-year undergraduates at public two-year college received institutional grants, compared to 74.4% in nonprofit four-year colleges and 39.9% of public four-year colleges (author's calculations using data from the NPSAS:16 survey of the National Center for Education Statistics (2016)). Second, because the geographic span of community college students tends to be smaller than for four-year institutions, only colleges within a reasonable commuting distance offer real competition.

Combined, these qualities help to identify the prices and potential competitors of community colleges.

Theoretical Framework

This study examines community colleges' growing reliance on student fees through the perspective of behavioral industrial organization, which is situated at the juncture of two branches of economics. The first branch is industrial organization, which is concerned with markets and competition between firms, especially within the oligopoly market structure where the interdependence of firms' actions matters and can be modeled using game theory. The second branch is behavioral economics, which replaces the assumption of perfect rationality with models that incorporate "systematic imperfections in human rationality" (Camerer, p.181).[7] Combining these ideas, behavioral industrial organization is the branch of economics that "analyzes markets with rational firms and consumers who depart from the standard rational-choice model" (Spiegler, 2016, p. 2).

One firm strategy that has gained considerable scholarly attention in recent decades is obfuscation, or the deliberate use of complex product or price descriptions, hidden fees, or other practices that make it difficult for consumers to compare a purchase decision across firms. Research on the effects of obfuscation generally takes one of two theoretical perspectives. First, the search-theoretic model assumes that rational consumers are imperfectly informed about prices and face "search costs" to learn prices offered across sellers (Stigler, 1961). Diamond (1971) showed that when all consumers are uninformed and face search costs, all firms will charge the monopoly price. Later scholars assumed that a portion of consumers were well

[7] While arguably an issue of semantics, it should be noted that Camerer (2006) believes behavioral economics is not a branch but "a style of modeling, or a school of thought, which is meant to apply to a wide range of economic questions…" (p. 183).

informed about market prices while others were uninformed and faced search costs, resulting in price dispersion and higher equilibrium prices (Salop & Stiglitz, 1977; Stahl, 1989; Varian, 1980; see Baye et al. (2006) for a review of search literature). While these papers assumed that the proportion of (un)informed consumers was exogenous, more recent scholarship incorporates obfuscation as a tool for firms to endogenously increase consumer search costs (or the proportion of consumers incurring search costs) and thereby raise equilibrium prices (Carlin, 2009; Ellison & Ellison, 2009; Ellison & Wolitzky, 2012; Wilson, 2010).

A second theoretical underpinning of obfuscation assumes that consumers are boundedly rational;[8] that is, in the face of complex decisions they might resort to rules-of-thumb, face cognition costs, or be subject to some systematic behavioral bias (Ellison, 2006). For example, Gabaix and Laibson (2006) examine "myopic" consumers who do not think about add-on fees, Spiegler (2006) considers consumers who sample only a few dimensions of their purchase and choose the best seller according to those dimensions, and Bordalo et al. (2013) posit that consumers are drawn to salient attributes of products and make purchase decisions with disproportionate weight on these attributes. Firms, which are considered rational actors aware of these systematic consumer biases, can obfuscate their prices accordingly. Bar-Gill (2012) summarizes the two tenets of this area of research as: "(1) Consumers' purchasing and use decisions are affected by systematic misperceptions (2) Sellers design their products, contracts, and prices in response to these misperceptions" (pp. 7-8).

Both the search-theoretic and bounded rationality explanations of obfuscation find that firms benefit financially and will obfuscate in equilibrium. While competition between firms is the go-to remedy for lowering prices back down to marginal cost in neoclassical economics,

[8] See Spiegler (2011) for an in-depth review of bounded rationality and industrial organization.

most studies find that obfuscation is not reduced by competitive pressure (Gabaix & Laibson, 2006; Kalayci, 2015, 2016) or can even be exacerbated as competition increases (Carlin, 2009; Bakshi, 2020; Chioveanu, 2020; Chioveanu & Zhou, 2013; Gabaix & Laibson, 2004; Spiegler, 2006, 2016). One explanation of this phenomenon is given by Carlin (2009), who argues that increasing the number of firms in a market reduces any one firm's chance of winning the business of informed consumers. Therefore, as competition increases firms will be further incentivized to obfuscate so as to endogenously increase the proportion of uninformed consumers in the market and increase their profits.

One type of price obfuscation that has a direct connection to community colleges is partitioned pricing (PP), or the division of prices into a base price (tuition) and mandatory surcharges (student fees). In their seminal study on the topic, Morwitz et al. (1998) found that PP tends to increase consumer demand compared to all-inclusive pricing. Their explanation was rooted in anchoring and adjustment theory, which suggests that consumers first anchor on large base prices and then insufficiently adjust their expected total price upward to incorporate additional surcharges (Morwitz et al., 1998; Tversky & Kahneman, 1974). Subsequent research has found that this effect can vary widely in the presence of various moderators (Greenleaf et al., 2016; Voester et al., 2017). In their meta-analysis on PP moderators, Abraham and Hamilton (2018) found that PP has a significant effect on consumers "when the total price is absent, as the price level increases, when surcharges are typical for the product category, when the surcharges are perceived as offering high benefit, and when the product category is utilitarian" (p. 686). Without going into detail, I believe that community college student fees are especially well represented in this list, making them potentially quite effective at increasing prospective student demand.

There is some real-world evidence that suggests college students are unaware of and systematically under-adjust for the cost of fees. For example, Weichselbaum and McClelland (1978) found that one-third of surveyed students at the University of Colorado (Boulder) did not know how much they paid in fees, and less than 30% of respondents guessed the amount within $5 of the true value. More recently, Ott (2009) found that 91% of surveyed students at the University of Toledo were aware they paid a general fee, but only 43% of respondents guessed the fee's cost within the correct $200 range, with 14.5% over-estimating the fee's cost and 43% under-estimating it. Similarly, Chapman (2011) found that 84% of surveyed students at Ohio University were aware they paid a general fee, but only 13.8% of respondents knew the actual fee amount charged,[9] with 39% over-estimating the fee's cost and 54% under-estimating it. In summary, these surveys find that while nearly all students are aware that they pay student fees, the majority do not know how much these fees cost. When in doubt, students appear have a systematic downward bias.

Community colleges fit neatly into the behavioral industrial organization literature on price obfuscation through their use of partitioned pricing. As noted earlier, the limited geographic bounds on community college markets grants them easy knowledge of who their competitors are and thus how their competitors' prices are framed. Their limited market span also means that competitors are usually other in-state institutions, so competition over students is a game over both student revenues and state appropriations, which "every state uses… as the centerpiece of its allocation process" (Cohen et al., 2013, p. 157).[10] Community college fees are well aligned with the attributes that make partitioned prices especially effective, such as their

[9] Chapman's (2011) requirement to accurately estimate the cost of the fee was more strict than prior surveys. When loosening the accuracy requirement, 21.3% of respondents reported the fee amount to within 5% of the actual cost.
[10] See Mullin and Honeyman (2007) for specifics on various state funding formulas for community colleges.

typicality in the industry, high price, and utilitarian descriptions. Finally, from the student perspective, all evidence points to students being aware they are charged fees, but nevertheless consistently under-estimate their costs. This suggests that students might very well be biased in the ways described by anchor and adjustment theory, in which they are aware of fees but systematically under-adjust for their added costs. If community colleges are aware of this systematic bias, they might well be incentivized to shift costs from tuition to fees as competition over student enrollments increases.

Data and Methods

Data

The sample is limited to the public two-year college sector as defined in IPEDS from academic year 2009-10 to 2019-20. The years of analysis were limited because IPEDS only collected college county codes starting in academic year 2009-10, information that was needed to accurately determine where college openings and closures occurred. The public two-year college sector excludes community colleges that offer baccalaureate degrees, which is appropriate for this study given the potential pricing effects that community college baccalaureate adoption might have (Ortagus & Hu, 2020). From this initial sample, colleges were also dropped if they were inactive in the given year, did not participate in Title IV, did not have reported tuition data, offered only online education, charged a higher price for fees than tuition, or had swapped tuition and fee prices by more than $300.[11] The final analytic sample contains 721 colleges.

[11] For example, if tuition is reduced by $300 or more in the same year that fees are increased by $300 or more, or vice-versa. Such swaps can cause sudden and sharp shifts in the proportion of price charged as fees (see Figures 2.1 and 2.2) and represent a redefinition of tuition and fee charges rather than simple changes in their magnitudes. These 33 colleges are excluded from the data to not conflate the factors that cause such a redefinition with the factors that lead to changes in fee magnitude.

I gathered data from IPEDS to construct both the dependent variable (proportion of price charged as fees) and the primary variable of interest (nearby college openings), with data from the US Department of Education's Postsecondary Education Participants System (PEPS) supplementing the latter. Socioeconomic control variables were gathered at the county level from the U.S. Census Bureau, the U.S. Bureau of Labor Statistics, and the Common Core of Data (CCD) from the National Center of Education Statistics.

Dependent Variables. The dependent variable was derived using the in-district tuition and fee rates from IPEDS. Tuition and fee rates were preferred over college revenue variables because the latter are not disaggregated by revenues from tuition versus from student fees. The tuition price reflects the tuition charged to a typical full-time student for an academic year, and the mandatory student fee price (as defined by IPEDS) reflects the sum of the fee prices charged to the majority of full-time students in the academic year. The dependent variable is constructed as follows:

$$fee\ proportion\ of\ price_{izst} = \frac{district\ fee\ rate_{izst}}{district\ tuition\ rate_{izst} + district\ fee\ rate_{izst}},$$

where $fee\ proportion\ of\ price_{izst}$ is the proportion of the total price that is charged as fees in college *i*, whose primary address is in commuting zone *z* and state *s*, in the academic year starting in fall of calendar year *t*.

Competition Variables. The primary variables of interest are the number of undergraduate-serving colleges within a given postsecondary sector that opened or closed their operation within each sample college's commuting zone in a given year. While the number of firms is only one way to describe the level of competition in a market, it is an especially important one in studies of oligopolistic price competition. Unfortunately, simply using the number of colleges reported in the IPEDS database is untenable because a college can suddenly

appear or become missing from IPEDS for reasons other than an institutional opening or closure.[12] As such, I use the IPEDS variable *ACT*, which indicates the status of a college's participation in IPEDS in the given year (such as new college, closed college, etc.) and *CLOSEDAT*, which provides the date of college closure. The college closure date is cross-checked using data from PEPS, which publicizes the exact date of all Title IV college closures in the nation. Taken together, these variables can precisely indicate the academic year of college openings and closures, which can be interpreted as the change in the level of market competition.

Control Variables. College leaders typically put great thought into setting their tuition and fee prices each year. Factors that might play a role in their decisions include the financial needs of the institution, the willingness and ability of prospective students to pay for college, changes in the size of the prospective student population, and more. Because tuition and fee prices are set deliberately, it is important to account for relevant factors that might play a role in price-setting decisions apart from nearby college openings and closures. I do so by controlling for several relevant variables at both the institutional and commuting zone levels.

First, I controlled for the college's *full-time equivalent (FTE) fall enrollment* from the previous year. The size of a college has implications for its market power, institutional research capabilities, brand recognition, and economies of scale. These factors can in turn affect the ability of college leaders to make informed decisions and to mitigate both the effects of and the need for price changes. For example, smaller community colleges might feel a greater threat to their enrollment if another college opens nearby because the loss of each student represents a

[12] For example, IPEDS is only required for colleges that participate in the federal Title IV program, so a gain/loss in Title IV status can cause a fully operational college to begin/stop reporting to IPEDS. Furthermore, some colleges that do not participate in Title IV choose to voluntarily report to IPEDS at their discretion. Finally, some (but not all) colleges report data to IPEDS in the year after closure.

greater percentage loss in total enrollment. Therefore, they might have a stronger incentive to obfuscate their price via fees in order to compete on price and retain students.

Second, I controlled for the total *state and local appropriations per full-time equivalent (FTE) student*. These appropriation funds comprised nearly half (46.9%) of public two-year college revenues in academic year 2018-19 (De Bray et al., 2021, table 333.10). As unrestricted revenue, this money can be used to mitigate pressure on tuition revenues. This substitution effect leads to state appropriations being consistently cited as the most influential factor in tuition setting (SHEEO Armstrong et al., 2017; Bell et al., 2011; Boatman & L'Orange, 2006; Carlson, 2013; Rasmussen, 2002). In terms of the proportion of price charged as fees, if colleges raise their tuition charge less as appropriations increase then it is expected that the fee proportion of price will increase as appropriations increase.

Third, I controlled for the *unemployment rate* of each college's commuting zone. I aggregated raw data on the size of the labor force and unemployed persons from the county to the commuting zone level, using monthly data to generate the average unemployment rate from July of the prior year through the June immediately preceding the fall semester. Previous research has shown that higher unemployment rates can increase demand for community college enrollment (Hillman & Orians, 2013). Periods of higher unemployment also foreshadow reduced government appropriations as the government's tax revenue is diminished. Thus, community colleges are faced with a simultaneous influx of financially strapped students and the expectation of limited government revenue support. The combination of these factors increases both the need for and political divisiveness of tuition increases, resulting in ambiguous effects on the proportion of price charged as fees.

Fourth, I controlled for *median annual household income* by aggregating county-level data from the Small Area Income and Poverty Estimates (SAIPE) program to the commuting zone level. However, because median family income is an aggregated estimate per county, I averaged this figure across the commuting zone using a weighted average (weighted according to the number of households per county). The weight was constructed as follows:

$$w_{czst} = \frac{households_{czst}}{\sum_{c=1}^{n} households_{czst}},$$

where w_{jcst} is the weight for county *c*, in commuting zone *z*, in state *s*, in year *t*, and where there are *n* counties within the commuting zone. The median household income for each commuting zone results from multiplying this weight against each constituent county's estimated median household income:

$$median\ household\ income_{zst} = \sum_{c=1}^{n} w_{czst} * \ median\ household\ income_{czst}\ .$$

Controlling for median household income is important because tuition hikes might be less politically divisive in areas with increasing incomes, with the expected effect that the proportion of price charged as fees would decrease.

Fifth, I controlled for the public high school *senior class* of the previous academic year. The number of the previous year's high school seniors were collected from the NCES Common Core of Data (CCD) database. I then aggregated the data from the school to the commuting zone level. This variable controls for the effects of changes in the prospective student population size which, similar to unemployment rates, can have a direct effect on the total demand for community college enrollments in a local area. If a community college faces overwhelming growth in its prospective student population, it may feel pressured to increase revenues to cover additional fixed costs (equipment, buildings, etc.), many of which are supported by student fees.

On the other hand, a decline in the number of prospective students could lead community colleges to compete more strongly for enrollments via price competition. Thus, the overall effect of a changing high school senior class on the proportion of price charged as fees is ambiguous.

Descriptive statistics and pairwise correlations of the data for academic year 2019-20 are provided in Table 4.1. The average tuition across all institutions was $3,409, the average total mandatory student fee was $567, and the average fee proportion of price was 18%. The standard deviation of the fee proportion of price is larger than the mean, indicating there is relatively high variation in the observed values of this variable. The maximum pairwise correlation between any two control variables was 0.439.

Methods

I used a balanced panel dataset from 2009-10 to 2019-20 to estimate how changes in local market competition were related to the proportion of price charged as fees across American public community colleges. I began by examining whether these two factors were related to one another using three correlational estimation techniques: cross-sectional ordinary least squares (OLS), pooled OLS, and two-way fixed effects OLS. The cross-sectional analyses considered one year of data at a time (i.e., the model was iterated over each individual year $t \in T$). The pooled OLS regression incorporated all years of data into one model without accounting for time (i.e., one model was run using, but not controlling for, all panel years *T*). Finally, the two-way fixed effects model incorporated and controlled for all years of data in addition to controlling for college-specific effects. This last model is represented in Equation (4.1) below:

$$
\begin{aligned}
fee\ proportion\ of\ price_{izst} = \quad & \beta_1\ colleges\ opened_{zst} \\
& + \beta_2\ colleges\ closed_{zst} \\
& + \beta_3\ colleges\ opened\ and\ closed_{zst} \\
& + \beta_4\ fall\ enrollment_{izs,t-1} \\
& + \beta_5\ state\ appropriations_{izs,t-1} \\
& + \beta_6\ local\ appropriations_{izs,t-1} \\
& + \beta_7\ unemployment_{zs,t-1} \\
& + \beta_8\ household\ income_{zs,t-1} \\
& + \beta_9\ seniors_{zs,t-1} \\
& + \gamma_i + \delta_t + \varepsilon_{izst}\ ,
\end{aligned}
\tag{4.1}
$$

where $fee\ proportion\ of\ price_{izst}$ is the proportion of the total tuition and fee price that is charge as fees at community college *i*, in commuting zone *z*, in state *s*, in fall semester of year *t*. $Colleges\ opened_{zst}$, $colleges\ closed_{zst}$, and $colleges\ opened\ and\ closed_{zst}$ are different categories of the variable of interest, indicating whether colleges opened in the commuting zone, closed in the commuting zone, or both. The numbers of colleges within each of these groups is presented in Table 4.2, and the reference category for this variable is no change in the number of colleges in the commuting zone.

Several college and state control variables are also included, all of which were lagged by one year. Lags are used because college prices are set prior to fall term, and therefore only factors prior to the start of the academic year can play a role in determining college prices.[13] At the college level, $fall\ enrollment_{izs,t-1}$ is the FTE fall enrollment from the prior year, while $state\ appropriations_{izs,t-1}$ and $local\ appropriations_{izs,t-1}$ are the college's revenue per FTE student from state and local appropriations. At the commuting zone level, $unemployment_{zs,t-1}$ is the unemployment rate from the previous year, $household\ income_{zs,t-1}$ is its weighted median household income from the previous year, and

[13] Alternatively, the variable of interest (college openings) was tested using both lagged and current year values. Current year values provided better explanatory value, likely due to the ability to anticipate a nearby college opening well ahead of time. Therefore, this variable is the only independent variable using current year values.

$seniors_{zs,t-1}$ is the number of high school seniors from the previous year. College and year fixed effects are included as γ_i and δ_t, respectively, and ε_{izst} is the error term.

Different techniques are needed to make causal claims between nearby college openings and the proportion of price charged as fees. For this, I used three causal estimation techniques: canonical two-group, two-period difference-in-differences; multi-period two-stage difference-in-differences; and two-stage event study. Canonical two group, two-period difference-in-difference models use two years of data to compare the differences in outcomes (in this case, the fee proportion of price) between control and treatment groups in the pre- and post-treatment periods. Colleges were selected into the control group if they experienced no nearby college openings or closings in either year. Treated colleges were selected if they experienced no nearby college openings or closings in the first year but subsequently experienced a nearby college opening in the second year. The difference in the outcomes stemming from assignment to the treatment group is the estimated average treatment effect on the treated (ATT), represented by β_3 in Equation 4.2 below:

$$\begin{aligned} fee\ proportion\ of\ price_{izst} = \quad & \beta_0 \\ & + \beta_1\ post\ treatment\ period_t \\ & + \beta_2\ treated\ group_i \\ & + \beta_3\ post\ treatment\ period_t * treated\ group_i \\ & + \boldsymbol{P\theta}_{izs,t-1} \\ & + \varepsilon_{izst}\ , \end{aligned} \tag{4.2}$$

where β_0 is an intercept, $post\ treatment\ period_t$ is an indicator for the second year, $treated\ group_i$ is an indicator for assignment to the treatment group, $post\ treatment\ period_t * treated\ group_i$ is an indicator for the treatment group in the second year, $\boldsymbol{P\theta}_{izs,t-1}$ is a matrix of the control variables listed in Equation 4.1, and ε_{izst} is the error term.

