The Rise of Self-Sustaining Master's Programs: What Is at Stake for Public Research Universities and Students

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Abstract

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During the late 1990s and early 2000s, master's education has expanded rapidly in the United States. Few studies have examined the reasons for the expansion of master's programs, especially not for the increase in self-sustaining professional master's programs (SSMPs) in public universities. This dissertation research explores the institutional rationales for establishing and expanding self-sustaining master's programs in public research universities during the last 20 years. SSMPs are academic programs in public universities that operate independently of state appropriations and only rely on student tuition as their financial means. This dissertation further analyzes the implication of the expansion of SSMPs on the institutional proclaimed missions of diversity and inclusion. Informed by organizational decision-making and educational theories, this comparative, multi-university, multi-state case study primarily adopted qualitative data collection and analysis methods complemented by examining secondary quantitative data. The study finds that depending on the timeline of an SSMP creation, the motivating factors for the SSMPs in the sample institutions include serving non-traditional student population (e.g., working professionals), coping with state budget cuts and financial uncertainty, and desiring

additional revenue by the college/school or graduate department leadership. This study also surfaces that the revenue-generating SSMPs do not meaningfully contribute to the diversity and inclusion mission of public universities. The existence of SSMP presents an inherent tension among the pursuit of revenue, elements of academic quality, and existing measures of accountability. Recommendations for more equitable practices among SSMPs highlight instituting more frequent academic reviews, providing funding assistance to recruit more underrepresented minority students, increasing staff-to-student ratios to provide accessible academic and career services, and ensuring more transparency in reporting program outcomes to support applicants and students in making informed decisions.

Keywords: organizational decision-making, privatization of higher education, master's education, educational equity, case study

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Chapter 1. Introduction

Master's degree candidates comprised 73.9 percent of the total graduate enrollment in the United States in fall 2018, and more than 1.38 million students were pursuing this degree (Okahana & Zhou, 2018). Overall, in the most recent decade (2008–2018), the trends in the numbers of master's degrees granted to women, ethnic minority groups, and international students are very positive. For example, the total number of master's degrees granted has increased drastically (30 percent) over the recent decade (compared to 23 percent increase at the doctoral level), including a steady increase of 98 percent in international master's graduates and 21 percent in domestic graduates. The proportion of master's degrees granted to international students increased 6 percentage points from 2008–2018 (Snyder, de Brey, & Dillow, 2019).

Despite the drastic increase and its predominance in graduate enrollment and degree production – 81 percent of all graduate degrees conferred were at the master's level in 2017-2018 academic year, factors associated with the expansion of master's education have not been empirically studied for more than two decades. The contributions of Conrad, Haworth, and Miller (1993); Glazer-Raymo (2005); and Sowell, Bell, Francis, and Goodwin (2010) serve as the most influential works to date. They focused on describing history, development, and disciplinary differences, and explored students' experiences and outcomes across disciplines. Although there exist reports on enrollment trends of graduate students from the Council of Graduate Schools' (CGS) member institutions, no recent research has prioritized the synthesis and analysis of enrollment trends of master's students.

Given the lack of consistent understanding of the desirable characteristics of master's candidates, CGS led a national effort named the Master's Degree Project in 2017 that surveyed master's program directors around the nation. The project found stark differences in the

admission qualifications of a desirable candidate between research-focused and professionally-focused master's programs, however, both types of programs preferred candidates with high potential for program completion (Okahana, Augustine, & Zhou, 2018). The project further called for more transparency by master's programs in publishing evaluation criteria for admission, given the complexity of master's degree programs.

Along with the decline in state appropriations during and after the economic downturns in 2001–2002 and 2008–2009 and the increase in revenue-generating behaviors of public higher education institutions that resulted, a funding model for some master's programs in public research universities has appeared and expanded at a fast pace: self-sustaining master's programs (SSMPs). These are master's programs that reside in public universities but do not rely on direct state appropriations, instead generating virtually all of their revenue from student tuition.

Despite the rapid development of SSMPs in many states and the increase in enrollment in these programs, they have attracted minimal attention from higher education researchers. So far, only one author, Hagigi (2014), has explicitly focused on exploring the alignment of the missions of SSMPs and public universities that house them. He alluded to, and Newfield (2016) concurred, that within the higher education research community there is a lack of understanding of both the institutional rationale for establishing these programs and the relationship between the development of SSMPs and privatization more broadly—replacing public partners, purposes, and interests with private ones—in public higher education (Newfield, 2016). Further, a few higher education scholars of organizational studies called for attention to SSMPs. For example, Kinne-Clawson (2017) delineated the fact that many public institutions offering master's degrees recognize the establishment of SSMPs as a mechanism for expanding graduate education. In addition, the fact that no existing national data exists distinguishing these programs and students

from traditional master's programs and the students in them creates a hurdle for researchers seeking to conduct large-scale explanatory studies of this new phenomenon. Although higher education scholars have emphasized the educational values of a diverse graduate student body for all students (Hurtado et al., 1999; Milem, 2003; Page, 2007; Smith, 2015), revenue-generating behaviors of public universities that result in rising tuition without adequate aid tend to hurt the accessibility of these institutions to low-income students (Bok, 2003; Ehrenberg, 2002).

Thus, this dissertation focuses on the explanation of the emergence and expansion of these SSMPs and the implications of this privatization behavior on the diversity and inclusion mission of public universities. Guided by resource dependence theory, institutional isomorphism, and garbage can decision-making theory, I explore the institutional rationale for establishing SSMPs. Then, through a qualitative multi-site case study I explore whether and how the expansion of SSMPs is related to the diversity and inclusion missions of flagship public research universities. Complementary quantitative comparative data analysis from six programs in three universities across three states was integrated into the primarily qualitative multi-site case-study research. The study is purposefully designed as an analysis at two levels—the institutional level and the program level. In this way I aimed to shed light on: (a) how and why public research universities decide to establish and expand master's programs that are independent of state funding; (b) whether or not these programs are academically comparable to state-funded programs and financially sustainable; and (c) how the expansion of SSMPs affects the diversity and inclusion mission of public universities.

In light of the literatures on the development of master's education, the financing of public higher education, diversity in graduate education, and relevant organizational theories

from which I have developed the main conceptual framework, this study addresses the following research questions:

1. What motivates public research universities to establish master's programs that are independent of state funding?

2. What are the organizational processes that public research universities adopt in establishing SSMPs?

3. Is the expansion of SSMPs undermining the mission of diversity and inclusion in sample public research universities? If so, why and how?

The evidence I collected included: (a) at the institutional level, information gathered from semi-structured interviews with deans of colleges, schools and the central graduate school, as well as document reviews and analysis of institutional market research data, financial reports, existing institutional student surveys, and other administrative data; and (b) at the program level, semi-structured interviews with department chairs, program administrative staff, and faculty, as well as document review and analysis of available student and alumni surveys and other administrative data.

The findings of the study will enrich the now very scarce institutional knowledge about SSMPs as well as provide an understanding of the implications of these programs on the diversity and inclusion missions of public universities. I hope to contribute to a discussion of the understanding of the changing nature of master's education in the U.S. to highlight this new pattern in the privatization behaviors of public universities and the roles of master's degrees. Through the dissemination of the research findings, I hope to become part of a group of scholars encouraging data collection efforts on graduate education by agencies like the CGS or the National Science Foundation (NSF). By having access to data that distinguishes SSMPs from

state-funded master's programs, researchers can undertake more descriptive and explanatory work on these topics, and thus provide an outlook on the sustainability of SSMPs and the encroachment of this form of privatization into the public research university.

As an overview of this dissertation, an introduction to the research topic is presented in this chapter, and the relevant literature is discussed in chapter 2. Chapter 3 presents research questions, which naturally leads to the theoretical framework that is designed to answer these questions in chapter 4. Chapter 5 describes the research design, including the methodology and research processes I have used. The next two chapters include research findings, where institutional and program profiles in the sample are highlighted in chapter 6 and answers to the three research questions are given in chapter 7. Chapter 8 further discusses notable themes that emerged from findings that are not directly related to the research questions. Chapter 9 concludes the dissertation and discusses implications for higher education leaders and directions for future research in this domain.

Chapter 2. Informing Literature

In this chapter, I will review the literature on master's education in the U.S., privatization in public higher education, and diversity and inclusion in graduate education. The intersection of these three bodies of literature informed my understanding of the knowledge gap—the lack of understanding of the institutional rationale and procedure for establishing SSMPs and the implications on the diversity and inclusion mission of public universities—that this dissertation aims to address.

This chapter begins with a literature review on master's education in the U.S. The purposes of master's education have changed several times since its establishment, and the types of master's programs and degrees have drastically increased. Enrollment and degree production at the master's level has been increasing especially fast in the past two decades, and women, racial/ethnic minority students, and international students were among the fastest-growing groups. Institutions also started new forms of master's programs either driven by national recommendations to better connect science master's education with workforce development, as in the case of such as the Professional Science Master's Programs initiative, or by financial pressures, as with SSMPs.

2.1 Master's Education in the U.S.

The history, development, and current status of master's education in the U.S. are essential elements to contextualize the issues around SSMPs. The growth in enrollment in master's programs and in degrees awarded, shifts in student demographics, the forces of professionalization among master's programs, and diversification of types of master's programs provided a fertile ground in which SSMPs were able to develop and prosper.

*2.1.1 A Brief H*istory

The master's degree originated in thirteenth-century European universities for students to earn a teacher's license (Glazer, 1986). For two centuries, until the mid-1800s, American higher education adopted the British model, with a bachelor's as the only earned degree (Storr, 1953). The master's degree was awarded to bachelor's-of-arts-degree holders who studied for one to three years following degree completion, or as honorary degrees, until the mid-1800s (Glazer-Raymo, 2005). According to Spurr (1970), in 1859, the University of Michigan awarded the first earned master's degree, a master of arts (M.A.), in the U.S. This degree was defined as a second degree in arts, with the bachelor of arts degree considered the first degree. Interestingly, this first master's degree did not have its roots in a particular profession or academic discipline. After that, academic institutions initiated some master's degree programs sporadically. It was not until the 1870s–1890s that both the M.A. and the master of science (M.S.) degrees started to rise in academic status. Before 1900, master's degrees were considered the necessary credentials for college faculty. In the early 1900s, Johns Hopkins University, together with Clark, Yale, and Harvard Universities, urged the need for new graduate programs at the doctoral level and introduced the doctor of philosophy (Ph.D.) (Spurr, 1970). As the prestige of the Ph.D. rose, it finally replaced the M.A. as the preferred qualification of university faculty members.

In 1909, the newly founded Association of American Universities (AAU)—an association of leading American research universities—conducted the first major study of the master's degree to define the degree's purpose, i.e., whether it was a research degree, an enrichment degree, or a prerequisite for secondary school teacher certification. Among the AAU member institutions at the time, the study found little standardization of requirements, degree titles, specializations, or credit requirements among the master's degrees offered (Glazer-Raymo,

2005, citing AAU, 1910). As a result, the AAU decided to recommend parameters for master's education in member institutions. Master's degree was not the only graduate degree that needed a comprehensive evaluation back then. Around the same time, criticisms of the quality of medical education led to a national study of 155 medical schools, funded by the Carnegie Foundation for the Advancement of Teaching. The study, also known as the Flexner Report after its author (Flexner, 1910), called for elevation of academic standards in the field of medicine, including of the qualifications and status of medical faculty, clinical professorships, and teaching faculty (Brown, 1979). After cycles of credentialism in graduate and professional schools, the first professional degree arrived, generally defined as "a post baccalaureate degree of at least three years in duration that earn[s] the recipient the title of 'doctor'" (Glazer-Raymo, 2005, p. 113), such as doctor of medicine (M.D.).

By the mid-twentieth century, master's degrees became so numerous and diverse in purpose that it was impossible to define what a master's degree meant precisely. Depending on the particular student or discipline, a master's degree could be a "Ph.D. steppingstone, professional degree and[/or] terminal degree" (Glazer-Raymo, 2005, p. 6). In 1945, the AAU recommended that academic institutions use master's degrees with four names: the M.A. or M.S. as research degrees and the master of arts in teaching (M.A.T.) or master in education (M.Ed.) as teaching degrees, with qualifying phrases for other professional degrees (e.g., an M.S. in engineering) (Glazer-Raymo, citing AAU, 1945, p. 124). Although it does appear to have had some influence among some institutions, there is no record on how widely this AAU recommendation was adopted.

Post–World War II (1945–1970) development of master's education was characterized by expansion, professionalization, and diversification (Conrad et al., 1993). In 1957, the National

Defense Education Act (NDEA) was passed to focus on academic quality, student access, and strengthening higher education reform primarily in an effort to enhance U.S. economic and military strength (Fleming, 1960). The act included financial support of students who were interested in becoming graduate-level professionals and college professors, mainly in the Science, Technology, Engineering and Mathematics (STEM) fields. This financial incentive served as a starting point for the later overall increase in students graduating with master's degrees. Due to the funding foci of NDEA, fewer master's degrees were granted in humanities and liberal arts than in fields that prepared students to enter science and engineering professional practice. Professionalization, within this time period, refers to the rapid development of and prestige gained by professional master's programs operated by professional schools, such as those in business, social work, and education (Glazer-Raymo, 2005). That meant prospective graduate students were no longer limited to an M.A. or M.S. but could also enroll, for example, in the master of business administration (MBA) program, the master in social work (MSW) program, or in a M.Ed. program. According to Galzer-Raymo (2005), the proliferation of professional master's degree programs contributed to the diversification of master's degrees.

Glazer-Raymo (2005) categorized the foci of master's education from the 1970s to the mid-1980s as achieving academic excellence and national standards within fields, and performing program quality assessment. During this period, professionalization went beyond just the development of master's programs in the professional schools to master's programs in graduate schools that were considered the en route degree to Ph.Ds. The establishment of professionalization and professionalism in master's education diverged by fields (Glazer-Raymo, 2005). According to Glazer-Raymo (2005), the culture of expert professionalism became manifested in the master's degree and first-professional degree, both of which were "evolving as

credentials of social and economic currency for their recipients" (p. 14). The expert professionalism was initially idealized by Collins (1979) as he connected professionalism to the marketplace and argued that American higher education is a credentialing for a society in which employers require ever higher academic credentials for entry, although the skills needed in the job do not necessarily upgrade with technology advancement. The payoff of an educational credential is a result of interaction of the supply of and demand for that particular credential. Burrage et al. (1990) concurred with Collins (1979) and claimed that practicing professionals have control over credentials required to enter a particular profession. Brint (1994) built off Collins and Burrage et al., arguing that expert professionalism emphasized "the instrumental effectiveness of specialized, historically grounded knowledge, but include[d] comparatively little concern with collegial organization, ethical standards, or service to the public interest" (p. 37). Thus, according to this school of thought, the focus on expert professionalism shifted the focus away from civic responsibility for the master's degree and first-professional degrees in the 20th century (Glazer-Raymo, 2005). More recently, however, Grubb and Lazerson (2004) argued that ethics should lie at the center of every occupation in the 21st century and universities can play a civic role through providing professional education that highlights work preparation and training on professionals' civic responsibilities. Their work seems to have had only limited influence, though.

In the 1990s, master's education attracted a new wave of national attention. The CGS launched a study of master's education in the U.S., with financial support from Pew Charitable Trusts. The study was motivated by the 48-percent increase in master's degrees awarded annually from 1970 to 1990, and by the fact that 80 percent of all master's degrees awarded since the early 1980s were in professional fields, such as engineering, education, nursing, and

business. Equally important was the sharp increase in master's degrees earned by women and minorities; by the 1990s, more than half of these degrees were granted to women and 12 percent were granted to underrepresented minority students. The study resulted in a 1993 publication on master's education by Conrad et al., entitled *A Silent Success*. This book became an instant classic in part because master's education had received little attention from researchers prior to the advent of the book. Through analyzing interview data from 781 key stakeholders across major fields of study and institutions, including students, faculty, institutional and program administrators, program alumni, and employers of program graduates, the authors discussed comprehensively three overarching issues in the field of master's education through comparative case studies. Those issues were: (a) people's direct and indirect experience with master's education; (b) how those experiences differed; and (c) which characteristics of master's programs contributed positively to student experiences. The authors found that students and alumni from all major fields of study were in general positive about their overall experience in master's programs; faculty and administrators were grateful for working with master's students; and employers highly evaluated employees with master's degrees. In another positive note, the authors concluded by making suggestions to improve master's programs and potentially provide students with richer experiences. An example of these suggestions was to hire faculty with industry experience to help students broaden their horizons when searching for jobs beyond academia.

By the late 1990s, the trend at the master's level had drifted even further from the traditional academic focus to becoming more professional and interdisciplinary. Further, four major innovations were manifested within master's programs: new instructional technology, external degrees, experiential and applied learning, and a trend away from a thesis requirement

(Conrad & Eagan, 1990). New instructional technology meant that academic institutions could offer both on-campus and remote instruction, such as instruction via computer. External degrees were programs that offered evening and weekend courses to increase accessibility. Experiential and applied learning techniques refer to the concept of learning through practice, such as via internships and field studies. A trend away from a thesis requirement meant many of the master's programs no longer required a thesis, which is the key component in a research master's degree, but often presents a large hurdle to students.

The earlier-mentioned studies on master's education have mainly focused on summarizing enrollment patterns, categorizing types of master's programs or degrees, and on connections between master's degrees and the workforce. The most recent comprehensive study of the master's degree was published by Glazer-Raymo in 2005, updating and revising her previous work on master's education in 1986, with support from the Sloan Foundation. In her work, she discovered the trend of commodification, i.e., using higher education as a commodity, in the development of master's education. In her conclusion, she highlighted that the rapid expansion of master's programs and the increasing production of master's degree holders in professionally focused fields was a relatively new phenomenon at the time. At the same time, she warned higher education institutions to maintain the value of the degree and not let credentialism water down the quality of master's education.

Some scholars have mentioned the revenue-generating aspects of academic programs, including master's programs (e.g., Slaughter & Rhoades, 2004), but so far, Hagigi's dissertation (2014) remains the only substantial scholarly work along this line. He focused on two revenue-generating master's programs in the field of public health in two public universities within the same state. Given the increasing popularity of SSMPs among public universities, a deep

understanding of how and why universities are creating SSMPs and implications of SSMPs on the diversity and inclusion missions of public universities are critical to contributing value to the scholarly work on master's education. In the next section, I will share enrollment and degree production data at the master's level, with a particular focus on international students and students from underrepresented minority backgrounds.

2.1.2 Patterns in Master's Enrollment and Degree Holders

Consistent with the trend in the 1990s—spurred in part by affirmative action—the representation of women and ethnic minorities in master's degree programs in the most recent two decades has increased across the board. It is essential to review the enrollment and degree production trends during this period of time since it corresponds with the development of SSMPs.

Master's degrees granted have increased the most in the past two decades, compared to smaller gains at bachelor's and doctoral levels. Master's degrees granted in American postsecondary institutions (including public, private not-for-profit, and private for-profit institutions) have increased drastically (91 percent) over the past two decades, from 430,164 in 1997–1998 to 820,102 in 2017–2018, with even larger proportional growth (177 percent) during the same two decades of international master's graduates, from 52,379 in 1997–1998 to 145,049 in 2017–2018. In the same period, bachelor's degrees granted increased by 67 percent and doctorate degrees increased by 48 percent. As for international versus domestic graduates within the same timeframe, bachelor's degrees granted to international students went up 150 percent, compared to a 64 percent increase for domestic students, and doctorate degrees grew 77 percent for international students and 44 percent for domestic students (Snyder, de Brey, & Dillow, 2019).

Master's degrees are awarded by a great variety of institutions in the U.S. Public institutions awarded more such degrees than private not-for-profit universities; public research universities with very high research activity, based on the Carnegie Classification of Institutions of Higher Education, awarded the most master's degrees in the public realm. In 2012–2013, twice as many institutions awarded master's degrees (1,930) as doctorates (915) (Allum & Okahana, 2015). In the same year, public institutions awarded 46.1 percent of all master's degrees and private not-for-profit institutions awarded 43.5 percent (Snyder, de Brey, & Dillow, 2016). By the basic Carnegie classification of types of institutions, in 2013–2014, public research universities in the classifications of very high and high research activity awarded a total of 38.7 percent of all master's degrees, with these two categories awarding 24.8 percent and 13.9 percent of the total, respectively. The acceptance rate of master's applicants at public research universities with very high and high research activity was 39.8 percent and 53.1 percent, respectively—and was 64.8 percent at institutions in the doctoral/research universities category (Allum & Okahana, 2015). The National Center for Education Statistics (NCES) has projected that, in 2023, 1,032,000 master's degrees will be awarded in the U.S., a 37 percent increase from 2012 (Hussar & Bailey, 2016).

Based on available data from the most recent decade (2008–2018), master's degrees granted to men increased at a slightly faster pace (31 percent) than those to women (30 percent), but the total annual number of master's degrees granted to women (an average of 60 percent of the total degrees granted each year) has been much higher than the number awarded to men for many years. Master's degrees granted to Black students over the same period increased by 38.5 percent, those to Hispanic students by 96.4 percent, and those to Asian/Pacific Islander students by 32.7 percent, but there was a 12 percent decrease in awards to American Indian/Alaska Native

students. The percentage change in the American Indian/Alaska Native group was small, so it could be due to random variations of small numbers. In addition, master's degrees awarded to white awardees increased by just 6.2 percent while those to international students jumped by 98 percent. The trend overall is very positive, except for among American Indian students. It is especially so among international, women, and the other domestic minority ethnic minority groups (Snyder, Dillow, & Hoffman, 2009; Snyder, de Brey, & Dillow, 2019).

According to *Science and Engineering Indicators 2020*, published by the National Science Board, between 2000 and 2017 master's degrees awarded annually in science and engineering fields more than doubled, from about 96,000 to about 206,000 (National Science Board, 2020). According to the U.S. Department of Education, this increase is projected to continue at least through 2028 (Hussar & Bailey, 2019). Increases occurred in most major fields and were strongest in engineering, computer sciences, mathematics and statistics, and biological sciences. Hispanic and Latino/a students in every science and engineering discipline saw more than a 100 percent increase during the same period of time. Among master's degrees awarded in non-science and non-engineering fields, although the absolute numerical increase was larger than the gain in science and engineering fields, i.e., from 363,912 to 603,916 between 2000 and 2017, the percentage increase was smaller, at 66 percent. In 2017, the numbers of master's degrees awarded in computer sciences and engineering reached their highest point in the last 17 years, with especially rapid growth since 2014. This growth was largely a result of international student enrollment. Although in the academic year 2017–2018 alone 17.7 percent of all master's degrees were awarded to international students in the U.S., these students earned a disproportionally large share of master's degrees in several disciplines in the same year. For example, international students earned 58.2 percent of master's degrees in mathematics and statistics, 62 percent of

those in computer and information sciences, and 55.3 percent of those in engineering (Snyder, de Brey, & Dillow, 2019).

2.1.3 New Initiative: Professional Science Master's Programs

Professionalization has been a theme in the development of master's education since the 1940s, although it has manifested in different ways from the 1940s to the 2000s. For example, from the 1940s to the 1970s, master's degrees in traditional professional schools (e.g. Law and Business schools) first flourished; from the 1970s to the 1980s, master's degrees became popular in other professional fields, such as engineering and nursing; from the 1980s to the 1990s, more professional master's degrees were created with features of interdisciplinarity and applied knowledge. Glazer (1986) forecasted the shift in the paradigm of master's education where more master's degrees would be created to meet the needs of the workforce, connecting closely to external stakeholders, such as potential employers. Following this new paradigm, one successful invention in master's education was the professional science master's (PSM) program, first established in the 1990s.

Driven by the goal of aligning science master's education more closely to the needs of the workforce considering that master's education had formerly been seen mainly as stepping stones to Ph.D. programs, the Sloan Foundation established an initiative in 1997, and the results persist today, namely the PSM programs (Francis, Goodwin, & Lynch, 2011). Grants were initially given to 14 research universities to support the founding of innovative master's programs in the natural sciences and mathematics, followed by a targeted set of programs at another 12 research institutions in the newly emerging field of bioinformatics. In 2001, a Sloan grant to the CGS extended the PSM initiative to master's-focused institutions that awarded 40 percent of all science and math master's degrees and where faculty were heavily invested in

master's education. Inspired by the initial success of PSMs and professionalization needs across social science fields, in 2002, 2005, and 2007, the Ford Foundation provided three waves of funding to CGS to promote the development of professional master of arts (PMA) programs in the humanities and social sciences at both doctoral and master's-focused institutions (Francis, Goodwin, & Lynch, 2011). Then the support from the Ford Foundation to PMAs ended. The pioneer PMAs are still around, but without sustainable funding and national leadership, no new PMAs have been established since foundation funding was cut (Cassuto, 2015). Cassuto (2015) also quoted CGS to the effect that the main reason for the Ford Foundation's halt in funding of the PMAs was its less affluent resources compared to the Sloan Foundation, which funded the PSMs. Cassuto (2015) also lamented the lost opportunity for the PMAs to gain the same level of popularity among institutions and students as the PSMs had they received more sustainable funding.

In 2006, CGS assumed primary responsibility for supporting and expanding the PSM initiative, intending to make it a regular feature of U.S. graduate education. Within one decade, PSM programs expanded from a handful in the early 2000s to more than 235 programs by June 2011 and to 345 programs in 2018 (Professional Science Master's, 2020). The PSM programs demonstrate value in three ways: by preparing students for attractive career opportunities in non-academic settings, by contributing to reducing STEM pipeline leakage, and by generally aligning with increasingly popular professionally oriented master's degree programs (Francis, Goodwin, & Lynch, 2011). For example, PSMs can reduce STEM pipeline leakage by increasing undergraduates' persistence in STEM majors by allowing them to consider PSMs as the next step to defined career paths that can be entered relatively quickly. PSMs offer an opportunity for STEM undergraduate degree holders to experience graduate education before committing to a

doctoral degree, which has a much longer timeline to completion. PSMs also expand options for undergraduate degree holders who aspire to pursue professional education at the master's level rather than the doctoral level. Besides, master's degrees in professional schools have gained popularity and reputation that provided additional opportunities for professionally-oriented programs in other fields to grow.

In August 2007, Congress passed the America COMPETES Act to invest in research, technology, and innovation in order to raise the global competitiveness of the U.S. This act authorized the NSF to develop and implement a program of grants directly to 4-year higher education institutions for developing or expanding science master's degree programs, including continuing funding in support of PSMs. Congress passed this act in recognition of the need for more science-trained professionals and the nation is moving forward on this front with the support of the federal government, states, philanthropic institutions, national associations, higher education institutions, employers, and students (National Research Council, 2008). As of 2018, 345 PSMs have been established in 115 institutions across 35 states, most commonly in the biomedical and information fields (Professional Science Master's, 2020). Among the 115 institutions, only a handful are doctoral universities with the highest level of research activities.