The canonical two-group, two-period difference-in-differences estimator cannot take full advantage of the 11 years of panel data collected for this study. This is unfortunate for two primary reasons. First, a crucial assumption of difference-in-difference models is the parallel trends assumption, which says that "*if no treatment had occurred*, the difference between the treated group and the untreated group would have stayed the same in the post-treatment period as it was in the pre-treatment period" (Huntington-Klein, 2022, p. 441, emphasis in original). While the emphasized counterfactual is inherently unobservable, observing parallel trends in the pre-treatment period is the next-best solution so long as the data exists over multiple years.[14] Second, the canonical two-period two-group estimator only considers immediate treatment effects (in the second period), and therefore does not permit treatment effects to be dynamic (change over multiple periods after treatment).

In light of these limitations on the canonical model, I used a two-stage multi-period difference-in-differences and event study estimation technique proposed by Gardner (2021) for use in panel data studies with staggered treatment timing.[15] This technique was created as one of several possible solutions to the growing concern that traditional staggered adoption difference-in-differences approaches do not generate readily interpretable treatment effects (Borusyak et al., 2022; de Chaisemartin & D'Haultfœuille, 2019; Goodman-Bacon, 2018). Because this technique still assumes only one treatment per observation, the treatment group was limited to colleges that experienced only one nearby college opening between 2012-2016 and no change in the number of nearby

[14] While I do have data for the years preceding each two-group, two-period analysis, I cannot use it to check the parallel trends assumption due to how I assigned treatment status. Colleges in the control group in the analysis (i.e., those that experienced no change in the number of nearby colleges in either the first or second year) might have experienced treatment in the preceding year(s).

[15] To conduct the two-stage analysis, I use the user-written STATA command *did2s* created by Kyle Butts of the University of Colorado, Boulder.

colleges in the preceding or subsequent years.[16] The control group was limited to colleges with no change in the number of nearby colleges in any panel year. The first stage of the procedure is given in Equation (4.3):

$$\begin{aligned} fee\ proportion\ of\ price_{izst} = \quad & \beta_1\ fall\ enrollment_{izs,t-1} \\ & + \beta_2\ state\ appropriations_{izs,t-1} \\ & + \beta_3\ local\ appropriations_{izs,t-1} \\ & + \beta_4\ unemployment_{zs,t-1} \\ & + \beta_5\ household\ income_{zs,t-1} \\ & + \beta_6\ seniors_{zs,t-1} \\ & + \gamma_i + \delta_t + \varepsilon_{izst}\ , \end{aligned} \tag{4.3}$$

where the sample is limited to untreated and not-yet-treated observations and where the residualized outcome variable (i.e., the observed fee proportion of price minus the estimated effects of unit fixed effects, time fixed effects, and control variables, or $\widetilde{fee\ proportion\ of\ price}_{izst} = fee\ proportion\ of\ price_{izst} - \hat{\gamma}_i - \hat{\delta}_t - \widehat{controls}$) is captured for use in the second stage, where it is regressed on the treatment dummy variable:

$$\widetilde{fee\ proportion\ of\ price}_{izst} = \quad \beta_1\ colleges\ opened_{zst} + \varepsilon_{izst}\ , \tag{4.4}$$

where $colleges\ opened_{zst} = 1$ is an indicator for receiving treatment, and $colleges\ opened_{zst} = 0$ indicates untreated or not-yet-treated observations. Because the second stage uses a generated regressand, the standard errors were adjusted using generalized method of moments (GMM) estimation (Dumont et al., 2005; Gardner, 2021).

Finally, robustness is added by running a two-stage event-study analysis of the same form described above, but where the second stage of the procedure is regressed on the treatment variable in relative event-time (i.e., using leads and lags). As Gardner (2021) notes, the primary benefits of an event-study design are twofold. First, it can show how the treatment effects might

[16] The range of 2012-2016 was chosen to allow for a three-year pre-treatment period to observe parallel trends and a three-year post-treatment period to observe dynamic treatment effects in the event study analysis.

vary over time after treatment. Second, the treatment leads can be used to test the plausibility of the parallel trends assumption having been met.

Results

The cross-sectional and pooled regression results are presented in Table 4.3. These results show the relationship between nearby colleges opening, closing, or both and the community college's proportion of price charged as student fees. The cross-sectional regressions explain anywhere between 7.3% to 14.9% of the variation in the dependent variable. In contrast to my expected findings, the coefficient for the variable of interest (nearby colleges opened) is moderately significant and negative in academic years 2010 and 2011, although the result is not significant in any other year nor in the pooled model. On the other hand, the coefficient for the variable indicating a nearby college closed is also negative in academic year 2016 and in the pooled model and is positive in academic year 2010. Thus, there does not appear to be a clear correlation between nearby colleges opening and closing and a shift towards or away from charging student fees. Of all the regressors, only the commuting zone unemployment rate is consistently significant; community colleges in areas with higher unemployment tend to charge a lower proportion of their price as fees.

Neither cross-sectional nor pooled OLS models account for unobserved unit-specific or time-specific confounders. A popular technique to adjust for these effects is the two-way fixed effects (TWFE) regression shown in Equation 4.1, which is modeled in Table 4.4 using no control variables, institution-specific controls only, and all controls in Models 1, 2, and 3, respectively. To account for the potential that changes in the number of nearby colleges affects tuition and fees similarly, and thereby shows significant shift in the proportion of price charged as fees, I included a model with the log of fees as the dependent variable (Model 4) and the log

of tuition as the dependent variable (Model 5). The log-transformation is used for comparison purposes with the fee proportion models because the coefficients can be interpreted as the percentage change in the outcome due to a one-unit change in the regressor across all models.

The results from Table 4.4 also do not show any indication that a change in the number of nearby colleges is related to the proportion of price charged as fees. In fact, the full Model 3 shows no statistically significant effects for any variable. The models examining log fee and log tuition rates also do not show any effect of nearby colleges on the outcomes. However, it is interesting to note that increasing in community colleges' local graduating high school class tend to lower fee rates but increase tuition. As predicted, it may be that larger pools of prospective students reduce the need for colleges to compete on price by obfuscation through student fees.

Shifting to the causal models, the canonical two-period, two-group difference-in-differences model outlined in Equation 4.2 is iterated over all two-period groups of the panel and presented in Table 4.5. Care should be taken to review the size of the treatment and control groups, as more recent years have small treatment group sizes and should be interpreted with an abundance of caution. Treatment group sizes range from 12 to 77 and control group sizes from 309 to 369, with the larger groups and greater explanatory value of the models generally located in the earlier years. The coefficient on the treatment effect variable is insignificant across all two-period iterations. Therefore, there is no evidence from these models that the opening of a nearby college causes a change in the proportion of community college prices charged as fees.

As noted earlier, there are several advantages of panel difference-in-differences techniques over the canonical two-period method, including the ability to check the parallel trends assumption in the pre-treatment period and to examine possible dynamic post-treatment effects. I do this using Gardner's (2021) two-stage estimation strategy outlined in Equations 4.3

and 4.4. Similar to Table 4.4, I also run this model with the log of fees (Model 2) and log of tuition (Model 3) as dependent variables to see if the treatment might be affecting both charges in a similar way and thus washing out any effects on the proportion of price charged as fees. The results are presented in Table 4.6.

One limitation in this method specific for this study is in the difficulty of finding community colleges that only experienced one change in the number of nearby colleges over the entire panel for the treatment group, and where the one change was limited between the 2012 and 2016 academic years. Thus, the treatment group is 20 colleges, and the control group is 192 colleges. In all three models, the treatment effect found in the second stage is statistically insignificant. Thus, this estimation strategy also does not find that nearby college openings affect the proportion of price charged as fees. As a robustness check, I ran a two-stage event study analysis on Model 1 (presented in Figure 4.1), where the treatment effect is shown in relative event-time (i.e., the number of years pre- and post-treatment). The event study satisfies the parallel assumptions check, as the estimated parameter of the treatment effect is not significant in the years prior to treatment (i.e., years -4 through -1). The estimated parameter then shows a slightly downward trend following treatment, but the null effect (estimate = 0.00) remains within the 95% confidence interval of the estimate, so no conclusions can be drawn from this trend.

Discussion

In this study I sought to uncover whether increased market competition (proxied by the opening of a new college nearby) encouraged community colleges to shift their prices away from tuition and towards mandatory student fees. I began by examining whether there is a correlational relationship between the opening of colleges within the same commuting zone as the sampled community colleges and the latter's proportion of price charged as student fees. The

correlational analyses showed scant and contradictory results; two cross-sectional years indicated that college openings were related to lower fee proportions, while other models indicated that college closings were related to lower fee proportions. Meanwhile, the two-way fixed-effects models, which account for unit- and time-specific confounders, did not return any statistically significant coefficients whatsoever, including in the control variables. Examining the separate effects on tuition and fee rates also did not reveal any relationship between these and the college openings or closures.

With inconclusive correlational results, I next turned to carefully specified causal inference models. I began by splitting the dataset into multiple two-period groups and then conducting two-period, two-group difference-in-differences estimation on each of these periods. Care was taken to select colleges into treatment and control groups so that a comparison of their differences in outcome represented a true average treatment effect on the treated (ATT). In all cases, this treatment effect was insignificant.

I next used Gardner's (2021) innovative two-stage difference-in-differences technique to take full advantage of the panel dataset in a causal model. Colleges were again carefully selected into treatment and control groups, although the specificity of the treatment group limited its size to only 20 colleges, thereby limiting its statistical power. In all cases, I failed to reject the null hypothesis that there was no causal effect of nearby college openings on the proportion of price charged as fees. Robustness was further added through a two-stage event-study analysis, which enabled me to check the parallel trends assumption and to see trends in the estimated treatment effect over time. While the parallel trends assumption was valid in the pre-treatment period, there were no significant dynamic treatment effects after treatment.

In light of these results, I fail to conclude that increased competitive forces encourage community colleges to shift their prices towards fees. I speculate three potential causes to explain these results. First, especially in the causal models, small sample sizes limited the statistical power of the analyses. In both the canonical and two-stage difference-in-differences analyses, relatively few community colleges met the criteria for the treatment group. Second, community college students could be more aware of the prices of student fees than was found in four-year college surveys. The lack of student fee coverage in many free community college promise programs and the often-limited financial resources of community college students could lead them to pay more attention to the price of student fees, thereby nullifying any potential obfuscation strategy on the part of the college. Third, community college leaders might not have enough power or influence to suddenly shift their prices towards fees.

Additional research could help to shed light on how aware community college students are of the fees they pay, which financial aid programs cover student fees, and the general fee setting process in community colleges. While not much is known about these topics in America's four-year colleges, practically nothing is known about them in the community college sector. Perhaps these pieces of the puzzle hold important clues as to why community college student fees have been increasing so consistently and how they might be affecting students.

Table 4.1

Descriptive Statistics and Pairwise Correlations for Study Variables, Academic Year 2019-20

Variable	*M*	*S.D.*	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) In-district tuition ($)	3,408.74	1,426.11								
(2) In-district fees ($)	567.49	504.96	0.272							
(3) Fee proportion of price (pct.)	17.83	18.74	-0.117	0.813						
(4) FTE undergraduates[a]	4,278.10	4,938.99	-0.168	-0.151	-0.059					
(5) State appropriations per FTE[a]	5,150.46	3,097.39	0.023	0.063	0.013	-0.284				
(6) Local appropriations per FTE[a]	2,877.00	3,254.70	-0.202	-0.131	-0.047	0.112	-0.261			
(7) Unemployment rate[a,c] (pct.)	4.00	1.10	-0.237	-0.257	-0.206	0.031	-0.038	-0.048		
(8) Median household income[b,c]	64,053.39	16,283.65	-0.004	-0.040	-0.093	0.324	-0.177	0.250	-0.280	
(9) High school seniors[a,c]	28,890.85	51,922.15	-0.303	-0.226	-0.179	0.398	-0.102	0.158	0.099	0.439

Note. $N = 721$ colleges.

[a] Data from the previous academic year. [b] Data from the previous calendar year. [c] Data from the same-state counties within the commuting zone.

Table 4.2

Count of Sample Colleges by Opening/Closing Status of Nearby Colleges

Year	Change in Nearby Colleges				Total
	No Change	Opened Only	Closed Only	Opened and Closed	
2009	395	179	20	127	721
2010	375	241	9	96	721
2011	384	239	10	88	721
2012	402	241	30	48	721
2013	426	165	6	124	721
2014	401	145	64	111	721
2015	446	65	42	168	721
2016	378	38	147	158	721
2017	456	71	81	113	721
2018	385	23	132	181	721
2019	489	88	51	93	721
Total	4,537	1,495	592	1,307	7,931

Note. Years are based on the fall semester of the academic year.

Table 4.3

Cross-Sectional and Pooled Regression Results: Nearby College Opening(s) and the Proportion of Community College Price Charged as Student Fees

Variable	2009	2010	2011	2012	2013	2014
Nearby college(s) opened only	-0.030	-0.041*	-0.050**	-0.030	0.001	-0.013
	(0.018)	(0.016)	(0.017)	(0.022)	(0.025)	(0.030)
Nearby college(s) closed only	-0.050	0.067*	-0.021	0.050	-0.046	-0.016
	(0.051)	(0.032)	(0.045)	(0.061)	(0.047)	(0.035)
Nearby college(s) opened and closed	-0.051	0.026	0.014	-0.078	0.079	-0.004
	(0.029)	(0.037)	(0.039)	(0.047)	(0.045)	(0.052)
FTE undergraduates[a] (10,000)	0.024	0.035	0.026	0.016	0.005	0.005
	(0.027)	(0.028)	(0.030)	(0.027)	(0.023)	(0.028)
State appropriations per FTE[a] ($10,000)	0.014	0.004	0.004	-0.006	0.023	-0.002
	(0.030)	(0.033)	(0.038)	(0.035)	(0.036)	(0.034)
Local appropriations per FTE[a] ($10,000)	0.003	0.016	0.008	0.005	0.009	-0.015
	(0.022)	(0.023)	(0.025)	(0.026)	(0.028)	(0.026)
Unemployment rate[a,c] (pct.)	-0.028***	-0.022***	-0.022***	-0.023***	-0.025***	-0.022***
	(0.004)	(0.003)	(0.004)	(0.004)	(0.005)	(0.005)
Median household income[b,c] ($10,000)	-0.013	-0.013*	-0.013	-0.012	-0.022*	-0.013
	(0.007)	(0.006)	(0.007)	(0.010)	(0.010)	(0.010)
High school seniors[a,c] (10,000)	0.001	-0.003	-0.002	-0.001	-0.005**	-0.003
	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
Constant	0.447***	0.438***	0.440***	0.426***	0.469***	0.405***
	(0.061)	(0.058)	(0.059)	(0.075)	(0.082)	(0.085)
Obs.	721	721	721	721	721	721
R-squared	0.149	0.149	0.140	0.138	0.133	0.090
F-statistic	7.667***	10.685***	7.129***	7.065***	9.761***	6.278***

Table 4.3 (continued)

Cross-Sectional and Pooled Regression Results: Nearby College Opening(s) and the Proportion of Community College Price Charged as Student Fees

Variable	2015	2016	2017	2018	2019	Pooled
Nearby college(s) opened only	-0.011	-0.018	0.033	0.094	0.015	-0.015
	(0.026)	(0.038)	(0.036)	(0.060)	(0.033)	(0.012)
Nearby college(s) closed only	-0.028	-0.075***	-0.023	-0.037	-0.017	-0.041**
	(0.025)	(0.022)	(0.027)	(0.024)	(0.031)	(0.013)
Nearby college(s) opened and closed	0.022	-0.022	-0.078	-0.023	-0.051	-0.022
	(0.047)	(0.035)	(0.054)	(0.033)	(0.044)	(0.022)
FTE undergraduates[a] (10,000)	0.006	0.011	0.012	0.012	0.005	0.011
	(0.028)	(0.030)	(0.034)	(0.035)	(0.037)	(0.030)
State appropriations per FTE[a] ($10,000)	0.020	-0.016	-0.031	-0.044	-0.063*	-0.016
	(0.034)	(0.028)	(0.025)	(0.029)	(0.027)	(0.027)
Local appropriations per FTE[a] ($10,000)	-0.014	-0.007	-0.004	-0.013	0.007	-0.014
	(0.026)	(0.031)	(0.028)	(0.029)	(0.023)	(0.024)
Unemployment rate[a,c] (pct.)	-0.027***	-0.019**	-0.017**	-0.020**	-0.031***	-0.014***
	(0.007)	(0.006)	(0.006)	(0.007)	(0.007)	(0.002)
Median household income[b,c] ($10,000)	-0.016	-0.003	-0.014	-0.012	-0.023**	-0.009
	(0.011)	(0.009)	(0.008)	(0.008)	(0.007)	(0.007)
High school seniors[a,c] (10,000)	-0.005*	-0.006***	-0.002	-0.004*	-0.003	-0.003**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)
Constant	0.416***	0.331***	0.373***	0.383***	0.491***	0.334***
	(0.090)	(0.075)	(0.070)	(0.070)	(0.070)	(0.053)
Obs.	721	721	721	721	721	7,931
R-squared	0.093	0.083	0.073	0.075	0.086	0.080
F-statistic	10.914***	7.807***	3.676***	4.151***	7.349***	12.953***

Note. Standard errors are clustered by commuting zone. Years are based on the fall semester of the academic year. Reference category for college openings/closings is no change in the number of nearby colleges.

[a] Data from the previous academic year. [b] Data from the previous calendar year. [c] Data from the same-state counties within the commuting zone.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4.4

Fixed Effects Regression Results: Nearby College Opening(s) and Various Price Outcomes

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
	Fee Proportion	Fee Proportion	Fee Proportion	Log of Fees	Log of Tuition
Nearby college(s) opened only	0.002	0.003	0.002	0.021	0.005
	(0.002)	(0.002)	(0.002)	(0.032)	(0.006)
Nearby college(s) closed only	-0.002	-0.002	-0.002	-0.009	-0.001
	(0.002)	(0.002)	(0.002)	(0.037)	(0.009)
Nearby college(s) opened and closed	-0.001	-0.001	-0.000	-0.021	-0.008
	(0.002)	(0.002)	(0.002)	(0.036)	(0.009)
FTE undergraduates[a] (10,000)		0.013	0.013	-0.047	-0.038
		(0.014)	(0.013)	(0.076)	(0.026)
State appropriations per FTE[a] ($10,000)		0.005	0.006	-0.091	-0.056**
		(0.009)	(0.009)	(0.167)	(0.019)
Local appropriations per FTE[a] ($10,000)		-0.007	-0.006	-0.079	0.055*
		(0.013)	(0.012)	(0.171)	(0.028)
Unemployment rate[a,c] (pct.)			0.002	-0.014	-0.002
			(0.001)	(0.018)	(0.003)
Median household income[b,c] ($10,000)			-0.000	-0.034	-0.060***
			(0.004)	(0.080)	(0.012)
High school seniors[a,c] (10,000)			-0.014	-0.231*	0.094***
			(0.008)	(0.091)	(0.028)
Constant	0.145***	0.139***	0.159***	6.114***	7.964***
	(0.003)	(0.009)	(0.035)	(0.584)	(0.091)
College-Years	7,931	7,931	7,931	7,931	7,931
R^2	0.081	0.083	0.088	0.104	0.447
F-statistic	8.222***	7.186***	6.033***	7.060***	46.582***
College Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes

Note. Standard errors are clustered by commuting zone. Years are based on the fall semester of the academic year. Reference category for college openings/closings is no change in the number of nearby colleges.