Survey results of PSM alumni from 2011 to 2016 show that they were satisfied with the training they received in general and would like to gain additional skills for better career preparation, such as training on programming and data analysis skills (Komura, 2017). The prosperity of PSMs and positive responses from alumni demonstrate that these programs are playing an increasingly important role in preparing the future workforce and connecting students to career pathways (Borchert, 2005; National Research Council, 2008). A recent small-scale survey of 17 PSM alumni from two institutions, conducted in 2018, revealed that more than half

of them acquired employment prior to graduation (Rivenbark et al, 2019). However, no more recent comprehensive evaluation of PSM alumni was available. On the other hand, more academically-oriented fields, such as liberal arts and humanities, have not experienced the same amount of growth (Glazer-Raymo, 2005).

2.1.4 New Development: Self-Sustaining Master's Programs

The development of PSM programs, as described in the previous section, was mainly driven by the need to connect science master's education to workforce demands. Besides this need, there are other forces that influenced professional master's programs in becoming pivotal forces in the economic growth of universities, such as globalization, privatization in higher education, accountability, and demographic changes (Glazer-Raymo, 2005). The funding from the Sloan Foundation and later from the NSF was a key impetus for institutions to establish PSMs. For institutions that were interested in starting other professional master's programs outside of professional schools, initial funding became a top concern, especially in the wake of periodic recessions that led to reduced state funding to public universities. In this section, a description of SSMPs, which utilize a self-sustaining financial model for the establishment of a new professional master's program, is provided in order to situate this dissertation's research topic in the national context.

Since the 1980s, the emergence and subsequent expansion of SSMPs in public research universities has been observed. SSMPs, defined as master's programs housed in public universities but which do not rely on direct state appropriations, were built under a different premise from PSMs. Publicly available institutional policy documents from university and program webpages (for example, at the University of Virginia, the University of Maryland, and the University of California) indicate that SSMPs can be in any discipline with a professional

focus, can deliver instruction in any modality, and can be housed in any public higher education institution that grants master's degrees, as long as they don't receive direct state appropriations in the same way as other graduate programs in the same institution.

Since SSMPs focus on professional fields that lead to particular types of jobs or careers, the design of the curriculum of SSMPs usually encompasses an internship component or period of apprenticeship in clinical practice and a clear pathway to professional licensure; there is also an emphasis on application of knowledge rather than academic research. Given the lack of a uniform definition or terminology around SSMPs, I will draw on examples from institutions to enrich the understanding of these types of programs. Examples presented here are from the University of California (UC) system, University of Washington–Seattle (UW–Seattle), University of Wisconsin–Madison (UW–Madison), and University of Texas at Austin (UT–Austin), all leading public research universities. SSMPs do exist in other types of institutions as well, such as public master's institutions, and they most likely function differently from those in leading public research universities. In this dissertation, I am only focusing on SSMPs in elite public research universities.

Historically, self-sustaining programs first started around 1983 at UW–Seattle, 1995 at UT–Austin, 1996 in the UC system, and 1999 at UW–Madison (University of Washington Graduate School, 2014; University of Texas at Austin Graduate School, 2019; University of Wisconsin-Madison Graduate School, 2019). The arrival of the self-sustaining programs corresponds with the emergence of privatization in public higher education in the 1980s (Ikenberry, 2009). The nomenclature of self-sustaining programs is inconsistent across institutions, for example, the UC system uses the term "self-supporting programs," UT–Austin implements "option III programs," UW–Seattle utilizes "fee-based programs," and UW–

Madison offers "non-standardized fee programs." Hereinafter, I will use the term "self-sustaining programs" (the original name used at the UW–Seattle) to refer generically to programs that do not receive state subsidies and rely purely on student fees in public higher education institutions. Some institutions do not have a general term for these programs, which makes it difficult to distinguish them from state-funded programs.

Extant scholarly work claims that self-sustaining programs were created in response to the relative decline in state appropriations and as a new source of tuition revenue (Hagigi, 2014). One example from a document entitled, "Self-Supporting Graduate Degree Programs and Policy at the UC system" (2008), showed the purpose of establishing the first self-supporting program in 1996 was two-fold: "to expand UC's degree programs to serve new groups of students, especially working adults," and "to find new ways to fund degree programs, in light of reduced state funding." The definition of the term "self-supporting programs" at the UC system in 1996 was "part-time programs that are supported within non-state funds only."

The growth of SSMPs was phenomenal in some institutions. For instance, the number of programs at UW–Seattle increased sharply during and after the historic economic downturn that began in 2008. Today, UW–Seattle has more than 100 SSMPs, enrolling 58 percent of all UW master's students in 2019–2020; this number was only 20 percent in 2007–2008 (UW, The Graduate School, 2014). The stated rationale for establishing SSMPs at UW–Seattle was the need to establish new programs to meet student demand and the urge to find new sources of funding in light of the decline in state appropriations for existing programs (UW, The Graduate School, 2014). UW–Seattle initially allowed the conversion of existing state-funded programs that sought to become self-sustaining. However, that raised vocal concerns regarding tuition increases and curriculum changes among already-enrolled students, leading to a strike and sharp

criticism from state legislators. Later, in 2014, the Washington State Legislature passed RCW 28B.15.071, which placed restrictions on this type of conversion, meaning that only new programs at UW–Seattle can be established as SSMPs.

There is barely any research on SSMPs in spite of the apparently increasing prevalence of these programs. Hagigi (2014) explored whether or not two public health SSMPs at two public universities in one state could follow their missions to serve the public good on a global scale and continue this mission despite this new funding structure. Evidence obtained from interviews and document analysis in Hagigi's dissertation suggested that these types of programs still served their public missions because the missions of public universities shifted from serving the community and state to serving global needs. Although SSMPs at the UC system and UW–Seattle claim to better address the special needs of enrolled students, positioning themselves as more student-centered and more sensitive to student needs when compared with traditional state-funded programs, no independent research has been undertaken to provide evidence for this claim. Further, some publicly available administrative data at UW–Seattle reveals low underrepresented minority (URM) student enrollment but high international enrollment in some SSMPs, which might be construed negatively relative to a public university's mission to provide educational opportunities for students from diverse backgrounds, especially URM students. Although it was not a focus in Hagigi (2014)'s work, he did reveal an illuminating observation that no interviewees voiced any concern over the potential lack of URM student enrollment among his two sample public health SSMPs.

Given their professional nature, SSMPs are not preparing students to advance into research degrees like some research-focused master's programs seek to do. Instead, they are mostly advertised and designed to prepare students for professional practice. For example, the

SSMP curriculum typically does not require a thesis. Additionally, these programs tend not to use faculty members for academic advising; most of them have a designated academic advisor and/or program director who is not a tenure-line faculty member but is employed half- or full-time by the program and whose sole duty is to provide academic advice (e.g., on course selection). Some programs also hire additional staff members for career consultation purposes. The proportion of tenure-line faculty teaching in some of the SSMPs is also much lower than in doctoral programs in the same department or school (see University of Washington Communication Leadership Program, 2020).

As of 2019, national data sources do not separate students in SSMPs from those in state-funded programs. Institutions collect their data on SSMPs without agreed-upon standards. On the official degree certificate, there is no indication of whether or not a degree was awarded through an SSMP or a state-funded program. The degree titles granted by SSMPs are usually the same as other master's degrees from the same institution. Based on my exploratory qualitative study on international students' career aspirations in SSMPs conducted at UW–Seattle in 2014–2015, I found that the sample SSMPs in the study shared the characteristics described in the paragraph above. Further, the study also revealed that there was a lack of understanding among students regarding the differences between SSMPs and other master's programs, considering that there was no distinction on the degree certificate or communication about the financing limitations and resulting constraints from the program to the students.

Based on the lack of literature on the SSMPs and on the information I gathered from the named institutions, I judged there was a need for a study that scales beyond one discipline, one institution, and one state. Universities are not operating in a vacuum, especially not in the case of state public flagship universities, and we need to understand the relationship of states with their

universities and their funding structures during the last two decades. State higher education governance structure plays a significant role in the design of finance policies within states (Li & Zumeta, 2015). Not all the states—depending on whether they have a higher education governing board, coordinating board, or commission—interact the same way with their flagship universities (McGuinness, 2011). Further, levels of state control over institutional finance and budgeting policies vary by state and institution. This diversity of states' relationships with public university systems and each institution within systems needs to be considered since the establishment of SSMPs sometimes needs to be approved by the university system in the state, while in other states each university makes independent decisions (see examples from the University of Texas System, 2019, and University of Washington Graduate School, 2019).

This interplay between states and their public flagship universities helped inform my research design and sampling strategy, which will be discussed later. In the next section, I review the literature on the diminishing role of state funding in public higher education and its impact in motivating the emergence and expansion of SSMPs.

2.2 Privatization in Public Higher Education

Researchers have claimed that the increasing institutional revenue-generating behavior of public universities in recent decades, including the emergence of SSMPs, was a result of the decline in state appropriations, especially during economic downturns. In the next section, I will review the literature on privatization behaviors in public research universities during periods of financial instability in order to determine how closely these behaviors may be associated with the emergence and expansion of SSMPs.

2.2.1 Diminishing Role of State Funding in Public Higher Education

Public higher education institutions are defined as institutions that "receive direct financial support in the form of appropriations from state governments" (Toutkoushian, 2009, p. 60). For virtually all public 2-year and 4-year higher education institutions in the U.S., ranging from community colleges to research universities, the relative proportion of state funding—meaning the percentage of state appropriations within overall institutional revenue—has decreased from 1980 to 2017 (Snyder, Dillow, & Hoffman, 2008; Snyder, de Brey, & Dillow, 2019).

A brief overview of the landscape of state funding for public higher education in the past decade will shed light on the trend. According to the State Higher Education Executive Officers Association (SHEEO, 2016), the economic recession that began in 2008 drastically reduced state revenue for higher education. There was a very deep cut between 2009 and 2011. In 2015, however, for the third straight year, overall state support for higher education increased, reaching $81.8 billion, up 6 percent from 2014 but still below the 2008 level after adjusting for inflation. Additionally, estimates from Grapevine's survey of FY2016 state appropriations for higher education show continued growth overall of 4.1 percent in nominal terms, and the more recent Grapevine survey of FY2019 showed a 2.4 percent increase from FY 2018 state appropriations per FTE student after adjusting for inflation. In a recent publication, Zumeta (2018) shows the very modest 5-year (FY 2013–FY 2018) restoration of state funding for higher education on average nationally (14 percent in nominal terms), excluding two states with the largest gains, California (52.5 percent) and Florida (51.5 percent). The national picture was distorted by the nine states that enjoyed gains larger than 30 percent since the states that gained more tended to

be the ones that cut their higher education budgets the most during the economic recession (Zumeta, 2018).

Historically, state appropriations per FTE student to higher education have been decreasing since the 1980s relative to the overall modestly increased institutional spending per FTE student (Eckel & Morphew, 2009a; Ehrenberg, 2012), and the role of states relative to public higher education institutions has shifted generally to less oversight and regulation and more campus autonomy and market adaptability (Zumeta, Breneman, Callan, & Finney, 2012). Toutkoushian (2009) summarized that the decline in state funding for public higher education institutions up to that time could be due to two reasons. First, the slower growth in income since 2000 contributed to the stagnation in state tax revenues and the decline of tax revenue as a share of each state's gross state product (GSP); as such, states usually cut funding to higher education given it is the largest discretionary item in the state budget. Second, the significant enrollment increases at the K–12 level, beginning in the mid-1990s, increased legislative demand for K–12 funding, such as pressures for school improvement, and K–12 education is a competing interest with higher education. Zumeta (2012) also stated that the state budget for higher education is usually less favorably treated in all but the most prosperous times, compared to funding for Medicaid clients, prisons, or K–12 education, given their strong political and even legal claims on state resources.

Although state budget cuts to public higher education overall have been severe, with more than 20 percent in overall cuts between 2008 and 2013, the influence on public research institutions has been more significant: "Between 2008 and 2013, inflation-adjusted state appropriation support for public higher education per FTE student declined by 26.3 percent in the median public institution. Of the 138 public research universities for which there was

comparable data, inflation-adjusted support per FTE student declined by more than 20 percent at 98 institutions, and more than 40 percent at 29 institutions" (American Academy of Arts and Sciences, 2015, p. 12).

This change had mixed effects for institutions, states, and students. To respond to state budget cuts, nearly all of the public universities have reduced administrative costs, improved financial management, and implemented new efficiencies in purchasing, information technology, and human resources infrastructure (American Academy of Arts and Sciences, 2016). In addition, public research universities have embedded themselves more deeply and productively in local communities by offering services and partnerships to government and businesses, as well as by extending their educational offerings to previously underserved populations of students. Unprecedentedly, tuition has become the principal source of revenue for many public research universities. In the 1970s, students and families were responsible for paying 33 percent of the cost of a public university degree, and the state was responsible for 60 percent in aggregate across the U.S.; in the 2010s, the former paid more than 50 percent and the states only supported 34 percent (Feldman, 2012).

Particularly at the graduate level, public research universities have experienced difficulties absorbing state budget cuts given that graduate students and research are essential to their research missions and the production of future faculty members. Public research universities must maintain relatively large numbers of faculty because graduate training requires intense faculty-student interaction. The study by the American Academy of Arts and Sciences in 2016 also found that most public research universities have responded to decreased state funding by increasing tuition. Institutions are also involved heavily in cutting costs (e.g., cutting faculty positions [Ehrenberg, 2012], reducing library services), better managing current finances (e.g.,

creating detailed financial models, setting performance metrics), and increasing alternative revenues (e.g., from philanthropy, from increased enrollment of out-of-state and international students [Jaquette & Curs, 2015], and from changing modes of instruction).

The initial response to the decline in state funding, as early as the 1990s, spurred more revenue-generating behaviors that potentially facilitated movement toward the privatization of public universities. In the following section, I will discuss some general behaviors public universities have engaged in to create additional revenue streams.

2.2.2 Definition and Development of Privatization in the Context of Public Higher Education Institutions

Privatization in most higher education contexts is defined as "the retreat of public dollars from public universities and a corresponding increased reliance on private money and diverse revenue streams, increased competition for resources, and freedom from excessive public regulations" (Eckel, Couturier, & Luu, 2005). The underlying assumption is that the change of university budget models could be managed so as not to compromise the quality of education or educational activities provided by public higher education institutions. This definition of privatization thus is solely based on the financial side of the university administration, not the academic side.

Historically, privatization of public universities began in the 1980s when relationships between public universities and states started to change. Public universities are typically not an official part of state government and they are usually considered quasi-autonomous public corporations that are aided by the states (McGuinness, 1997). During years of economic downturn when state dollars are constrained states still hold universities accountable for their performance. One class of accountability measure is performance funding, performance budgeting, and performance planning, all of which started in some states in the 1980s but were

less prevalent among universities when the economic conditions improved and which have experienced ups and downs in popularity since the 1990s (Burke, 2004). This funding model, however, does not directly impact my research, considering the states I sampled only implemented performance-based funding for 2-year institutions rather than 4-year universities (National Conference of State Legislatures, 2015).

Public research universities' well-known missions are teaching, research, and public service (Haycock, Lynch, & Engle, 2010; Kerr, 1963). These are reflected in enrolling state residents as a priority, and limiting resident tuition is a subject of discussion with state leaders; many institutions rely on increasing the enrollment of international students who pay much higher out-of-state tuition rates to generate needed revenue and to avoid raising in-state tuition. In the past ten years, institutions also increased international student enrollment, which could be read as weakening their commitment to educating citizens within the state. Empirical research has found a negative relationship between non-resident enrollment and state appropriations. Facing declines in state appropriations, public research universities resort to growing revenue from tuition as one of the major mechanisms to increase revenue. In-state tuition level is usually monitored closely be the state, but the same rule doesn't apply to out-of-state tuition for out-of-state residents and international students. Some programs in public research universities adopt three-tier tuition rate schedules: in-state, out-of-state, and international (e.g., Arizona State University, 2020).

Raising tuition at institutions relying on external sources of full-paying students could lead to problematic disparities in the socio-economic profiles of in-state versus out-of-state and international students. Concurring with Ehrenberg's (2006) and Toutkoushian's (2009) arguments, the American Academy of Arts and Sciences (2016) cautioned institutions that the

current financial model, with sharply rising tuition and more dependence on this revenue, had put the public character of these institutions at the greatest risk. Recent trends also threaten to increase the divide between relatively well-endowed public research universities and lesser-endowed institutions and weaken the relative quality of the educational experience at both. The American Academy of Arts and Sciences (2016) also called for careful and sustained attention to make sure that states and universities are neither blurring the line between public and private research universities nor magnifying other social divides. Further, students coming from low socio-economic backgrounds could suffer more financially from attending public research universities, where tuition is generally higher than at other types of public higher education institutions (Toutkoushian, 2009), and even worse they could be deterred from enrolling in these institutions (Heller, 1999; Paulsen & St. John, 2002; Perna, Steele, Woda, & Hibbert, 2005).

Another privatization behavior is commercialization, an academic capitalism–related behavior that started to surge in universities where all kinds of academic products (commercially relevant findings prior to publication, prototype inventions, ideas for products, software, curriculum, etc.) can be commercialized and bring in revenue (Slaughter & Rhoades, 2004). More collaboration between industry and universities has led to the influx of revenue from the private sector. Some scholars have cited these behaviors as a harmful reaction to state budget cuts, while others have posited these as opportunities for institutions to gain more freedom from the states (Ikenberry, 2009). All these behaviors are, in essence, replacing public revenue with private sources of income, i.e., privatizing institutional finances.

Some scholars have made it clear that public research universities would not likely become completely privatized or become private universities because of their funding structure and traditionally public missions (including state claims on their assets); instead they would

simply call for more financial support from the state (Eckel & Morphew, 2009b; Wiley, 2006). Considering the difference in funding structure between public and private universities, replacing reduced state annual appropriations in public universities requires a very substantial sudden infusion of endowments from private funds, which very rarely happens. However, one needs to be more cautious when making this type of argument. Facing instability in state appropriations, fund-raising campaigns among public universities (e.g., UW and the other institutions I examine in case studies) became very popular, as did the creation of graduate degree programs that do not rely on state funding (e.g., SSMPs). So, public universities can become increasingly privatized without becoming entirely private.

Along the same line of argument that public universities are becoming more privatized, Ehrenberg (2006) argues against privatization and warns that with privatization comes increased risk of public higher education becoming even more stratified, with "upper- and upper-middle-income students studying at relatively well-funded flagship campuses and lower-and lower-middle-income students studying at less well-funded public comprehensive institutions and two-year colleges" (p. 51). He suggests that in order to improve quality and access to the public higher education system, federal policies should reward states that spend more on their public higher education institutions and need-based financial aid. Although privatization helps flagship public universities compete with their private counterparts, Ehrenberg (2006) strongly recommends that continuous efforts need to be made to enroll students from low- and middle-income families, and this requires better state support.

To echo scholars' concerns about the ever more privatized public universities, I argue that although universities in my sample clearly claimed to uphold diversity in their mission statements, the establishment and expansion of SSMPs are not meaningfully contributing to the

public university mission to provide access to students from diverse backgrounds, regardless of socio-economic status. If these professionally-focused programs are better at preparing students for the labor market, their financial model restricts some students' capability to enroll in them due to financial constraints. On the other hand, if these programs are aiming at generating additional revenue to support other activities in the graduate department or college, as findings from this study will show, in years when fewer students apply, higher level administrators of SSMPs would be tempted to compromise the selection criteria for incoming students for the sake of keeping the program fully enrolled and operating successfully financially.

Within the scope of this dissertation, the intersection and congruence of academic and financial goals of professional master's programs merited deeper investigation. Establishing SSMPs seems to have become a method for public universities to generate revenues that has resulted in limiting access to students who are not able to pay the full cost of their education. By only providing this form of professional education to the financially capable students, public research universities have stepped away from fully serving the public. In this case, considering financial sustainability during the program design itself poses a threat to the public nature of master's programs, even when academic quality and professional development serve as the primary goals.

2.3 Diversity in Higher Education Institutions

Diversity, in describing humans, is not easily defined, considering its manifestation through differences in race, ethnicity, gender, sexuality, religion, class, national origin, language, culture, and so on (Knapp & Yeh, 2012). The articles in the *Encyclopedia of Diversity in Education*, edited by James Banks in 2012, serve as good references for understanding this concept. In relation to education, the term diversity is so widely used in the contexts of student

diversity or diverse students, further scrutiny of the usage is required, especially around sensitive topics like students' race, ethnicity, socio-economic background, linguistic background, and more (Knapp & Yeh, 2012). This section of the literature review starts with a description of the philosophical orientations along a political economy spectrum underlying different beliefs about diversity, followed by the usage of the term diversity in the field of education, specifically higher education, and ends with a summary of the benefits of having diverse students in graduate programs.

To understand the differences underlying beliefs regarding diversity, Vavrus (2012) recommended the most appropriate approach is to distinguish the three major contested conceptualizations of the term diversity from different philosophical orientations on a political economy spectrum, namely social conservatism, liberal multiculturalism, and critical multiculturalism. Briefly, "social conservatism on the political right is the most dominant opponent of diversity" (Vavrus, 2012, p. 2); liberal multiculturalism is the political centrism that "contains elements of social conservatism but seeks to manage and accommodate diversity within the existing structure of a liberal nation-state, a form of governing that is based on individual rights" (Vavrus, 2012, p. 2); and critical multiculturalism is the political left of these positions that "rejects certain underlying assumptions of liberalism and focuses on how power relations within a stratified society affect diversity" (Vavrus, 2012, p. 2). Vavrus (2012) recognizes that people may shift their orientations in practice depending on their interests in terms of a particular diversity matter.

Before offering examples of these three conceptualizations, it is essential to first describe the different theoretical understandings of diversity in relation to education using the above-mentioned three contested conceptualizations. Social conservatism, described by Ladson-Billings

(2003) and McLaren (1994), with its emphasis on the individual and private arena of life and an exclusionary common culture (which is historically white and European in the U.S. context), upholds that everyone has equal opportunities to become successful based on merit, that educational resources should not be allocated based on students' financial needs, and that the role of public education is to assimilate individuals into a homogenous common culture and disregard the relevance of culturally diverse groups. Liberal multiculturalism, as explained by Ladson-Billings (2003) and King (2001), recognizes the legitimacy of people of diverse group identities, and the fundamental value of having a culturally diverse group to the larger society, however, it also assumes, like social conservatism, that the goal is to fold these different cultures into the common culture. For example, universities recognize the cultural differences among their changing student populations; however, these differences can be recognized and treated as equal as long as they do not mobilize against the existing campus culture. Critical multiculturalism, largely in opposition with both social conservatism and liberal multiculturalism, assumes that "wealth and economic achievement gaps among social class groups are inherently unequal" (Vavrus, 2012, p. 4); therefore, it is necessary to seek justice and equity for all rather than meritocracy and equal opportunity (Banks, 2004; Grant & Sleeter, 1998; Nieto, 2000; Sleeter, 1996).

Then, to move from theoretical understanding of the conceptions to practice, Vavrus (2012) gives a summary of seven contested issues around diversity in education. First, the interpretations of the social, political, and economic impact of different racial and ethnic backgrounds are not shared. Second, color blindness, a conservative perspective, means that people are evaluated based on merit without consideration of the relevance of racial and ethnic differences. Third, affirmative action is a "policy instituted in public and private organizations to

purposefully and intentionally recruit and promote individuals who have historically been discriminated against and excluded from participating in mainstream political and social activities" (Baptiste & Villa, 2012, p. 36). An example of this policy in practice is considering race and ethnicity in the college admission process. While conservatives are against it and liberal multiculturalists embrace it, critical multiculturalists question the effectiveness of this approach to make structural changes.

Fourth, social conservatives support color-blind, zero-tolerance policies around student discipline in schools that dismiss the cultural diversity of students, which ended up disciplining disproportionally more students of color; critical multiculturalists argue against such policies and claim that not all citizens are equally protected under the law by them. Fifth, the "culture of poverty", which means that poor people share characteristics and values that would perpetuate their impoverishment (Bourgois, 2015), is believed by conservatives to explain the disproportion of diverse peoples of color who are poor and not successful educationally and economically, while critical multiculturalists claim that the cause of poverty is that the capitalist economy is structurally stratified with inherent inequality among classes.

Sixth, one politically dominant language is preferred by social conservatives, so they perceive diverse languages as a disadvantage, while liberal multiculturalists and critical multiculturalists appreciate language diversity. Seventh, social conservatives consider ethnic and multicultural studies in the school curriculum as a threat to the common culture upheld by the dominant white group. For example, Hirsch (2009), as a representative of this line of thinking, argues against a curriculum that incorporates diversity and instead advocates for assimilating students from diverse groups into a common-culture curriculum through schooling in order to close achievement gaps. However, critical multiculturalists claim that Hirsch misread the

American history of schooling, which has been filled with conflict over ethnic identities and public condemnation of diverse identities.

Lastly, social conservatives' understanding of religion and sexuality is largely about regarding homosexuality as a life choice rather than as a biological reality. While liberal multiculturalists argue against the former statement and recognize the diverse sexual and gender identities extant and therefore advocate for programs that provide safe space for students of diverse sexual orientations, critical multiculturalists assert that these programs are mistakenly focusing on individuals rather than addressing the structural issues at the institutional level.

To summarize briefly, social conservatives, liberal multiculturalists, and critical multiculturalists neither share the same understanding nor promote similar practices in terms of diversity in the field of education, although some overlaps exist between multiculturalists who are liberal and those who are critical. Scholars who uphold any of these perspectives differ in how they approach their research and what they advocate for that is beneficial for the U.S. Acknowledging this inherent disparity in value systems that inform practices and policies, I take the perspective of critical multiculturalism in my arguments and analysis in this dissertation.

In higher education, the term diversity is mostly used in the context of student diversity or diverse students (Knapp & Yeh, 2012). Student diversity in education is applied in three major ways in the literature. It has been used "as a collective property of the whole," referring to a group, community, or population; "as a property of an individual," referring to individual attributes; or "as a collective property of a subset of the whole," referring to attributes of particular groups or populations other than the rest (Knapp & Yeh, 2012, p. 2088). Knapp & Yeh (2012) consider the first definition of student diversity, "a collective property of the whole," meaning student diversity is a collective property of all students, the most appropriate for three

reasons. First, the other two usages are ambiguous in distinguishing who diverse students are and what makes them diverse. Second, they imply the existence of dominant versus non-dominant groups. Third, they are obscure and can refer to any sensitive attributes or differences (e.g. in the usages of "diverse students" or "students who are culturally diverse") without considering how individuals or groups contribute to the collective diversity and the society embedded with power differentials. I concur with Knapp & Yeh's (2012) usage of student diversity in educational research, as they precisely stated that "individuals in all their dimensions matter" (p. 2090).

With this understanding of the term student diversity, an inspection of the changing landscape of higher education pertaining to diversity is also crucial. In the U.S. higher education system, racial and ethnic diversity of student enrollment has been increasing. For example, in the last 20 years Hispanic student enrollment at the undergraduate level changed from 10.3 percent in 1995–1996 to 19.8 percent in 2015–2016, Black student enrollment changed from 12.3 percent to 15.2 percent during the same period, and international student enrollment changed from 0.6 to 2.8 percent (Espinosa et al., 2019). Similarly, the landscape of master's education has been changing to a large extent due to the changing student composition of master's programs in the U.S. Earlier, I highlighted the increase in master's degree attainment by women students, ethnic minority students, and international students in the past couple of decades. In 2015-2016, among all racial and ethnic student groups except for those enrolled in master's programs in for-profit institutions, almost half of each racial and ethnic group enrolled in master's programs in public 4-year institutions and the other half enrolled in private not-for-profit 4-year institutions. A caution here is that the enrollment percentages for American Indians/Alaska Natives, and Native Hawaiians or other Pacific Islanders were more volatile due to the low numbers of each group, so that their trends were hard to discern. The American Indian/Alaska Native group had

more enrolled in the public sector, whereas the Native Hawaiian/other Pacific Islanders group had less.

In terms of field of study for master's programs among all minority groups, approximately 20 percent of each racial and ethnic group were enrolled in business and management; between 23 and 40 percent of each racial and ethnic group were enrolled in education and health fields combined. Similar to the disciplinary distribution of ethnic minority students, most white students enrolled in the fields of education and health combined (40%) and business and management (20%) (Espinosa et al., 2019).

Educational scholars like Turner, Garcia, Nora, and Rendon (1996) have argued that, to ensure the educational outcomes of an increasingly diverse student population, higher education institutions should seize the opportunity that diversity brings to reexamine their missions, values, and conventional practices, and take actions accordingly (Turner et al., 1996). The Association of American Colleges and Universities (AAC&U, 2015) published a report calling for institutional commitment to equity and inclusive excellence, emphasizing the importance of expanding access to quality education, which can ultimately make the opportunity to enroll in higher education real for all people. However, the reality, as the report revealed, was that, "at all levels of US education, there are entrenched practices that reinforce inequalities—and that lead to vastly different outcomes for low-income students and for students of color" (AAC&U, 2015, p. 3) than for students from higher social-economic status groups and other racial groups.

The American Council on Education published a statement in 2012 urging universities to embrace diversity as a key component of their missions, reasoning that "diversity enriches the educational experience"; "it promotes personal growth and a healthy society"; "it strengthens communities and the workplace"; and, finally, "it enhances America's economic

competitiveness" (ACE, 2012). Issues related to diversity can be reflected in many aspects of higher education, including but not limited to curriculum, teaching and learning, student experiences, faculty, administration, leadership and governance, and research. Informed by literature, I will discuss the student diversity aspect with a focus on access to graduate education, also known as compositional diversity in graduate education, considering this is the first and fundamental step in ensuring that any subsequent steps to achieve equity, inclusion, and diversity can be accomplished (Griffin, 2012; Chang, 2012). Compositional diversity refers to "the numerical and proportional representation of various racial and ethnic groups on a campus" (Milem, Chang, & Antonio, 2005, p. 15). Relatively few empirical studies have focused on compositional diversity that concerns enrolling students of diverse groups. Most researchers agree that, although achieving compositional diversity is an essential first step, by itself it is not going to lead to the maximization of educational benefit for students without engaging in curriculum diversity and increasing student-to-student interaction across diverse groups (Chang, 2012).

More broadly, in terms of educational benefits of diversity for college students, two lines of research have been conducted: a psychological-lens, student-level body of research that focuses on how interacting with diverse students and engaging in curriculum that exposes students to knowledge about race and ethnicity can contribute to students' cognitive development (Denson, 2009; Bowman, 2010; Gurin et al., 2002); and institutional-level research that examines the environmental effects of diverse institutional context on students' ability to interact with each other and increase their knowledge about student diversity (Denson & Chang, 2009; Smith & Schonfeld, 2000).

Although these studies highlighted undergraduate students' experience after they are already on college campuses, similar studies exist at the graduate level. At the graduate level, racial and ethnic diversity in the student body has educational value for all students (Hurtado et al., 1999; Milem, 2003; Smith, 2015). The benefits of racially and ethnically diverse postsecondary educational experiences include but are not limited to promoting more active learning, higher intellectual engagement, and deeper citizenship and cultural engagement (Gurin, Dey, Hurtado, & Gurin, 2002). A diversity of perspectives can foster the innovation necessary to tackle complex research problems (Page, 2007). In many graduate fields of study, these benefits are critical for understanding the issues being researched, such as preparing individuals for effective professional practice in multiracial settings and fostering creativity and innovation through the embrace of multiple perspectives (e.g., Harvey & Allard, 2014; Page 2007). Diversity of ideas also comes with the diversity of the talent pool. The National Academies strongly recommended that STEM master's and Ph.D. programs continuously expose students to multiple worldviews, promote interdisciplinary activities involving individuals from different backgrounds, welcome international students, and employ diverse approaches to teaching and learning (National Academies of Science, Engineering, Medicine, 2018).

Many SSMPs were established in STEM fields or as interdisciplinary programs (e.g., data science, human-centered design and engineering). It is critical to create equitable opportunities for the involvement of underrepresented groups in such programs. Higher education's responsibility is to advance social progress (Bowen, 1977). Although enhancing the structural diversity of a student body is not sufficient to produce outcomes such as growth in values, attitudes, content knowledge, cognitive skills, and academic skills, it is a necessary first

step (Hurtado, 2007). Breaking down institutional barriers and taking initiatives to improve access and success for students of color is imperative, argues Hurtado (2007).

Given that SSMPs are housed in public universities, they should adhere substantively to the mission statements of their respective institutions. In public research-intensive universities, "commitment to diversity" in mission statements is common; however, mission statements are not always operationally substantive, nor do they necessarily guide strategic planning or institutional behaviors (Morphew & Hartley, 2006). Earlier research did find that two SSMPs within one specific field were not compromising the public mission of state-funded universities (Hagigi, 2014); however, whether or not these programs adhere to the diversity mission is unknown.

In this dissertation, I will explore the implications of the expansion of SSMPs specifically on the student compositional diversity among the sample universities. As Milem, Chang and Antonio (2005) suggested, compositional diversity can play a key symbolic role in indicating diversity as a priority for the institution and its leaders, but must not be the only dimension of diversity that an institution seeks to develop. Considering the essential role compositional diversity plays on a university campus, hereafter, when I use diversity in the findings and discussion chapters, it refers to student compositional diversity.

Chapter 3. Research Questions and Informing Theories

3.1 Research Questions

Given the increasing frequency with which public universities are engaging in revenue-generating strategies and the lack of detailed understanding of the institutional rationale and procedures for establishing SSMPs in public research universities, I designed my dissertation research to answer the following research questions.

1. What motivated public research universities to establish master's programs that are independent of state funding?
2. What are the organizational processes that public research universities adopted in establishing SSMPs?
3. Is the expansion of SSMPs undermining the mission of diversity and inclusion in sample public research universities? If so, how and why?

To answer the research questions, I drew on resource dependence theory, institutional isomorphism, garbage can decision-making theory, human capital theory, and signaling theory. The need for multiple theories is due to the exploratory nature of the study, in the hope of contributing to a more comprehensive understanding of the issues surrounding the SSMPs. These theories were used to illuminate he higher education institutional decision-making processes and are popular in studies examining similar research topics. Competitive strategy and academic capitalism were also considered as possible theoretical lenses of relevance in explaining institutional revenue-generating behaviors but were eliminated due to inappropriateness to address the research questions. In the next four sections, I provide a brief explanation of each theory, its application to higher education institutions, and its relevance to the research topic of

SSMPs. At the end of this chapter, informed by literature and guided by theoretical lenses, I develop hypotheses derived from the research questions.

3.2 Resource Dependence Theory

Resource dependence theory (RDT) is defined as "the extent to which a focal organization depends on resources controlled by nominally independent parties in its environment" (Pfeffer & Salancik, 1978). When facing environmental uncertainties or declining resources, Davis and Cobb (2010) described the three strategies institutions adopt based on RDT: compliance, cooperation, and resource diversification. For example, organizations adopt compliance strategies to more or less reluctantly accept additional demands by the external resource providers. The cooperation strategy category refers to organizations that invite the external resource providers to be part of organizational activities to achieve goals defined by the organization and presumably agreeable to both parties; organizations adopt resource diversification strategies to locate new resource providers.

RDT is perhaps the most comprehensive of the theories in the scope of its approach to organizations, especially at explaining how organizations seek to manage their environments. RDT has had a widespread intellectual influence that has spread to a variety of disciplines, including the field of education. When examining higher education institutions' revenue-seeking behaviors, Hagigi (2014) applied RDT to shed light on one resource diversification strategy that public research universities adopt in the climate of declining state appropriations— establishing SSMPs. Also guided by RDT, Jaquette and Curs (2015) found that there is a strong negative relationship between state appropriations and non-resident freshman enrollment over time, and this negative relationship was stronger at public research universities than at master's or baccalaureate institutions. Based on the results of panel data analysis, these authors argued that

public universities facing state budget cuts increase enrollment of nonresident students for the additional tuition they bring. When discussing the adoption and production of master's degrees, Jaquette (2011) derived arguments from RDT and found that prestigious universities use revenues from master's degree programs to subsidize the pursuit of prestige in undergraduate education.

Public research universities' revenue is mainly composed of state appropriations, student tuition and fees, research grants and contracts, and gifts and endowments. There is a representative body of literature investigating universities' revenue-generating behaviors when state financial support severely decreases. The impacts of diminishing state support on public higher education are also well documented (Hearn, 2003). Thus, RDT would be appropriate to examine whether institutional revenue-generating behaviors, such as establishing of SSMPs, are driven by the need to replace "lost" revenue.

3.3 Institutional Isomorphism

Isomorphism is defined as "a constraining process that forces one unit in a population to resemble other units that face the same set of environmental conditions" (Hawley, 1968) and it captures the process of homogenization. Institutional isomorphism was introduced by Kanter (1972) in the statement that, "the major factors that organizations must take into account are other organizations." Carroll and Delacroix (1982) recognized that organizations compete not only for resources and customers but for political power and institutional legitimacy, as well as social and economic fitness. In other words, in their view, institutions competing with other institutions for the same resources become isomorphic in order to achieve political power and institutional legitimacy.

DiMaggio and Powell (1983) further identified three mechanisms that are manifested in institutional isomorphic changes: (a) coercive isomorphism, which "stems from political influence and the problem of legitimacy;" (b) mimetic isomorphism, which "result[s] from standard response to uncertainty;" and (c) normative isomorphism, which is "associated with professionalization" (p. 140). In the context of higher education, Meyer, Ramirez, Frank, and Schofer (2007) argued that institutional theories predict a high degree of isomorphism, which explains the remarkable resemblance of higher education institutions and systems to one another over time—despite the variation in social, cultural, and economic conditions within countries or across the world.

In discussing the rationales for establishing SSMPs and the design of their program structure, Hagigi (2014) found mimetic isomorphism the most appropriate category for his cases in describing the similarities of two self-sustaining public health master's programs in two research universities. Hagigi (2014) drew from mimetic isomorphism because uncertainties in state funding contributed to institutions' isomorphic behaviors in his cases where administrators of the focal programs were seeking solutions from other institutions that faced similar challenges. However, this type of mimetic isomorphic behavior—that is, establishing SSMPs when state funding for specific programs diminishes—only helps address financial uncertainties. Beyond the scope of Hagigi's (2014) work, normative isomorphism is present to a certain extent across disciplines and helps exemplify academic motivations for establishing programs to satisfy professional needs and for legitimacy. Normative isomorphism can be developed after certain mimetic isomorphic behaviors become popular and accepted as a standard method of operation. The best example to illustrate normative isomorphism is the "formal education and legitimacy of

the knowledge base required of a field" (Tuttle & Dillard, 2007, p. 394), such as the training process for acquiring a Ph.D. in the field of accounting.

3.4 Garbage Can Decision-Making Theory

Privatization's impact on the decision-making process of public research universities can also be understood using the framework of garbage can decision-making theory as applied to organized anarchy (Eckel & Morphew, 2009a). "Organized anarchy" is understood as "obscenely decentralized, and specialized subunits . . . nested under one another with apparently no means of communicating information above, below, or sideways on the organizational chart" (Eckel & Morphew, 2009a, p. 94); these subunits are understood to have "poorly defined goals, unclear technology (i.e., how things work, not the debate between open source and proprietary information technology), and fluid participation of key constituents" (Eckel & Morphew, 2009a, p. 94). In the article introducing garbage can decision-making theory, Cohen, March, & Olsen (1972) considered a university as an example of organized anarchy given its complex organizational system and that not all individuals within the organization share the same goals in making choices. Universities can be viewed as organizations providing sets of procedures for individuals within them to follow and interpret in the process. Based on this perspective, which was informed by seven studies on universities, Cohen, March, & Olsen (1972) summarized that a theory of organizational decision making must concern itself "with a relatively complicated interplay among the generation of programs in an organization, the deployment of personnel, the production of solutions, and the opportunities for choice" (p. 2). They also argued that, metaphorically, a choice opportunity–an opportunity for decision-making–within an organization can be viewed as a garbage can filled with all kinds of problems and solutions dumped into it by participants. After one garbage can is filled up, it will be removed and replaced with a new

garbage can. What gets mixed together in one garbage can depend on the timing of garbage-dumping behaviors, the capacity of the garbage can, and the schedule of garbage collection and garbage-can replacement. Thus, garbage can decision-making refers to "streams of problems, solutions, and participations converge in the metaphoric garbage can to shape and dictate choice opportunities" (Eckel & Morphew, 2009a, p. 95).

In this theory, the four key components to decision making are problems, solutions, participants, and choice opportunities. According to Cohen, March, & Olsen (1972), problems are concerns people have inside and outside of the organization that require attention, such as state budget cuts to public universities during an economic recession. Solutions are products developed by people who are constantly looking for problems to solve, such as a self-sustaining funding model that has been adopted by business schools and continuing education units in public universities which they try to "market" to other units. Participants in the decision-making process are neither always fully engaged nor staying constant, depending on the choice opportunity being selected and the time each participant has available; for example, the faculty who initiated an SSMP could leave the institution to pursue other professional opportunities in the middle of developing an academic program proposal. Choice opportunities are occasions where organizations are expected to make a decision, such as the choice between finding another faculty member to replace the person who left in the middle of developing a program proposal or terminating the program proposal. In the garbage-can decision-making process, decisions are not made rationally to maximize organizational benefit, efficiency, or effectiveness; rather, they are made by chronological proximity and accidents of timing. Although this decision-making theory involves problems and solutions, most often the decisions universities make do not resolve problems; instead they are simply a choice made while the problem continues (Cohen, March, &

Olsen, 1972). Timing, in many cases, determines the coupling of problem and solution and the involvement of particular decision makers. The understanding and interpretation of a problem changes over time. If a problem is not coupled with a solution soon enough, a different solution or problem will present itself by the time a decision is called for. Also, individuals within a university have limited time and energy for making one decision when many decisions, important or not, require attention at the same time.

Decisions are usually made in one of three ways in organized anarchy (Cohen & March, 1986): (a) by *resolution*—where participants make a collective effort to find a solution for an agreed-upon problem; (b) by *flight*—when the problem is attached to an unintended solution or participants, or when the original decision is no longer a choice, such as when a suggested foreign language requirement triggers discussions of new faculty hiring and resource constraints (Eckel & Morphew, 2009a); and (c) by *oversight*—when key decision makers have no time to engage in the particular decision-making process, and then problems and solutions are coupled simply when no one is paying attention. A decision made by resolution is the closest to the rational decision-making process but is relatively unusual. Cohen and March (1986) noted that universities do not make all decisions by presenting all the possible options first and then evaluating which ones will most likely lead to the best outcomes to determine the solution to the problem; rather, they tend to make decisions by flight or oversight.

Eckel and Morphew (2009a) argued that garbage can decision-making theory is very illuminating in explaining public research universities' decision-making process when the decision involves privatization. The researchers used the theory to construct six propositions, of which three are appropriate for the case of SSMPs. First, when facing external changes, universities tend to create new units to interact with external audiences in the hope of rendering

quicker decisions. For example, Clark (1998) found, in the entrepreneurial institutions he studied, additional units outside of the academic core were created to interact with an external audience to better position the universities in the market. Second, as the number of actors in the decision-making process increases, the ability to achieve shared understandings decrease, thus resulting in fewer decisions made by resolution. For example, starting a new SSMP requires the involvement of department faculty and staff and leadership, sometimes college/school leadership, and staff from university/college extension units that are not likely to share the same goals. Third, strategies associated with privatization tend to follow the fast-paced, market-driven sense of time so timing that plays a central role in determining when a decision is made. For example, although the time from program initiation to launching varies, self-sustaining programs might start enrolling students far sooner than when the program is fully prepared in order to get additional revenue from an additional cohort of students. Besides these three propositions, another two of the six propositions proposed by Eckel and Morphew (2009a) are also related to timing, and the sixth proposition suggests that leadership would pay more attention to new revenue-generating programs, so decisions about them tend to be made by resolution.

3.5 Human Capital Theory and Signaling Theory

Both human capital theory and signaling theory help explain the market-demand side of master's education, so I explain both of them in one section. Human capital theory illuminates students' demand to earn master's degrees in the hope of gaining additional economic benefit through higher subsequent earnings and signaling theory sheds additional light on employers' demand to hire master's degree holders for the skills (i.e., human capital) these degrees signal. Human capital theory asserts that education and training is the most important type of investment in human capital and is reflected in increased productivity in the labor force, where high

productivity brings high economic return when markets are functioning efficiently (Becker, 1994). This framework, which researchers have widely used in studies on the economic benefits of postsecondary education and related human behavior, helps explain why students are flooding into more advanced education at the graduate level (Perna, 2005; Titus, 2007).

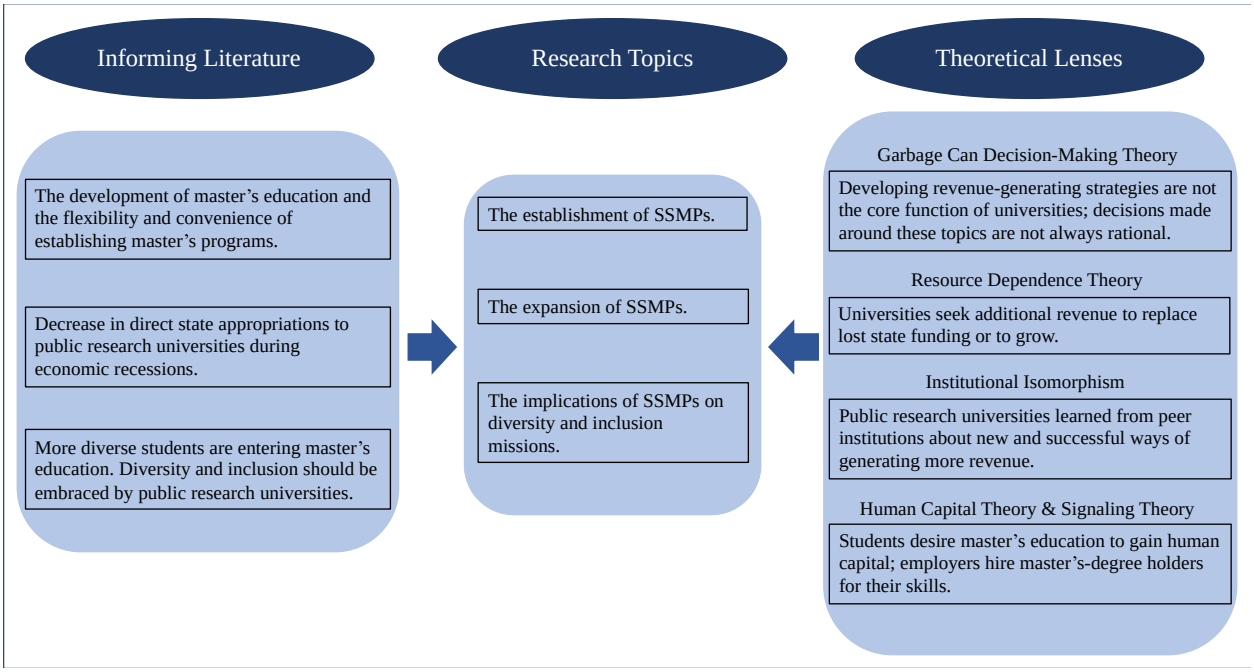
On the labor-market side, signaling theory explains how employers determine candidates' likely level of productivity based on their formal educational credentials in the absence of more accurate signals (Spence, 1978). Employers associate one's likely capabilities with formal credentials and have increasingly raised hiring standards in terms of degree credentials, often without concrete knowledge of what a degree encompasses. This is especially problematic at the master's level, given the confusion in nomenclature and variation in program content. Employers tend to expect skills such as in leadership, management, and communication in their candidates with master's degrees; however, these skills are usually part of the training of particular master's programs, such as the MBA, but not necessarily offered in all other master's programs (Gallagher, 2014). The demand from employers for such skills has pushed universities to create programs or program components that satisfy these needs and has pushed students to invest in master's programs that give credentials in expectation of higher salary.

In summary, Figure 1 below represents the conceptual framework described above, showing how the informing literature and threads of theories weave together to help us understand the phenomenon of SSMPs. Driven by the increased enrollment in master's programs and changing student demographics, identified students' and employers' demand for professional degrees, public research universities learned from peer institutions, and made decisions to establish SSMPs to be more independent of state appropriations, at least when these were hard to come by, and gain more autonomy from the state. Through this conceptual framework, I

developed hypotheses to explain the institutional rationale for establishing and expanding SSMPs and to explain the implications of SSMPs on the diversity and inclusion missions of public universities.

Figure 1

Conceptual Framework



3.6 Hypotheses Development

Based on the conceptual framework above, I developed the following hypotheses regarding the institutional rationale for establishing and expanding SSMPs and their implications on the diversity and inclusion missions of public research universities.

Hypothesis 1: Factors motivating public research universities to establish and expand SSMPs include: decline of state appropriations during economic recessions, evidence of the success of similar practices from peer institutions, more students entering higher education and graduate education systems especially those in professional fields in market demand.

Hypothesis 2: Although the process of establishing SSMPs involves different stakeholders from those in establishing state-funded master's programs due to the distinct financial mechanism, the financial mechanism creates threats to academic standards.

Hypothesis 3: Considering the financial mechanism of SSMPs, which does not allow state-subsidized funding opportunities to be offered to students, these programs are enrolling disproportionately (compared to state-subsidized programs) more students who are capable of paying relative to students from underrepresented minority backgrounds, thus undermining the diversity and inclusion missions of public universities.

In the next chapter, I will present the research design and implementation process that I designed to test these hypotheses.

Chapter 4. Research Design

To test the hypotheses proposed in the previous chapter, I designed a qualitative multi-site comparative case study to understand the institutional decision-making processes regarding establishing and expanding SSMPs. I compared six programs in different disciplines across three sample institutions in three states. In this chapter, I will describe the chosen methodology, sampling techniques, data collection, and analysis procedure, as well as discuss the researcher's positionality, study validity and reliability, and limitations.

4.1 Methodology

Qualitative methodology suits the exploratory purpose of this research study. Whereas quantitative research relies on big enough sample sizes and statistical analysis to generalize causal relationships between variables, qualitative research focuses on "meaning in context" (Merriam, 2009, p. 2). Within the realm of qualitative methods, I chose a multi-site case study design. By definition, case studies are suited for understanding some contemporary non-controlled social phenomena, especially for an "in-depth" exploration of the nature of these phenomena (Yin, 2014). A case study as a research method "relies on multiple sources of evidence, with data needing to converge in a triangulating fashion" and "benefits from the prior development of theoretical propositions to guide data collection and analysis" (Yin, 2014, p. 17).

In this study, I examined institutional rationales for establishing and expanding SSMPs and the implications for universities and students. Given the wide variety of stakeholders involved in the decision-making process of any institution, for instance deans, central university administrators, program administrators, and faculty, there is no monolithic rationale for decisions even within one institution. Also, the research questions are qualitative in nature. To address

them, I collected and analyzed qualitative and quantitative data from six SSMPs in three flagship public research universities in three states.

4.2 Sample Selection

I started off implementing a purposeful sampling technique to select three institutional cases that would tell the most about the research topic (Patton, 2002). State contexts are essential to understanding how public research flagship universities interact with their states and how intuitional policies vary in relationship to state higher education governing structures (Weerts & Ronca, 2006; 2012). Therefore, I sampled three public state flagship research universities in three states with different state higher education governing structures to maximize the variation in sampling: State A on the West Coast, State B in the Midwest, and State C in the South (see Table 1 below). The reason for choosing these three states lies in capturing relationships between states and their flagship public research universities in differently governed states, which is likely to be essential to understanding the establishment and approval processes of SSMPs in each institution. This maximum variation in sampling based on state higher education governance structure also enhances the external validity of this qualitative study (Merriam, 2009). For example, States A and B are not involved in the approval process for new SSMPs; however, the university C system in State C rather than the State C higher education coordinating board oversees the new academic program creation process in that state. Besides, the higher education coordinating board does ensure that new programs, including SSMPs, can only be established after statewide notice to all universities in the state. All three states share a strong interest in expanding their graduate education capacity—especially at the master's level.

To protect the confidentiality of the institutions and especially the individual informants within each institution, I will present a comparison table with detailed information about each

institution without naming them. Table 1 provides an overview of key characteristics among the three sample institutions, including location, control, state higher education governance, Carnegie classification (2018), total enrollment (fall 2018), graduate enrollment (fall 2018), master's degrees conferred (2017–2018), the first year a SSMP was started on record, the total number of SSMPs by September 2017, and state appropriations as a percentage of institutional revenue in 2017. A detailed comparison of sample institutions is presented in the next chapter.

Table 1

Sample Institutional Profiles

Institutions	University A	University B	University C
Location	West Coast	Midwest	South
Control	Public	Public	Public
State and/or University System Higher Education Governance	State higher education coordinating board	No single statewide higher education coordinating or governing board; system-wide governing board (Board of Regents of University B System)	state higher education coordinating board; system-wide governing board (Board of Regents of University C System)
Carnegie Basic Classification (2018)	Doctoral university: very high research activity	Doctoral university: very high research activity	Doctoral university: very high research activity
Total Enrollment (Fall 2018)	> 47,000	> 44,000	> 51,000
Graduate Enrollment (Fall 2018)	> 12,000	> 8,000	> 11,000
Master's Degrees Conferred (2017–2018)	> 3,900	> 2,200	> 3,000
Year First SSMP Established	1983	1999	1995
Total Number of SSMPs (September 2017)	111	48	26
State Appropriations (Percentage of Total Revenue in 2017)	9%	10%	14%

Within each institution, I sampled SSMPs based on the following criteria: (a) full-time program for students, (b) in-residence program, and (c) programs that have graduated more than one cohort of students. The reason for choosing only full-time programs was that international students could only be enrolled full-time due to visa requirements and they are an important part

of U.S. graduate education and my research interest. My choice for in-residence programs is based on the fact that funding models, structure, and student populations are different from those of online programs. Online programs do not require international students to obtain visas since they are not physically on campus long enough to trigger the visa requirement. The reason for choosing programs that have graduated more than one cohort of students is that usually the number of graduates in the first year of a new program differs from later years, and having alumni of the program helps with the understanding of student placement. In most cases, I was able to sample similar disciplines across institutions; at the same time, within each institution, I tried to maximize variation across programs in order to obtain a spectrum of disciplinary differences. At the graduate level, disciplinary differences profoundly affect culture, program design, and program outcomes (Berelson, 1960; Golde & Walker, 2006).