[a] Data from the previous academic year. [b] Data from the previous calendar year. [c] Data from the same-state counties within the commuting zone.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4.5

Two-Group, Two-Period Difference-in-Differences Regression Results: The Impact of Nearby College Opening(s) on the Proportion of Community College Price Charged as Student Fees

Variable	2009-10	2010-11	2011-12	2012-13	2013-14
Post-treatment period	0.048***	-0.006	-0.014***	-0.012***	-0.026***
	(0.008)	(0.005)	(0.004)	(0.004)	(0.006)
Treated group	-0.034	-0.073*	0.037	0.016	0.069
	(0.028)	(0.034)	(0.056)	(0.039)	(0.056)
College opening treatment effect (ATT)	-0.003	-0.010	-0.014	-0.009	0.002
	(0.007)	(0.008)	(0.015)	(0.006)	(0.008)
FTE undergraduates[a] (10,000)	-0.039	-0.014	-0.052	-0.057	-0.023
	(0.041)	(0.059)	(0.041)	(0.045)	(0.020)
State appropriations per FTE[a] ($10,000)	-0.009	0.015	-0.003	0.011	0.047
	(0.037)	(0.040)	(0.044)	(0.038)	(0.036)
Local appropriations per FTE[a] ($10,000)	0.030	0.050	0.023	0.037	0.041
	(0.029)	(0.035)	(0.032)	(0.030)	(0.032)
Unemployment rate[a,c] (pct.)	-0.026***	-0.026***	-0.024***	-0.030***	-0.031***
	(0.004)	(0.005)	(0.005)	(0.005)	(0.007)
Median household income[b,c] ($10,000)	-0.032**	-0.035**	-0.021	-0.046***	-0.035**
	(0.012)	(0.012)	(0.013)	(0.012)	(0.012)
High school seniors[a,c] (10,000)	0.032	0.056	-0.007	0.011	-0.057
	(0.021)	(0.031)	(0.018)	(0.020)	(0.031)
Constant	0.547***	0.579***	0.514***	0.667***	0.593***
	(0.094)	(0.100)	(0.103)	(0.104)	(0.109)
Treated colleges	77	47	53	45	38
Control colleges	309	316	328	353	351
R-squared	0.126	0.121	0.113	0.157	0.147
F-statistic	5.074***	4.499***	3.875***	6.333***	5.266***

Table 4.5 (continued)

Two-Group, Two-Period Difference-in-Differences Regression Results: The Impact of Nearby College Opening(s) on the Proportion of Community College Price Charged as Student Fees

Variable	2009-10	2010-11	2011-12	2012-13	2013-14
Post-treatment period	-0.023**	-0.007	-0.001	-0.012*	-0.007*
	(0.007)	(0.004)	(0.004)	(0.005)	(0.003)
Treated group	0.042	0.044	0.163*	0.071	-0.041
	(0.031)	(0.046)	(0.073)	(0.072)	(0.054)
College opening treatment effect (ATT)	-0.000	0.004	0.010	0.011	0.006
	(0.005)	(0.008)	(0.010)	(0.009)	(0.011)
FTE undergraduates[a] (10,000)	-0.055	-0.014	-0.020	-0.157***	-0.004
	(0.042)	(0.083)	(0.095)	(0.044)	(0.138)
State appropriations per FTE[a] ($10,000)	0.021	0.001	-0.050	-0.082*	-0.102*
	(0.038)	(0.037)	(0.036)	(0.039)	(0.040)
Local appropriations per FTE[a] ($10,000)	0.022	0.027	0.047	0.050	0.052
	(0.029)	(0.036)	(0.040)	(0.036)	(0.036)
Unemployment rate[a,c] (pct.)	-0.028***	-0.030***	-0.023*	-0.023**	-0.034***
	(0.007)	(0.008)	(0.009)	(0.007)	(0.008)
Median household income[b,c] ($10,000)	-0.020	-0.012	-0.004	-0.018	-0.024
	(0.012)	(0.013)	(0.013)	(0.013)	(0.015)
High school seniors[a,c] (10,000)	-0.030	-0.049	-0.052	-0.004	-0.030
	(0.022)	(0.034)	(0.041)	(0.035)	(0.051)
Constant	0.491***	0.446***	0.379**	0.478***	0.543***
	(0.110)	(0.112)	(0.117)	(0.099)	(0.113)
Treated colleges	24	26	16	17	12
Control colleges	369	337	346	340	344
R-squared	0.121	0.081	0.074	0.072	0.068
F-statistic	4.774***	4.093***	3.795***	2.679**	2.416*

Note. Standard errors are clustered by commuting zone. Years are based on the fall semester of the academic year. Treatment group includes colleges with a nearby college opened in 2nd year and no change in nearby colleges in 1st year. Control group includes colleges with no change in the number of nearby colleges in either year.

[a] Data from the previous academic year. [b] Data from the previous calendar year. [c] Data from the same-state counties within the commuting zone.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4.6

Multi-Period Two-Stage Difference-in-Differences Regression Results: The Impact of Nearby College Opening(s) on Various Price Outcomes

Variable	Model 1	Model 2	Model 3
	Fee Proportion	Log of Fees	Log of Tuition
	Stage 1		
FTE undergraduates[a] (10,000)	0.060	-1.651***	-0.100
	(0.035)	(0.486)	(0.067)
State appropriations per FTE[a] ($10,000)	0.006	-0.014	-0.071***
	(0.008)	(0.115)	(0.016)
Local appropriations per FTE[a] ($10,000)	0.010	-0.175	-0.016
	(0.011)	(0.156)	(0.021)
Unemployment rate[a,c] (pct.)	0.002*	-0.008	-0.001
	(0.001)	(0.014)	(0.002)
Median household income[b,c] ($10,000)	-0.002	-0.141	-0.043***
	(0.006)	(0.080)	(0.011)
High school seniors[a,c] (10,000)	-0.050	0.203	0.214
	(0.100)	(1.386)	(0.191)
Constant	0.153**	7.630***	8.287***
	(0.051)	(0.697)	(0.096)
	Stage 2		
College opening treatment effect (ATT)	-0.011	0.222	0.021
	(0.013)	(0.357)	(0.033)
Stage 1			
College-Years[d]	2,223	2,223	2,223
R^2	0.944	0.839	0.964
F-statistic	147.262***	45.689***	233.621***
Stage 2			
College-Years[d]	2,332	2,332	2,332
R^2	0.003	0.005	0.003
F-statistic	0.783	0.399	0.403

Note. Standard errors are clustered by commuting zone. Treatment group includes colleges with a nearby college opened only once in the panel period and between 2012-2016 ($N = 20$). Control group includes colleges with no change in the number of nearby colleges in any year of the panel period ($N = 192$).
[a] Data from the previous academic year. [b] Data from the previous calendar year. [c] Data from the same-state counties within the commuting zone. [d] Stage 1 only includes never treated and not-yet-treated observations. Stage 2 includes all observations.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

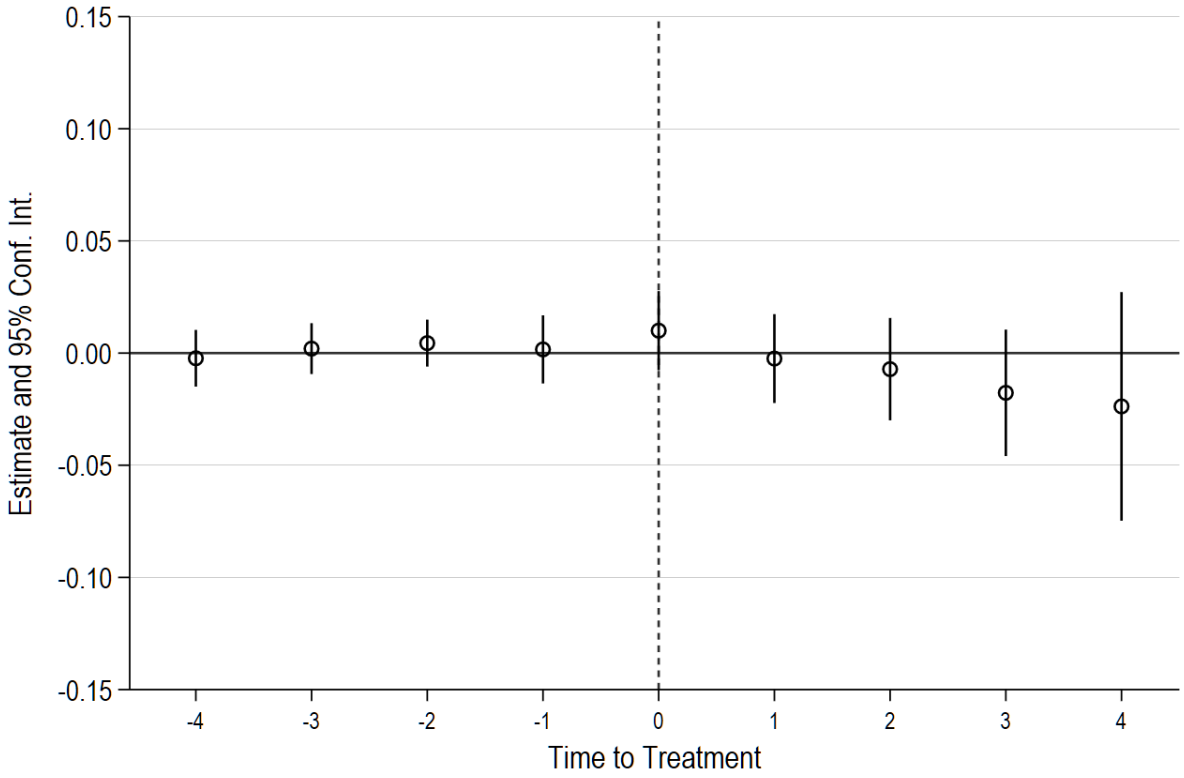

Figure 4.1. Two-Stage Event Study: The Impact of Nearby College Opening(s) on the Proportion of Price Charged as Student Fees

Note. Standard errors are clustered by commuting zone. Treatment group includes colleges with a nearby college opened only once in the panel period and between 2012-2016 ($N = 20$). Control group includes colleges with no change in the number of nearby colleges in any year of the panel period ($N = 192$).

CHAPTER 5

HOW COMMUNITY COLLEGE FEES AFFECT STUDENTS [17]

[17] Mayfield, S.D. To be submitted to *Community College Journal of Research and Practice*.

Abstract

The law of demand is a fundamental principle in economics that states that, all else being equal, as the price of a good rises, the quantity demanded of that good will decrease. Studies have quantified this relationship for four-year colleges and universities, usually examining how an increase in tuition and fees causes a decline in applications or enrollments. However, few studies have addressed demand for community colleges, and no study has considered whether tuition and fees might have different effects on demand for American postsecondary education. Evidence from research on partitioned prices in other industries suggests that consumers may under-react to changes in fees compared to similar changes in a product's base price. Guided by this theoretical insight, the present study quantifies the tuition and fee elasticities of demand (separately) for a panel of American community colleges between academic years 2009-10 through 2019-20 using two-way fixed effects estimation. The findings do not suggest that community college students under-react to fees; in fact, there is no significant evidence of a price-enrollment relationship whatsoever. Potential explanations for this finding are addressed.

Introduction

What do hotels, rental cars, and air travel have in common with American higher education? When Consumer Reports surveyed Americans in 2018, roughly the same percentage of respondents indicated that they had received a bill from these industries containing an unexpected fee (Consumer Reports, 2019). Fees are not new to higher education; they have been charged to cover non-instructional costs since the very origins of the university (Axtell, 2016; Shanwei, 2017). But over the past 20 years, mandatory student fees have consistently grown faster than tuition across America's public colleges, especially in the public community college sector (see Figure 1.1). These fees are not trivial. In academic year 2019-20, community college mandatory student fees averaged $663 per year, more than 14% of the direct cost of attendance (author's calculations using data from IPEDS (n.d.)). Considering how community colleges serve as a gateway to higher education for low-income and nontraditional students, the rising cost of student fees raises important questions about how they might affect student demand.

Scholars have long been interested in how *combined* tuition and fees affects students. Many of these studies quantify the price elasticity of demand for postsecondary education, or the percentage change in applicants or enrollees stemming from a one-percent change in college price (Havranek et al., 2018; Heller, 1997; Jackson & Weathersby, 1975; Leslie & Brinkman, 1987). Research on the topic has consistently found that postsecondary education is a normal good (i.e., demand rises as consumers' incomes rise) and is relatively price inelastic (i.e., demand is not very sensitive to price changes).

To date, only one study has examined the potential for tuition and fee increases to have differing effects on student demand. Bruckmeier, Fischer, and Wigger's (2013) analysis of German tuition and fee elasticities of demand found that students were less sensitive to fee

increases than tuition increases. The authors concluded that, “this result is striking, as both tuition fees and administrative fees serve similar purposes in higher education financing. Moreover, both types of fees affect the rate of return to higher education in identical ways” (p. 1282). Their surprise was in keeping with the assumptions of neoclassical economic theory, which assumes that consumers should not respond differently to how a price is framed. That is, students should not be affected differently by a same dollar increase in fees versus tuition so long as they have an equivalent impact on the student’s budget. Such assumptions are taken for granted in most postsecondary literature; as Delaney and Kearney (2016) point out, “we have little reason to believe that student price responses would be substantially different for fees as opposed to tuition charges” (p. 735).

In light of their apparent contradiction with economic theory, it might seem reasonable to write off Bruckmeier et al.’s (2013) results. However, their findings are corroborated by research on the effects of partitioned pricing in other industries. Partitioned pricing is the practice of splitting a price into two or more mandatory parts, such as tuition and mandatory student fees. Experimental evidence suggests that consumers systematically under-react to fees, leading to higher demand when prices are partitioned (Abraham & Hamilton, 2018; Greenleaf et al., 2016; Voester et al., 2017). For example, Chetty et al. (2009) found that increases in sales tax that are shown to the consumer at checkout reduce alcohol consumption more than a same-dollar increase in excise tax that is incorporated into alcohol’s base price.

One potential explanation for this phenomenon is a systematic behavioral bias uncovered by Tversky and Kahneman (1974), which they coined “adjustment and anchoring.” Using a variety of experiments, the authors illustrated how people tend to anchor on starting values when performing mental calculations and often insufficiently adjust for additional information. In their

seminal study on partitioned pricing, Morwitz et al. (1998) suggested that some consumers might resort to simplifying heuristics rather than perfect mental calculations to estimate a total price from partitioned prices, and thus might anchor on the large base price and insufficiently adjust their cost estimates upwards to incorporate fees. Much of the subsequent research on the topic has focused on how this bias might be moderated by various characteristics of the fees, the seller, or the consumer (Abraham & Hamilton, 2018).

In summary, as community college fees continue to comprise an ever-larger share of the direct cost of attendance, it is important to consider the effects that this trend might have on student demand. Research on postsecondary price elasticity of demand has thus far failed to incorporate the fact that tuition and fees are separate charges. Rooted in the findings of Bruckmeier et al. (2013), and partitioned pricing research more generally, this study aims to test whether community college student demand is less sensitive to student fee increases than to tuition increases. In particular, it aims to answer the following research question:

RQ 5.1: Do public two-year college enrollments respond less to changes in mandatory student fee prices than to changes in tuition?

Literature Review

This study contributes to two strands of literature. The first consists of studies that examine how a change in college price affects enrollment, also known as the student price response. The second considers how the framing of a price can affect consumer perceptions, decision making, and demand.

Student Price Response

Demand theory from the field of economics posits that the quantity of a good or service demanded by consumers is a function of its price, and that market demand can change based on

the price of other goods, consumer income, and consumer tastes and preferences. When the price of a good or service rises, it is usually expected that the quantity of that good or service demanded will decrease. To quantify this relationship, economists often measure the price elasticity of demand, or the percentage change in quantity demanded stemming from a one-percent change in price. Demand is considered inelastic if the absolute value of the elasticity is less than one, elastic if greater than one, and unit-elastic if equal to one. In other words, inelastic demand indicates that consumers are relatively insensitive to price changes, and vice-versa for elastic demand.

Scholars have long attempted to measure postsecondary student price responsiveness. Reviews of these studies have generally found that enrollment declines modestly as tuition rises, although it is problematic to compare early estimates because they were often reported in student price response coefficients (SPRC) which, in contrast to elasticity measures, are based on the value of the dollar at the time of publication (Heller, 1997; Jackson & Weathersby, 1975; Leslie & Brinkman, 1987). More recently, meta-analyses have examined the sources of heterogeneity in price response estimates. In this vein, Gallet (2007) reviewed 53 studies from 1953-2004 and found that price response estimates were sensitive to study design characteristics such as the functional form, definition of enrollment and price, and estimation method. Gallet (2007) also found that including fees in the measure of price tended to result in less elastic demand than only including tuition – a finding with relevance to the present study. Meanwhile, Havranek et al.'s (2018) meta-analysis of 43 studies found that student price sensitivity estimates are heavily influenced by publication bias, and that the true price response is likely close to zero.

Relatively few studies have examined student price response in the community college sector. This literature can be broadly divided into two categories.[18] The first category consists of studies that compare community college price sensitivity with other postsecondary sectors. In an early example, Leslie and Brinkman (1987) calculated a SPRC for community colleges that was roughly two to three times larger than selective private colleges, suggesting that community college students are relatively price sensitive. Subsequent research has generally supported the notion that community college student demand is more elastic than other sectors (Cameron & Heckman, 2001; Heller, 1997; Kane, 1995).

The second strand of research focuses on estimating the actual elasticity of demand at community colleges, usually by employing quasi-experimental methods. For example, Denning (2017) and Martorell et al. (2014) analyze community college elasticities in Texas by exploiting the boundaries of community college taxing districts. Both studies find significant inverse relationships between tuition and enrollment, with Denning (2017) noting that the relationship varies by age and poverty status. Meanwhile, Acton (2021) exploited geographic differences of in-district tuition discounts in Michigan and found that a $1,000 reduction in tuition at a student's local community college increases enrollment at the college by 3.5 percentage points and reduces enrollment at public and private two-year institutions by 1.9 percentage points. Acton (2021) found no significant evidence of a substitution away from four-year colleges, suggesting that they are not strong substitutes.

[18] Other closely related studies examine how enrollment is affected by the price of competing institutions (cross-price elasticity), student income (income elasticity), and the business cycle (unemployment elasticity). The latter is especially relevant to the community college sector (see Betts and McFarland (1995), Hillman and Orians (2013), and Nutting (2008)).

The Framing of Prices

Standard economic theory assumes that consumers are rational and that their decisions are not affected simply by the presentation of equivalent options – an assumption known as descriptive invariance. Yet experimental evidence from behavioral economics has shown that people's decisions are indeed affected by how choices are framed (Tversky & Kahneman, 1974, 1981, 1986). Facing complex decisions, individuals might choose to process only a portion of information, resort to simplifying heuristics (rules-of-thumb), or other strategies that can lead to systematic biases (DellaVigna, 2009).

One framing problem that has received a good deal of attention in recent years is partitioned pricing, or the division of a product's price into a base price and one or more mandatory surcharges (Greenleaf et al., 2016). According to the standard model of rational choice, "a perfectly informed and fully rational consumer will merely add together the two parts of a price to obtain the total out of pocket price for an item and then determine whether or not to buy based on this total price" (Hossain & Morgan, 2006, p.1). In contrast, early experiments on partitioned pricing found that consumers tended to recall lower total prices for products when prices were partitioned, thereby increasing consumer demand (Lee & Han, 2002; Morwitz et al., 1998).

According to Morwitz et al. (1998), consumers who are presented with a partitioned price must weigh the costs and benefits of estimating the total cost, leading to three general strategies. First, some consumers might choose to simplify their decision by ignoring surcharges altogether, perhaps believing that incorporating their costs would not likely improve their decision. Second, some consumers might anchor on the base price and insufficiently adjust their perceived total price upward for surcharges. This rationale stems from the experimental findings of Tversky and

Kahneman (1974), who show how "In many situations, people make estimates by starting from an initial value that is adjusted to yield the final answer…adjustments are typically insufficient" (p. 1128). Third, some consumers might commit to precisely calculating the total price. Because the first two strategies downwardly bias the perceived total price and the third produces an unbiased estimate, the average of the three strategies is downwardly biased.