To get assistance with sample program selection, I conducted initial phone interviews with assistant deans in charge of academic program establishment in the graduate schools of the sample institutions. They helped me identify SSMPs I could potentially contact for my research. Based on their recommendations, and through online searches on university websites, I identified a list of ten SSMPs that seemingly satisfied the sampling criteria. Considering that not all SSMPs are offered in the same disciplines across institutions, I tried to select similar disciplinary programs. After reaching out to program administrators, I learned that four out of the ten programs did not meet the sampling criteria in terms of the program history and structure. Two programs had just started recruiting their first cohort, delayed one year from their original plan. One program turned out to be 100 percent online, and one program was for part-time students. As a result, the list of programs I eventually chose for my sample are: mechanical engineering, information management, and statistics from University A; statistics–data science from

University B; and software engineering and economics from University C. Although the total number of SSMPs at University B is higher than that of University C, more than half of B's are online programs that do not satisfy the sampling criteria.

I then adopted a snowball sampling strategy of interviewing informants, starting with the person who was potentially most knowledgeable. Snowball sampling of informants is the most commonly used strategy for getting referrals from informants after the researcher has established some shared understanding after the interview (Patton, 2002). To further screen and identify informants with the most knowledge of the topic, I purposefully sampled the following individuals who worked directly with SSMPs in some capacity: program directors, administrators, and faculty. They possessed the necessary working knowledge of SSMPs. In addition, given the academic approval role the universities' graduate schools play in the academic program establishment process, I sampled administrators in the graduate schools who worked directly with departments on establishing SSMPs.

4.3 Data Collection Procedure

The data collected for the study are composed of two components: qualitative and quantitative, according to the nature of the research questions. I collected first-hand qualitative data through semi-structured interviews, while quantitative data came from secondary institutional data from the sample institutions and programs.

Interviews were especially useful when I was not able to observe informants' behaviors directly, and they helped to reveal informants' perspectives and actions (Merriam, 2009). I chose semi-structured interviews as a method for its flexibility, which allowed informants to answer more freely and the researcher to ask open-ended questions to follow up on specific points. Especially in a case study, typically the interviewees are more knowledgeable than the

researcher, thus semi-structured interviews, rather than structured interviews, also permit informants to shape their responses based on their understanding of the topic (Yin, 2014). The protection of anonymity was guaranteed to informants prior to the interview process. Although the institutional data on graduate-level admission and enrollment was found on publicly available webpages, not all institutional quantitative data on SSMPs is publicly available. So, I made requests to each institution to get access to data specific to these programs (see Appendix I for Sample Email Request). Driven by the research questions and conceptual framework, I drafted interview protocols to cover essential topic areas and to follow the same procedure for each informant. Sample interview protocols are presented in Appendix II. During these semi-structured interviews, I asked whether I might be granted access to institutional data beyond what is publicly available on the universities' websites. In response, the graduate schools in all three institutions emailed program-level admission and enrollment data to me. I also reviewed policy documents and archived documents of SSMP proposals and reviews, which were either accessed from university websites or were sent to me by university administrators via email.

During the research implementation process, the key first step is gaining access to key organizations and interviewees (Yin, 2014). I made initial contact via phone with two assistant deans for academic affairs in the Graduate Schools of University B and University C and met one assistant dean in person at University A. All three assistant deans serve as the stewards of academic program proposals. In these universities, any new program establishment is required to go through them.

Since I chose the case study method, unlike with quantitative research design, the researcher's behavior is more constrained in terms of when and where to conduct interviews and how closely to follow the predesigned interview protocols (Yin, 2014). I conducted all semi-

structured interviews via telephone or in person from late 2017 to early 2019. Approval by the University A Human Subjects Division under its Institutional Review Board was acquired prior to any data collection activity. I followed up three to five times with a number of informants at each case institution. Each semi-structured interview lasted between 30 and 150 minutes, with most lasting 60–90 minutes. Most of the interviews were in one-on-one format, except for two interviews where I interviewed two informants at the same time. None of the informants were compensated. At University A, I conducted semi-structured interviews in person from September 2017 to September 2018, including five follow-up interviews. At University B, I conducted all data-collection activities via phone interviews from June 2018 to February 2019, including three follow-up phone interviews. At University C, I made initial connections via phone interviews from March to June 2018 and later followed up with in-person interviews in October 2018.

In total, I interviewed 32 informants, including faculty, administrators, directors in each SSMP, associate deans and deans in the college/school where the SSMPs were housed, administrators from the central Graduate School, administrators from university extension units, and administrators from the system-wide university administration, if applicable (see Table 2 below). I took notes throughout all interviews. The interviews were recorded with permission from the interviewees and further transcribed for analysis.

Table 2

Interview Participants by State, University, Program, and Role

State A			
University A			
University Extension Unit administrators	2		
The Graduate School administrators	3		
College dean, associate deans	4		
	Info. Management	Mech. Engineering	Statistics
Dept. chair, faculty, staff	2	2	2
Subtotal by university	15		
State B			
University B			
University Extension Unit administrator	1		
The Graduate School administrators	2		
	Data Science		
Dept. chair, faculty, staff	3		
Subtotal by university	6		
State C			
University system high level administrator	1		
University C			
The Graduate School administrators	2		
College dean, associate deans	2		
	Software Engineering	Economics	
Dept. chair, faculty, staff	4	2	
Subtotal by university	11		
Totals by State			
All of University A	15		
All of University B	6		
All of University C	11		
Total Participants	32		

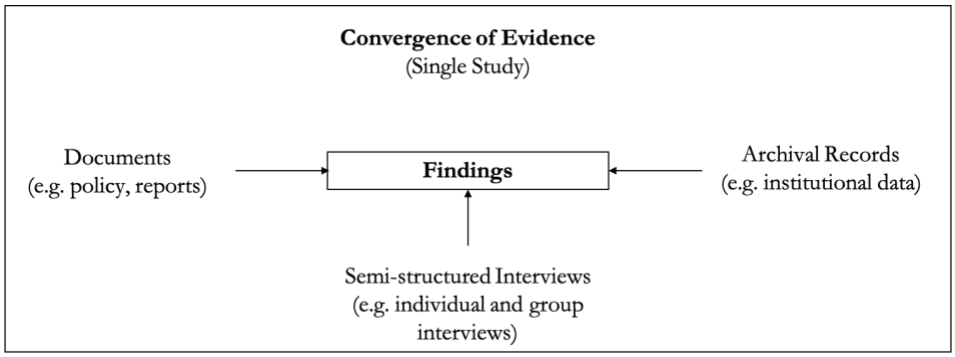
4.4 Data Analysis

I conducted qualitative data analysis during and after interviews. The quantitative data analysis took place either prior to the interviews using existing data sources I had access to or after the interviews when I gained access to institutionally protected data. In the case study method, the triangulation of two or more sources of evidence is critical (Yin, 2014) and it enhances the credibility and consistency of the qualitative research findings (Creswell & Miller, 2000; Mathison, 1988). Sources of evidence in the triangulation process include but are not

limited to archived academic program documents, institutional financial reports, relevant policy documents, online/website information, interview transcripts, and institutional data on SSMPs and students. Through triangulation, I achieved "convergence of evidence" (Yin, 2014, p. 121) (see Figure 2 below).

Figure 2

Illustration of Convergence of Evidence



During the data analysis, I performed the following analytical steps. First, I followed Merriam's (2009) recommendations to analyze the interviews and my notes as soon as I gathered them and before further data collection efforts. This allowed me to use the interview content collected earlier in the process to help inform later interview efforts. I paid particular attention to content that would be helpful to address my research questions and looked for evidence that supported or contradicted my hypotheses (Merriam, 2009). Content that emerged organically from interviews with multiple participants or with a single participant at different time points was especially meaningful. The cross-participant analysis helped me establish reliability and trustworthiness in the findings (Lincoln & Guba, 1985; Merriam, 2009).

Then, by listening to interview recordings and reading transcripts for each case (SSMP), I started with open coding of data, guided by the conceptual framework. Each open code represents a meaningful or potentially meaningful segment of text of interview transcripts

(Merriam, 2009) and must "reveal information relevant to the study," which stimulated me "to think beyond that particular bit of information" (Lincoln & Guba, 1985, p. 345). From the beginning of the coding procedure, I concealed my informants' identities to protect against possible professional backlash against them and ensure the reliability of the information. Followed by open coding of all transcripts, I conducted analytical coding using the previously determined open codes. This process involved categorization that was part of an initial "primitive outline or classification system" (Merriam, 2009, p. 181) to reflect recurring ideas across interviews. I noted patterns, made comparisons and contrasts, and clustered concepts in order to condense and distill the data, and through this process, generated meaning from the data (Huberman & Miles, 2014). In this phase of analysis, I frequently grouped, ungrouped, and regrouped codes to best formulate the most relevant categories (Patton, 2002). I present sample codes in Table 3 to give a glimpse of the process of the open and analytical coding.

The final step I took for qualitative data analysis was a deductive process that involved defining categories, verifying that each category contained a series of codes, and ensuring that a specific unit of text supported each code. These categories were then used to form a coherent "story" about SSMPs that addressed the research questions. I followed White and Marsh's (2006) recommendations to "use analytical constructs, or rules of inference, to move from the texts to the answers to the research questions", and paid attention to keep texts and context logically independent, in order to "draws conclusions from one independent domain (the texts) to the other (the context)" (p. 27). The goal was to create a "logical chain of evidence" where relationships between variables made sense and the data told a story (Huberman & Miles, 2014, p. 290).

Table 3

Inductive Coding Example

Examples of Open Codes	Example of Categories	Themes	Theoretical Construct
SSMPs to generate revenue; additional revenue generated supports other programs; run academic programs like businesses; ways to use the additional revenue.	Benefits of revenue generated by SSMPs.	One rationale of establishing SSMPs is to generate revenue for the department and college/school.	Resource dependence theory.
State funding constraints; unpredicted future of state funding; no state funding to develop new programs; self-sustaining model allows for program development; economic recessions in 2008–2009.	State budget cuts and financial uncertainty.	State funding is not available to establish new SSMPs during economic recessions.	Resource dependence theory.
Program conversion; existence of self-sustaining model; steady enrollment.	No obvious reason for state-funded programs to become self-sustaining.	Some SSMPs are converted from state-funded programs for no apparent academic or financial reasons; converted solely due to the existence of self-sustaining model and persuasion of continuum college.	Garbage-can decision-making theory.
Similar programs at other institutions; national ranking of programs; university response to state funding uncertainty.	Benchmarking peer institutions.	Graduate depts. learn from successful examples of master's programs in peer institutions.	Institutional isomorphism.
Students' interest; large number of applicants to Ph.D. program; good program reputation; market research; career outlook in the field.	Demand for master's education.	Some students are interested in pursuing master's education, and some employers are interested in hiring master's degree holders.	Human capital theory and signaling theory.

Additionally, the purpose of quantitative data collected was to complement the qualitative data collection and analysis. The purpose of the quantitative data analysis performed prior to interviews was to enrich my understanding of the topic I was going to investigate. The purpose of post-interview quantitative data analysis was to verify and validate findings from the qualitative data analysis.

I analyzed the quantitative data to show the trends in admission and enrollment in SSMPs, state-funded master's programs, and all graduate students in each institution. Although descriptive, these figures and tables that I generated from the quantitative components of the study provided the necessary backdrop about institutions, programs, and student body, in order to address the third research question concerning whether and how the expansion of SSMPs potentially impacted the diversity and inclusive missions of the universities. For example, by looking at enrolled student gender, race/ethnicity, and citizenship data since the programs' establishment, I was able to compare these data points broadly to other graduate programs. Since I have gained access to admission data for all programs from all three institutions for the past 5 years (if the programs have been established for longer than 5 years), I was able to perform some calculations. For example, I calculated the selectivity of the programs, namely the ratio of the number of offers made over the number of applications received, as a measure of whether or not these programs prioritize financial stability over academic quality.

4.5 Internal Validity, Consistency, and Transferability

In quantitative research, ensuring the reliability and validity of the research conducted is essential. Although different from quantitative research processes, it is equally critical for qualitative research to maintain the study's reliability and validity through a careful conceptualization of the research problem; the rigor in data collection, analysis, and interpretation processes; and trustworthy presentation of findings (Merriam, 2009). Merriam (2009) recommends strategies to enhance the reliability and validity of qualitative studies, which are to address concerns in terms of internal validity, reliability, and external validity.

Establishing an understanding of the meanings of internal validity, reliability, and external validity in the context of qualitative research is appropriate before moving into

discussing strategies. Internal validity, or credibility in qualitative research, "deals with the question of how research findings match reality" or the "truth" (Merriam, 2009, p. 213), however, qualitative research can never capture the objective "truth", just the constructed reality. Reliability, or consistency, according to Merriam (2009), refers to "the extent to which research findings can be replicated" (p. 220). However, she stated that replication of research findings is not always possible in qualitative research, given sometimes it involves multiple understandings of one reality. Instead, she adopted Lincoln and Guba's (1985) understanding of reliability in qualitative research, which deals with whether or not the results make sense (Lincoln & Guba, 1985), or in other words whether or not the interpreted research findings are consistent with the data collected.

External validity is concerned with "the extent to which the findings of one study can be applied to other situations" (Merriam, 2009, p. 223). In qualitative research, external validity is understood as transferability, in which "the burden of proof lies less with the original investigators than with the person seeking to make an application elsewhere. The original inquirer cannot know the sites to which transferability might be sought, but the appliers can and do" (Lincoln & Guba, 1985, p. 298). Although investigator can make some reasonable estimates, they are required to provide rich descriptive information to make transferability possible.

Merriam (2009) suggested that both internal validity and reliability can be enhanced by triangulation of data sources, member checks, peer review/examination, or sharing of the researcher's positionality; and external validity can be improved by providing a rich description of the contexts of the research or maximizing variation during sampling. For this dissertation, I enhanced the rigor and trustworthiness of the research through triangulation of data sources during the research implementation process, member check strategies during the initial coding

and interpretation of findings, peer discussions of select research findings with three social science Ph.D. candidates who implemented qualitative dissertation research, providing a reflection of the researcher's positionality, rich descriptions of the research contexts, and maximum variation in sampling. I have described the triangulation of data sources and maximum variation in sampling in previous sections.

I applied member check strategies during the initial interpretation of interview transcripts, where I later emailed three informants to confirm my understanding of interviewee responses. These three informants were among the earliest interviews I conducted where I did not ask clarification questions during the interview. In later interviews, along with taking notes, I was able to clarify during the interview any information I was not understanding. All the informants I contacted with follow-up questions responded to me. As for peer examination, I was able to discuss my initial findings selectively with three qualitative social science researchers by sharing with them what interviewees mentioned along with the institutional contexts, without revealing interviewee identities. Both of the researchers corroborated my interpretations of the interview transcriptions.

In the next section, I will share the reflection on my positionality, including assumptions, worldviews, biases, theoretical orientation, and any relationship to the study that may have affected the investigation and interpretations. I will present a rich description of the research context in the next chapter to enhance the external validity, or transferability, of the findings of this study.

4.6 Researcher's Positionality

In qualitative research where the researcher is the instrument, the researcher is required to state his or her positionality and what potential biases were brought into the study due to the

researcher's background (Patton, 2002). Stating a researcher's positionality is also a recommended strategy for enhancing the internal validity of qualitative research (Merriam, 2009). I completed my undergraduate education in China, majoring in physics and English, in 2011 and earned a master's degree in higher education in the U.S. in 2013. Having majored in Physics cultivated my appreciation and understanding of science disciplines and statistics. As an international student researching a U.S.-based topic, I brought a fresh perspective to the understanding of context without being bound by extensive prior knowledge of the country. I learned to understand the U.S. research university system by having worked in the graduate school at the institution where I pursued my graduate education for more than seven years with a variety of units, ranging from admissions, to student affairs, to data management. Therefore, my perspective for understanding how U.S. graduate schools and universities work was certainly informed by my professional experiences. I am very cautious about not overgeneralizing based on my rich knowledge of the one institution where I pursued my graduate work, considering that U.S. higher education is not uniform and each university manages its affairs differently. Although being a foreigner can sometimes place hurdles on one's experience due to cross-cultural communication misunderstandings, I took advantage of speaking with a foreign accent during the data collection process. When I did not gain a clear understanding of an interviewee's response, I asked for clarifications, repetitions, and paraphrasing. At the same time, interviewees were more lenient with their responses to make sure that I understood them well. Realizing how my professional and educational experience might affect me during the research process is essential for the audience of this dissertation as well as for me in researching and composing this dissertation.

4.7 Limitations

There are three limitations of this study pertaining to the research design of a case study: first is the sample selection; second is the data collection regarding interviews; third is the generalizability of the findings. Although I tried to maximize variation in sampling institutions in states with different higher education governing structures, I used convenience and purposeful sampling to sample programs rather than stratified sampling that would have potentially yielded more comprehensive findings, especially in enhancing external validity. Given scheduling challenges, data collection via interviews took longer than the original plan. Also, the nature of a case study is to explore a social issue in depth within a bounded setting, not to generalize across contexts of the entire U.S.

Although a case study provides insights that would not otherwise be revealed, it is a resource that consumes the researcher's time, and it is costly (Yin, 2014). The end of the data collection process is determined by the researcher based on knowledge and experiences. Given no clear definition of how much data should be collected, I ended data collection when the data was able to tell a coherent story and was sufficient to address my research questions.

During the interview process, scheduling was challenging, especially when key informants (e.g., deans) were too busy to schedule a meeting within several months of the request. Extending the length of data collection is not uncommon when the researcher is in the field (Merriam, 2009). The telephone interviews conducted were, in some aspect, inferior to in-person interviews due to the lack of social cues (e.g., facial expression, body language) and the likely lesser degree openness of informants (Bryman, 2012). However, phone interviews are still favored over other forms of asynchronous interview methods, such as email interviews. I was

able to receive signed consent before recording all phone interviews. Utilizing phone interviews allowed me to contact people whom I might otherwise not have reached.

The generalization of qualitative research findings has long been debated in research design. The purpose of a qualitative case study is not to generalize across all contexts but to make meaningful conclusions within the research context. With a thick description of each case in its organizational context, readers may be able to adapt the findings of this study to their own or other institutional contexts.

Chapter 5. Profiles of Case Universities and Case Programs

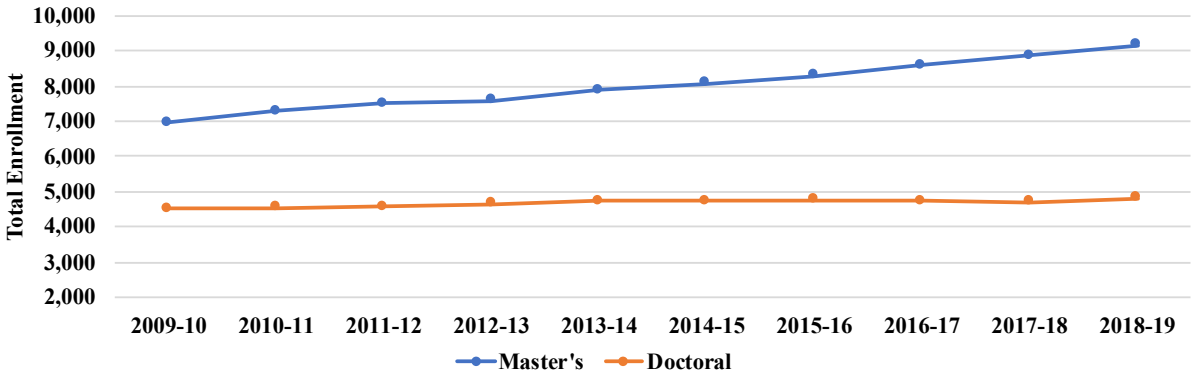
It is crucial to contextualize the rationale for and process of establishing SSMPs within each institution, considering its diverse institutional history and culture. In this section, I will provide state, institutional, and program contexts, case by case. Within each case, I will first delineate the state-established projections of supply and demand for graduate-degree holders, as well as the state's higher education governing structure and statewide higher education strategic planning priorities relevant to the development and expansion of master's education; then I will provide the institutional context, including trends of graduate enrollment and the history and development of SSMPs; and finally, I will describe in detail the background of sample SSMPs in the sample institutions, including the history, development, structure of the program, and admission and student enrollment trends.

5.1 Case 1—University A on the West Coast

University A is a large public research university on the West Coast. The total enrollment in fall 2017 was approximately 46,000, including more than 13,000 graduate students in master's, doctoral, and professional programs. The university granted 800 doctoral degrees and 4,500 master's degrees in the 2017–2018 academic year. In the most recent decade (2009–2019), graduate enrollment at University A increased overall. The largest increase was at the master's level, while enrollment at the doctoral level has remained stable over the same period (see Figure 3 below). Similar to other state-funded universities, University A plays a crucial role in contributing to the economic development of State A, including contributing to meeting the state's workforce demands.

Figure 3

Graduate Enrollment at University A: 2009–2019



Source: Enrollment Data, The Graduate School, University A

5.1.1 State A—Higher Education Governance

In the United States, all fifty states have a state-level higher education governing body to oversee or consult with higher education institutions in different areas, such as admissions, program establishment, tuition rate-setting, and mission oversight. State postsecondary education governance systems play a vital role in the policy and decision-making process that affects a state's ability to pursue its education and workforce goals (Fulton, 2019). Although no two states have the same postsecondary governance system, states' postsecondary governance falls into the following four general structural models: (a) single, statewide governing board; (b) single, statewide coordinating board/agency (e.g., State A and State C); (c) one or more system-wide coordinating or governing boards (e.g., State B); and (d) administrative/service agency (Fulton, 2019). There are shared responsibilities among state higher education governing and coordinating boards; however, the functions of a state higher education governing body and their impact on the management and performance of flagship public universities varies by state (Knott & Payne, 2004). I will describe the role of the state higher education governing body in each of the three sample states in corresponding sections in this chapter.

In 2012, State A disbanded the formerly established Higher Education Coordinating Board (HECB). As a result, the state transferred some of the HECB's authorities to a coordinating agency that focused more broadly on the transition from secondary to postsecondary education, rather than solely on higher education. By statute, this agency, established in 2012, "provides strategic planning, oversight, advocacy, and program administration to support increased student success and higher levels of educational attainment in State A" (State A Higher Education Agency, 2014).

The former HECB had responsibilities for reviewing and evaluating operating and capital budget requests for each of the 4-year public institutions in the state, recommending tuition and fee policies, reviewing and approving degree programs, and overseeing telecommunicated education. However, concerning higher education, the new agency focuses more on disseminating messages of the importance of higher education to all stakeholders, aiming towards the goal of increasing high school and postsecondary degree attainment of state residents and playing a minimal budgetary and regulatory role for institutions (State A Higher Education Agency, 2013). The establishment of this new agency and the elimination of the former HECB suggest a diminished role of State A in governing and regulating its higher education institutions, including University A. The relationship between the former HECB and public 4-year institutions was loose compared to states with consolidated governing boards (Lacy, Jr, 2011), but the new agency provided abundant opportunities for University A to take more control of its budgetary process and increase alternative revenue-generating behaviors.

As of 2019 in State A, each 4-year public institution is governed by an individual statutory governing board with eight trustees serving on most of the boards—with the exception that 10 members are on the Board of Regents of University A. In general, the governing boards

are responsible for the operation of the university and the establishment of local administrative rules and policies. The Board of Regents now has the ultimate decision-making power over approving tuition rates and the establishment of state-funded programs at this university. On the self-sustaining side, the provost of University A has the highest authority over program approval, and the Board of Regents is simply informed of any new SSMPs in the form of a presentation during regular Board of Regents meetings. Since sample SSMPs in University A were established when the former HECB was in place, it is pivotal to understand the role of that board in approving new SSMPs. Although the former HECB had the statutory responsibly of approving and reviewing degree programs, the University A Board of Regents is the governing body that controls the university (ECS, 2019).

5.1.2 State A—Workforce Demands

All state universities have an obligation to serve the state education system and workforce development needs, and University A is not an exception despite the weak role State A's higher education agency plays. Every other year, multiple agencies in State A evaluate the state's workforce demands under the guidance of the most recent 5-year strategic plan. The evaluation report typically includes the number of forecasted net job openings in broad occupational categories at each level of higher education and training and the number of credentials the education system needs to produce in order to respond to the job forecast. University A uses this workforce demand forecast as a pivotal criterion to justify the need for new graduate programs, as academic departments are required to provide evidence on existing regional or national workforce demand prior to any discussion of the formal SSMP establishment process.

The most recent version of this report, published in 2017, identified that among mid-level jobs, the most substantial shortfalls in supply are in the computer and information science, technician, service, and education occupations; gaps at the graduate and professional level are in computer science and health occupations. In particular, for graduate degree holders, the projected unmet demand (by currently projected workforce supply) for 2020–2025 is 6,712, centered in the fields of business, computer and information science, and health professions (State A Skilled and Educated Workforce Update, 2017). I will note later in this chapter how earlier versions of these projections influenced the establishment or continuation of SSMPs at University A.

5.1.3 State Appropriations to University A

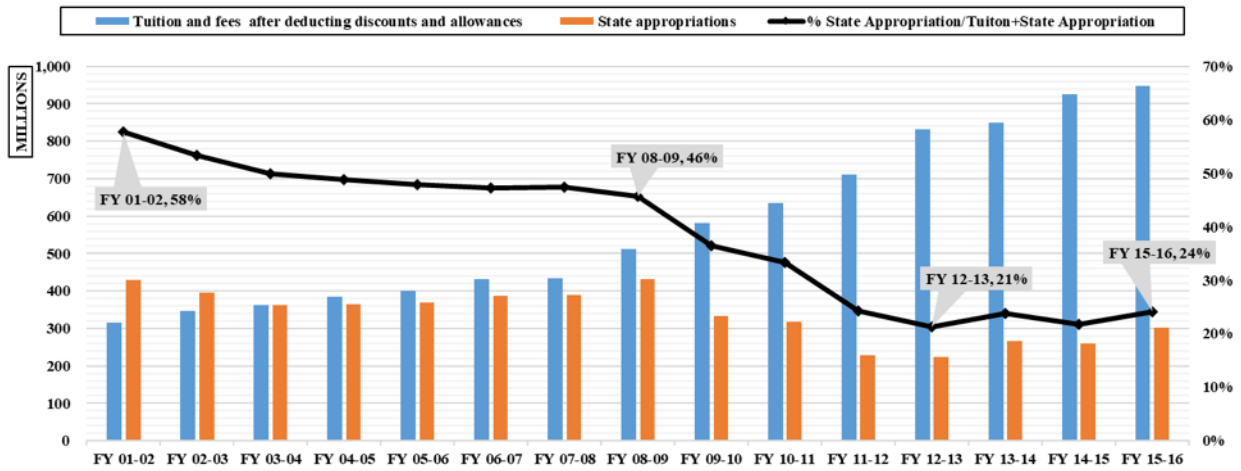
During recessions, state governments cut most budget categories, especially those of their higher education institutions. University A suffered severe budget cuts from the state during the 2008–2009 economic recession and immediately succeeding years. Similar to state universities in other states, this budget loss was never fully recovered. Although SSMPs at University A started much earlier than 2008, only a very limited number of SSMPs were established prior to 2000. Many more SSMPs were established around 2001-2002 and 2008-2009, both recession periods in the state. Therefore, an understanding of changes in state appropriations (as revenue to University A) is instrumental in understanding the changes in the university budgetary process. In order to illustrate the changed budgetary situation at University A, Figure 4 below shows selected inflation-adjusted financial facts over 15 fiscal years, between FY01–02 and FY15–16, based on available data from IPEDS. University A did experience two slight dips in state appropriations in two single years in the 1980s and 1990s, but none of those declines lasted longer than one year. In Figure 4, state appropriations stayed relatively stable before FY08–09, then dipped from FY09–10 to FY12–13 and slowly recovered somewhat from FY13–14 to

FY14–15; however, the level of appropriations had not recovered to the pre–FY09–10 level by the end of the data series, FY15–16.

Figure 4 shows how tuition and fees have been rising throughout the last 15 years, in major part to make up for the loss of state appropriations. Compared to the two other universities in the sample, tuition and fees increased the most at University A. Still, the ratio of state appropriation to the summation of state appropriation and tuition revenue saw a sharp dip around the Great Recession of 2008–2009 and never recovered. Figure 4 shows the important role tuition revenue has come to play at University A. Creating more SSMPs and enrolling more students in SSMPs seems to have been a very effective way of increasing revenue for the university and the relevant departments.

Figure 4

State Appropriations at University A: FY01–02 to FY15–16



Source: Institutional Financial Characteristics, IPEDS

5.1.4 History of Self-Sustaining Master's Programs at University A: 1980–2018

At University A, according to a report published by its Graduate School in 2014, the first two SSMPs were established in the 1980s in the fields of engineering and business in order to

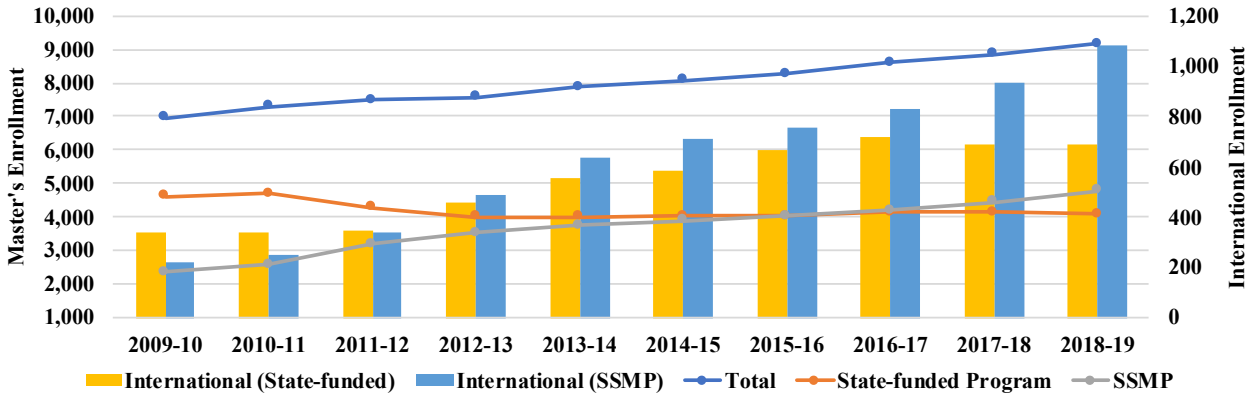
cater to educational needs of working professionals. Between the 1980s and 2009, SSMPs were established on an ad-hoc basis without significant growth. In 2009, as described, the university experienced severe state budget cuts and the provost allowed state-funded programs to convert to SSMPs. Permission for this conversion resulted in a sharp increase in the number of SSMPs. Between 2009 and 2013, 21 state-funded master's programs converted to SSMPs. The move was controversial and, since 2013, state law has forbidden existing state-funded programs from converting to a self-sustaining model. However, new SSMPs continued to be established between 2013 and 2019. As of 2019, among all the SSMPs the university offers, 55 are administered by the University extension unit, while the remaining 21 are administered by individual professional schools like business, law, and medicine. The University extension unit is the business arm of University A that is responsible for administering the majority of the SSMPs, including monitoring their annual financial situation. It charges a fee to SSMPs to cover the cost of marketing, student enrollment management, and reporting services. The university extension unit also provides loans to new SSMPs to help with the start-up cost. The remaining SSMPs are administered by colleges themselves, such as the university's business school and law school. In all, from two programs in the 1980s, SSMPs grew to 76 in 2019 (University A Office of Planning and Budgeting, 2019).

Figure 5 shows the trend of master's enrollments in SSMPs and state-funded programs at University A from 2009 to 2019, with highlights on enrollment trends of international students in SSMPs and state-funded programs. In Figure 5, the blue line represents the total master's enrollment over time, the orange line the enrollment in state-funded master's programs, and the gray line the enrollment in SSMPs. The yellow column represents international student enrollment in state-funded programs, and the blue column international student enrollment in

SSMPs. The graph shows that student enrollment in SSMPs has been increasing steadily since 2009, while master's students enrolled in state-funded programs experienced a sharp drop around 2010 that has never been recovered. A startling observation is that the proportion that international students made up in SSMPs was 9.8 percent in 2007, but increased to 13.8 percent in 2013, and then to 22.6 percent in 2019. This increase means that international students make up a more significant proportion in SSMPs than they do in state-funded programs— the proportion that international master's students make up in state-funded programs was 16.9 percent in 2019.

Figure 5

Master's Student Enrollment at University A: 2009–2019



Source: University Profile Interactive Dashboard, University A.

5.1.5 Stated Rationale for SSMP Establishment

What are the officially provided reasons for the rapid establishment and expansion of SSMPs after 2008? The Graduate School's report on SSMPs published in 2014 did not elaborate on the reasons for the university to offer SSMPs. Both the Registrar's Office and University A's Extension Unit did provide rationales. According to the University Registrar's frequently asked questions for SSMPs on their webpage, the official reason for University A to offer SSMPs is that the state can no longer afford to provide financial assistance for colleges and schools to

design new programs, but at the same time the university does have academic resources, infrastructure, and reputation for supporting new program establishment. Thus, it is argued that the university established these programs because of lack of state support.

The university extension unit published the SSMP policy handbook in January 2014 and revised it in November 2017. The policy handbook explicitly states that the institutional rationale for establishing SSMPs includes "providing more access for students," "the potential for academic units to generate net revenue," "greater flexibility in pricing," and "quick response to market demand to allow additional students entry into the program." (University A Extension, 2017, pp. 3) Besides these rationales, this policy handbook also specifies how SSMPs can help the institution and graduate departments better utilize university and departmental resources to educate more students.

Graduate departments usually do not keep records of the reasons for starting SSMPs. During my investigation process, I discovered this fact and validated it by explicitly asking departments about written records. However, I learned that program proposals are usually archived with the academic affairs unit within the Graduate School at University A, which documents the stated reasons by graduate programs for starting SSMPs. Not all historical documents for all SSMPs could be located. In the section providing detailed descriptions of the three selected programs at this university (information management, statistics, and mechanical engineering), I will discuss the stated reasons for starting these SSMPs. These findings are supported by interviews with departmental faculty, relevant deans, and administrative staff.

5.1.6 Stated Procedure for SSMP Establishment

Each university has its administrative way of establishing new programs, including the establishment process for SSMPs. At University A, based on interviews with academic affairs

staff in the Graduate School who have worked with departments to design new program proposals for 14 years, the initial idea of starting an SSMP tends to come from faculty members and then got passed on to the dean of the college/school or to the department chair. In some cases, it was a dean or a department chair who started thinking about an SSMP and invited faculty to be part of the discussion. The average time for a program to launch from idea initiation could be as short as 1–2 years and as long as 3–4 years. The decision to pursue the SSMP option has to be signed off by deans of the relevant college or school. Based on the interviews with deans, they usually recognized that state support is not likely to recover to previous levels. If they want to grow and maintain the quality of doctoral programs and other college priorities, additional revenue is needed.

According to the Graduate School policy document of University A, all new graduate degree programs need to follow the same academic review process with the Graduate School and receive approval from the Graduate Council (a university-wide faculty body), the dean of the Graduate School, college/school deans if applicable, the provost, and the Board of Regents. Establishment of new SSMPs not only requires the formal academic review process, but also requires a separate budget proposal that involves negotiation among the program administrators, the college/school that houses the program, and the university extension unit because all new SSMPs have to be managed by it. In the case of SSMPs administered by an individual college (e.g., business school), the college determines the budget as a result of negotiation among faculty and administrative leadership.

The budget proposal serves as the initial financial blueprint of the program, mainly describing how the revenue from student tuition will cover the expenses of the program. Based on accounts of staff members from the Office of Planning and Budgeting, tuition rates for

SSMPs are typically selected from a list of existing tuition tiers or justified explicitly by the program if adopting another market-based rate. The market rate is usually determined based on market research analysis that includes data about career prospects, graduates' salaries, student demands, peer institutions' charges, and more. Students in SSMPs are not allowed to accept state-subsidized funding opportunities. Upon negotiation between SSMPs and in rare cases, with state-funded programs, very limited number of students from some SSMPs can take classes outside of their pre-defined curricula. In these cases, revenue allocation would be discussed as well.

Besides the involvement of the university and the Board of Regents, accreditation agencies also play a very limited role in the new SSMP establishment. The regional accreditation agency accredits the university as an institution, not on a program-by-program basis. Starting from 2017, the regional accreditation agency requires University A to send all proposals of newly approved SSMPs to it for documentation purposes. No existing record has shown refusal from the accreditation agency for any established SSMP at University A. Besides regional accreditation agencies, some engineering, business, and nursing programs require accreditation by the relevant professional association. However, these programs are mostly at the undergraduate level, with a limited number of them at the master's level. None of the SSMPs at University A are required to be professionally accredited.

5.1.7 Case Study 1: Sample SSMPs in University A

For University A, the SSMP programs in information management, mechanical engineering, and statistics have been selected according to the sampling criteria explained in the research design section. In the following sections, I will describe their program structure, career goals and career support, staffing, tuition, and the selection and characteristics of students.

5.1.7.1 Program I: Information Management

Program Structure.

Established in 2001, the self-sustaining master of science in information management started as a full-time 2-year, cohort-based program requiring completion of 65 quarter credits of core and elective courses. The program intends to develop leaders with skills to manage information systems that meet the needs of organizations of all types and sizes. In 2015, the program started offering six specializations students can choose from in addition to the core and elective courses. The six specializations include business intelligence, data science, user experience, information consulting, information architecture, and information security. For the class of 2019, the program started offering two formats: a 1-year accelerated format and a 2-year extended format. Both formats are designed for full-time enrollment, with different credit-hour requirements. Students in the 2-year format can select two specializations, and those in the 1-year format one specialization. According to the program website, the potential career options for graduates of the program include becoming analysts and consultants, managers, technical specialists, and strategic oversight personnel. Potential employers range from transnational technology companies and government sectors to academic institutions. Another feature of the 2-year format is that it highly recommends that students undertake internships in the second year. Students may complete 2–4 academic credits from internships in the summer quarter or 2 such credits during a winter, spring, or fall quarter.

Career Goals and Career Support.

The program provides all kinds of career support through a designated nonfaculty professional career advisor who organizes workshops and information sessions on topics such as resume building, networking, and interviews, as well as how to find pertinent job listings. An

annual career fair, the Employer Connection Fair, is held at the beginning of each winter quarter within the School of Information. Besides these services within the college, campus-wide career services are also available to students.

Fees and Financial Support.

Full-time tuition for both in-state and out-of-state students in this program was $809 per credit for 2018–2019. The program requires 40 and 65 credits for the respective tracks to graduate, with a total tuition cost of $32,360 for the 40-credit track and $52,585 for the 65-credit track. Based on the course plan for a full-time student in 2019, about 21 credits for each track count towards the required core courses and capstone project, and the remaining credits count for electives or specialization credits. Since students in the SSMPs do not qualify for state-tuition exemption for graduate teaching and research assistant positions, the program does offer a limited number of merit-based scholarships available to all applicants and endowed scholarships for students to which students may apply, in addition to available university, federal, and external funding opportunities.

Selection and Characteristics of Students.

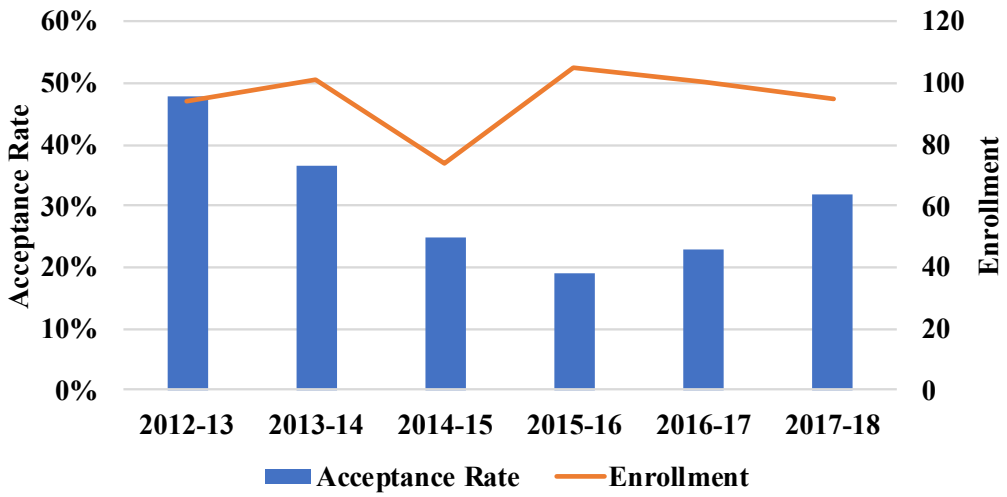
Based on 2017–2018 admissions data, the acceptance rate in this program was 32 percent (with 211 offers made out of 664 applicants). The number of students who accepted the offers was 100 leading to an enrollment of 96, thus the yield rate (the ratio of the number enrolled to the number of offers made) was 45%. Among all enrolled students in 2017, 60 percent (58 out of 96) were international students, the vast majority from China and India.

In Figure 6, a closer examination of the annual admission and enrollment data showed that the information management program has been relatively selective over the past six admission cycles (2012–2018) and has had stable enrollment. Over the same period, the

breakdown of student enrollment by student demographics shows that more than half of the student population consisted of international students and around one-fifth of students were from U.S. underrepresented minority groups.

Figure 6

Admission and Enrollment Trends at University A—Information Management Program: 2012–2018



Source: Graduate Admission and Enrollment Dashboard, The Graduate School, University A

Staffing.[1]

In addition to the career advisor, the program has one full-time staff academic advisor and one full-time nonfaculty program coordinator. In total, the school where the program is housed has two career services advisors and one career services coordinator that serve one undergraduate program, two SSMPs (including information management), and one Ph.D. program. The instructors in this program are a mix of tenure-line faculty and lecturers. The majority of the lecturers teaching in the program have a master's as a terminal degree rather than a Ph.D.

[1] The staffing information was accessed during data collection in 2018, so any subsequent personnel changes in the school are not captured.

5.1.7.2 Program II: Mechanical Engineering

Program Structure.

The mechanical engineering master's program was established as a state-funded program but became self-sustaining in 2012. As of the 2018–2019 academic year, the Department of Mechanical Engineering, within the College of Engineering, offers two SSMPs. One is the master of science in mechanical engineering program for students with undergraduate degrees in mechanical engineering or a closely related field. The other one is the master of science in engineering for students with a non–mechanical engineering background. According to the website, both programs share the same curriculum and degree requirements; however, students without undergraduate mechanical engineering backgrounds must complete undergraduate prerequisites. In addition to the courses, in order to fulfill the degree requirements, students only need to complete a capstone project that does not need to be a thesis; however, if a student prefers to do a thesis, it is their responsibility to reach out to faculty members about the availability of suitable research topics and opportunities. According to the program administrators, only a few students in each cohort typically pursue a thesis option, mostly those who want to pursue a doctoral degree. Both mechanical engineering programs require 6 credits composed of three core courses of two credits each, one required course from a list of options (ranging from 3–5 credits), and 24 credits of electives at both the upper-undergraduate level and the graduate level. Students can discuss course selection with their faculty advisor.

Structurally, the College of Engineering encapsulates more than a dozen departments, and each department has many programs. Similar to the non-departmentalized School of Information, where the information management program is housed, the College of Engineering offers centralized services that students from any department can utilize.

Career Goals and Career Support.

Based on the interview with the staff academic advisor of both programs, students who enter both programs are either in the workforce already or are exploring career opportunities in mechanical engineering. This single staff advisor for both SSMPs believes that the reason students pursue the degree is that a master's degree would set many students apart from those who only got bachelor's degrees. When asked, the staff advisor was not sure exactly why students were motivated to join the programs, and she does not provide any career-related support. She only refers students to the University Career Center or the career services offered by the College of Engineering, which offers many opportunities that students in these two programs can fully utilize. For example, the engineering internship program is a structured program with dedicated advisors to help students find and prepare for meaningful work in engineering.

Fees and Financial Support.

As for the 2018–2019 admission cycle, the tuition cost for the two SSMPs in mechanical engineering is $985 per credit for out-of-state or international students and $535 per credit for in-state students. The program requires 42 credits to graduate (42 credits of coursework for the non-thesis track; 30 credits of coursework plus 12 credits of thesis for the thesis-track), so the total cost of the program is approximately $22,470 for in-state students and $41,370 for out-of-state students. Students need to meet general requirements in both tracks, including core courses and elective courses. As mentioned earlier, students with non–mechanical engineering backgrounds need to fulfill additional prerequisites prior to application to the program. All students need to speak with their faculty advisor to finalize their course plan. Since students in the SSMPs do not qualify for state-tuition exemptions associated with TA and RA positions, students only qualify

for available university, federal, and external funding opportunities. This SSMP does not provide scholarships to its students.

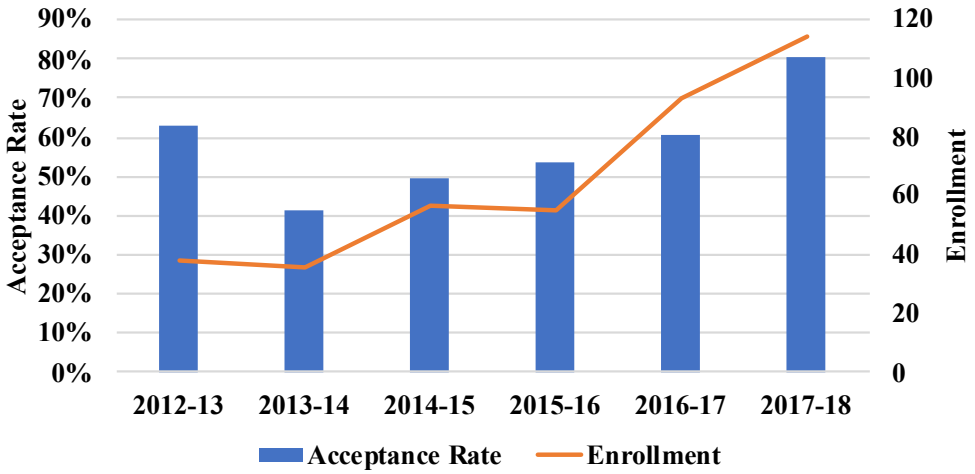
Selection and Characteristics of Students.

Based on 2017–2018 admission data for both master's programs, the acceptance rate (the ratio of the number of offers made by the department to the total number of applications) was 81 percent (417 out of 517 applicants accepted). The number of students who accepted offers and enrolled was 128, and the yield rate was thus 30.7 percent. Among all students enrolled in 2017-2018, 21 percent (27) were in-state residents and 56 percent (72) were international students.

Since the program became self-sustaining in 2012, the acceptance rate has been gradually increasing. For example, in Figure 7, compared to the 2017–2018 acceptance rate mentioned above, 41 percent of students were accepted (109 out of 264 who applied) in the 2013–2014 admission cycle. The yield rate has been relatively stable over the 5 years of data I reviewed, with an average of 30 percent, ranging only from 28 percent to 32 percent. The enrollment tripled in 2017–2018 compared to 4 years ago (in 2013–2014). The increase mainly centered around international students, which grew from an enrollment of 14 in 2013-14 to 72 in 2017-2018. The proportion of international students increased from 26 percent in 2012–2013 to 63 percent in 2017–2018.

Figure 7

Admission and Enrollment Trends at University A—Mechanical Engineering Programs: 2012–2018



Source: Graduate Admission and Enrollment Dashboard, The Graduate School, University A

Staffing.[2]

Both programs share one full-time staff academic advisor and one full-time program coordinator, who is a part-time tenured faculty member. In additional to instructional support by faculty, both SSMPs are supported by this one staff academic advisor, whom students can contact for academic help. The instructors in these two programs are mostly tenure-line faculty.

5.1.7.3 Program III: Statistics

Program Structure.

The statistics master's program is in the Department of Statistics, housed in the College of Arts and Sciences at University A. It was established as a state-funded master's program for students en route to pursuing a Ph.D. but became self-sustaining as a terminal master's degree program in 2012.

[2] The staffing information was accessed during data collection in 2018, so any subsequent personnel changes in the department are not captured.

Career Goals and Career Support.

The program is intended for full-time international and domestic students who wish to receive rigorous training in statistics in order to work in industry or to apply for doctoral programs. According to the faculty director of the statistics SSMP, although the PhD program in the Department of Statistics does not require a master's degree for admission, having a master's degree can potentially make a candidate more competitive. As for post-graduation placement, an alumni survey from the 2018 graduating class reported that, within three months of graduation, half of the graduates pursued a doctoral degree either at the same institution or at another institution, while the remaining half pursued careers in the industry. This survey had a 50 percent response rate.

Fees and Financial Support.

The tuition cost for this program is $925 per credit for out-of-state or international students and $550 per credit for in-state students in the 2018–2019 admission cycle. The program requires 49 credits to graduate (31 credits of required coursework, a minimum of 1 credit of consulting or research credits, and the rest elective, consulting, or research credits), so the total cost of the program is approximately $26,950 for in-state students and $45,325 for out-of-state students. Since students in SSMPs do not qualify for state-tuition exemption, students only qualify for available university, federal, and external funding opportunities. This SSMP does not provide scholarships to its students.

Selection and Characteristics of Students.

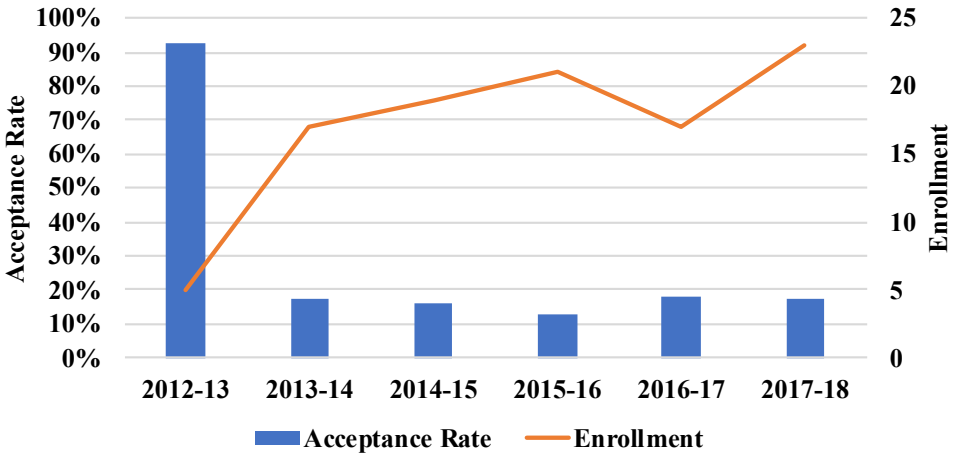
The program only accepts students with a strong mathematical background and requires students to complete a capstone project. Based on the 2017–2018 admission data for the master's program, the program had an acceptance rate of 17 percent (82 out of 476 applicants accepted).

The number of students who accepted offers was 23, so the yield rate was 28 percent. For the 2018 entry class, 24 out of 27 were international students, composing 89 percent of total enrollment. The proportion of international enrollment has been relatively high but stable over the years. Since 2012-2013, only four in-state residents have enrolled in the program, including one in 2013-2014 and three in 2015-2016.

Similar to the mechanical engineering SSMPs that are stand-alone master's programs, the statistics SSMP in the Department of Statistics was the first stand-alone master's program in the department, alongside a state-funded master's program designed for students en route to the Ph.D. The statistics SSMP launched in the 2012-2013 academic year with limited time for recruitment of applicants, but later it became highly selective starting from 2013-2014, as is shown in Figure 8, with an annual acceptance rate ranging from 13 percent to 18 percent. Consistent with the goal of the program contained in the academic program proposal, it has been enrolling almost all international graduate students. Prior to the 2018 entry class, the student body in 2017–2018 was composed of 20 international students and 3 domestic students (87 percent international students). The year before, in 2016, the proportion of international students was 89 percent.

Figure 8

Admission and Enrollment Trends at University A—Statistics Program: 2012–2018



Source: Graduate Admission and Enrollment Dashboard, The Graduate School, University A

Staffing.[3]

One full-time advisor serves as the primary point of contact for students in this SSMP. There is no designated career advisor in the department or the college. Students can utilize the university's centralized career services. Similar to the SSMPs in mechanical engineering, instructors in this program are mostly tenure-line faculty.