Other theoretical perspectives predict different outcomes. In contrast to the prediction of Morwitz et al. (1998), Thaler's (1985) mental accounting principle suggests that partitioned pricing should decrease demand because consumers prefer to integrate their losses and the existence of multiple fees signals multiple losses to the consumer (see Kim (2006) for an application of this theory). Alternatively, attribution theory implies that consumers will ascribe reasons for the existence of surcharges and predicts that responses to fees will differ depending on how consumers construe seller motivations (Lee & Han, 2002; Voester, 2017). Finally, other studies consider consumer attention a limited resource and propose that consumers devote less attention to the less salient parts of a partitioned price (usually the smaller price component) (DellaVigna, 2009). This framework is similar to Morwitz et al.'s (1998) first strategy of ignoring surcharges but replaces complete inattention with an inattention parameter that is typically construed as a function of salience (Chetty, 2009; DellaVigna, 2009; Gabaix, 2014; Taubinsky & Rees-Jones, 2018).

The inconsistent predictions of these theoretical perspectives have led scholars to investigate specific factors that might moderate partitioned pricing effects. For example, studies have examined how the effect of partitioned pricing varies by surcharge magnitude, number, and presentation (Brown et al., 2010; Kim, 2006; Morwitz et al., 1998; Xia & Monroe, 2004); whether a total price is shown (Carlson & Weathers, 2008); and characteristics of the consumer,

seller, or their perceptions (Bertini & Wathieu, 2008; Burman & Biswas, 2007; Choi et al., 2020; Das & Roy, 2019; Das et al., 2020; Hamilton & Srivastava, 2008; Pan et al., 2013). Scholars have also broadened the dependent variable to examine how partitioned pricing impacts perceptions of value and fairness (Chu et al., 2020; Pallas et al., 2018; Sheng et al, 2007); purchase intentions and demand (Hossain & Morgan, 2006; Morwitz et al., 1998); and seller reputation and brand attitude (Lee & Han, 2002; Tuzovic et al., 2014). Several literature reviews cover these topics in more detail (see Ahmetoglu et al., 2014; Greenleaf et al., 2016; Voester et al., 2017).

One limitation of these studies is that they typically control for only a few moderators at a time, making it difficult to parse out their relative influence. To remedy this, Abraham and Hamilton (2018) conducted a meta-analysis of 43 studies to compare the effects of various partitioned pricing moderators and partitioned pricing against all-inclusive pricing more generally. They found that partitioned prices generate a 9% higher consumer preference[19] than all-inclusive pricing, on average, and that consumers respond more preferably "when the total price is absent, as the price level increases, when the surcharges are typical for the product category, when the surcharges are perceived as offering high benefit, and when the product category is utilitarian" (p. 686). The authors found that partitioned pricing has higher consumer preference than all-inclusive pricing when the total price was above $35.

Partitioned Pricing and Community Colleges

According to the accumulated knowledge of partitioned pricing effects, there are at least three aspects of community college student fees that make them likely to be underestimated by

[19] The authors defined their dependent variable as "preference," or "an inclination toward stimuli" (p. 687). This is because the studies under review had varying preference-related dependent variables such as product choice, purchase intention, offer evaluation, or attitude.

prospective students. First, community college student fees are computationally complex. Reviews of partitioned pricing studies agree that increased computational complexity can lead consumers to resort more to heuristics and lower their perceived total price (Greenleaf et al., 2016; Voester et al., 2017). Results from a collection of fee presentation data from 96 community colleges showed that the average college charged about four mandatory fees on top of tuition (see Table 3.2), and many institutions charged additional fees for courses offered online or for specific labs, courses, or programs (see Table 3.3). In addition, the way that mandatory fees are charged is not standardized; for example, 59% of collected fees were charged by the credit hour, whereas 40% were charged per semester (see Table 3.4).

The complexity of student fee charges can require prospective students to solve complex arithmetic operations. For example, Aims Community College presented the following instructions for calculating total direct costs on their tuition and fee webpage:

1. Find your tuition rate in the table below
2. Add student fee of $7.00 per credit to your tuition rate (up to $105 maximum)
3. Multiply the total of #1 and #2 by the total number of credits for the course(s)
4. Add a $25 Administrative Fee (one time fee per semester) to the base cost
5. Add any lab and/or course fees (fees found in online class schedule). (Aims Community College, n.d.)

Calculations such as this also do not account for the cost of books, supplies, or living arrangements, and usually must be discounted for financial aid amounts that are often not known until late in the admissions process. In this respect, college prices are vastly more computationally complex than the shipping charges commonly studied in the partitioned pricing literature.

The second quality of community college fees that makes them susceptible to partitioned pricing effects concerns the postsecondary industry. In their meta-analysis of partitioned pricing, Abraham and Hamilton (2018) found that higher total price levels and typicality of partitioning in the industry are significant predictors of partitioned pricing effects. Community college tuition and fee prices are far higher ($3,377) than the average study reviewed in the meta-analysis ($302) (De Bray et al., 2021, Table 330.20). In addition, 94% of both public four-year and two-year colleges charge mandatory fees to in-state students, so the charging of fees is very typical (author's calculation using data from IPEDS (n.d.)).

Finally, the qualities of the fees charged at community colleges also suggests that students are likely to under-adjust for their added cost. Hamilton and Srivastava (2008) show that surcharges with a high perceived benefit to the consumer results in lower price sensitivity than surcharges with a low perceived benefit. While the perceived benefit of a fee can vary by consumer, I believe there is good reason to think that many prospective students perceive technology fees, facilities fees, and student activity fees as providing them with direct tangible benefits. These are three of the four most meaningful fees (by typicality and price) charged at a sample of 96 community colleges (see Figure 3.3). In addition to perceived benefit, Hamilton and Srivastava (2008) also found that partitioned pricing increases consumer preferences for utilitarian products more than hedonic products. Results from a national survey of community college students indicated that only 16% of students enrolled primarily for "personal enrichment," with the remaining 84% seeking job skills, a credential, or to transfer to another institution (Hoachlander et al., 2003). Thus, a majority of students participate in community college postsecondary education for primarily utilitarian motives.

Community college fees align well with significant predictors of partitioned pricing effects on consumers. With a high computational complexity, total price, typicality of being charged, perceived benefit, and utilitarian purpose, community college students are presumed to be less responsive to changing fee prices than to changing tuition. While this study cannot test whether this insensitivity stems from a systematic downward bias of perceived total price or some other factor (e.g., attribution or salience effects), there is some evidence from four-year college surveys that students often under-estimate the total price of fees. For example, Ott (2009) found that 91% of student respondents at the University of Toledo were aware they paid a general fee, but nearly three times more students under-estimated the price of the fee than over-estimated it. Similarly, Chapman (2011) found that 84% of respondents at Ohio University were aware they paid a general fee, with 54% under-estimating its price and 39% over-estimating it. These results provide some evidence that students have a downward bias toward their fee costs.

Data and Methods

Data

The observations for this study consisted of colleges that were identified in IPEDS as belonging to the public two-year college sector between the 2009-10 and 2019-20 academic years. The years of analysis were limited due to IPEDS only beginning to collect college county codes in academic year 2009-10. The public two-year college sector excludes community colleges that offer bachelor's degrees, which is appropriate for this study given the potential pricing and enrollment effects that community college baccalaureate adoption might have. Colleges were also dropped from the sample if they were inactive in the given year, did not participate in Title IV, did not have reported tuition data, offered only online education, charged

a higher price for fees than tuition,[20] or had swapped tuition and fee prices by more than $300.[21] Finally, community colleges that were very large (fall enrollments over 40,000) multi-site campuses were dropped because the control variables assume a small service area surrounding the college's primary address.

I gathered data from IPEDS for both the dependent variables (enrollment) and the primary variables of interest (tuition and fee prices). Socioeconomic control variables were gathered at the county level from the U.S. Census Bureau, the U.S. Bureau of Labor Statistics, and the Common Core of Data (CCD) dataset from the National Center of Education Statistics.

Dependent Variables. The dependent variables are various measures of fall enrollment from the IPEDS fall enrollment survey. They include the total fall semester undergraduate student count, student count by full- and part-time status, and a measure of full-time equivalent (FTE) enrollment constructed using the IPEDS conversion factor for public two-year colleges. These variables are then log-transformed, which changes the interpretation of the models' coefficients from being numeric changes in enrollment to percent changes in enrollment. This is a more nuanced way to interpret coefficients given the large range of college enrollments across the sample.

Price Variables. The college price variables reflect the academic year tuition and mandatory fee charges (separately) assessed to in-district full-time students, adjusted for inflation. In-district prices are used because many locally subsidized community colleges offer discounted prices to students residing in the college's local service area. Mandatory fees are defined by IPEDS as those that affect the majority of students; as such, program fees, parking

[20] Charging a higher price for fees than tuition switches the theoretical implications of these prices, as fees would be considered the base price rather than tuition.
[21] As a robustness check, I ran the regression models with and without these 43 colleges. Results remained nearly identical no matter their exclusion or inclusion.

fees, online fees, and others are often not included. In addition, mandatory fees are not broken down into their individual components but are reported as a lump sum in IPEDS surveys.

Control Variables. In price response studies it is crucial to control for factors that alter market demand. For example, increasing the number of consumers in a market will, all else equal, lead to increased demand for a product even apart from any price effects. Accordingly, I control for several relevant demand-shifting factors. Because public two-year college enroll a majority of their students from the surrounding locality,[22] most of these variables control for socioeconomic characteristics at the commuting zone level. Commuting zones are geographic units comprised of counties that were selected using the U.S. Census Bureau's journey to work data to "more closely reflect the local economy where people live and work" (Economic Research Service, 2019). However, commuting zones can cross state boundaries. This is problematic for postsecondary research because colleges charge different prices for in-state and out-of-state residents and often offer resident-based financial aid. As such, I control for variables at the commuting zone level using only those counties of the commuting zone that are contained within the college's state. The control variables are described below.

First, I derived the college's *discount rate* as the ratio of total institutional grant aid received by FTFT undergraduates to the gross tuition and fee revenue from the students. This accounts for institution-specific price discounts offered to students and helps correct for tuition discounting practices that sometimes make sticker prices less relevant indicators of what students actually pay.

[22] According to publicly available data from the National Postsecondary Student Aid Study (NCES, 2016), over half (57.5%) of public two-year college students attend within 10 miles of home, and more than 9 out of 10 attend within 50 miles.

Second, I controlled for the *unemployment rate* of each college's commuting zone. Because the Bureau of Labor Statistics provides data on the labor force and number of unemployed persons per county, I was able to aggregate unemployment rates from the county to the commuting zone level. In addition, I was also able to use monthly data to generate the average unemployment rate from July of the prior year through the June immediately preceding the fall semester of enrollment. This timeframe is more suitable than controlling for average calendar year unemployment rates and represents the average unemployment rate of the commuting zone during the prior academic year.

Third, I controlled for *median annual household income* by aggregating county-level data from the Small Area Income and Poverty Estimates (SAIPE) program to the commuting zone level. However, because median family income is an aggregated estimate per county, I averaged this figure across the commuting zone using a weighted average (weighted according to the number of households per county). The weight was constructed as follows:

$$w_{czst} = \frac{households_{czst}}{\sum_{c=1}^{n} households_{czst}},$$

where w_{jcst} is the weight for county *c*, in commuting zone *z*, in state *s*, in year *t*, and where there are *n* counties within the commuting zone. The median household income for each commuting zone results from multiplying this weight against each constituent county's estimated median household income:

$$median\ household\ income_{zst} = \sum_{c=1}^{n} w_{czst} * \ median\ household\ income_{czst}\ .$$

Fourth, I controlled for the *price of competitors* (also known as the cross-price elasticity of demand) by using the total tuition and fee price of the nearest active, open-access, Title-IV participating, not-exclusively online college with at least 100 students enrolled and which

reported data in every year. The median distance to the competitor college was 24 miles, and the median fall undergraduate enrollment of the competitor was 3,539 students. While some studies control for the average price of all colleges within a state, the local service area of public two-year colleges encourages controlling for geographically proximate competitors. An average competitor price within a certain radius of the college was considered, but the significant pricing differences across sectors would give undue weight in the average to high-priced competitors. Meanwhile, limiting local competitors to only one postsecondary sector risked dropping observations for which no such competitor existed or extending the distance to such a competitor far outside any meaningful competitive distance.

Fifth, I controlled for the size and gender/racial background of the public high school *senior class* of the previous academic year. The number of the previous year's high school seniors as well as their gender and race/ethnicity were collected from the NCES Common Core of Data (CCD) database. I then aggregated the data from the school to the commuting zone level. I tested this measure against other ways of selecting high schools (e.g., within various radii of the college, or the nearest *x* high schools), but found that high schools within the commuting zone provided the best explanatory value.

Descriptive statistics for academic year 2019-20 are provided in Table 5.1, with pairwise correlations provided in Appendix F. Overall, the colleges in the sample enrolled an average of just under 6,000 students, charged $3,429 for in-district tuition for an academic year and $566 for all in-district mandatory fees, with a total price of $3,995 that was nearly two thousand dollars less than the average competitor college ($5,891). The fee share of total price ranged from 0% to 49% with an average of 13%. The mean discount rate was 13%, with a maximum

value of 112% (i.e., this college provided more institutional aid per student than its total collection from tuition and fee charges).

Methods

I used an unbalanced panel dataset of American public two-year colleges from 2009-10 to 2019-20 to estimate the log of fall enrollment in two separate models. The first model, depicted in Equation (5.1) below, examines the tuition and fee elasticities of demand using double-log fixed-effects OLS panel data estimation. The double-log functional form should be interpreted as the percent change in fall enrollment stemming from a one-percent change in the given log-transformed independent variable. This interpretation provides useful nuance given the wide range of enrollments and prices across the sampled colleges.[23] Meanwhile, the two-way fixed effects estimator is advantageous because it controls for the effects of time-invariant qualities of the colleges (assuming they do not change, these might include the college's location, surrounding geography, building capacity, signage, etc.) and for secular time trends across all institutions (e.g., general national interest in or payoff from attending community college).

[23] For example, in a model without log transformations the interpretation would be that some fixed-dollar change in price would affect enrollments by a constant number, no matter the size or price of the college.

$$\begin{aligned}\log fall\ enrollment_{izst} = \quad & \beta_1\ \log fees_{izst} \\ & + \beta_2\ \log tuition_{izst} \\ & + \beta_3\ discount\ rate_{izst} \\ & + \beta_4\ \log competitor\ price_{izst} \\ & + \beta_5\ \log median\ household\ income_{zst} \\ & + \beta_6\ unemployment\ rate_{zs,t-1} \\ & + \beta_7\ \log high\ school\ seniors_{zs,t-1} \\ & + \mathbf{Z}_{zs,t-1}\ \boldsymbol{\lambda} \\ & + \gamma_i + \delta_t + \varepsilon_{izst}\ ,\end{aligned} \tag{5.1}$$

where $\log fall\ enrollment_{izst}$ is the log undergraduate enrollment (by enrollment status, total, or FTE) at community college *i*, in commuting zone *z*, in state *s*, in fall semester of year *t*. $\text{Log}\ fees_{izst}$ is the log in-district total mandatory fee magnitude, $\log tuition_{izst}$ is the log in-district total tuition, $discount\ rate_{izst}$ is the college's ratio of institutional grant aid to gross tuition and fee revenue, $\log competitor\ price_{izst}$ is the log tuition and fee price of the nearest open-access competitor college, $\log median\ household\ income_{zst}$ is the log of the commuting zone's weighted median household income, $unemployment\ rate_{zs,t-1}$is the commuting zone's average unemployment rate from June of the previous year through July of year *t*, $\log high\ school\ seniors_{zs,t-1}$ is the log high school senior enrollment across public high schools in the commuting zone in the previous year, $\mathbf{z}_{zs,t-1}$ is a matrix of variables representing the percentage of the high school senior class by gender and race, γ_i are institution fixed effects, δ_t are year fixed effects, and ε_{izst} is the error term.

The second model examines how a change in fees as a proportion of total tuition and fees affects fall enrollment in a semi-log fixed effects OLS estimation technique, as shown in Equation (5.2). A semi-log functional form was used because the primary variable of interest, $fee\ proportion\ of\ price_{izst}$, is already a percentage. Therefore, the interpretation of its coefficient is similar to a log-transformed variable (i.e., the percentage change in fall enrollment associated with a one-percent change in $fee\ proportion\ of\ price_{izst}$).

$$\begin{aligned} \log fall\ enrollment_{izst} = \quad & \beta_1\ fee\ proportion\ of\ price_{izst} \\ & + \beta_2\ price_{izst} \\ & + \boldsymbol{P\theta} \\ & + \gamma_i + \delta_t + \varepsilon_{izst}\ , \end{aligned} \tag{5.2}$$

where $fee\ proportion\ of\ price_{izst}$ is the proportion of total in-district tuition and fees charged as fees, or:

$$fee\ proportion\ of\ price_{izst} = \frac{fees_{izst}}{tuition_{izst} + fees_{izst}}.$$

Changes in the $fee\ proportion\ of\ price_{izst}$ variable are indicative of the relative growth rates of tuition and fees; an increasing value of this variable indicates that fees grew by a larger percentage than tuition (i.e., the college shifted its price more towards fees relative to the previous year). This variable is particularly useful paired with the panel fixed effects estimation strategy because the estimator evaluates changes in the variable within the institution over time. The variable $price_{izst}$ is equivalent to the denominator above and is used to control for changes in the relative expensiveness of the college, and $\boldsymbol{P}$ is a matrix of the control variables listed in Equation (5.1) with their associated parameters contained in vector $\boldsymbol{\theta}$.

F-tests were conducted to ensure that the unit and year fixed effects were both jointly significant ($p < 0.000$). In addition, the value of the Sargan-Hansen test statistic (51.58, $p < 0.000$) indicated that a fixed effects model was preferred over a random effects model. Finally, significant first-order autocorrelation was indicated by a Portmanteau test (Inoue & Solon, 2006) across all regression specifications ($p < 0.000$), so I clustered the standard errors by institution for robustness (Wooldridge, 2013).

Results

The tuition and fee elasticities as described in Equation (5.1) are presented in Table 5.2. There are a total of four regressions according to which enrollment measure was used as the dependent variable. All of the regressions are significant using a joint F-test. However, the explanatory power of the independent variables for variation in fall enrollments within each college is noticeably higher for full-time enrollments (R^2 (within) = 0.46) than part-time enrollments (R^2 (within) = 0.043), which corroborates the findings of Hillman and Orians (2013). Overall, well over 90% of the variation in fall enrollments is explained by the models (such a high value is typical in fixed-effects regressions).

The elasticity estimates for tuition and fees are close to zero and are not statistically significant in any of the models, suggesting that changes in tuition or fee prices might not have clear and direct implications for community college enrollments. The lack of a clear connection between prices and enrollments could stem from the heavily subsidized nature of community college education, and future elasticity studies would benefit from tightly controlling for financial aid. Of the control variables, the number of high school seniors and the median household income had significant positive effects on enrollment. Meanwhile, the price of the nearest competitor college is inversely related to enrollment (especially part-time enrollment), in contrast to the expected substitution effect. I hypothesize that as prospective students hear of higher postsecondary prices in the local area, they become discouraged from attending any college, although this issue warrants further investigation.

Table 5.3 presents the results of Equation (5.2), which examines how an increase in fees as a share of total price affects various measures of fall enrollment. Similar to Table 5.2, all of the regressions are significant using a joint F-test, with lower within-institution explanatory

power (i.e., R^2 (within)) in the part-time enrollment regression than the full-time enrollment regression. The variable of interest, $fee\ proportion\ of\ price_{izst}$, is negative and statistically significant in all regressions except the part-time enrollment regression. The negative coefficient indicates that an increased proportion of price charged as student fees is associated with a decrease in full-time, total, and FTE enrollments. More specifically, a one-percent increase in the percent of total price stemming from fees is associated with a .003% decrease in enrollment – a highly inelastic estimate. Nevertheless, this inverse relationship runs contrary to my theoretical predictions. I had predicted that an increase in price stemming from fees would be less noticed by students than one stemming from tuition, which would have resulted in a positive coefficient. I hypothesize that this contradictory finding may result from financial aid packages that cover tuition but not fees, making students more conscious of fee prices than tuition.