In summary, the three disciplinary SSMPs, including both tracks in mechanical engineering I sampled, in University A are all 2-year programs that do not require a thesis for completion. Information management charges a flat tuition, while the other two programs charge differential tuitions for in-state and out-of-state students. With regard to in-state vs. out-of-state enrollment, compared to 51 percent of in-state enrollment among all master's programs in 2018-2019 academic year, both information management and mechanical engineering enrolled much lower proportions of in-state residents, 24 and 21 percent respectively, while the statistics

[3] The staffing information was accessed during data collection in 2018, so any recent personnel changes in the department are not captured.

program enrolled zero in-state students. Since none of the three programs provides funding opportunities with state-subsidized tuition exemptions, students can apply only for available loans or merit-based scholarships funded external to the department. Although all three programs prepare students directly for the workforce, the statistics program also equips students with the relevant knowledge to apply for doctoral programs. Students in all three programs get academic support mainly from a staff academic advisor and get career development support either within the college/school or from the campus centralized service. Student enrollment in all three programs has either been stable or gradually increasing, with a high proportion of international students. In the 2017–2018 admission cycle alone, the mechanical engineering program had by far the highest acceptance rate, followed by information management and then statistics, which are both rather selective in admissions.

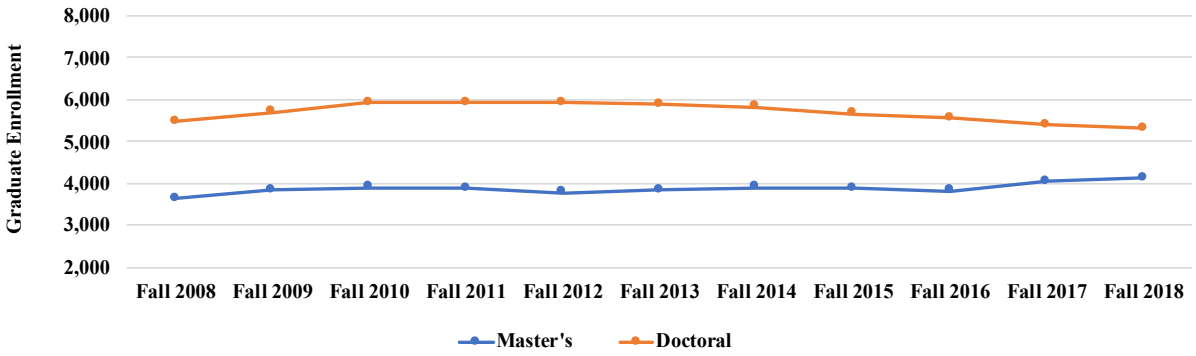
5.2 Case 2—University B in the Midwest

University B, a flagship campus within a state university system, is a large public research university in the Midwest. The total enrollment in fall 2018 was approximately 44,000, including more than 11,000 graduate students in master's, doctoral, and professional programs. The university granted 1,400 doctoral degrees and 2,200 master's degrees in the 2017–2018 academic year. In the most recent decade (2008–2018), graduate enrollment at University B did not experience much growth. Enrollment at the master's level slightly increased, but enrollment at the doctoral level has been declining since 2010–2011 (see Figure 9 below). Compared to University A, with similar total enrollment, University B granted almost twice as many doctoral degrees in the 2017–2018 academic year but only half of the number of master's degrees. Hence, University B has a stronger focus on doctoral education overall. Similar to other state-funded

flagship universities, University B plays a crucial role in contributing to the economic development of State B, including helping to meet state workforce demands.

Figure 9

Graduate Enrollment at University B: 2008–2018



Source: Enrollment Data Dashboard, The Graduate School, University B

5.2.1 State B—Higher Education Governance

Different from the higher education governance structure in State A, State B has no single statewide governing or coordinating board but instead has multiple university systemwide governing and coordinating boards. The Board of Regents of the University B system governs the state's 13 public 4-year universities, 13 freshman-sophomore university centers, and system-wide university extension unit (Education Commission of the States [ECS], 2019; University B system, 2018). Established in 1971, the board consists of 17 members.[4] The president of the Board of Regents, the superintendent of the Department of Public Instruction, and the president or a designee of the State B Technical College System Board serve as ex-officio members of the Regents. The board has statutory responsibility for program planning, coordinating, approval, and evaluation, and is accountable for the use of state and federal funds. Since 2016, the strategic framework that guides the university system aims at strengthening the following four areas: the

[4] Information is accurate as of March 1, 2019, and is subject to change.

educational pipeline, students' university experience, business and community mobilization, and operational excellence—in order to boost collaboration between universities and non-profit organizations, businesses, communities, and local government (University B System, 2016).

From FY13 to FY18, State B was among the 16 states that experienced a decrease in state appropriations per FTE, close to the most significant percentage decline among states (SHEEO, 2019). In particular, the former governor of State B instituted a 5 percent annual budget cut to the University B system starting in FY16. As a result, the University B system had to make plans to meet the reduction within state operations appropriations, which may have negatively impacted course offerings and student services (University B System, 2017). When the new governor took office in 2019, some suspected that he would provide more direct state appropriations to higher education as he unfolds his political agenda. However, considering the potential negative impact of the current public health crisis, COVID-19, on the economy, the future of state appropriations to higher education cannot be accurately predicted.

Although the board is responsible for planning for future state needs for university education, approving university budgets, and establishing a regulatory framework, individual university campuses can operate with some degree of autonomy within the controlling limits of system-wide policies and priorities established by the board (Weerts & Ronda, 2006). Although University B is directly governed by the Board of Regents of the University B system, the establishment of SSMPs does not require the approval of the system-wide board office; this decision is made entirely at the campus level (University B Graduate School, 2018; University B System, 2019).

5.2.2 State B—Workforce Demands

Based on 2016 employment data, the State B Department of Workforce Development projected that, by 2026, besides health-related occupations, the following jobs that typically require a master's degree would have the highest increase in demand: statisticians, with a 43.3 percent change from 2016 to 2026; economists, with a 13.95 percent change; sociologists, with a 22.06 percent change; and anthropologists and archeologists, with a 20.19 percent change (State B Job Center, 2019).

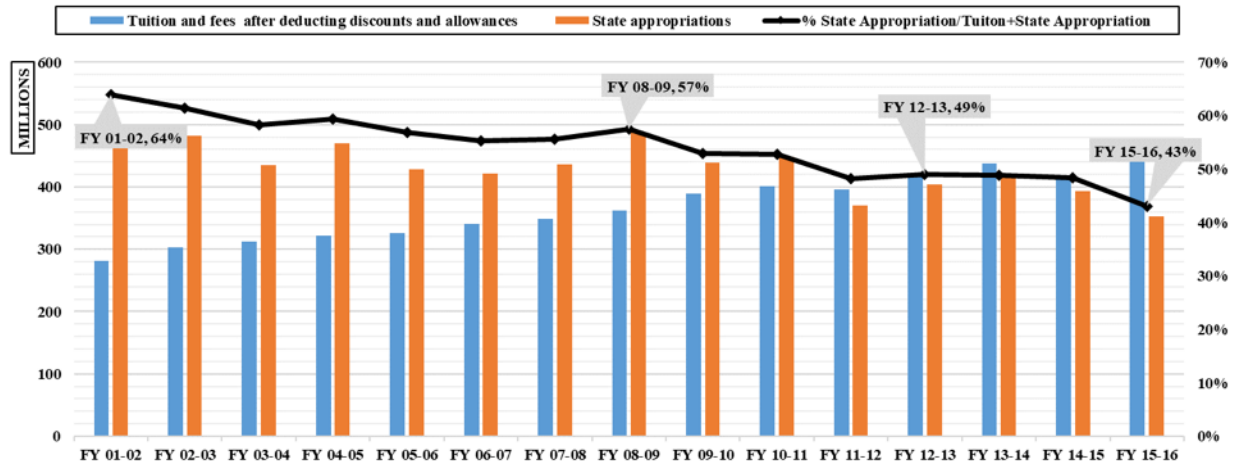
5.2.3 State Appropriations to University B

During and after the recession in 2008–2009, the economy in State B experienced a sharp decline (Carnevale & Smith, 2014). University B suffered severe budget cuts from the state, which have not been recovered since. Figure 10 below shows selected inflation-adjusted financial facts about University B over the past 15 fiscal years. State appropriations stayed relatively stable prior to FY08–09, then decreased moderately from FY09–10 to FY11–12 and reached their lowest level, then recovered slightly from FY11–12 to FY13–14 but started to decrease again from FY14–15 to FY15–16. Even with the slight recovery, the level has not come close to the pre–FY08–09 state support level. The overall long-term trend is a gradual decrease from FY01–02 to FY15–16. Tuition and fees have been rising throughout the past 15 years even after adjusting for general price inflation. This increase was not as steep as what was implemented by University A and is only slightly higher compared to University C, as will be shown later. Besides these facts, the ratio of state appropriation to the summation of state appropriation and tuition revenue has been decreasing since FY01–02 and reached the lowest point around FY15–16. This pattern of continuing decline is different compared to University A and University C, as they both showed slight but steady recovery after FY13–14. As shown

earlier in Figure 9, the master's enrollment at University B has been steadily increasing in the past decade (2009–2019). Later, I will present data to relate the growth of enrollment at the master's level to the growth of SSMPs. Similar to University A, creating more SSMPs or enrolling more students into SSMPs seemed to have been a very effective way of increasing enrollment at the graduate level at University B.

Figure 10

State Appropriations at University B: FY01–02 to FY15–16



Source: Institutional Financial Characteristics, IPEDS

5.2.4 History of Self-Sustaining Master's Programs at University B: 1999–2018

The University B SSMP policy document, published in September 2017, listed 48 SSMP options at University B, housed in 17 academic programs. Here, options refer to different tracks, either state-funded or self-sustaining, of the same academic program. For example, there are seven self-sustaining master's program options in civil and environmental engineering, one of which is civil and environmental engineering – structural engineering. The options allow one academic program to offer both state-funded and self-sustaining tracks with different foci. Among all the 48 SSMP options, 14 are distance-learning programs (University B Graduate School, 2018). An earlier version of the same policy document published in 2015 listed twice as

many distance-learning programs, indicating that departments either chose to include on-site classes in the program or terminated the program.

Historically, the first four SSMP options started enrolling students in 1999. These were in-residence programs in the fields of business, education, and biotechnology. The next wave of seven new SSMP options came in 2001. These were six distance-learning programs, including five in the field of engineering and one in the field of education, as well as one in-residence program in the field of foreign language. Between 2001 and 2008, no new SSMP options were established. From 2009 to 2016, 16 new professional SSMP options in the fields of law, medicine, and social work were established. The largest program expansion was in 2017, when 11 SSMP options were established in the field of engineering. Then, two more were established in 2018. This surge pattern corresponds well with the post 2008-2009 recession decline in state support.

A key feature of SSMPs at University B is that more distance-learning programs are offered than at the other two sample institutions. The fact that University B has so many distance-learning SSMP programs relates to the university academic technology unit's provision of an online platform to support online course design and help with online student interactions. According to the information provided by the former assistant dean for academic affairs from the Graduate School, it takes about 1–3 years to develop a new academic program or add a new track/option to an existing academic program. The length of time depends on the academic department's internal process of document preparation to meet the requirements of the Graduate School. SSMPs that were started after 2018 were mostly 1-year accelerated, in-residence master's programs (rather than distance-learning programs) to accommodate students' needs for on-campus experiences. International students would need visas to attend these programs,

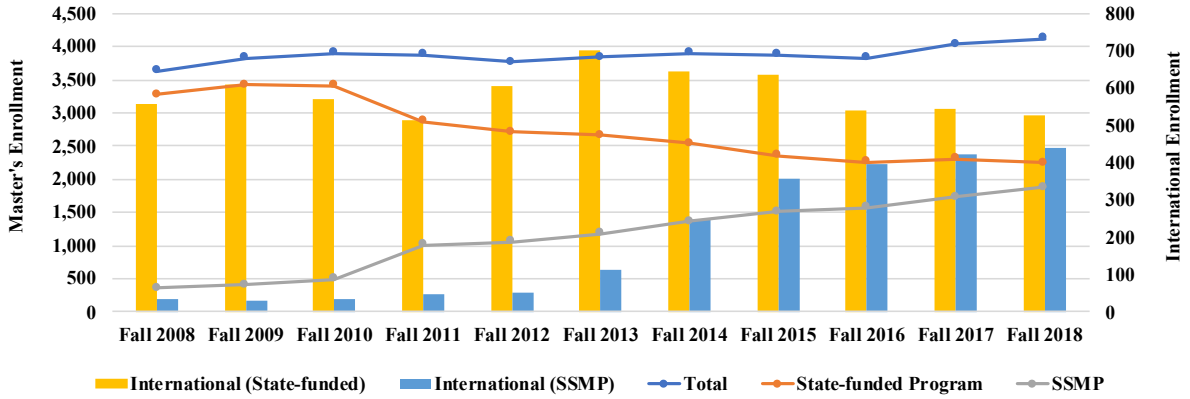
whereas no visa requirement exists for enrolling in distance-learning programs. Also, according to the information from a former staff member of the Graduate School, over the years some popular graduate certificate programs became SSMPs and other SSMPs closed down due to low enrollment. By 2018, the university had 48 SSMP options, the same as in 2017.

Figure 11 shows the trend of master's enrollment in SSMPs and state-funded programs at University B from 2008 to 2018, with highlights on enrollment trends of international students. The blue line represents the total master's enrollment over time, the orange line the enrollment in state-funded master's programs, and the gray line the enrollment in SSMPs. The yellow column represents international student enrollment in state-funded programs, and the blue column international student enrollment in SSMPs.

Very similar to University A, between 2008 and 2018 most of the expansion and development of master's degree programs and enrollments at University B occurred in self-sustaining programs, rather than state-funded programs. During these 10 years, based on student enrollment data from the Graduate School at University B, enrollment in SSMPs increased 300 percent, while those in state-funded master's programs experienced a 31 percent decrease. In 2018, almost half of all master's students enrolled at University B (46 percent) were in SSMPs, compared to 31 percent in 2013 and 10 percent in 2008. A noteworthy observation is the large proportion of international students enrolled in SSMPs. Starting from 10 percent in 2008, the proportion of master's students in SSMPs who were international students went up sharply to 25 percent in 2016. In 2018, 23 percent of students enrolling in SSMPs were international. In contrast, the proportion of international students within state-funded master's programs has been relatively stable, ranging from 17 percent in 2008 to 23 percent in 2018.

Figure 11

Master's Student Enrollment at University B: 2008–2018



Source: Graduate Enrollment Data, The Graduate School, University B

The drastic increase of international student enrollment has a strong association with the Visiting International Students Program (VISP) at University B. The context of this program is critical to understand why and how four SSMP options, including the sample SSMP option – statistics-data science program studied in this research, were established. At University B, VISP, administered by the university extension, allows international students to come to the university for non-degree, short-term studies. The university extension unit administers the admission of international students at all degree levels (undergraduate and graduate) to the university for taking some courses or a selection of courses in a particular academic department. There are two options for these visiting international students: one is to enroll in any course (for credit or not) that they are interested in; the other option is to enroll in a list of courses in the same academic department and receive additional staff and faculty support. In 2019, 10 academic departments offered the option for VISP students to enroll in a list of courses, and 3 out of these departments offered a list of courses for visiting undergraduate students to fulfill an SSMP requirement upon successful admission. In the following sections, I will describe in detail the statistics–data science program option, which is within the Department of Statistics, that gives undergraduate

visiting international students the option to continue to study in a master's program after a year of visiting and upon successful admission to the master's program. The other two departments that also use this model to attract VISP students to enroll in SSMPs are the Department of Mathematics and the Department of Agricultural and Applied Economics.

5.2.5 Stated Rationale for SSMP Establishment

The university policy governing the establishment process for SSMPs states, "the program must bring in NEW and ADDITIONAL students. Overall enrollment in all other school/college programs must not be eroded" (University B Graduate School, 2018). In other words, the enrollment in state-funded programs must not decline as a result of adding SSMPs. SSMPs must be distinctly identifiable in the student record system. All SSMP student admission and enrollment data are publicly available, which is different from the data access at the other two institutions I sampled. Universities A and C distinguish SSMPs in their internal database but share the data in different ways. University A allows any university personal or group account holders to view all the student enrollment data, filtered by whether students are in state-funded programs or SSMPs. University C only publishes select SSMP data and relies on academic departments to decide whether or not to publish information on student enrollment in SSMPs publicly.

In addition, University B policy also specifies that the university will allow the establishment of self-sustaining programs but only if the proposed program does not take advantage of the existing curricula and program offerings on campus and is market oriented towards serving the needs of new streams of students. The tuition rate is typically set as a result of discussions among the proposing College/School, the Graduate School, the university continuing education unit, the provost, and is formally signed off by the university Chief Finance

Officer. Different from state-funded programs, the revenue generated from SSMPs is allowed to flow back entirely to the program and to be invested at the program's discretion. In state-funded programs, the central administration collects all the revenues, including tuition and state appropriations, and reallocates funds based on institutionally defined formulas with some measure of discretion. Regardless of the institutional budgetary formulas, graduate departments and colleges receive much more revenue back by operating an SSMP and enjoy more freedom of expenditure than they would with state-funded programs with the same enrollment.

Based on the interviews with staff from the Graduate School Office of Academic Affairs, departments are encouraged to adopt the self-sustaining funding model if they are exploring the possibility of establishing a professional master's program. In this state, as I have explained earlier, University B policy specifies that SSMPs are to target working professionals who want to advance or change careers; or SSMPs must be designed to serve other new populations that have been underserved before.

5.2.6 Stated Procedure for SSMP Establishment

The university policy governing SSMPs, dated February 2018, presents a thorough picture of why and how SSMPs are established at University B. This policy states that departments that are interested in exploring the possibility of establishing an SSMP or an SSMP option must first discuss this intention with their college/school, then consult with the Graduate School with regard to the academic planning. They must have a detailed budgetary plan and discuss it first within the department, then with the budget office within the college/school, then afterward with the university budget office, and the university extension unit if the VISP is involved. A new SSMP program proposal must receive final approval from the university graduate faculty executive committee and the university academic planning unit and be signed

off by the provost. If the proposed SSMP is an online program, the department will have the option of working with the university academic technology unit that supports online curriculum design and technology for a fee. A critical distinction between establishing a new master's degree program versus adding a master's degree option is that the state is not involved in the approval process of adding a program option to an existing master's degree. If a master's degree is already offered in a department, the department would typically take this approach of establishing an option instead of another new degree program because the review process is less cumbersome.

The college/school that wishes to establish an SSMP provides a fixed amount of start-up funds for program development, and any additional financial support above that amount is loaned to the SSMP by the college/school. It is expected that the program pays back the loan after it starts generating net revenue. University extension lists all the SSMPs on its website as a marketing strategy, while each department or school that offers SSMPs only lists their own SSMPs. The Graduate School administers the admission processes for all SSMPs, while the department/graduate program undertakes admission selection among those who apply.

The university policy of 2018 also requires all SSMPs to have a live website, a handbook, a faculty director, a program coordinator, and other key staff identified. Further, the university policy recommends a template for admission letters that highlights two policies pertinent to students' concerns: their ineligibility for a graduate assistantship, which would result in a tuition waiver; and zero opportunity for taking courses outside of the SSMP curriculum.

The 2018 University SSMP Policy also states that all in-residence SSMPs must either follow a regular tuition schedule (i.e., select from a list of standard graduate tuition rates) or make requests for a flat, market-based tuition rate that can be higher than the regular tuition

schedule. Online programs are allowed to use a flat tuition rate that is determined by the university. This way of determining tuition at University B is similar to that of University A but different from University C. At University A, tuition rates for SSMPs are selected from a list of existing tuition tiers or justified explicitly by the program if adopting a market rate. At University C, tuition rates for SSMPs are based on a field-specific, market rate as a result of market research analysis, including using data about career prospects, salary, student demands and supply, and peer institutions' charges. Following institutional reporting requirements, all student admission and enrollment data on SSMPs at University C are reported separately from state-funded programs.

Further, if proposing an SSMP requires sharing instructional resources, courses, or infrastructure with another department, school/college, or division, the proposing SSMP or department at University B is asked to complete a memorandum of understanding with the other unit including any provisions for financial exchanges between the programs. The Graduate School requires two separate memoranda of understanding templates, one on new course development and another on new program development that aim to bring all stakeholders to the same level of understanding about resource allocation and ownership of intellectual property.

Given the centralized process and precise procedural requirements, all new SSMPs must and have been following the university policy. I will next draw one example to substantiate the policy and illustrate one way of establishing and expanding an SSMP at this university. This example will also shed light on how four other programs were established at University B (e.g., SSMPs in mathematics, economics, and computer science).

5.2.7 Case Study 2: Sample SSMP in University B

Following the sample selection in chapter 4, I have explained why I only selected one SSMP option at University B, unlike the multiple programs I selected at Universities A and C. During sampling, I included a program option rather than the entire academic program to deepen my understanding of nuances of rationale and procedures for SSMP establishment at University B. I chose the statistics–data science program option because it enrolls mostly international students. This example allows for explaining the infrastructure of VISP, a unique organizational setup, non-existent at Universities A and C, and thus contributes to the understanding of this specific model. In the following sections, I will describe these aspects of the data science program: structure, career goals and career support for students, staffing, tuition, and the selection and characteristics of students.

5.2.7.1 Program: Statistics—Data Science Option

Program Structure.

In 2013, the statistics–data science SSMP option was established as a 3+(1)+1 program for senior undergraduate students, regardless of major, from select Chinese universities to come to the U.S. for one year in a visiting international student program during their 4th year in college and then continue to complete the master's program in statistics-data science for another year after being officially admitted. The program aims at helping graduates build data analysis, reasoning, and communication skills in a realistic professional strategic-planning setting that involves making sense of complex data to realize organizational objectives. In fall 2014, the program accepted its first cohort of visiting students, who were offered the option of entering a master's program at the end of their visiting period. Subsequently, in fall 2015, the SSMP welcomed its first master's cohort, composed entirely of these students. Fall 2018 was the first

year that the SSMP decided to open the admission up to applicants beyond only visiting international students.

Career Goals and Career Support.

According to the student handbook dated October 2018, the program is equipped with one full-time student service coordinator, who is also the career advisor. Students' course selection forms need to be signed off by the student service coordinator. The instructors in the program are mostly tenure-line faculty.

Fees and Financial Support.

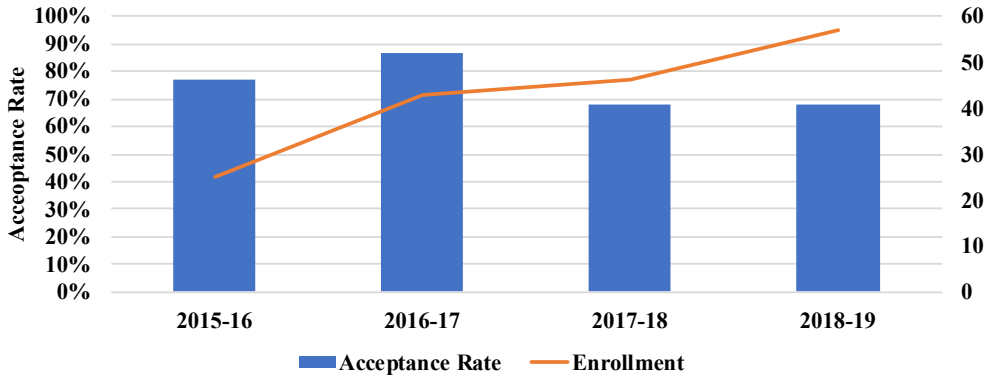
The program requires 30 semester credits for completion. The tuition for the 2018–2019 academic year was $1,600 per credit. The total cost for the degree was thus $48,000. For VISP students, 15 of them previously earned credits while visiting as senior undergraduates that could be applied to the master's program; thus, they only needed to pay for the remaining 15 credits, which cost $24,000, to complete the degree requirements. Students who were not part of the VISP program have to pay the full cost of the program. Based on the course plan for a full-time student in 2018–2019, about 15 credits are required core courses, 6 credits are for professional skill building such as technical communication skills, and 9 credits are electives. The handbook states explicitly that "students in the program are not allowed to accept research assistantships, teaching assistantships, project assistantships or other university appointments that grant tuition remission, tuition waiver, and/or academic fees." Since this SSMP does not provide scholarships, students only qualify for available university, federal, and external funding opportunities, which are mainly in the form of loans. International students have more limited funding opportunities, although in some cases they can rely on aid from their home country.

Selection and Characteristics of Students.

Between fall 2015 and fall 2017, all students who joined the SSMP transferred directly from VISP. These students were all Chinese students from the specified eight Chinese universities. The connections between the program and the eight Chinese universities are explained in the next chapter. The program started with 25 students and increased to 45 in 2017. In fall 2018, 3 U.S. students joined the program as a result of the program opening admission up to all applicants, resulting in a total of 65 students in the program. Figure 12 below shows the admission and enrollment data from the beginning of the program through 2019. Due to the targeted admission, the acceptance rate of the program has been high, ranging from 68 percent to 88 percent. The decision to open admission up to all applicants in 2018 aimed to increase enrollment.

Figure 12

Admission and Enrollment Trends at University B—Statistics–Data Science Program: 2015–2019



Source: Graduate Admission and Enrollment Dashboard, The Graduate School, University B

In summary, the statistics–data science option program at University B was initially geared only towards international students but eventually opened up to domestic students 10 years after the 2008–2009 economic recession. By opening up the admission to all applicants, the program increased enrollment with a slight decline in the acceptance rate, however, it is still too

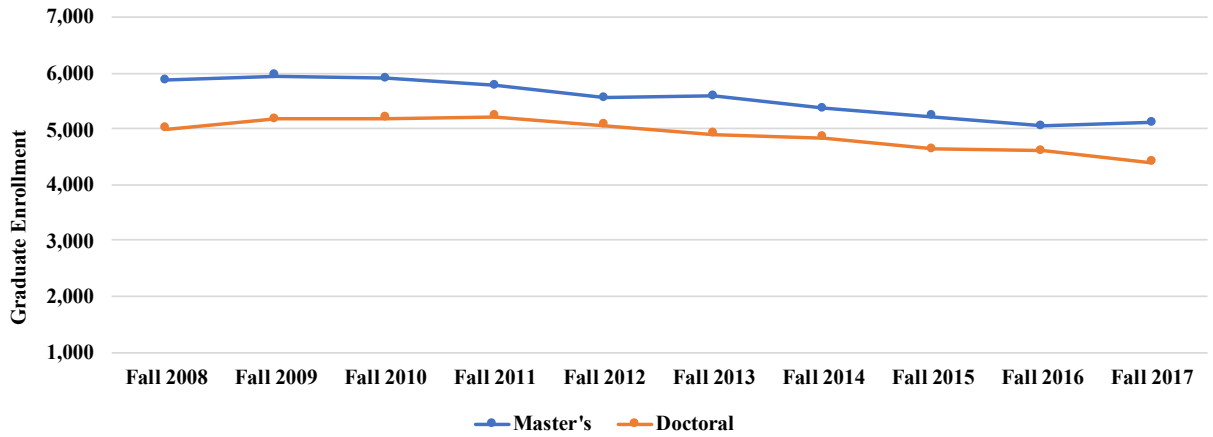
early to draw any conclusion about the effects of this change on selectivity considering the high acceptance rate throughout the program history.