Discussion

In summary, I find no indication that community college students are less sensitive to student fee increases than tuition increases. In fact, my results suggest the opposite; as student fees make up a greater share of the direct cost of attendance, community college enrollments tend to go down. I infer two possible explanations for this result. First, many state and local free community college programs cover the cost of tuition but not fees. This may make students under these programs more sensitive to the additional costs of fees than tuition. Second, as noted earlier, there are alternative theories that predict purchasers to have greater price responses to fees than to base prices. One prominent theory is Thaler's (1985) mental accounting principle, which predicts partitioned pricing to decrease demand because consumers prefer to integrate their losses.

I also find that community college student demand is not responsive to price generally, contradicting previous research (Heller, 1997), but corroborating the meta-analysis of Havranek et al. (2018) which finds that, "judging from the available empirical research, our best guess concerning the effect of tuition on enrolment is close to zero" (p. 1174). With little price sensitivity generally, it is difficult to conclude whether students are more sensitive to changes in one type of price than another.

Future research would benefit from tightly controlling for the effects of financial aid. The publicized tuition and fee rates in American colleges are often not equivalent to the actual cost borne by students and their families. Especially in community colleges, federal and state financial aid can cover a significant portion of the cost of attendance, often covering more than the full tuition and fee price (Ma et al., 2021). Unfortunately, publicly available data is not precise enough to control for the effects of financial aid. Further studies at the student level that control for these factors may provide more precise price sensitivity estimates.

Table 5.1

Descriptive Statistics for Study Variables, Academic Year 2019-20

	M	*SD*	Min.	Max.
Fall Enrollment Variables:				
Full-Time Equivalent (FTE)	3,419.81	3,209.94	57.00	20,367.00
Total Enrollment	5,983.31	5,721.46	65.00	36,885.00
Full-Time Enrollment	2,124.16	2,058.49	40.00	17,772.00
Part-Time Enrollment	3,864.40	3,962.45	2.00	30,072.00
Price Variables:				
In-District Tuition	3,429.04	1,447.43	871.91	11,854.61
In-District Fees	566.33	497.65	0.00	3,625.54
In-District Tuition & Fees	3,995.37	1,645.47	988.59	12,735.00
Fee Proportion of Price	13.33	10.20	0.00	48.57
Control Variables:				
Discount Rate	12.75	16.80	0.00	111.73
Unemployment Rate[a,b]	4.03	1.11	1.62	16.72
Median Household Income[a,c]	66,365.53	17,206.58	32,889.61	126,459.69
Competitor Price	5,890.96	4,908.64	988.59	31,694.31
High School Seniors[a,d]	27,427.07	52,421.71	94.00	232,178.00
% Male	50.79	1.52	43.54	57.20
% Female	49.21	1.52	42.80	56.46
% White	56.93	22.90	4.83	98.05
% Black	14.37	15.40	0.00	89.49
% Hispanic	19.58	19.48	0.00	93.34
% Asian	4.05	4.76	0.00	24.17
% American Indian	1.99	7.02	0.00	71.79
% Pacific Islander	0.20	0.26	0.00	2.43
% Two or More Races	2.88	1.64	0.00	10.59

Note. $N = 736$ colleges. [a] Total of the same-state counties withing the college's commuting zone. [b] Average of monthly unemployment from June of prior year to July of current year. [c] Weighted by number of households per county. [d] Data on high school seniors are for the prior academic year.

Table 5.2

Tuition and Fee Elasticities of Demand for Community College Fall Enrollment

	Part-Time Enrollment		Full-Time Enrollment		Total Enrollment		FTE Enrollment	
	β	S.E.	β	S.E.	β	S.E.	β	S.E.
In-District Fees (ln)	-0.016	(0.008)	-0.001	(0.005)	-0.010	(0.006)	-0.007	(0.005)
In-District Tuition (ln)	-0.065	(0.056)	0.075	(0.052)	-0.005	(0.044)	0.032	(0.044)
Discount Rate	0.000	(0.001)	-0.001	(0.001)	0.000	(0.001)	-0.000	(0.001)
Unemployment Rate[a,b]	-0.005	(0.005)	0.010*	(0.004)	0.001	(0.003)	0.005	(0.003)
Median Household Income (ln)[a,c]	0.114	(0.124)	0.582***	(0.095)	0.322***	(0.084)	0.442***	(0.078)
Competitor Price (ln)	-0.075*	(0.034)	-0.007	(0.035)	-0.061*	(0.028)	-0.041	(0.028)
High School Seniors (ln)[a,d]	0.324***	(0.069)	0.186**	(0.061)	0.282***	(0.052)	0.248***	(0.051)
% Male	-0.002	(0.002)	0.001	(0.001)	-0.001	(0.001)	-0.001	(0.001)
% Black	-0.002	(0.003)	0.001	(0.003)	-0.001	(0.003)	0.000	(0.003)
% Hispanic	-0.009**	(0.003)	0.009***	(0.002)	0.001	(0.002)	0.005**	(0.002)
% Asian	0.003	(0.009)	-0.013	(0.007)	-0.005	(0.006)	-0.008	(0.006)
% American Indian	-0.003	(0.008)	-0.005	(0.004)	-0.002	(0.003)	-0.003	(0.003)
% Pacific Islander	-0.010	(0.023)	-0.003	(0.017)	-0.004	(0.016)	-0.002	(0.015)
% Two or More Races	-0.009*	(0.004)	-0.003	(0.003)	-0.006*	(0.003)	-0.005*	(0.003)
Constant	5.216**	(1.643)	-1.166	(1.287)	3.089**	(1.156)	1.011	(1.085)
College-years	8,754		8,776		8,776		8,776	
Colleges	880		883		883		883	
R^2	0.979		0.979		0.986		0.986	
R^2 (within)	0.043		0.460		0.257		0.402	
Model F-statistic	6.965***		66.279***		36.688***		60.425***	
College FE	Yes		Yes		Yes		Yes	
Year FE	Yes		Yes		Yes		Yes	

Note. Cluster-robust standard errors are presented in parentheses. [a] Total of the same-state counties withing the college's commuting zone. [b] Average of monthly unemployment from June of prior year to July of current year. [c] Weighted by number of households per county. [d] Data on high school seniors are for the prior academic year.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5.3

Effect of Fee Proportion of Price on Community College Fall Enrollment

	Part-Time Enrollment		Full-Time Enrollment		Total Enrollment		FTE Enrollment	
	β	S.E.	β	S.E.	β	S.E.	β	S.E.
Fee Proportion of Price	-0.002	(0.002)	-0.003*	(0.001)	-0.003*	(0.001)	-0.003**	(0.001)
In-District Tuition & Fees	-0.000	(0.000)	0.000	(0.000)	-0.000	(0.000)	-0.000	(0.000)
Discount Rate	0.000	(0.001)	-0.001	(0.001)	0.000	(0.001)	-0.000	(0.001)
Unemployment Rate[a,b]	-0.005	(0.005)	0.011**	(0.004)	0.001	(0.003)	0.005	(0.003)
Median Household Income (ln)[a,c]	0.127	(0.125)	0.570***	(0.096)	0.323***	(0.084)	0.436***	(0.079)
Competitor Price (ln)	-0.089**	(0.033)	0.010	(0.032)	-0.060*	(0.026)	-0.033	(0.026)
High School Seniors (ln)[a,d]	0.313***	(0.069)	0.192**	(0.060)	0.278***	(0.052)	0.249***	(0.051)
% Male	-0.002	(0.002)	0.001	(0.001)	-0.001	(0.001)	-0.000	(0.001)
% Black	-0.002	(0.003)	0.002	(0.003)	-0.001	(0.003)	0.000	(0.002)
% Hispanic	-0.009***	(0.003)	0.009***	(0.002)	0.001	(0.002)	0.005**	(0.002)
% Asian	0.004	(0.009)	-0.013	(0.007)	-0.004	(0.006)	-0.007	(0.005)
% American Indian	-0.003	(0.008)	-0.005	(0.004)	-0.002	(0.003)	-0.004	(0.003)
% Pacific Islander	-0.005	(0.023)	-0.006	(0.018)	-0.002	(0.016)	-0.003	(0.015)
% Two or More Races	-0.008	(0.004)	-0.004	(0.003)	-0.006*	(0.003)	-0.005*	(0.003)
Constant	4.740**	(1.604)	-0.617	(1.241)	3.059**	(1.141)	1.254	(1.067)
College-years	8,754		8,776		8,776		8,776	
Colleges	880		883		883		883	
R^2	0.979		0.979		0.986		0.986	
R^2 (within)	0.040		0.460		0.258		0.404	
Model F-statistic	6.747***		66.273***		35.729***		59.102***	
College FE	Yes		Yes		Yes		Yes	
Year FE	Yes		Yes		Yes		Yes	

Note. Cluster-robust standard errors are presented in parentheses. [a] Total of the same-state counties withing the college's commuting zone. [b] Average of monthly unemployment from June of prior year to July of current year. [c] Weighted by number of households per county. [d] Data on high school seniors are for the prior academic year.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

CHAPTER 6

DISCUSSION

This dissertation broke new ground in investigating student fees across America's public two-year college sector. Historically, little scholarship was devoted to postsecondary student fees aside from legal arguments over the right of colleges to charge fees (Chambers, 1932; Shelburne, 1939) or limitations on their collection, control, or use for controversial purposes (Fishbein, 1973; Meabon et al., 1979; Wallace, 2005). Two recent innovations spurred renewed scholarly interest in student fees. First, the Department of Education's annual IPEDS survey began collecting tuition and total mandatory fee prices separately for the first time in academic year 1999-00. This data has been used to study why fees increase (Arnott, 2012b; Kelchen, 2016) and how they might be used to mitigate the revenue constraints of guaranteed tuition (Delaney & Kearney, 2016). Second, as the internet became ubiquitous, colleges across the nation posted their tuition and fee prices online. For the first time, scholars were able to collect and analyze nationally representative samples of detailed fee data, such as their types, frequencies, and magnitudes (Arnott, 2012a; Reinagel & Cooper, 2019).

Surveys of how students perceive postsecondary fees, which were mostly conducted in the 1970s (Fiedler, 1975; Matross et al., 1975, 1979; Weichselbaum & McClelland, 1978), have also found new life in two student theses since the turn of the century (Chapman, 2011; Ott, 2009). Their results highlighted how unaware university students were of what their fees paid for and how much they cost. In both surveys, students significantly under-reported the cost of their fees. This downward bias in student perceptions of fee costs aligned with the empirical findings

from a German study that found student demand to be less sensitive to a change in student fees than a same dollar change in tuition (Bruckmeier et al., 2013).

The aforementioned research broadly addresses three questions – what do postsecondary student fees pay for, why are they growing, and how are they perceived by or affect students? These questions cover substantial territory, but scholarship to date has been strictly limited to the public four-year college sector. Meanwhile, student fees in the public two-year college sector are growing at a faster pace (see Figure 1.1), are often excluded from free community college promise programs (Jones & Berger, 2018; Jones et al., 2020), and are affecting the most price sensitive postsecondary students (Heller, 1997). With these motivations in hand, this dissertation attempted to answer the three fee questions for America's public community college sector.

Major Findings

The three studies that comprise this dissertation sought to broadly answer what community college fees pay for (Study 1), why they are growing so rapidly (Study 2), and how they might uniquely affect students (Study 3). While the first study was descriptive and focused on basic data collection and tabulation, the second and third studies were rooted in economic theory to help frame their causal research questions.

Study 1.

The first study was descriptive in nature and focused on the broad question of what community college fees pay for and how they are presented to students. The study relied on data collected from a purposive sample of 96 individual community college websites. For each state, two colleges were selected into the sample (where available) based on their relative fee-to-price ratio. The college nearest the first quartile of fee-to-price ratio weas selected and assigned to the "low fee proportion" group, while the college nearest the third quartile was selected for the "high

fee proportion" group. The data from these colleges was used to answer the following research questions:

RQ 3.1: What are the types, frequencies, and magnitudes of mandatory fees typically charged in America's public two-year community colleges?

RQ 3.2: How are student fees presented on public two-year community college websites?

RQ 3.3: How do the answers to RQ 3.1 and RQ 3.2 differ across colleges that charge a greater or lesser proportion of their price as fees?

A total of 382 student fees were collected and grouped into 20 categories. Data was also gathered on how the fees were presented to students, how they were charged (e.g., per credit hour or semester), and whether fee descriptions were provided.

The results indicated that sample colleges charged an average of about four mandatory student fees per semester with a total academic year price of $736, or about 17% of the total tuition and fee bill. These figures were closely aligned with the tuition and aggregate fee prices collected by IPEDS. The general characteristics of colleges in the low- and high-fee dependent groups only revealed two statistically significant differences ($p < .05$). Low fee-dependent colleges had a slightly higher ratio of in-state students (96% vs. 91%) and spent a higher percentage of their total expenditures on institutional support (18% vs. 16%).

The five most common and expensive fee categories across the colleges were, in order: technology fees, generic fees, facilities fees, student activity fees, and registration fees. Some fees were charged at similar frequencies and prices across both low and high fee-dependent colleges, such as student activities fees, academic support fees, and fitness fees. Other fees showed large differentials in their frequencies and prices between the groups, such as technology

fees, generic fees, facilities fees, and student services fees. Registration fees were the only category to be charged at a higher price and frequency in the low fee-dependent group.

Student fees were overwhelmingly shown on the same webpage as tuition, albeit sometimes in a different text or table. Nearly two-thirds of colleges did not provide any description of the fees' purposes on these webpages. While only about eight percent of colleges charged tuition on a per-semester basis, 40% of fees were charged per semester. Fees are almost always (93%) shown after/lower down than tuition or on a different webpage altogether.

In summary, community colleges charge student fees to fund a wide range of campus services and activities. While student fees were traditionally restricted to explicitly defined purposes, the prevalence generic student fees and the low proportion of colleges offering fee descriptions begs the question of whether community colleges are pushing past these traditional restrictions. Further qualitative research could help shed light on the use of generic fees on community college campuses.

Study 2.

The second study used both correlational and causal statistical methods to address one potential cause of student fee growth – increased market competition. The study used a balanced panel of 721 public community colleges from IPEDS covering academic years 2009-10 through 2019-20, where each college was assigned to the commuting zone that corresponded with its county. Socioeconomic data was also gathered from federal sources at the county level and aggregated to the commuting zone level. Finally, data on college openings and closures was taken from IPEDS and cross-validated using data from the Department of Education's PEPS database. These college openings and closures were also assigned to the commuting zones corresponding with their counties, and then used as an indicator of increasing or decreasing

levels of local market competition, respectively. The collected data was analyzed to answer the following research question:

RQ 4.1: Does increased market competition encourage community colleges to increase the proportion of their price charged as student fees?

The preliminary models were correlational in nature and checked whether the data revealed any relationship between the opening or closure of nearby colleges and a community college's proportion of price charged as student fees. The findings of cross-sectional models, which analyze one year of data at a time, showed few significant findings. Only two cross sectional regressions returned mildly significant and negative coefficients on the variable of interest (nearby college openings). However, other models also returned a statistically significant and negative coefficient for college closures. The results are contradictory because both nearby college openings and closures appear to be associated with lower proportions of price charged as fees. A second correlational design used a two-way fixed effects regression model, which accounts for both time-invariant college effects and secular time trends, but it did not reveal any statistically significant coefficients. In summary, the study's correlational models did not provide any clear evidence of a relationship between competition in community college markets and the proportion of community college prices charged as fees.

Causal models move beyond relationships between variables to address whether a potential treatment might cause a change in the outcome. To do this, causal models normally assign observations to either a treatment group or to a control group. One popular causal technique, known as difference-in-differences, compares the outcomes of these two groups before and after the treatment occurs. In this study, two different difference-in-differences techniques were used. First, the panel was broken into multiple two-period groups in order to

conduct two-period, two-group difference-in-differences. Colleges were assigned to the treatment group if a nearby college opened in the second year but not the first and were assigned to the control group if there was no change in the number of nearby colleges in either year. The dependent variable, the *fee proportion of price*, was compared across these two groups pre- and post-treatment. None of the two-period models returned a significant treatment effect.

Second, the entire panel was used to conduct a two-stage difference-in-differences estimated with multiple treatment periods. Community colleges were assigned to the treatment group if a college opened nearby in any one academic year between 2012-13 and 2016-17, with no change in the number of nearby colleges in the prior or subsequent years of the panel. The control group consisted of community colleges with no change in the number of colleges over the entire panel. The results did not indicate that a college opening causes a change in the proportion of price charged as fees. A two-stage event study analysis was conducted for additional robustness, the findings of which corroborated the initial null results.

In summary, the findings of this study did not reveal a relationship between increased market competition and a shift towards student fees as the behavioral industrial organization literature suggests. However, before concluding this is indeed the case, I would consider that the causal models required tight definitions of treatment status which significantly limited the size of the treatment groups, thereby limiting the models' statistical power. Perhaps there are other ways to model the phenomenon in question that would provide more robust statistical power.

Study 3.

The third study used an unbalanced panel of community colleges from academic year 2009-10 through 2019-20 to investigate whether increases in student fees resulted in a smaller decline in community college enrollments than similar increases in tuition. This premise is

rooted in research on partitioned prices in the broader economy, where studies have shown that consumers tend to under-react to surcharges compared with base prices. One common concern with studies on postsecondary demand is that there are numerous factors other than price that could affect enrollment levels, such as the prices of competitor institutions, the local unemployment rate, the pool of likely applicants, and more. Data was collected from a variety of sources to control for these outside influences at the commuting zone level. The data was then analyzed using linear two-way fixed effects techniques to address the following research question:

RQ 5.1: Do public two-year college enrollments respond less to changes in mandatory student fee prices than to changes in tuition?

Two models were constructed to answer the research question. The first model quantified the tuition and fee elasticities of demand using a double-log functional form. This model measured the percentage change in enrollment given a one-percent change in tuition and a one-percent change in fees. Multiple measures of fall enrollment were used as the dependent variable, including part-time, full-time, total, and full-time equivalent (FTE) enrollments. Across each of these measures, the effects of both a one percent increase in tuition and one percent increase in fees were not statistically significant. Because neither elasticity measure had a statistically significant effect on any measure of enrollment, no comparisons could be made between the effects of tuition increases versus fee increases.

The second model replaced the log of tuition and the log of fees with the proportion of the college's price charges as fees, holding the college's total price constant. As such, this model examined whether colleges whose fees grew by a larger percentage than tuition over the previous year experienced smaller enrollment declines. All four measures of fall enrollment were again

analyzed, with mildly significant ($p < 0.5$) negative coefficients on the variable of interest for the full-time and total enrollment measures and a moderately significant ($p < 0.1$) negative coefficient for the FTE measure. In other words, the results suggest that colleges that increase the magnitude of their mandatory fees by a greater percentage than tuition in a given year are likely to see greater enrollment declines than otherwise. This result runs counter to the predictions of most partitioned pricing research, which suggests that an increase in surcharges should result in a smaller loss of demand than an increase in base prices.

I offer two possible explanations for the contradictory results found in the second model. First, perhaps community college students are aware that some financial aid programs cover tuition but not student fees, leading them to become hyper-aware of the costs of fees. Second, there are alternative theories of partitioned pricing effects that predict surcharges to have greater effects on consumers than base prices. One prominent theory is that of mental accounting, which asserts that consumers prefer to integrate their losses (Thaler, 1985). Prospective students who experience higher student fee prices might feel the effects of a price increase multiple times over (once for each fee), whereas a similar dollar increase in tuition is only felt once.

Limitations

This dissertation is limited in several aspects, some broad and others specific to individual studies. One broad limitation, which served as a catalyst for the first study, is that no line-item data is collected on postsecondary student fees. Such information could be used to disaggregate the causes and effects of particular student fees, rather than resorting to the single IPEDS-defined total mandatory fee price as used in the second and third studies. Another broad limitation is the lack of information on the fee-setting process or fee limits, caps, and freezes. Without such information, I was unable to control for the amount of authority that colleges have

over setting their own fees or the boundary limits within which they could adjust their fees. Finally, and most important to the results of this dissertation, there is no source of information on whether major financial aid programs cover student fee costs. The question of whether financial aid covers fees is relevant to the amount of attention students give to them and to how fees affect students' ability to afford college.

In addition to these broad limitations, each study had its own unique challenges. The first study was limited by being the first of its kind to gather data on the presentation of student fees. Defining how fees are presented is complicated; they are often presented in multiple locations and in different formats. For example, an aggregated fee price might be presented in the primary tuition schedule while individual fee prices might be presented in a subsequent table or even another webpage. To help mitigate this, I collected fee presentation data at two different levels. At the college level, I focused on how fees were presented in the primary tuition schedule. Meanwhile, I also collected data at the individual fee level where I gathered data from whichever location had the most detailed information. These two data collection levels offer a relatively clear and organized method to collect and present information, but it is inevitable that the data between the two levels sometimes appears contradictory.

The second study was limited by low sample sizes in the treatment groups, which might explain the lack of statistically significant results. There are relatively few community colleges that experienced exactly one other college opening nearby within an 11-year timespan. Previously, I had attempted to enlarge the treatment group by only considering one sector of college openings at a time. But this was fraught with its own problems because it essentially ignored the effects (on both the treatment and control groups) of colleges from other sectors opening or closing nearby. In the end, I only considered the effects of any undergraduate-serving

college opening nearby regardless of its sector. The statistical power of these models was limited by small sample sizes, perhaps explaining the statistically insignificant results.

Another beneficial change to the second study might be to alter the parameters of the market to ensure that the community college and its competitors "exercise some meaningful constraint on each other" (Becker & Toutkoushian, 2013, p. 335). For example, if a significant portion of students chose to enroll at a community college for specific degree programs, then the opening or closure of a nearby college that did not offer these degree programs might not have a large effect on student enrollment decisions. If this were the case, then selecting competitors based off of overlapping academic programs might be a beneficial improvement on the model.

Finally, the third study was perhaps most affected by not having data on financial aid fee coverage. An important assumption of this study was that a one dollar increase in tuition should impact the budget of a potential student similarly to a one dollar increase in fees. This is because the predictions of partitioned pricing literature are, on the whole, based on the systematically biased response of consumers to the *framing* of prices, where a rational consumer should be indifferent as to whether a dollar is charged as a base price or a fee. However, there is evidence that at least some financial aid programs cover substantial tuition costs while covering less or no fee costs. In these cases, rational prospective students would not be indifferent to a dollar charged as tuition versus as a fee. Rather, they would respond more strongly to a dollar increase in fees than in tuition because the former affects their budget more than the latter. This response would work to counteract the expected partitioned price framing effect on students; as such, future work on this topic would benefit from carefully controlling for the differential coverage of tuition and fee costs by financial aid programs. Analyses at the student level might best control for these effects.

Implications for Policy and Future Research

Policymakers and college leaders should benefit from this dissertation's first-ever collection of the types, frequencies, prices, and presentation formats of community college student fees. In particular, the findings that sampled community colleges rely heavily on generic fees and typically do not post fee descriptions begs the question of whether they are using fees to supplant tuition. Recent studies suggest that tuition and fees are at least partially substitutable in the public four-year college sector (Delaney & Kearney, 2016; Kelchen, 2016), and multiple state audits have discovered supposedly restricted student fees revenues inappropriately comingled with tuition reserves (California State Auditor, 2020; State of Arizona, 2018; State of New Jersey, 2016; State of Utah, 2020).

If community colleges are indeed using fee revenues to supplant tuition, then policymakers should carefully consider the ramifications of this on the free college movement. About a quarter of state-level free college programs were found to not cover any fees at all in a recent report from The Education Trust (Jones et al., 2020). Georgia's HOPE scholarship gives a prime example of what can happen when a scholarship does not cover fees. Only five years after limits were place on the program's coverage of student fees, the Georgia Board of Regents implemented a statewide "special institutional fee" that served as a direct replacement for tuition (Sterritt, 2011). This fee grew to an average cost of $462 in fall semester 2021 at Georgia's research universities, the largest fee on each campus and more than six times the average cost of their other mandatory fees ($76) (author's calculations using data from University System of Georgia (2022)). The creation and dramatic growth of this fee should serve as an example to policymakers who are considering the effects of free community college programs that do not cover the costs of student fees.

This dissertation also contributed to furthering the scholarship of community colleges by considering their localized markets and incorporating data at the commuting zone level. Higher education finance research often controls for the socioeconomic condition of the entire state, which can lead to aggregation bias. This bias might especially impact community colleges, which overwhelmingly serve students from within a commutable distance. Future scholars of community colleges could benefit from considering whether controlling for local economic conditions might be beneficial to their work.

To my knowledge, this dissertation is also the first higher education research to use two-stage difference-in-differences analysis in its third study. In recent years, there has been much debate and concern over the potential pitfalls of difference-in-differences analyses where the treatment is assigned to units in different time periods. Several innovative estimation strategies have come out of this debate, with the two-stage method being one. It is hoped that this use of the method might encourage higher education scholars to branch out and try this strategy or other contenders.

Apart from the innovative use of the two-stage difference-in-difference technique, the third study also provided surprising results. In particular, the tuition and fee elasticities of demand were found to be statistically insignificant. While the general consensus of higher education scholars is that postsecondary demand is relatively inelastic (but perhaps most elastic for community college students), my findings suggest that changes in community college charges do not have an effect on their enrollments. This null effect corroborates the findings of a recent meta-analysis of research on the topic which argues that the scholarly consensus suffers from significant publication bias (Havranek et al., 2018). On the other hand, new quasi-experimental research on community college elasticity of demand in Michigan (Acton, 2021)

and Texas (Denning, 2017) has shown significant estimates of inelastic demand. Given these conflicting results, more studies on this topic would help to provide definitive conclusions.

Finally, the limitations of this dissertation leave gaps of fruitful work to be filled. The price-setting process of colleges across states and sectors is surprisingly understudied. For example, we do not know in which states students are required to approve fees, whether there are laws in each state governing the fee-setting process, or whether there are caps, curbs, or freezes on fees in any given state and year. In addition, data has never been collected on whether or how fees are covered by various financial aid programs across the nation. Descriptive information on each of these points would go a long way to help uncover potentially unintended consequences of student fees.

Conclusion

As repeated throughout this dissertation, community college student fees are increasing rapidly, consistently outpacing tuition over the past 20 years (see Figure 1.1). They are also affecting some of higher education's most price sensitive students (Heller, 1997), lack coverage in some major financial aid and free college programs (H.B. 326, 2011; Jones & Berger, 2018; Jones et al., 2020; LAC 28:IV.Chapter 3, 2021), and have been consistently criticized in state audits for improper accounting (California State Auditor, 2020; State of Arizona, 2018; State of New Jersey, 2016; State of Utah, 2020). Frustrations over student fees have found a home in national news media (Pickert, 2008; Sharpe, 2016), the White House (Anderson, 2016; National Economic Council, 2016), the Federal Trade Commission (Leibowitz, 2012), Consumer Reports (Consumer Reports, 2019), student protests (Lewis, 2020; Marcus, 2019; Smith, 2019), and literature (Fergus, 2018), but higher education scholarship has been slow to address the issue.

This dissertation now comprises the sum total of scholarship on community college student fees. It attempted to address three broad question: what community college student fees pay for, why they are growing, and how they might affect students. Assigning each question to a study, this three-paper dissertation was among the first of its kind in the field of higher education to adopt theory from behavioral industrial organization and partitioned pricing to inform and guide its analyses. While the latter two questions remain unresolved due to a lack of significant findings, there is still much more work to be done to understand why community college student fees are increasing and how this trend might affect students. It is my fervent hope that this is only the starting place for further research.

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Appendix A

Fees as a Proportion of Tuition and Fees by State

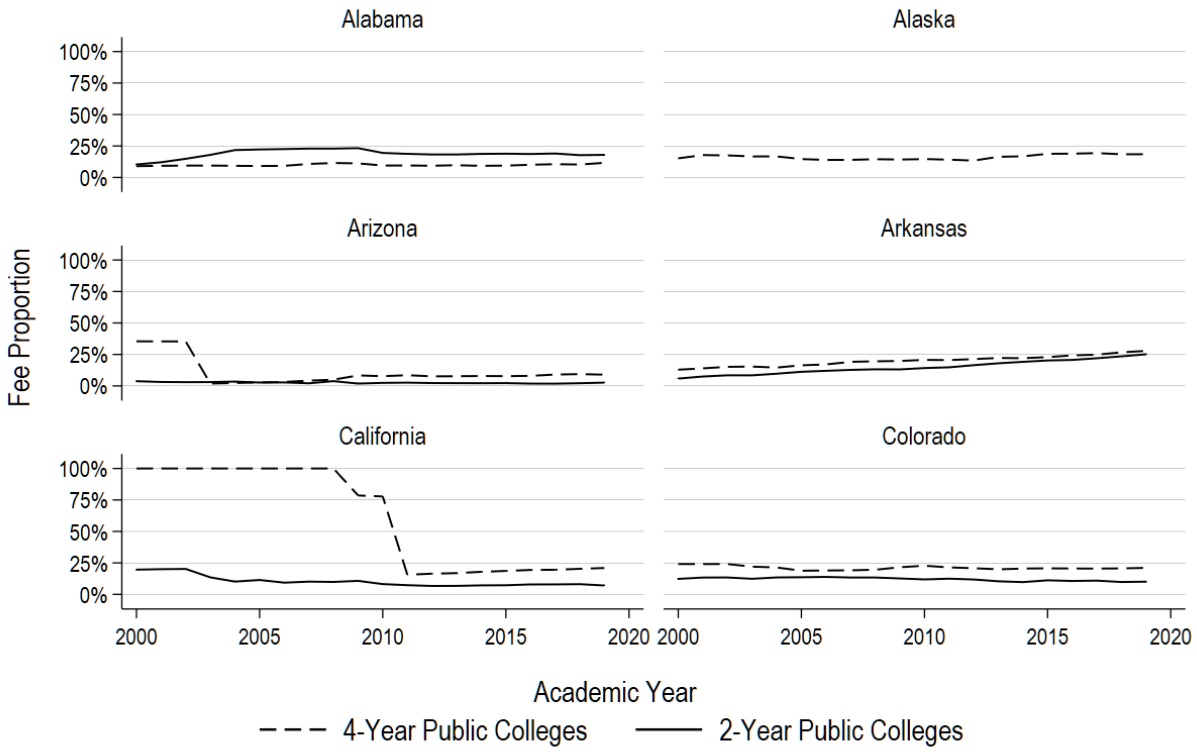

Figure A.1. Fees as a Proportion of Tuition and Fees by State, Academic Years 2000-01 to 2019-20

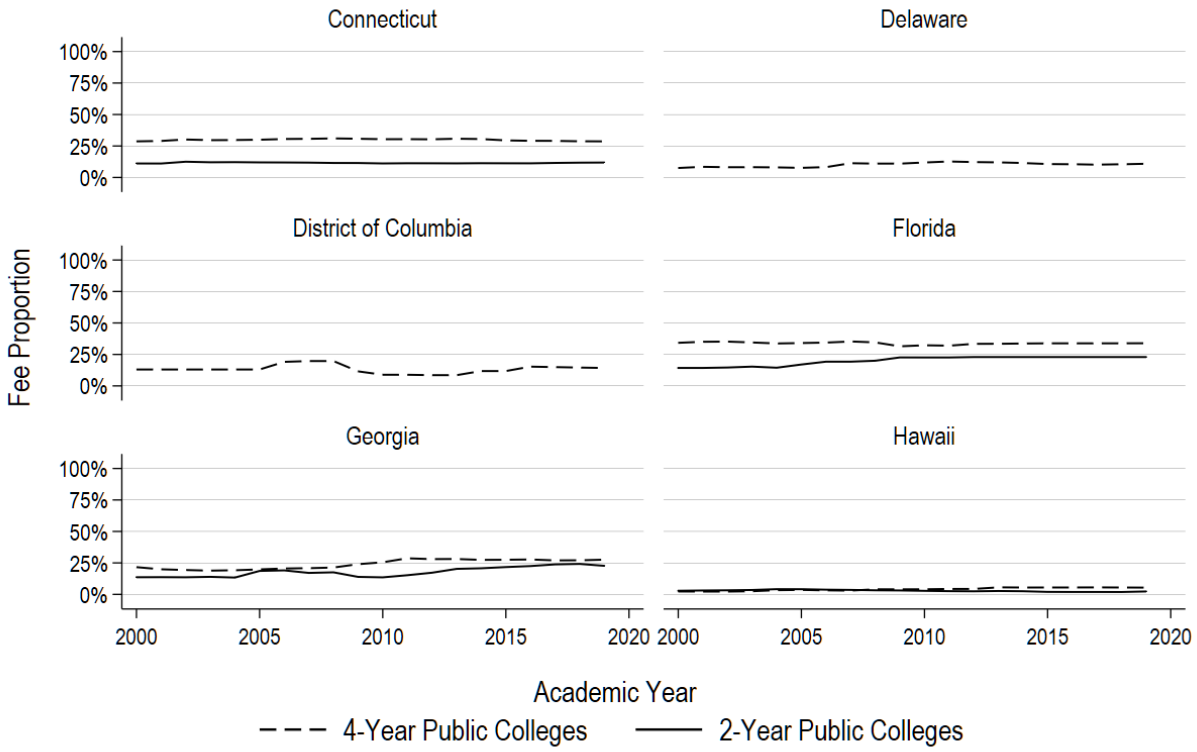

Figure A.1 (Continued). Fees as a Proportion of Tuition and Fees by State, Academic Years 2000-01 to 2019-20

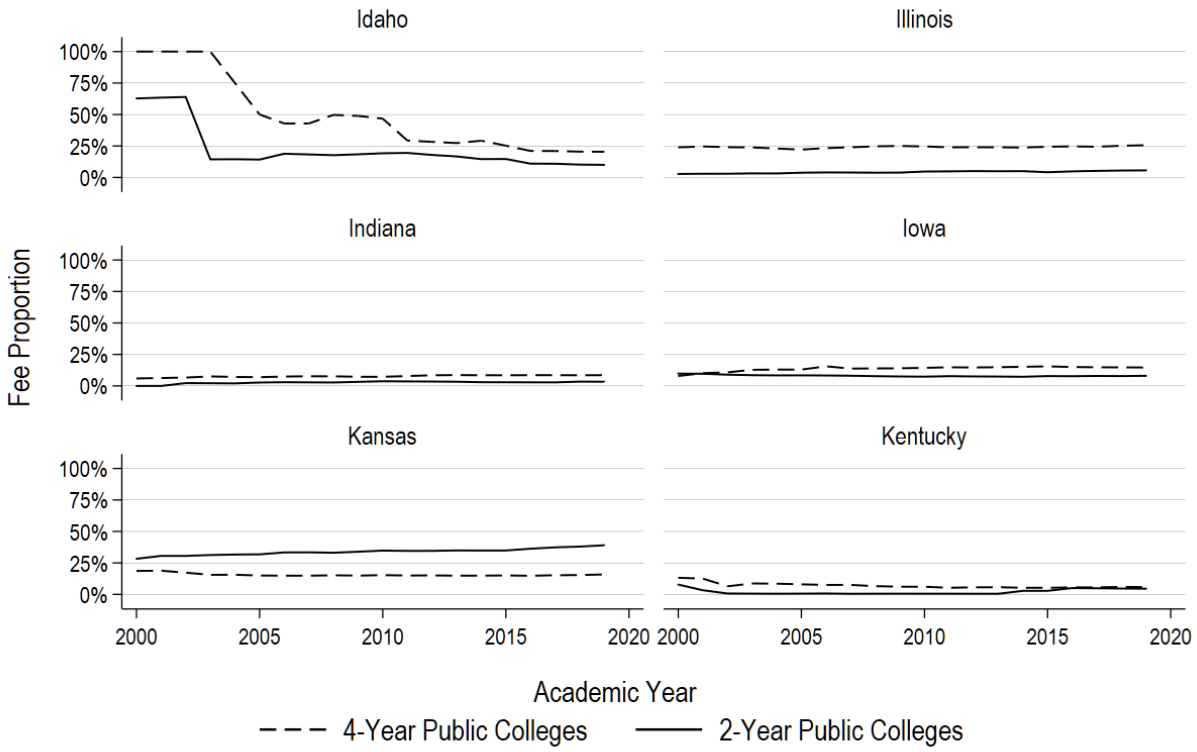

Figure A.1 (Continued). Fees as a Proportion of Tuition and Fees by State, Academic Years 2000-01 to 2019-20

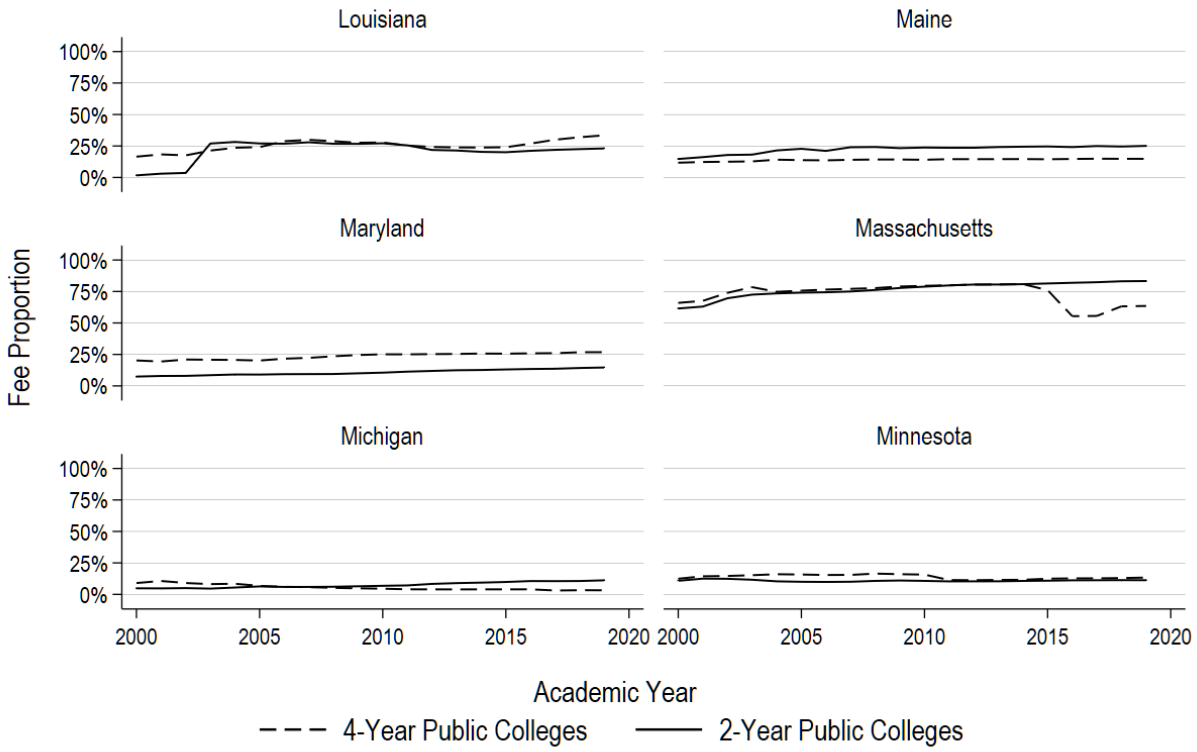

Figure A.1 (Continued). Fees as a Proportion of Tuition and Fees by State, Academic Years 2000-01 to 2019-20