5.3 Case 3—University C in the South

University C is a large public research university in the South, part of the University C system in State C. The total campus enrollment in fall 2018 was approximately 51,000, including more than 11,000 graduate students in master's, doctoral, and professional programs. The university granted more than 900 doctoral degrees and 3,000 master's degrees in the 2017–2018 academic year. In the most recent decade (2008–2018), graduate enrollment at both master's and doctoral levels among state-funded programs at University C has been slightly decreasing. University C does not include enrollment data on self-sustaining programs in institutional reporting, and thus Figure 13 does not reflect the growth in self-sustaining programs. I requested SSMP data directly from the Graduate School at University C. In terms of the number of graduate degrees granted, University C is similar to University A. If looking at the ratio of doctoral degrees to master's degrees, University C's ratio is much higher than University A's but lower than that of University B. Similar to other state-funded universities, University C plays a crucial role in contributing to the economic development of State C, including trying to meet the rapidly growing state's workforce demands.

Figure 13

Graduate Enrollment at University C: 2008–2017



Source: Enrollment Data, Institutional Reporting Office, University C

5.3.1 State C—Higher Education Governance

Different from State A, with a weak state higher education coordinating function, and State B, with a system-wide university governing board, the single statewide Higher Education Coordinating Board in State C serves as the statutory coordinating agency for public postsecondary education in the state and is considered a "strong" coordinating agency. The coordinating board also authorizes and monitors accredited degree-granting private postsecondary institutions. The State C Higher Education Coordinating Board is composed of nine voting members and one non-voting student member appointed by the governor. The board appoints the commissioner of higher education and develops formulas for use by the governor and the Legislative Budget Board in recommending legislative appropriations needed to finance public higher education institutions. In 2015, the coordinating board launched its statewide strategic plan to increase the participation and completion of postsecondary credentials from 38 percent in 2013 to 60 percent among young adults aged 25–34 in 2030 (State C Higher Education Coordinating Board, 2015). The expansion of graduate education was also officially

assessed by the coordinating board at the time. The assessment results recommended that professional master's education should be an area for growth and that academic doctoral programs need tighter oversight as well (Karam, Goldman, Basco, & Carew, 2017).

In addition, state C has 10 individual statutory university governing boards, of which six are responsible for multiple campuses and four for a single institution. The University C system is responsible for governing eight universities, three health science centers, one medical branch, and two medical centers. The Board of Regents of the University C system was established in 1881 and consists of nine members. This Board of Regents is authorized and directed to govern, operate, support, and maintain institutions under its purview. Connected to the previously mentioned 2015 strategic plan in State C, the Board of Regents developed a framework to guide the expansion of students gaining advanced degrees and professional skills within the University C system (State C Higher Education Coordinating Board, 2015). Within the system, the approving authority for new master's degree programs lies either with the executive vice chancellor for academic affairs in the University C system if the program's first 5-year cost is under $2 million or with the Board of Regents if it is above the $2 million mark. The state higher education coordinating board is informed of new program approvals.

New program establishment is heavily monitored by the University C system Board of Regents and the state higher education coordinating board. Institutions are required to send necessary information about new program proposals to the state coordinating board and allow for 30 days for other institutions to provide comments or objections, if applicable (State C Higher Education Coordinating Board, 2017). For example, other institutions can veto a new SSMP proposal for a reason such as that it is competing for the same type of student clientele within the same geographic vicinity as other already established programs (State C Higher Education

Coordinating Board, 2014). Additionally, master's program proposals are required to demonstrate workforce needs within the state.

5.3.2 State C—Workforce Demands

State C has a robust state-level initiative to increase the number of master's degree holders. In the state's annual report on the progress in implementing earlier strategic planning, published in 2019, State C set the goal of graduating 550,000 students in certificate, associate degree, bachelor's degree, and master's degree programs in 2030, increasing from 341,307 in 2018. State C also promotes the idea of higher education as one gateway to a better life and emphasizes that the benefits of earning a higher education degree include a higher salary (State C Higher Education Coordinating Board, 2019b). In the State C workforce study report, engineers, computer specialists, and financial specialists have been identified as professions that, up to 2018, were in medium supply but high in demand; mathematical science occupations are considered to have an uncertain supply but were also estimated to have a higher than average demand (Goldman et al., 2015). The report predicted that, by 2020, 8 percent of all occupations in State C would require a graduate degree, an increase of 238,600 jobs from 2010. Among all states, State C ranks 9th in the proportion of occupations requiring a graduate degree (Carnevale & Smith, 2012). According to the state's workforce projection, the highest number of jobs in 2020 will be held by those who hold master's or higher degrees and will mainly be in the managerial occupations and in engineering, and computer and mathematical sciences (Carnevale, Smith, & Strohl, 2014).

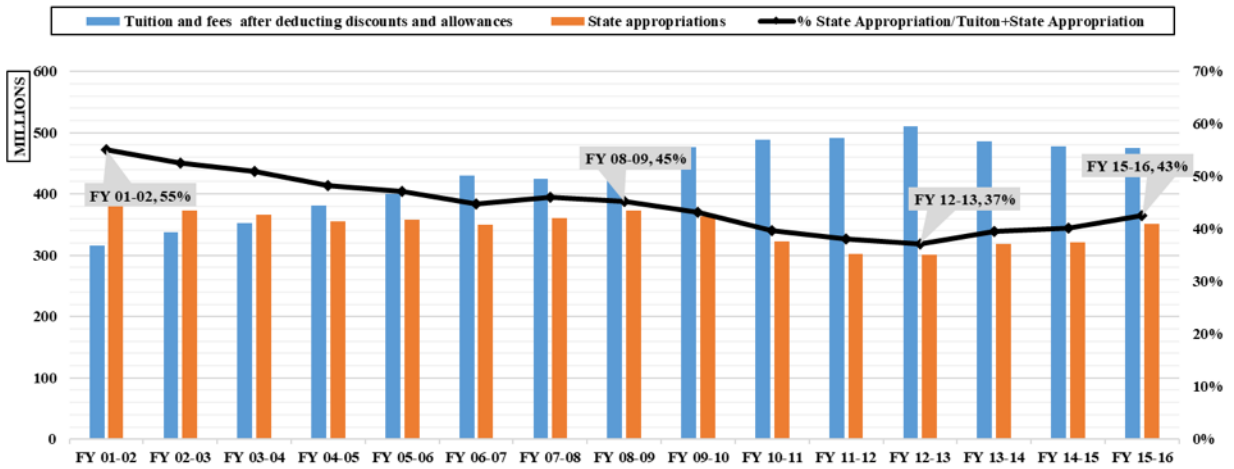
5.3.3 State Appropriations to University C

Similar to Universities A and B, University C also suffered severe budget cuts from the state during the economic recession in 2008–2009, and the budget loss has not been recovered.

Figure 14 below shows selected inflation-adjusted financial facts about University C over the past 15 fiscal years, based on available data from IPEDS. State appropriations stayed relatively stable prior to FY08–09, then dipped from FY09–10 until FY12–13 and slowly recovered after FY13. By FY15–16, the level had almost reached the pre–FY09–10 standard. Tuition and fees have been rising mildly throughout the 15-year period but the increase was not as sharp as at University A, rather it was more similar to the increase at University B. The ratio of state appropriations to the summation of state appropriations and tuition revenue decreased from FY01–02 to FY06-07, experienced a slight recovery in FY07-08, but started to decrease again in FY-08-09 and subsequent years, reaching the lowest point around FY12–13 before it started to recover again. Given the decrease in graduate enrollment (see Figure 13), creating SSMPs or enrolling more students into SSMPs seemed to be an effective way of increasing enrollment at the graduate level. Although enrollment in SSMPs has been increasing (see Figure 15), the state higher education coordinating board requires that enrollment in SSMPs be calculated separately from master's enrollment in state-funded programs (State C Higher Education Coordinating Board, 2019c). In a later section, I will present data to compare the trend of overall enrollment at the master's level to the trend of enrollment in SSMPs.

Figure 14

State Appropriations to University C: FY01–02 to FY15–16



Source: Institutional Financial Characteristics, IPEDS

5.3.4 History of Self-Sustaining Master's Programs at University C: 1995–2018

At University C, the number of active SSMPs was 20 as of September 2018, as listed on the Graduate School website. This number is much smaller than the numbers at Universities A and B. The first SSMP at University C started in 1995. According to the appendix in the Graduate School SSMP policy document dated September 2018, between 1995 and 2018 six SSMPs either have been discontinued or were planned but never implemented. Similar to the origins of SSMPs at Universities A and B, the earliest SSMPs at University C were also in the fields of business and engineering, approved in 1995 and 1998, respectively. Similar to University B, there was a seven-year gap between 2005 and 2011 when no SSMPs were proposed or approved.

At University C, similar to Universities A and B, the centralized university extension unit does not play a degree-granting role. The SSMPs are governed by individual colleges or extension units within the colleges. For example, all engineering SSMPs are governed by the engineering extension unit of the College of Engineering, but two SSMPs in the College of

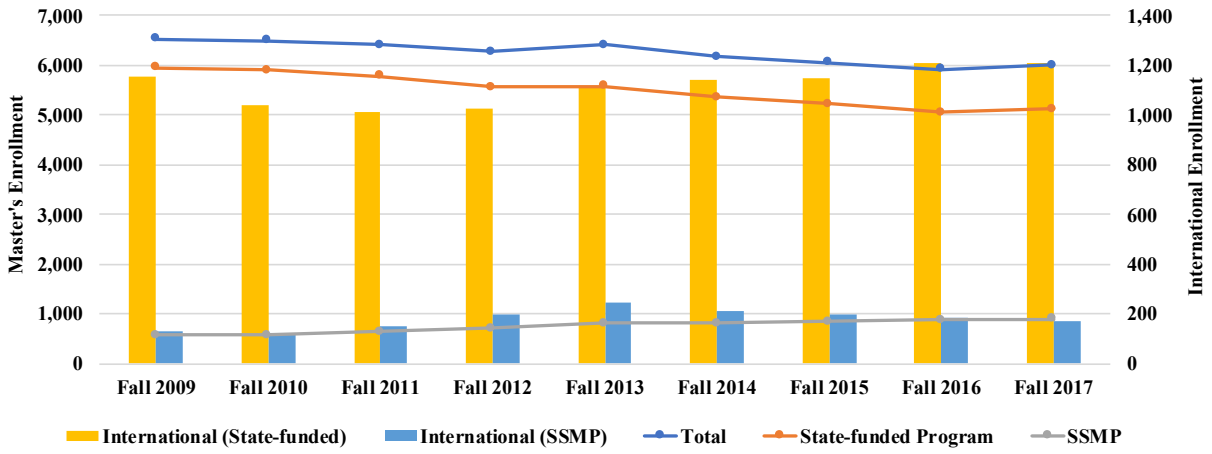
Liberal Arts are governed directly by the college. As of September 2018, most of the SSMPs are in the fields of business or engineering, with four programs in the social sciences.

As mentioned earlier, the enrollment data on SSMPs are not in the published institutional report due to the separate reporting requirement from the university system-wide governing board (State C Higher Education Coordinating Board, 2019d). Given the fact that there is no public institutional data on SSMPs, I inquired whether or not I could get access to administrative data from the University C Graduate School. Based on the data that I was allowed to access, I summarized the enrollment trends of master's students in state-funded programs and SSMPs and was able to disaggregate international student enrollment in the respective programs. In Figure 15, the blue line represents the total master's enrollment over time, the orange line the enrollment in state-funded master's programs, and the gray line the enrollment in SSMPs. The yellow column represents international student enrollment in state-funded programs, and the blue column international student enrollment in SSMPs.

The enrollment in SSMPs increased by 56 percent from 2009 to 2017 in contrast to the downward trend of enrollment in state-funded programs, which declined during the same period by 14 percent. Different from the international student enrollment trends at both University A and University B, international student enrollment in SSMPs at University C did not experience much growth over the same period. Interestingly, the number of international students in state-funded master's programs experienced a couple of years of decline from fall 2009 to fall 2011, but has been climbing steadily since fall 2012, with a gain of 18 percent increase by fall 2017.

Figure 15

Master's Student Enrollment at University C: 2009–2017



Source: The Graduate School, University B

5.3.5 Stated Rationale for SSMP Establishment

Most recently updated in September 2018, the Graduate Assembly—a committee of faculty representatives from departments across campus—issued the university SSMP policy document. This policy document described in great detail what these programs have to consider and report in their proposals. They have to offer master's degree curricula that demonstrate that they meet particular requirements in a variety of areas, including class schedule and meeting location, course design, delivery modes, and student audience. Additionally, under certain circumstances, the SSMP model can be considered by academic departments. Graduate departments with an SSMP proposal are required to justify that the new SSMP fits these circumstances, including existence of community demands, that the new SSMP is responsive to the market needs, that the regular state-funded program in the same field is above capacity, and that the new SSMP does not threaten existing degree programs. Prior to any formal discussion of proposing a new SSMP, its financial sustainability must be discussed between the proposing graduate department and the Graduate School and approved by the dean of the Graduate School

and the provost. The financial benefit of the SSMP program in this model is that the net revenue gained through the SSMP can be used for curriculum and program development, faculty development, or even can be used totally at the department's discretion.

A strong advocate of SSMPs played a crucial role in disseminating the knowledge of SSMPs on the University C campus and facilitated the expansion of SSMPs since 2007. The former provost of University C, appointed in 2007, promoted the idea of SSMPs ever since then and shared with me during an interview the lessons he had learned from establishing one SSMP in the previous school where he had held the dean position from 1998 to 2007. He provided three major reasons for the establishment of SSMPs during his tenure at University C. First, the SSMP model allows programs to expand student enrollment, including through offering online education and through off-campus programs. Second, it allows the university to serve students that are out of reach using an alternative mode of delivery, which results in broadening the university's impact and reputation. Third, under state funding constraints that existed at the time, the SSMP is a useful model for public universities because it can provide quality educational programming and increase revenue at the same time. The former provost did not voice concerns over the potential tension between the pursuit of revenue and certain indicators of academic quality (e.g., low yield rates) after SSMPs were launched, probably due to the fact that the former provost left the institution prior to the most rapid expansion of SSMPs, which is after the 2008-2009 economic recession. I will discuss the waves of SSMP establishment activities in detail in the next Chapter.

5.3.6 Stated Procedure for SSMP Establishment

The Graduate School is responsible for the overall administration and coordination of all the SSMPs. In the program proposal, besides the same academic requirements as state-funded

programs, SSMPs are obligated to submit a financial proposal with details of proposed revenue and expenses. Every year, SSMPs need to submit a report to the Graduate School delineating the program's academic and financial status, including but not limited to student enrollment and financial sustainability. SSMPs must operate only using fees collected from students.

Usually, a program proposal for an SSMP at University C starts with a department chair or college dean who is interested in developing such a program, and this person would consult the Graduate School to explore the possibility. The Graduate School works with the department to develop financial and academic proposals and then moves things forward. Departments and/or schools or colleges are the investors in starting up new SSMPs. Therefore, they develop the business plan that would meet the financial targets, meaning the revenue generated by student headcount and tuition paid needed to cover the cost of program development and operation. The business plan includes market research results about demand and supply of the potential student clientele in the region, assessment of costs for operating the program, and decisions on enrollment and tuition amount to cover the cost. When assessing potential student clientele, a key consideration is whether this population would be capable of paying for their education. According to the former provost, part of the organizational structure of SSMPs at University C is that each program must have a director who understands both the business and academic sides of operating an SSMP.

A distinct feature of the SSMPs at University C is that faculty who teach in these programs are working on a voluntary but paid overload basis, according to the SSMP policy issued by the Graduate Assembly. Faculty are allowed to work beyond 100 percent FTE. When a department proposes an SSMP, the departmental faculty buy-in is vital since the teaching force usually comes from the department. Due to the requirement of teaching on an ongoing overload

basis for SSMPs, not all faculty members are interested in participating[5]. To protect research time, the University C Graduate School recommended that graduate departments limit the participation of junior faculty (e.g., tenure-line assistant professors) in teaching in SSMPs, as this may affect their research productivity and further negatively influence their tenure review. In my interviews, the assistant dean for academic affairs in the Graduate School, the associate dean for academic affairs in the College of Engineering, and the department chair of economics all confirmed that they did not allow assistant professors to be listed as teaching faculty in an SSMP proposal.

Within the university, the members of the Graduate Assembly as well as the dean of the Graduate School and the provost must approve the final decision to establish a new SSMP. The tuition rate is established at the university level with the final sign-off by the president. All establishments of new SSMPs require approval from the university's system-wide governing board and notification to the state higher education coordinating board. New degree programs, regardless of whether they are SSMPs or state-funded programs, need to be approved by the regional accreditation agency. Also, in State C there exists no record of refusal of SSMPs by the regional accreditation agency, just as it is the case for Universities A and B.

5.3.7 Case Study 3: Sample SSMPs in University C

Considering the fields identified in the state workforce assessment report and SSMPs with high enrollment during the last three years, I sampled two SSMPs to further understand the rationale and process of establishment, namely those is the fields of software engineering and economics. Both programs satisfy the sampling criteria identified in the research design section. In the next section, I will describe the following aspects for each of the programs I sampled:

[5] Although University A also allows faculty to teach on a voluntary but paid overload basis within the first three years of a new SSMP, ongoing overload teaching is not allowed after that.

program structure, personnel, career goals and career support for students, fees and financial support, selection and characteristics of students, and staffing.

5.3.7.1 Program I: Software Engineering

Program Structure.

The software engineering program was started in 1998 and is housed in the extension unit within the College of Engineering. The engineering extension unit administers and manages all the SSMPs in engineering, including four master's degree programs (online and in-residence). Software engineering is the only 100 percent in-residence SSMP in engineering that is designed for full-time working professionals to complete in two years.

According to the program website, this program is structured to meet one consecutive Friday and Saturday each month and for students to complete 30 credit requirements in two years. International applicants are not eligible to apply due to the fact that an international student visa requires full-time registration, which translates into 10 credits per quarter or 9 credits per semester.

Career Goals and Career Support.

The program caters to needs of professionals working locally, including software engineers who aspire to learn more technical skills, engineers looking for career advancement, and graduating undergraduate students in relevant engineering majors or with the required skill sets who want to stay updated with technology and innovation.

Fees and Financial Support.

For the 2018–2019 academic year, the program costs $3,400 per course and $34,000 total to complete. There is no differential tuition for in-state and out-of-state students. The program offers two courses per semester during the regular school year and one course during the

summer, for a total of five courses per year. Six out of the 10 courses offered are required for all students in the program. During each regular semester, except for the summer semester, the program offers two optional courses in the morning on program weekends for students to choose from, and the afternoon course is the same for all students in the program. Since students in the SSMPs do not qualify for state-tuition exemption, students only qualify for available university, federal, and external funding opportunities. Considering that students in this program are mostly working full-time, the program does not provide scholarships.

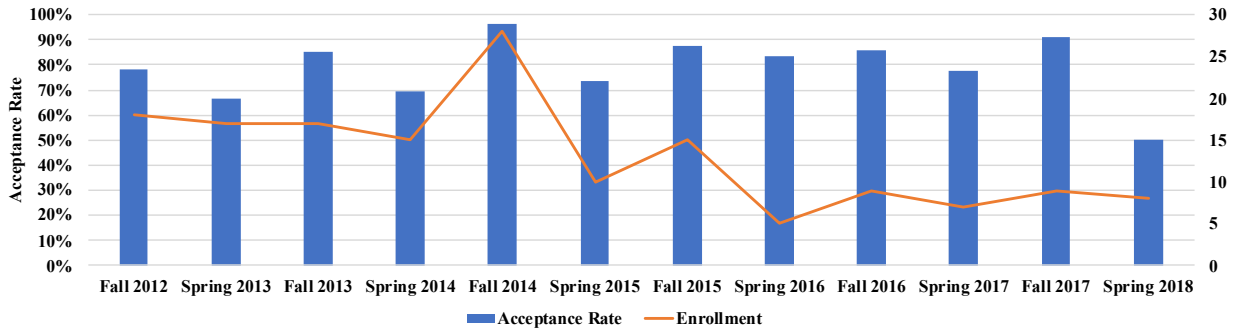
Selection and Characteristics of Students.

Given the nature of the program, almost all students enrolled are U.S. students who are working full-time in the region. Based on the admission and enrollment data, students who applied to the program in the past five years had a very high chance of being admitted (see Figure 16). The acceptance rate was around 70–90 percent, except in the most recent admission cycle of the data sampling, in spring 2018, when the acceptance rate was 50 percent, with 11 offers made to 22 applicants and a cohort enrollment of eight. The program accepts students two times a year, with cohort size ranging from 5 to 28 from 2012 to 2018. The new cohort enrollment experienced a drop from Fall 2015 to Spring 2016, from double-digit cohort enrollment before 2015 to single-digit cohort enrollment after 2016. Upon being asked about this enrollment change, the executive director of the engineering continuing education unit believed that it could be explained by two reasons. First, the program has been training local full-time working professionals since the 1990s, and the more recent college graduates are more equipped with the skills the program aims to help students develop. Second, full-time working professionals became less interested in completing a degree programs for skill development. As a result, the executive director shared their future plan of incorporating micro-credentialing into

SSMP degrees, meaning a completion of a couple of related courses would lead to a micro-credential and a stack of micro-credentials would contribute to a master's degree.

Figure 16

Admission and Enrollment Trends at University C—Software Engineering Program: 2012–2018



Source: The Graduate School, University C

Staffing.[6]

The instructional faculty are made up of a majority of tenured professors and a number of other teaching faculty. The program has one administrative staff person serving as coordinator. In addition, the engineering extension unit has two event coordinators that serve all four engineering SSMPs.

5.3.7.2 Program II: Economics

Program Structure.

Established in 2013, the master of arts in economics program was initiated by the department chair as one of the first projects he worked on after assuming the position in 2012. The economics program only had a Ph.D. track before this stand-alone master's program was established. Students could pursue a master of science en route to a Ph.D. but not as a terminal degree.

[6] The staffing information was accessed during data collection in 2018, so any subsequent personnel changes in the department are not captured.

The program has three tracks to accommodate students' needs: 10 months, 18 months, and 24 months to completion with the same core courses but different credit requirements. The additional credits allow students to do internships. Since the program opened up these tracks in 2015, more than half of the applicants have preferred the 10-month accelerated track. The program only accepts applicants during summer and does not require applicants to have a background in economics, only some level of quantitative training during undergraduate education.

Career Goals and Career Support.

The program is designed for people who are interested in jobs in private or government sectors that require a certain level of analytical, statistical, and economic knowledge and skills; who are interested in pursuing a Ph.D. in economics; or who want to learn more about economics to strengthen or complement their current training or knowledge base. The program does not have a designated career advisor, nor does the college that houses the economics department.

Fees and Financial Support.

In the 2018–2019 academic year, the 10-month program costs $29,250 for in-state students and $39,000 for out-of-state and international students. For the 18-month and 24-month tracks, in-state students pay 25 percent less than out-of-state students, $52,000 and $62,000 for out-of-state and international students, respectively, and $39,000 and $46,500 for in-state students. Students are not eligible for any university financial aid (including assistantships) but qualify for federal loans if U.S. citizens or permanent residents. For the purpose of recruiting exceptional candidates, the program offers a limited number of merit-based tuition reductions or partial tuition waivers. The program states on its website that students in this SSMP are not

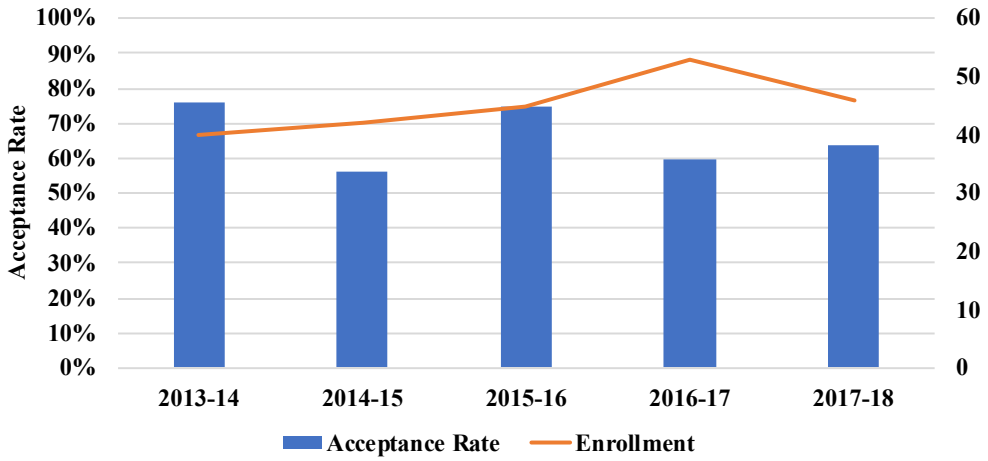
offered any other department or university financial support, and in addition, they are not eligible for any positions that involve state tuition exemption or subsidy.

Selection and Characteristics of Students.

Admission and enrollment numbers have been steady since the program took off in 2013 (see Figure 17). From the 2013 to the 2018 admission cycle, the acceptance rate fluctuated from 50 percent to 70 percent, and enrollment stayed between 40 to 53 students. The number of applications increased from 117 in 2013 to 257 in 2018. The yield rate has been below 50 percent, ranging from 28 percent to 44 percent, with an average of 34 percent. Based on the student demographics data of the 2018–2019 entry class, out of a total enrollment of 56 students, 52 percent were female students and 47 percent were international students (all from Asian countries).

Figure 17

Admission and Enrollment Trends at University C—Economics Program (All Tracks): 2013–2018



Source: The Graduate School, University C

Staffing.[7]

At the onset, the program did not have any administrative support; however, a full-time director who also teaches some of the classes and a staff member who is responsible for administrative duties were hired using the gross revenue generated by the program. Half of the courses in the program are taught by tenured faculty on an ongoing overload basis, and the other half by full-time lecturers or senior lecturers. The university does not allow using tenure-line assistant professors to teach in SSMPs to protect their research time and productivity.

Table 4 shows a summary of the characteristics of all sample programs in the three sample universities. Among these sample programs, the years of establishment, as well as the enrollment and acceptance rates for the 2017–2018 cohorts presented significant variations. These variations will be discussed further in the next two chapters.

Table 4

Sample Program Characteristics

[7] The staffing information was accessed during data collection in 2018, so any future personnel changes in the department are not captured.