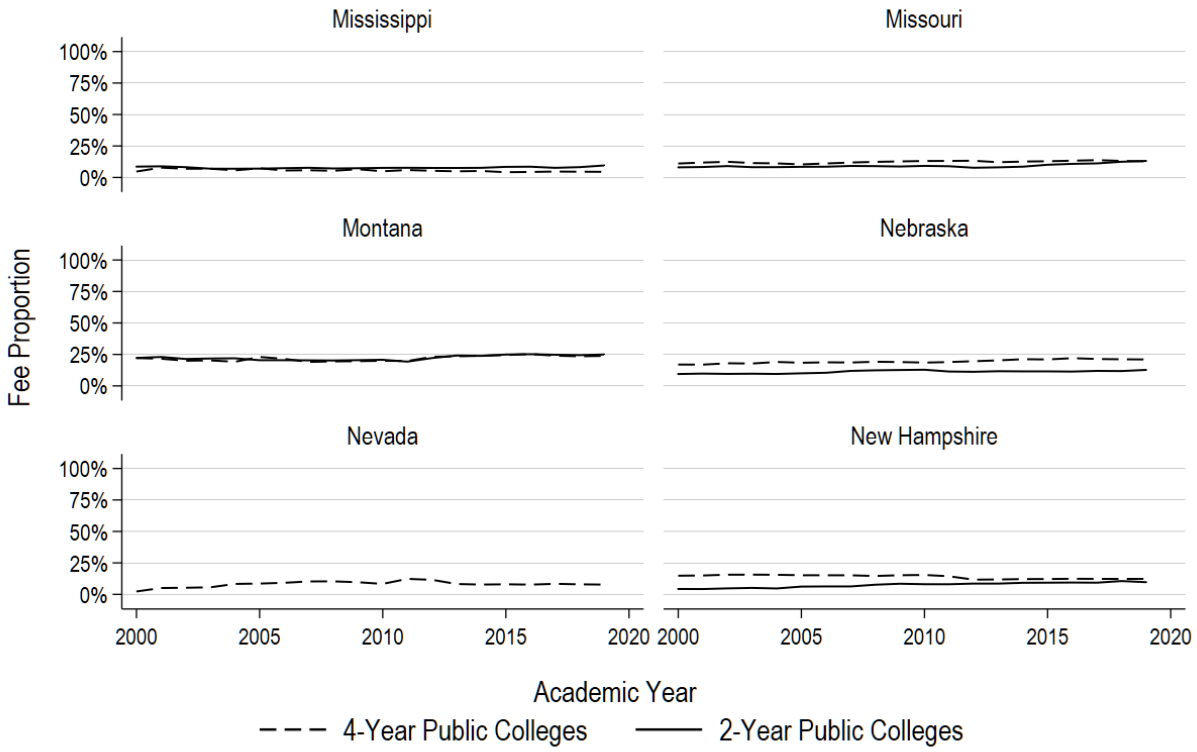

Figure A.1 (Continued). Fees as a Proportion of Tuition and Fees by State, Academic Years 2000-01 to 2019-20

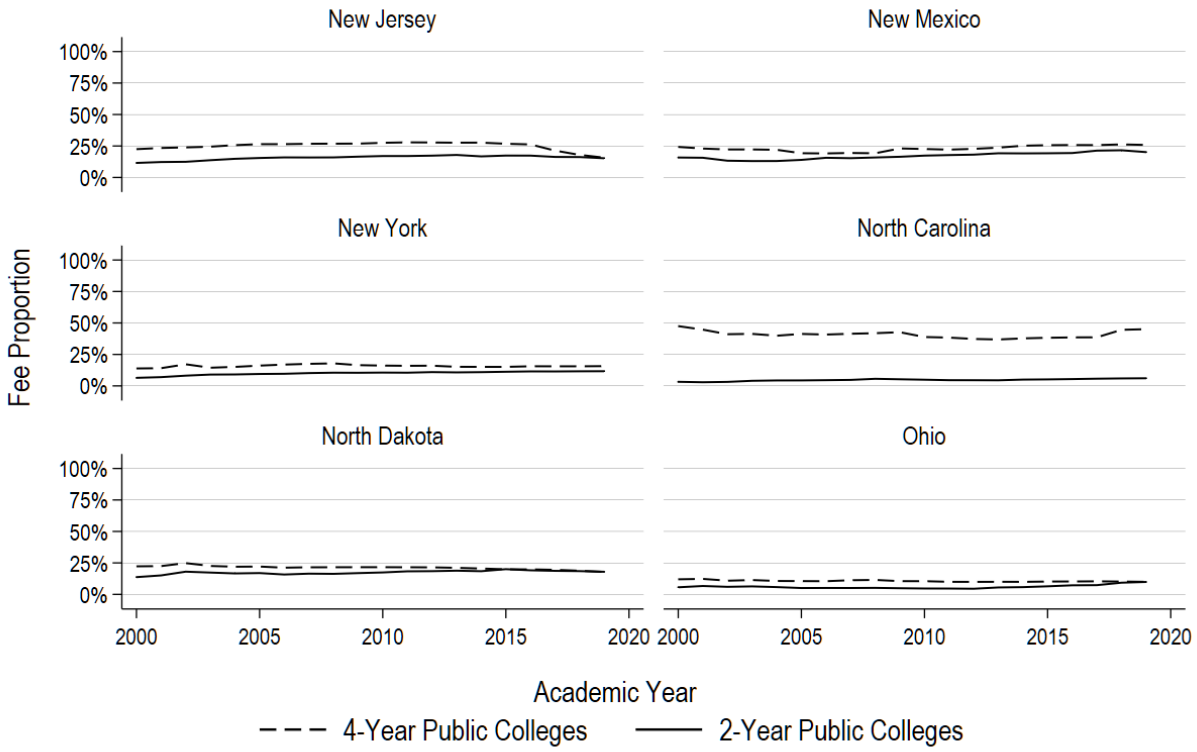

Figure A.1 (Continued). Fees as a Proportion of Tuition and Fees by State, Academic Years 2000-01 to 2019-20

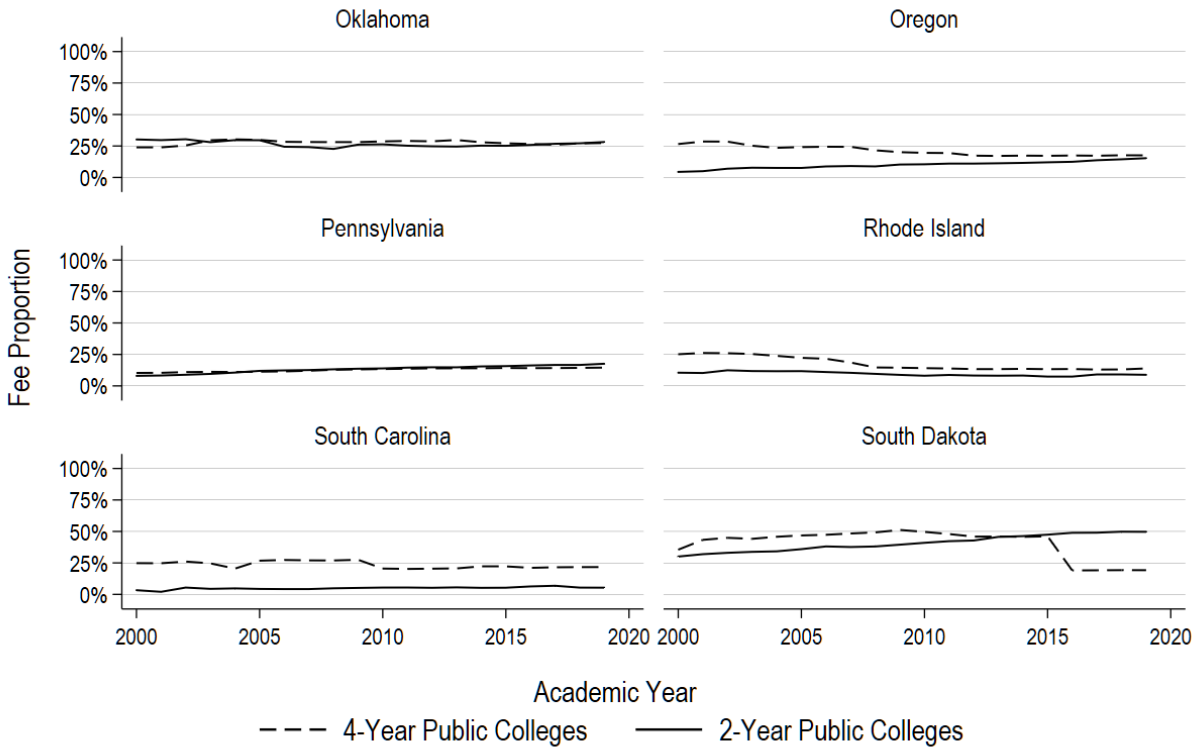

Figure A.1 (Continued). Fees as a Proportion of Tuition and Fees by State, Academic Years 2000-01 to 2019-20

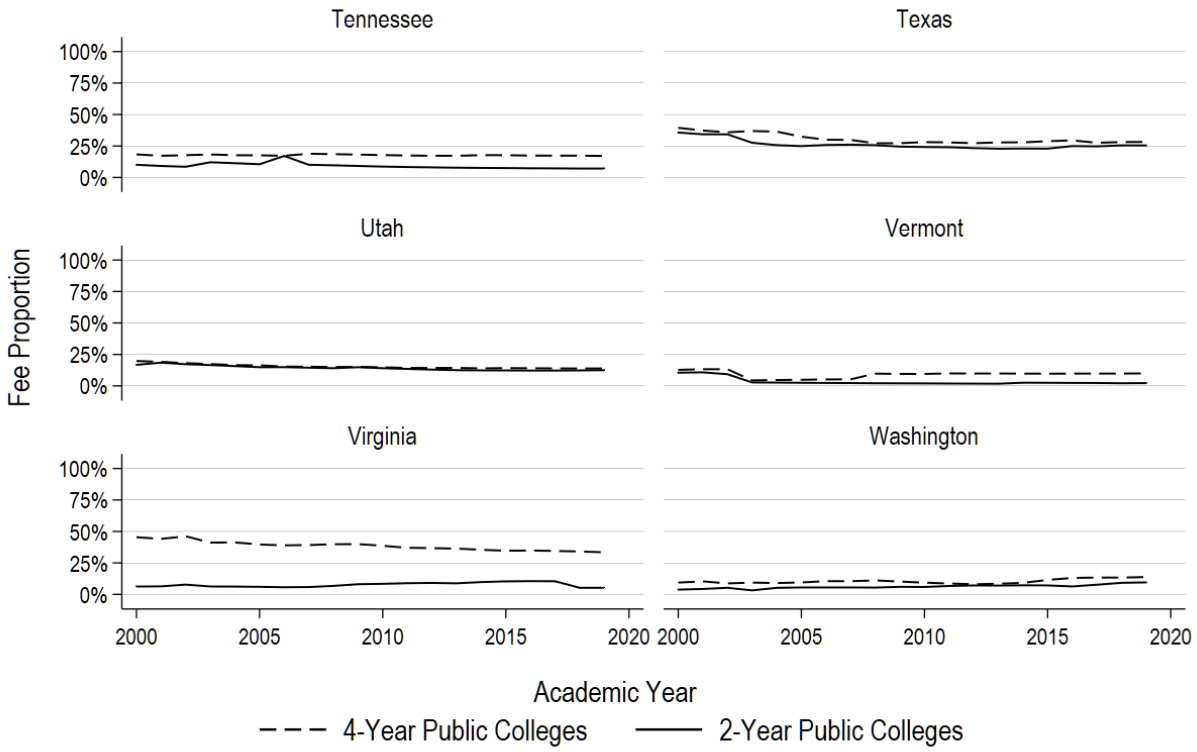

Figure A.1 (Continued). Fees as a Proportion of Tuition and Fees by State, Academic Years 2000-01 to 2019-20

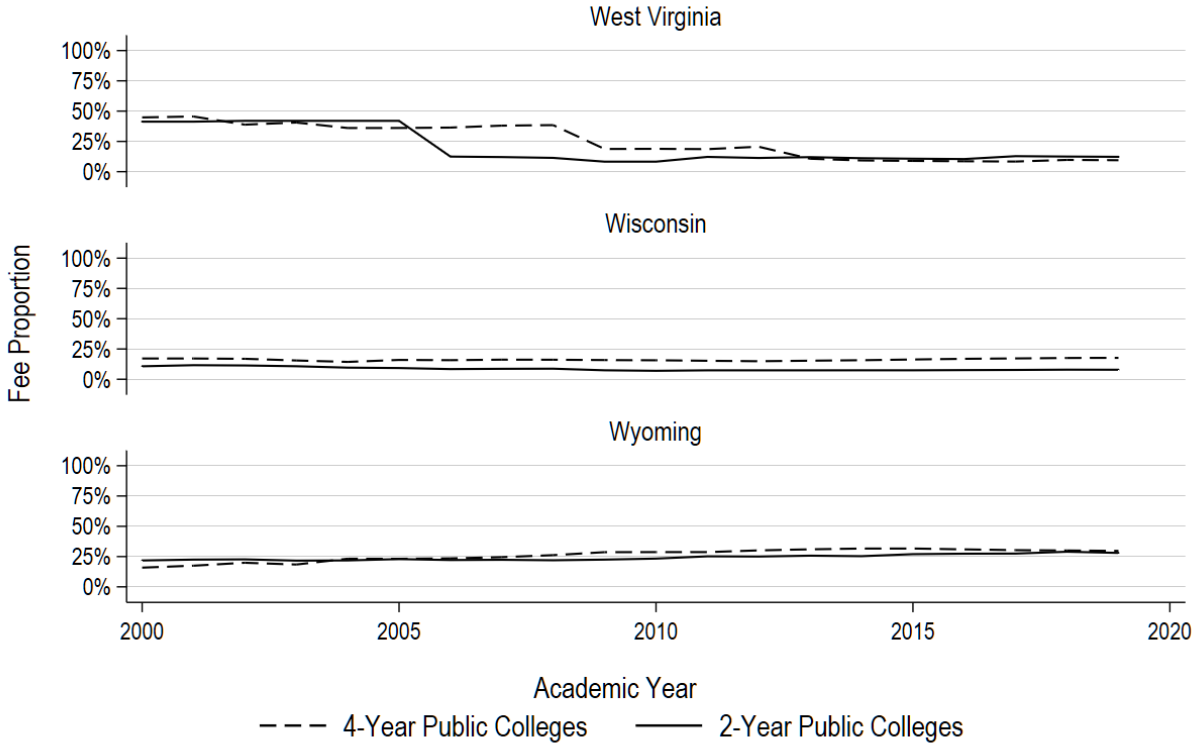

Figure A.1 (Continued). Fees as a Proportion of Tuition and Fees by State, Academic Years 2000-01 to 2019-20

Appendix B

Postsecondary Student Fee Categories

The following list illustrates the various types of fees that are charged across American colleges and universities:

- Mandatory fees, also known as required fees, are charged to the majority of students each academic year. Examples might include activity fees, technology fees, health fees, athletics fees, and student government fees. These fees are notable for repeating each semester and for being charged regardless of whether the student takes advantage of the service that the fee supports.
- Program fees, also known as differential tuition, are fees that are added to all courses offered in a specific academic program. Examples might include fees for all business program courses or vocational program courses.
- Course fees are charged to students of a particular course to cover additional costs. Lab fees are a common form of course fees.
- Instructional delivery fees are charged for particular delivery formats or locations, such as online courses or courses at a particular campus.
- Service fees include fees for the processing of particular administrative services. Examples might include fees for new students/matriculation, graduation, obtaining records, issuing student identification cards, examinations, equipment rentals, and similar services.
- Fines are penalty charges such as late fees, parking violations, and other additional costs for particular (in)actions on the part of an individual student.

Appendix C

Dilbert “Confusopoly” Cartoon by Scott Adams

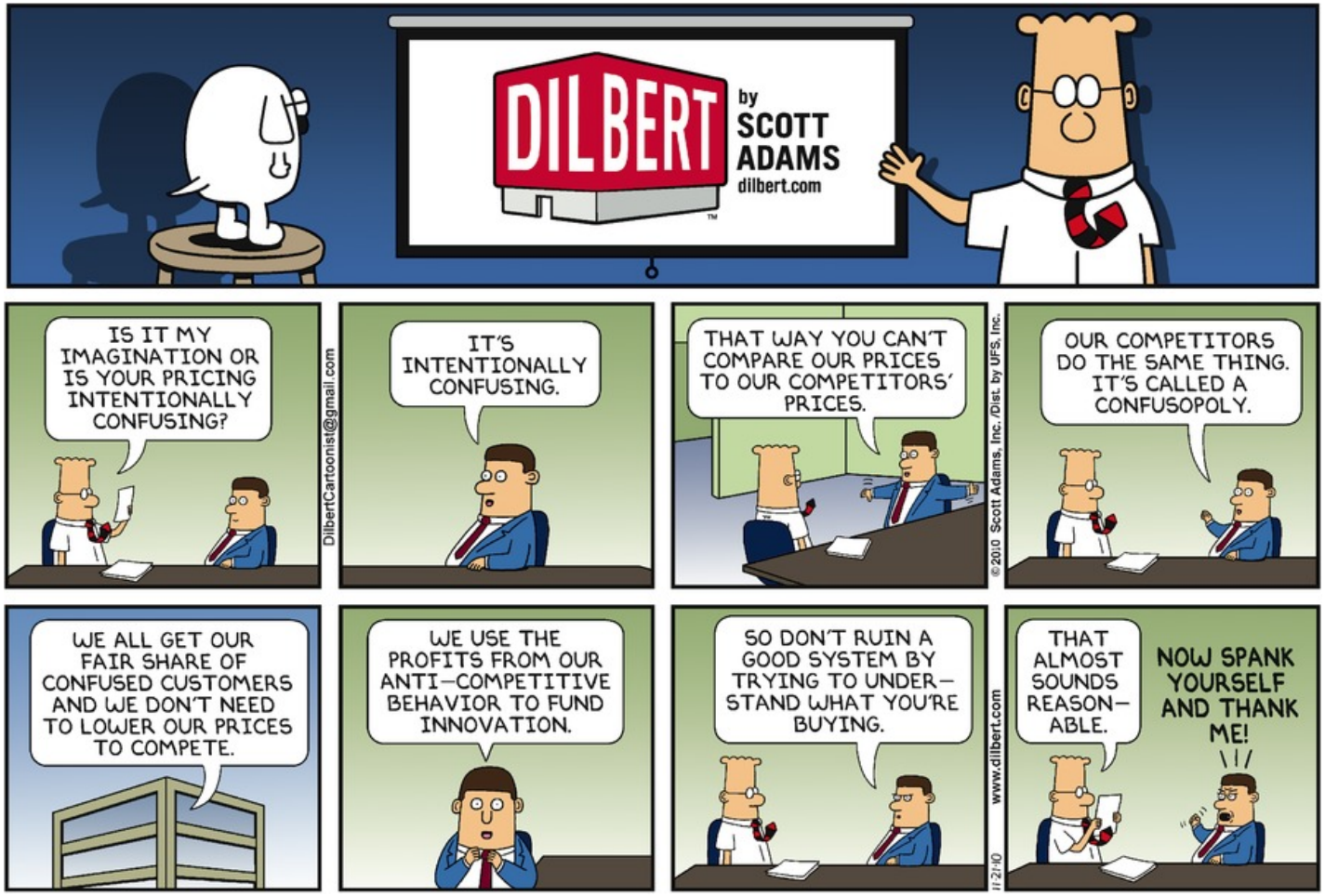

Figure C.1. Dilbert "Confusopoly" Cartoon by Scott Adams.

Note. From Adams, S. (2010, November 21). *Dilbert by Scott Adams* [Cartoon]. Andrews McMeel Syndication. https://dilbert.com/search_results?month=11&page=3&sort=date_asc&year=2010. Copyright 2010 by Scott Adams. Reprinted with permission.

Appendix D

Community College Student Fee Data Entry Form

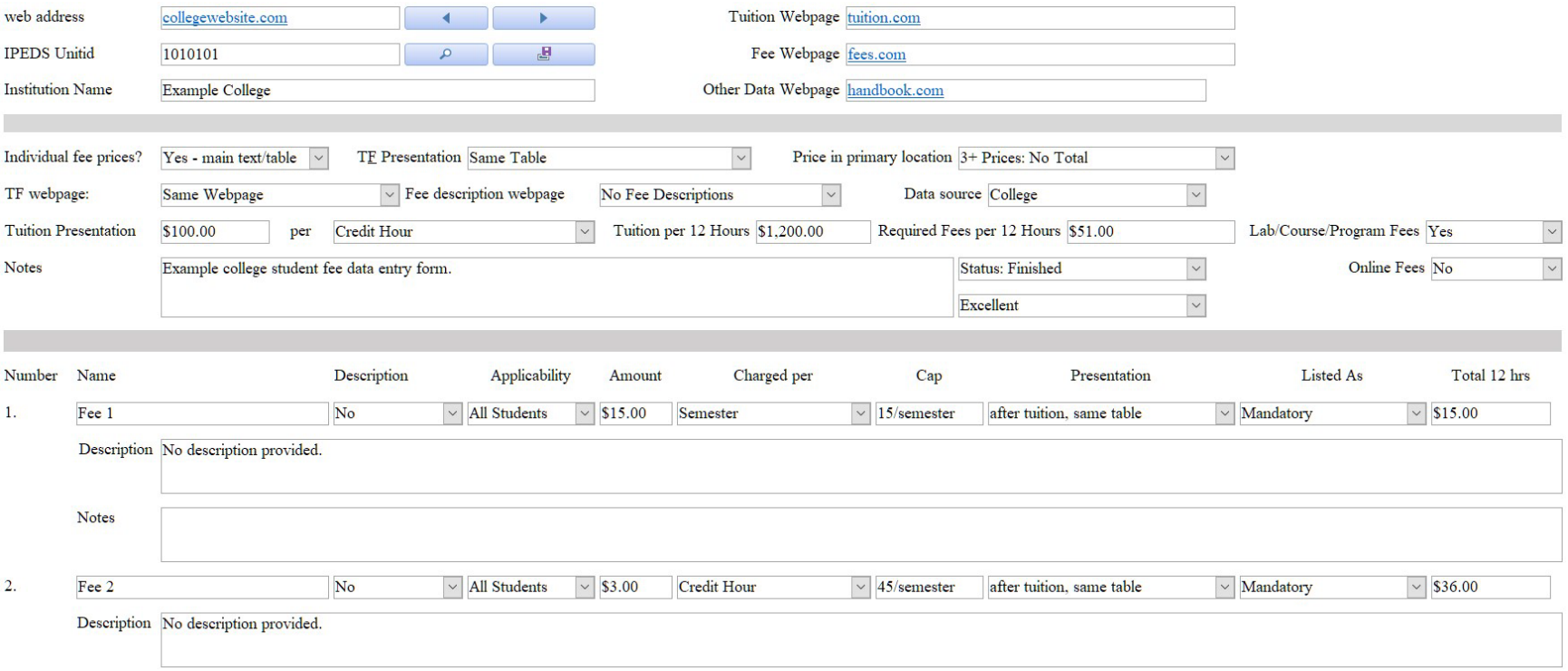

Figure D.1. Community College Student Fee Data Entry Form

Appendix E

Study 1 Student Fee Categories

Table E.1

Study 1 Student Fee Categories

Original Fee Name	Grouping 1: Using Fee Words	Grouping 2: Sort into 20 Categories
academic excellence fee	Academic Excellence	Academic/Learning Support
academic records maintenance fee	Records	Administrative/Records
academic success initiative fee	Academic Success	Academic/Learning Support
academic support	Academic Support	Academic/Learning Support
academic technology fee	Academic Technology	Technology/Computer/Internet
access fee	Access	Access/Parking/Transportation
accident insurance	Insurance	Accident Insurance
accs enhancement fee	State Enhancement	Generic
activity center	Activity Center	Facilities/Capital/Maintenance
activity fee	Activity	Student Activities
activity fee 1	Activity	Student Activities
activity fee 2	Activity	Student Activities
administrative	Administrative	Administrative/Records
administrative fee	Administrative	Administrative/Records
administrative records	Records	Administrative/Records
administrative technology fee	Technology	Technology/Computer/Internet
advising program	Advising	Academic/Learning Support
arts & cultural events	Arts & Culture	Culture/Performing Arts
assessment	Assessment	Academic/Learning Support
assessment fee	Assessment	Academic/Learning Support
Associated Student Body (ASNIC)	Student Association	Student Association/Government
athletic fee	Athletics	Recreation/Athletics
Athletics	Athletics	Recreation/Athletics
athletics and recreation fee	Athletics & Recreation	Recreation/Athletics
board of publication fee	Publication	Communications/Marketing
bond fee	Bond	Facilities/Capital/Maintenance
bond surety fee	Bond	Facilities/Capital/Maintenance
building	Building	Facilities/Capital/Maintenance

Original Fee Name	Grouping 1: Using Fee Words	Grouping 2: Sort into 20 Categories
building fee	Building	Facilities/Capital/Maintenance
building use fee	Building Use	Facilities/Capital/Maintenance
building/maintenance fee	Building	Facilities/Capital/Maintenance
bus pass	Bus Pass	Access/Parking/Transportation
campus access, parking, and security	Access & Parking & Safety/Security	Access/Parking/Transportation
campus fee	Campus	Access/Parking/Transportation
campus activities fee	Campus Activities	Student Activities
college activity fee	Campus Activities	Student Activities
campus grounds & safety fee	Campus Grounds & Safety	Access/Parking/Transportation
campus safety	Safety/Security	Safety/Security
campus safety & security fee	Safety/Security	Safety/Security
campus safety fee	Safety/Security	Safety/Security
campus improvement fee	Campus Improvement	Access/Parking/Transportation
student campus enhancement fee	Campus Improvement	Access/Parking/Transportation
capital assessment fee	Capital	Facilities/Capital/Maintenance
capital fee	Capital	Facilities/Capital/Maintenance
capital improvement	Capital	Facilities/Capital/Maintenance
capital improvement fee	Capital	Facilities/Capital/Maintenance
career services	Career Services	Student Support/Services
child care	Child Care	Student Support/Services
Classroom facility maintenance fee	Classroom Maintenance	Facilities/Capital/Maintenance
classroom support/technology fee	Classroom Maintenance	Facilities/Capital/Maintenance
campus service fee	Campus Service	Generic
college comprehensive fee	College Comprehensive	Generic
college fee	College	Generic
college service fee	College Service	Generic
college services fee	College Service	Generic
combined fee	Combined	Generic
Commencement	Commencement	Matriculation/Graduation
communications	Communications	Communications/Marketing
community service	Community Service	Student Activities
commuting and parking fee	Parking	Access/Parking/Transportation

Original Fee Name	Grouping 1: Using Fee Words	Grouping 2: Sort into 20 Categories
comprehensive fee	Comprehensive	Generic
comprehensive student fee	Comprehensive	Generic
comprehensive student services fee	Comprehensive Student Services	Student Activities
computer & technological fee	Computer & Technology	Technology/Computer/Internet
computer fee	Computer	Technology/Computer/Internet
computer usage fee	Computer	Technology/Computer/Internet
computer use and technology	Computer	Technology/Computer/Internet
ConnectND fee	Technology	Technology/Computer/Internet
consolidated fee	Consolidated	Generic
consolidated service	Consolidated	Generic
counseling fee	Counseling	Student Support/Services
course fee	Course	Course/Department/Equipment
course materials fee	Course	Course/Department/Equipment
cultural & recreation fee	Cultural & Recreation	Culture/Performing Arts
cultural/recreation service fee	Cultural & Recreation	Culture/Performing Arts
department fee	Department	Course/Department/Equipment
enterprise resource planning fee	Technology	Technology/Computer/Internet
equipment fee	Equipment	Course/Department/Equipment
ERP fee	Technology	Technology/Computer/Internet
extracurricular fee	Extracurricular	Student Activities
facilities and infrastructure fee	Facilities	Facilities/Capital/Maintenance
facilities fee	Facilities	Facilities/Capital/Maintenance
facilities maintenance fee	Facilities	Facilities/Capital/Maintenance
facility fee	Facilities	Facilities/Capital/Maintenance
facility usage fee	Facility Usage	Facilities/Capital/Maintenance
facility use	Facility Usage	Facilities/Capital/Maintenance
fees	Fees	Generic
financial aid	Financial Aid	Financial Aid
fitness	Fitness	Fitness/Health/Wellness
Fitness and Recreational Fee	Fitness & Recreation	Fitness/Health/Wellness
fitness center allocation of student life fee	Fitness	Fitness/Health/Wellness
fixed fees	Fees	Generic

Original Fee Name	Grouping 1: Using Fee Words	Grouping 2: Sort into 20 Categories
flat fee	Flat Fee	Generic
general fee	General Fee	Generic
general fees	General Fee	Generic
general student and technology fee	General Fee & Technology	Generic
general student fee	General Fee	Generic
general use fee	General Use	Generic
green fee	Green	Facilities/Capital/Maintenance
hall council program fee	Student Association	Student Association/Government
health & fitness	Health & Fitness	Fitness/Health/Wellness
health and wellness	Health & Wellness	Fitness/Health/Wellness
health center fee	Health	Fitness/Health/Wellness
Health Services	Health	Fitness/Health/Wellness
health services fee	Health	Fitness/Health/Wellness
information services fee	Technology	Technology/Computer/Internet
information technology fee	Technology	Technology/Computer/Internet
infrastructure fee	Infrastructure	Facilities/Capital/Maintenance
institute fees	Institutional	Generic
institutional	Institutional	Generic
institutional athletics	Athletics	Recreation/Athletics
institutional fee	Institutional	Generic
instructional & technology support	Instructional & Technology	Academic/Learning Support
instructional fee	Instructional	Academic/Learning Support
instructional support	Instructional	Academic/Learning Support
Instructional Technology	Technology	Technology/Computer/Internet
insurance	Insurance	Accident Insurance
international education fee	International Education	Student Support/Services
internet fee	Internet	Technology/Computer/Internet
intramurals	Athletics	Recreation/Athletics
KCTCS BuildSmart Investment for Kentucky Competitiveness fee	Capital	Facilities/Capital/Maintenance
Learning Assistance	Learning Support	Academic/Learning Support
learning resource fee	Learning Support	Academic/Learning Support

Original Fee Name	Grouping 1: Using Fee Words	Grouping 2: Sort into 20 Categories
learning tech fee	Learning Technology	Technology/Computer/Internet
library automation fee	Library	Course/Department/Equipment
library fee	Library	Course/Department/Equipment
maintenance fee	Maintenance	Facilities/Capital/Maintenance
material fee	Material	Course/Department/Equipment
materials/technology fee	Material & Technology	Technology/Computer/Internet
matriculation	Matriculation	Matriculation/Graduation
minnesota state college student association fee	Student Association	Student Association/Government
minnesota student association fee	Student Association	Student Association/Government
music	Music	Culture/Performing Arts
NDSA Fee	Student Association	Student Association/Government
network services fee	Technology	Technology/Computer/Internet
Online Learning Fee	Online Learning	Technology/Computer/Internet
operational fee	Operational	Generic
Other charge	Other Fee	Generic
out-of-district fee	Out-of-District	Residency
parking	Parking	Access/Parking/Transportation
parking access fee	Parking	Access/Parking/Transportation
parking fee	Parking	Access/Parking/Transportation
parking pass	Parking	Access/Parking/Transportation
Parking permit	Parking	Access/Parking/Transportation
processing fee	Processing	Administrative/Records
program services fee	Program Services	Generic
public safety fee	Safety/Security	Safety/Security
publications fee	Publication	Communications/Marketing
recreation	Recreation	Recreation/Athletics
registration	Registration	Registration
registration fee	Registration	Registration
registration fees	Registration	Registration
safety and security fee	Safety/Security	Safety/Security
security fee	Safety/Security	Safety/Security

Original Fee Name	Grouping 1: Using Fee Words	Grouping 2: Sort into 20 Categories
security services fee	Safety/Security	Safety/Security
SGA activity fee	Student Association	Student Association/Government
sga fee	Student Association	Student Association/Government
special assessment fee	Special Assessment	Generic
special building fee	Building	Facilities/Capital/Maintenance
state facility fee	State Facility	Facilities/Capital/Maintenance
state fees	State Fee	Facilities/Capital/Maintenance
state M&R Fee	State Facility	Facilities/Capital/Maintenance
student	Student	Generic
student accident insurance	Insurance	Accident Insurance
student activities	Student Activities	Student Activities
Student Activities and Recreation	Student Activities & Recreation	Student Activities
student activities fee	Student Activities	Student Activities
student activity	Student Activities	Student Activities
student activity & computer fee	Student Activities & Computer	Student Activities
student activity fee	Student Activities	Student Activities
campus supply fee	Campus Supply	Generic
student center bond fee	Student Center	Facilities/Capital/Maintenance
student center fee	Student Center	Facilities/Capital/Maintenance
student computer operations	Computer	Technology/Computer/Internet
student engagement fee	Student Engagement	Student Activities
student facility fee	Student Facility	Facilities/Capital/Maintenance
student fee	Student	Generic
student fees	Student	Generic
student financial aid fee	Financial Aid	Financial Aid
student government	Student Association	Student Association/Government
student government association	Student Association	Student Association/Government
student government fee	Student Association	Student Association/Government
student health	Health	Fitness/Health/Wellness
Student ID card validation fee	ID Card	Access/Parking/Transportation
student identification card fee	ID Card	Access/Parking/Transportation
student identification fee	ID Card	Access/Parking/Transportation

Original Fee Name	Grouping 1: Using Fee Words	Grouping 2: Sort into 20 Categories
student injury insurance	Insurance	Accident Insurance
student life fee	Student Life	Student Activities
student life/activity fee	Student Life & Activity	Student Activities
student marketing	Student Marketing	Communications/Marketing
student records fee	Records	Administrative/Records
student representation fee	Student Representation	Student Association/Government
student senate fee	Student Association	Student Association/Government
student service fee	Student Service	Student Support/Services
Student Service Fee (Debt)	Student Service	Student Support/Services
student services	Student Service	Student Support/Services
student services fee	Student Service	Student Support/Services
student success fee	Student Success	Student Support/Services
student success incentive fee	Student Success	Student Support/Services
student support services fee	Student Support	Student Support/Services
student technology fee	Technology	Technology/Computer/Internet
Student Transportation and Congestion Reduction Fee	Transportation	Access/Parking/Transportation
student union fee	Student Union	Facilities/Capital/Maintenance
swimming pool	Swimming Pool	Facilities/Capital/Maintenance
system integration fee	Technology	Technology/Computer/Internet
technology	Technology	Technology/Computer/Internet
technology access charge	Technology	Technology/Computer/Internet
technology fee	Technology	Technology/Computer/Internet
technology services fee	Technology	Technology/Computer/Internet
technology support	Technology	Technology/Computer/Internet
technology support fee	Technology	Technology/Computer/Internet
theatre	Theater	Culture/Performing Arts
transcript	Transcript	Administrative/Records
transportation and parking fee	Transportation & Parking	Access/Parking/Transportation
transportation fee	Transportation	Access/Parking/Transportation
union building	Student Union	Facilities/Capital/Maintenance
universal fee	Universal	Generic

Original Fee Name	Grouping 1: Using Fee Words	Grouping 2: Sort into 20 Categories
vehicle registration	Vehicle Registration	Access/Parking/Transportation
vehicle registration fee	Vehicle Registration	Access/Parking/Transportation
Wellness & Fitness fee	Wellness & Fitness	Fitness/Health/Wellness
wellness center	Wellness	Fitness/Health/Wellness
wellness center fee	Wellness	Fitness/Health/Wellness

Appendix F

Pairwise Correlations of Study Variables

Table F.1

Pairwise Correlations of Study Variables

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Fall Enrollment Variables:										
(1) Full-Time Equivalent (ln)	1.00									
(2) Total (ln)	0.99	1.00								
(3) Full-Time (ln)	0.98	0.94	1.00							
(4) Part-Time (ln)	0.92	0.96	0.83	1.00						
Price Variables:										
(5) In-District Tuition (ln)	-0.20	-0.25	-0.13	-0.30	1.00					
(6) In-District Fees (ln)	-0.20	-0.23	-0.15	-0.25	0.34	1.00				
(7) In-District Tuition & Fees	-0.23	-0.27	-0.16	-0.34	0.93	0.45	1.00			
(8) Fee Proportion of Price	-0.19	-0.21	-0.15	-0.22	0.01	0.71	0.20	1.00		
Control Variables:										
(9) Discount Rate	-0.28	-0.29	-0.26	-0.29	-0.04	0.10	-0.02	0.29	1.00	
(10) Unemployment Rate[a,b]	0.10	0.08	0.13	0.05	-0.25	-0.24	-0.28	-0.21	-0.16	1.00
(11) Median Household Income (ln) [a,c]	0.42	0.45	0.36	0.46	-0.08	-0.05	-0.02	-0.11	-0.21	-0.31
(12) Competitor Price (ln)	0.04	0.02	0.07	-0.01	0.54	0.22	0.49	0.09	-0.03	-0.19
(13) High School Seniors (ln) [a,d]	0.62	0.64	0.57	0.62	-0.25	-0.24	-0.23	-0.27	-0.38	0.05
(14) % Male	0.01	0.02	-0.01	0.05	0.03	-0.03	0.06	-0.05	0.03	-0.13
(15) % Black	0.02	0.00	0.05	-0.04	0.07	0.08	0.02	0.04	-0.08	0.13
(16) % Hispanic	0.31	0.35	0.23	0.39	-0.60	-0.35	-0.53	-0.19	-0.04	0.05
(17) % Asian	0.42	0.45	0.37	0.44	-0.39	-0.23	-0.30	-0.22	-0.28	0.00
(18) % American Indian	-0.23	-0.23	-0.22	-0.21	-0.08	0.04	-0.07	0.09	0.12	0.02
(19) % Pacific Islander	0.22	0.25	0.17	0.27	-0.38	-0.22	-0.32	-0.18	-0.11	-0.01
(20) % Two or More Races	0.01	0.04	-0.03	0.09	-0.07	-0.05	-0.06	-0.06	0.02	-0.28

Variables	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Control Variables:										
(11) Median Household Income (ln) [a,c]	1.00									
(12) Competitor Price (ln)	-0.01	1.00								
(13) High School Seniors (ln) [a,d]	0.70	-0.05	1.00							
(14) % Male	0.18	0.02	0.04	1.00						
(15) % Black	-0.18	0.02	0.05	-0.52	1.00					
(16) % Hispanic	0.34	-0.33	0.48	0.13	-0.28	1.00				
(17) % Asian	0.72	-0.27	0.69	0.15	-0.11	0.47	1.00			
(18) % American Indian	-0.19	-0.05	-0.21	0.07	-0.17	-0.06	-0.13	1.00		
(19) % Pacific Islander	0.39	-0.28	0.36	0.21	-0.20	0.38	0.63	-0.03	1.00	
(20) % Two or More Races	0.20	-0.10	0.11	0.18	-0.13	0.07	0.22	0.08	0.44	1.00

Note. [a] Total of the same-state counties withing the college's commuting zone. [b] Average of monthly unemployment from June of prior year to July of current year. [c] Weighted by number of households per county. [d] Data on high school seniors are for the prior academic year.