	University A			University B	University C	
Programs	**Information Management**	**Mechanical Engineering**	**Statistics**	**Statistics–Data Science**	**Software Engineering**	**Economics**
Year of Establishment	2001	2012 (Conversion from state-funed program)	2012 (Conversion from state-funed program)	2013	1998	2013
Length of Program	2 years	2 years	2 years	2 years	2 years	10/18/24-month tracks
Credit Requirement	65	42	49	30	10 courses	30
Tuition (per credit) 2018–2019	$809	$535 (In-state); $985 (Out-of-state)	$550 (In-state); $925 (Out-of-state)	$1,600	$3,400 per course	N/A
Tuition (total) 2018–2019	$52,585	$22,470 (In-state); $41,370 (Out-of-state)	$26,950 (In-state); $45,325 (Out-of-state)	$48,000 (non-VISP); $24,000 (VISP)	$34,000	10-month: $29,250 (In-state); $45,325 (Out-of-state)
Enrollment 2017–2018	96	114	32	65	17	56
Acceptance Rate 2017–2018	32%	81%	17%	68%	63%	64%
State-subsidized Fellowship	Not allowed	Not allowed	Not allowed	Not allowed	Not allowed	Not allowed
International Students	Eligible to apply	Eligible to apply	Eligible to apply	Eligible to apply	Ineligible to apply	Eligible to apply
Teaching Faculty 2018-2019	Majority of teaching faculty have master's degrees as terminal degrees	Majority of teaching faculty are tenure-line faculty	Majority of teaching faculty are tenure-line faculty	Majority of teaching faculty are tenure-line faculty	No tenure-line faculty; mostly tenured faculty, and some lecturers	No tenure-line faculty; mostly tenured faculty, and some lecturers
Administrative Staff 2018-2019	1 full-time staff academic advisor; 3 staff administrators shared by 3 SSMPs	1 full-time staff academic advisor	1 full-time staff academic advisor	1 full-time staff student services/career advisor	1 full-time administrative staff; 2 staff administrators shared by 4 SSMPs	1 full-time staff administrator hired after the program started

Chapter 6. Findings

Having considered the state, institutional, and program profiles and contexts in the previous chapter, I will now answer the research questions posed earlier.

To remind readers of the research questions, these questions are:

1. What motivated public research universities to establish master's programs that are independent of state funding?
2. What are the organizational processes that public research universities adopted in establishing SSMPs?
3. Is the expansion of SSMPs undermining the mission of diversity and inclusion in sample public research universities? If so, why and how?

Guided by the conceptual framework in chapter 3, I will answer the research questions using data analysis results from policy documents, archived records, administrative data, and semi-structured interviews. In chapter 4, I presented a table (Table 4 on page 115) of 33 interview participants, including their institutional affiliation and role at the respective institutions. Several informants were interviewed more than once for validation purposes.

6.1 Motivations for Establishing SSMPs

Based on the results of my data analysis, six motivations for SSMP establishment emerged among sample institutions: (1) labor market demands; (2) seeking to serve non-traditional student populations (e.g., full-time working professionals); (3) responding to state budget cuts and volatility; (4) targeting the international student market (5) learning from peer institutions; and (6) the opportunity to create a self-sustaining financial model and the potential for more direct income to the offering departments.

Admittedly, the motivating factors driving SSMP establishment are complex. I summarized primary motivating factors by a timeline composed of three major time periods: before 2000, between 2001 and 2011, and after 2011. This timeline is based on the year of the first cohort's enrollment in SSMPs, not on time of the first idea of creating a program or initiating a proposal submission. The SSMP activity in the first time period, prior to 2000, was primarily motivated by program needs and was aimed to cater to special student population needs (e.g., full-time working professionals) or industry/government/community needs. The activity during the second time period, between 2001 and 2011, was primarily driven by state budget cuts which were a result of two economic recessions around both 2001–2002 and 2008–2009, and the lasting effects several years after those. The third time period, which was the period of the largest amount of activity, was characterized primarily by graduate departments' desire for revenue-generation, the appeal of a self-sustaining funding mechanism as an option, and opportunities created by available supply of qualified international students who could pay, along with labor market demands in the fields of SSMP activity. No one motivation could encapsulate the rationale for establishing any particular SSMP, however. In the following, I will weave the theoretical framework into an explanation of the primary motivations for establishment of the sample SSMPs.

6.1.1 Motivation 1: Labor Market Demands

Based on employment projection data from the U.S. Bureau of Labor Statistics (BLS, 2019), the labor market demands higher skills in more jobs, especially those jobs that typically require a master's degree for entry, such as computer and information scientists, statisticians, economists, survey researchers, mathematicians, and engineers. As for growth occupations projected for the period 2018–2028, by 2028 the expected jobs for statisticians will have

increased by 30 percent and for mathematicians by 26 percent, both ranked in the top 10 among all occupations based on percentage of change in demand. These two occupations are just examples of jobs that directly require statistical skills. Many other occupations also require statistical and quantitative analytical skills that would welcome graduates in fields that train in these skills. In other words, SSMPs are designed to train students with employable skills to meet the needs of students and potential employers of graduates.

Evidence from document reviews and interviews showed that the creation of the statistics program at University A, the statistics–data science program at University B, and the economics program at University C were all partially motivated by the demand for workers with statistics and data analysis skills. Both driven by technology advancement, the information management program at University A was partially motivated by the market demands for people with information technology skills, and the software engineering program at University C was partially driven by local full-time working professionals needing to receive retraining in software technology. However, evidence from the mechanical engineering program at University A did not highlight the program's desire to meet particular labor market demands, considering the program has not been tracking alumni placement since it became self-sustaining.

6.1.2 Motivation 2: Seeking to Serve Non-Traditional Student Populations

Prior to 2000, a software engineering SSMP at University C was established primarily due to the needs of special student populations, such as local working professionals, as they were not considered the traditional students on campus. Compared to traditional students, working professionals are not able to attend classes during regular weekday hours due to their commitment to full-time jobs, so they are considered non-traditional students in this context. The secondary motivation was to generate revenue.

6.1.2.1 Software Engineering Program at University C

The software engineering program, one of the earliest SSMPs on the campus, was established during a time when technology and data were playing an increasingly important role in industry, particularly in the area around University C and in the state. As a result, many people already in the workforce needed retraining to keep up with newer technology.

One director at the engineering extension unit shared his thoughts on how SSMPs are serving a different student population and generate revenue at the same time:

> It meets [the needs of] a different student population. Most of the master's degree students that are on campus have finished their baccalaureate degree, and they have moved right into a master's. Our learners [in SSMPs] have finished their bachelor's degree and got a job, so they are working professionals. The ability to come here and sit in a classroom, whatever two or three or four days a week, is not an option for them. So, we serve a different population than the [state-funded programs]. And then I think there is also an interest in the revenue, as budgets get tighter for the university, the college, schools, and the departments. I think there is this [issue], how do we generate revenue to support our programming?

The associate dean for academic affairs in the College of Engineering shared his observations with regard to the revenue-generation purpose of SSMPs in the field of engineering:

> I think most people enter into [the business of SSMP creation] primarily, at least in engineering, with the idea that we are going to make money. We are not quite like the business school, but we are not so far from them. We all create products, but it is always about what does it cost? Is it competitive? . . . You can be sure anything we do here, we may have other reasons, but we are in it to make money too.

Additional revenue generated by SSMPs in the College of Engineering has become part of the dean's discretionary fund. In the past, the dean would discuss with the engineering extension unit the usage of the additional revenue and would make a decision on balancing between the support of the development of the SSMPs and the college more broadly. For example, based on the opinions from the director and the executive director from the engineering extension unit, the college planned to construct a new building but was short of several million dollars needed, and net revenue from SSMPs contributed that remaining part. Being able to take

advantage of the net revenue from SSMPs was also a motivation for the college to support these programs. The executive director from the engineering extension unit shared,

> Our profit [from the SSMP] enables the dean to have a pot of money that can be used completely at her discretion. It could be that we're trying to recruit a superstar faculty member, and we need to build out a world-class lab. And where are you going to get those funds from? . . . If you've seen our new engineering building, you're building out a brand-new building, but your fundraising didn't quite hit the mark. So, you need a million dollars to finish it out properly. Those discretionary funds can come from us.

The motivation of primarily serving non-traditional students is most applicable to SSMPs that started before 2000. Similar to the software engineering program at University C, the earliest two SSMPs in the fields of engineering and business established at University A were also designed for working professionals who needed further training (University A Graduate School, 2014). SSMPs in the sample that started after 2000, such as the information management program and the statistics program at University A, the statistics–-data science program at University B, and the economics program at University C, stressed more preparing of recent bachelor's graduates for certain career paths rather than on serving full-time working professionals.

6.1.3 Motivation 3: Responding to State Budget Cuts and Volatility

In the literature review section, I explained that privatization in public higher education started in the 1980s, and thus infused revenue-generating ideas into public institutions (Toutkoushian, 2009). Resource dependence theory suggests that, during the economic recessions in 2001-2002 and 2008–2009 and ensuing years, institutions were encouraged or forced to become more entrepreneurial while facing state budget constraints. In particular, self-sustaining programs established during the second phase of the timeline mentioned earlier, between 2001 and 2011, were mainly driven by resource constraints.

6.1.3.1 Information Management Program at University A

The information management program at University A was created during the earlier of these times of budget constraints in the state. The School of Information is non-departmentalized, so the school leadership (dean and associate deans) serve as the decision-makers in proposing and establishing new degree programs or new tracks within existing degree programs. The master's in information management program was established in 2001 as an SSMP when the newly constituted school was given no support from the state for new program development. In addition, the local labor market demanded more skilled workers in the field of data science and information management. As the dean who led a team to establish the program put it,

> We knew that there was a need for a kind of executive or mid-career [information master's] program. But, at the time, there was no financial support available from the university to do this. So, we were blocked from that level of expansion in terms of programming, if we were to rely on the resources of the university. So that triggered our first foray into self-sustaining programs.

The dean emphasized that the initial purpose of establishing the program was not profit-making but serving a mid-career population of workers who did not gain the necessary knowledge of data analysis and information management, a rapidly evolving field, during their formal undergraduate education. Without the self-sustaining model, the school would not have been able to expand its academic program offerings in any other way. The dean voiced his frustration with the limited funding from the state to public higher education, saying "It is ridiculous for state universities to rely upon a trickling of funds from legislators who have so many other things that they need to obviously fund [besides higher education]."

This motivation is most applicable to SSMPs started between 2001 and 2011, when two economic recessions (in 2001–2002 and 2008–2009) took place. In addition to a response to state budget cuts, resource dependence theory also offers an explanation of public universities' sudden

surge in revenue-seeking behaviors. Other SSMPs in the sample were launched after 2011, while the states were just beginning to recover their appropriations to higher education; these programs are the statistics program and mechanical engineering program at University A, the statistics–data science program at University B, and the economics program at University C.

6.1.4 Motivation 4: Targeting the International Student Market

Universities have always acted according to external forces (e.g., labor market demands, state budget constraints, and changes in demographics of potential students) as well as internal (e.g., faculty, staff, and student needs) influences. Supply and demand have always been crucial decision-making factors for creating or eliminating university degree programs (Clark, 1998). International students constitute a large pool of tuition-paying potential students that can contribute additional revenues for higher education institutions, particularly when they pay the out-of-state tuition rate (Bok, 2003; Cantwell, 2015). The total number of international students in the U.S. pursuing higher education has increased by more than 80 percent from 2008–2009 to 2018–2019 and has reached an all-time high of almost 1.1 million in 2018–2019 (IIE, 2019a). According to data from the U.S. Department of Commerce, international students contributed $44.7 billion to the U.S. economy in 2018. Among the graduate student population (see Figure 18), the total international enrollment at the master's level has been increasing since 2008-2009 but evidenced a decline starting from the 2017–2018 academic year on, likely in response to U.S. political developments and immigration policies. In contrast to the enrollment trend at the master's level, doctoral-level enrollment has been steady over the past decade. In the U.S., in 2018–2019, 74 percent of enrolled international graduate students were from Asian countries, with the largest share of enrollment held by Chinese students (35 percent), followed by Indian

students (24 percent). International graduate students from these two countries comprised 59 percent of the total international graduate students.

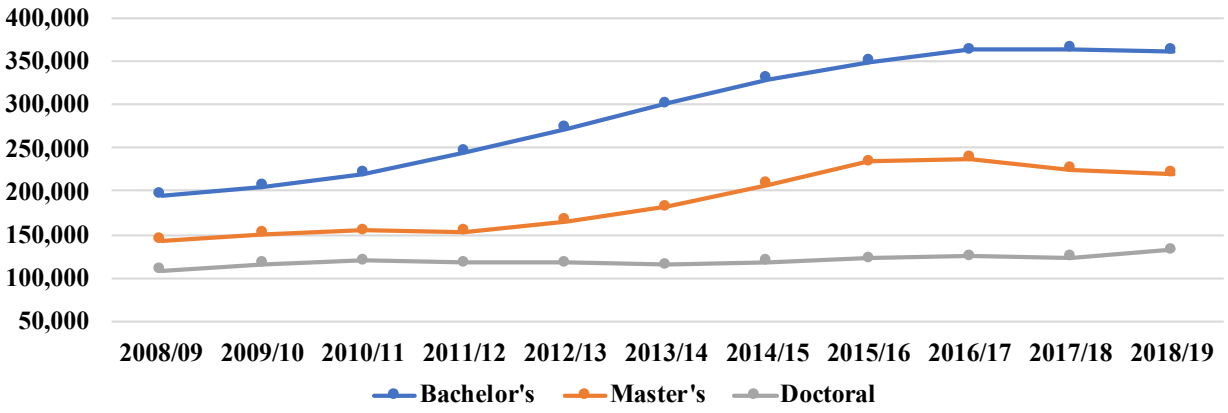
Tracing back to the 2008–2009 academic year, Chinese graduate students then only constituted 20 percent of the total international graduate students enrolled in U.S. higher education, while Indian graduate students represented a larger share at 25 percent (IIE, 2009). From 2008–2009 to 2018–2019, the number of Chinese graduate students in the U.S. increased more than two-fold, from 57,452 to 133,396. The increase in self-paying Chinese students entering U.S. master's programs was mainly due to Chinese parents' high valuation of education and the increasing income level of Chinese families (Chao et al., 2017). Chinese students going abroad to pursue master's programs were also driven by the desire for cultural enrichment, career betterment, and personal growth and development (Wu, 2014). This pace of increase was much faster than the growth of international graduate students overall (33 percent) in the same decade. In other words, without the increase of Chinese graduate student enrollment, the international graduate enrollment from the rest of the world would have only experienced a slight increase of 8 percent over the eleven-year period from 2008–2019.

The increasing number of international, especially Chinese, graduate students coming to the U.S. is very relevant to explaining the rationale to establish SSMPs due to the fact that it is known that many international graduate students are willing to pay the high out-of-state tuition fees they are charged by leading public universities in the U.S. Among all international graduate students, 58 percent finance their education primarily through personal and family funds, rather than relying on financial support from the university (IIE, 2019b). I can safely assume that almost all of these self-financed students are at the master's level because doctoral programs, which involve several additional years of study, tend to fund students through teaching

assistantships or, in some cases, research assistantships (except during the first year), or they have national fellowships from their home country.

Figure 18

International Student Enrollment in the U.S. by Degree: 2008–2009 to 2018–2019



Source: Institute of International Education, Open Doors Report

6.1.4.1 Statistics Program at University A

Based on the archived program proposal for the statistics SSMP at University A, the department wanted to offer a stand-alone terminal master's program rather than a master's program enroute to a Ph.D. program, aimed at attracting international students. This stand-alone program focuses on advanced methodology training, which is most appropriate for international students who either need more training in order to be competitive when applying for a subsequent Ph.D. program in the U.S. or pursue a career in a field requiring data analytic skills upon graduation with a master's degree. The department did not have a stand-alone master's program. The existing state-funded master's degree is an enroute option for Ph.D. students who are not able to complete the doctoral degree— as a quasi "consolation prize."

The current SSMP was created to meet particular market demand and was not converted from an existing state-funded program. The program director shared his insight regarding the purpose of the program: "I think this is the first time that the department really ended up

designing a terminal master's program. Before that, the master's program was really not a big component of the department." To distinguish it from the state-funded master's option, the SSMP was designed to be a structured, non-thesis, two-year full-time program that requires a capstone project and 51 quarter credits.

Since the statistics department, according to the program director, funds its Ph.D. students mainly through teaching assistantships from the time students enter the program, admitting international doctoral students into the program requires that the department know how well the students can communicate in English. Practicing and training in English during the master's program better prepares international students to enter a Ph.D. program and fulfill the teaching requirements. Thus, the establishment of this SSMP, with one key focus on training international students who want to pursue a doctorate degree later, also serves the purpose of better preparing students with the ability to deliver course content in English.

The statistics Ph.D. program at University A ranks very high in the national rankings (by U.S. News and World Report), and thus the department enjoys an outstanding reputation. This reputation, along with the known interest of international applicants in the program, made a stand-alone master's program potentially very attractive to applicants. The program administrator proudly emphasized how the high ranking of the statistics programs, without distinguishing between the master's and doctoral program, drew prospective students to apply: "It [the statistics program] is ranked very high. When you look at the U.S. News and World Report, we're pretty much [ranked] number five or number six."

Similarly to the statistics program at University A, the establishment of the statistics–data science program at University B was also primarily driven by international student supply.

6.1.4.2 Statistics–Data Science Program at University B

At University B, the Visiting International Students Program, as described in chapter 5 under the section on case 2, is administered by the university extension and it allows international students to come to the university to seek educational opportunities. The Data Science program in the Department of Statistics is one of the four SSMPs at University B that allow advanced undergraduate visiting international students to apply to study in a master's program after a year of visiting.

In 2008, the idea of initiating a master's program in data science came from the department chair, who was well-connected with scholars and universities in China. He was exploring opportunities for allowing students from China to visit the University and attend statistics classes in the Department of Statistics. However, his idea of establishing a master's program for Chinese applicants could not be realized due to the lack of existing institutional infrastructure to support such a program at the time. When the university extension unit launched VISP, he and another colleague sought out this opportunity and established an international visiting program in the department to allow students from eight Chinese universities, with which he and the colleague had connections, to come and study. These visiting international students have brought in additional revenue for the department, which only housed one Ph.D. program and one undergraduate major at the time.

According to the program director, in 2012 a McKinsey report on big data claimed that by 2018, "The United States alone could face a shortage of 140,000 to 190,000 people with deep analytical skills as well as 1.5 million managers and analysts with the know-how to use the analysis of big data to make effective decisions" (Manyika et. al., 2011). This report inspired the department to start the process of establishing a data science program to retrain people who were

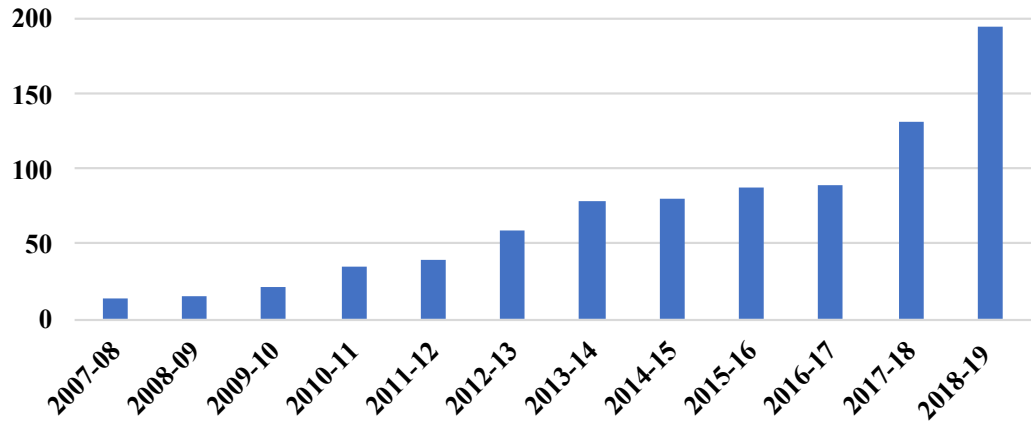
already in the workforce. However, the primary factor in making it a self-sustaining program was the inadequate available administrative infrastructure for creating and managing such a program and its potential to generate additional revenue. During the discussion about starting the program, faculty in the department vetoed the format of an online program due to an excessive amount of time and resources required to set it up.

In 2013, the SSMP was established as a combined undergraduate and master's program for students from select Chinese universities to finish the first three years of their undergraduate education in China having taken sufficient prerequisite courses, then complete the last year of their undergraduate study as visiting international students and continue on to fulfill the requirements of the master's program in another year. In the previous Chapter, I described the backgrounds of applicants and students in the program.

A new academic program required increased teaching capacity. At the time, the department did not have the additional teaching capacity to meet the curriculum needs of a professional master's program, which required more than just an offering of traditional research methods courses. The program director explained that an opportunity to expand the teaching capacity came when the enrollment in the undergraduate program drastically increased, along with the higher course demand in statistics from sister departments, such as computer science and economics.

Figure 19

Undergraduate Enrollment in the Statistics Department at University B: 2007–2019



Source: Enrollment Dashboard, University B

Figure 19 shows the undergraduate FTE major enrollment over the past decade. The more than 100 percent increase in enrollment over a two-year span (2011–2012 to 2013–2014) allowed the department to make additional hires (e.g., lecturers and student services staff) to accommodate the more demanding teaching and service load. Given the stable undergraduate enrollment from 2013–2014 to 2016–2017 and a further 50 percent increase from 2016–2017 to 2017–2018, as well as the revenue brought in by the SSMP, the department was able to hire several tenure-track faculty members in the 2017–2018 academic year and planned to hire several more in 2018–2019 academic year. This is another example of how the revenue generated from SSMPs helped to support new hiring in the statistics department, and as such, it was another motivation for the department to start an SSMP.

Besides the two programs mentioned above, the information management program and mechanical engineering program at University A and the economics program at University C also enrolled a large number of international students. However, international student availability did not drive the establishment of these programs.

6.1.5 Motivation 5: Learning from Peer Institutions

Institutional isomorphism asserts that institutions are motivated to develop similar programs to those of peers in order to compete for resources and customers and to establish their legitimacy. The establishment of the SSMP in economics at University C was primarily driven by this rationale.

6.1.5.1 Economics Program at University C

The department chair of the economics program at University C served as the champion for starting the SSMP in 2013. Before becoming a department chair in 2011, he had been a faculty member in the economics department for many years. While a faculty member, he learned from peer institutions (Duke University, Boston University, New York University) about successful stand-alone master's programs in economics, including how to launch a stand-alone master's program, design a curriculum, target the right student population, and plan for post-graduation placement. Also, he was aware of the funding model and history of SSMPs at his own university. During the interview, he emphasized that the key to the success of an SSMP is both to sustain the program financially and to make sure that students receive the training they aspire to:

> The funding model had existed at [the university], so I knew about it. That was part of the reason we wanted to do it because, without that funding model, it is not clear that we would be able to have a standalone master's program unless we got a set of resources from the upper administration. Nevertheless, by having a funding model, this funding model that already exists at [this university], it gave us an avenue to be able to make it work financially. The program itself is certainly not the only standalone master's [program] in economics in the country.

In addition, he learned from his professional network in economics that some of the stand-alone master's programs were generating a substantial amount of revenue. He decided to pursue this route to help the department financially, in particular to better support the Ph.D. program and Ph.D. students. Strengthening the Ph.D. program was also a motivation for the

department to establish the SSMP, considering the research mission of University C as a research-intensive university.

6.1.6 Motivation 6: The Opportunity to Create a Self-Sustaining Program and the Potential for More Direct Income to the Department

It is not uncommon for academic programs in public universities to lack what they consider to be adequate funding from the state even before severe state budget cuts. At the graduate level, in addition to SSMPs, programs without support by direct state appropriations are typically certificate programs administered by university extension units or professional degree programs offered by medical schools or business schools. The self-sustaining funding mechanism of these certificate or professional degree programs became a viable option for traditionally state-funded graduate degree programs in light of budget restrictions. As explained earlier in the theoretical framework section, garbage can decision-making theory sheds light on how the decision to adopt the self-sustaining funding model without strong motivations (e.g. from loss of state funding or changing labor market demands) but simply due to the fact that the funding model already existed.

6.1.6.1 Mechanical Engineering Program at University A

The mechanical engineering department at University A did not have a strong reason to become self-sustaining in 2012. However, the department decided to pursue this path and stayed on it to benefit from the additional revenue the program brought to the department and college. Given that the earliest SSMPs at University A dated back to the 1980s, the self-sustaining funding model has been widely known on the University A campus ever since. During the 2008–2009 recession and for several years afterward, University A was facing severe budget cuts. As a result, all the programs were encouraged to think of alternative ways to fund their graduate

programs. Before 2008, the university did offer the self-sustaining model for a handful of programs, mainly in the business school. These were programs that were offered during non-regular school hours—evening programs or weekend programs–and were managed by that school. In 2010, the university extension unit took the initiative in approaching the mechanical engineering department with a proposal to convert its state-funded program into an SSMP. A faculty member in mechanical engineering, who was on the two-person team negotiating with the university extension at the time of program proposal, shared his insights:

> This [the time when the university extension approached the mechanical engineering department] was the darkest time of the recession. They [the state] were giving us budget cuts, and there is a lot of pressure [from the university] for all the departments to find alternative sources of revenue at that time. . . . We thought it [SSMP] was a bad model, and we [needed to] do more work [to convert to a new self-sustaining model] with no more [new] students [likely to apply]. But, the people at university extension, the guy that we worked with up there said, why don't you convert your [current] day program, the master's program over to university extension [as a self-sustaining program]?

The mechanical engineering department was not considering this funding model because it had robust enrollment in its state-funded program and was still able to keep the program running even with the state budget cuts. He also considered the initial conversion from a state-funded program to an SSMP a trial until the second year after the conversion, when indeed more revenue flowed back to the department and the college. The dean of the college made the decision to convert the state-funded master's program to an SSMP mainly for financial reasons. The associate dean for academic affairs of the college stated the motivation as "primarily opportunities to grow funding in the department [that the department has more control over]. I think it is as simple as that."

Although hesitant, as the faculty member shared in the earlier quotation, the program was the first in the College of Engineering to convert its funding model from state-funded to self-sustaining. Faculty attitudes towards SSMPs changed a year after the program conversion, when

the majority of the revenue from the tuition and fees came back to the department. The conversion became beneficial for the department, as the associate dean for academic affairs in the College of Engineering described,

> [At the beginning,] one of the confusing things to faculty was that [why] we're going to convert this from a state-based program to a [SSMP]. What's the big deal [about converting a state-funded program to a self-sustaining program]? The big deal is a lot of the revenue comes into the department. In the old [state-funded] model, the revenue went to the provost, and some would get back to the departments, and in this [self-sustaining] model, departments are now more entrepreneurial [and have more revenue].

The net revenue allowed for more freedom for the department to make budgetary decisions and invest where it saw fit. The uses of the net revenue included but were not limited to richer start-up packages for hiring tenure-line faculty and salaries of additional staff who would support students. The dean of the college emphasized the indispensable role the revenue played in the development of the college:

> We spend 10 to 20 million dollars a year as startup costs for our new faculty, and a big source of those funds are funded from professional master's programs [SSMPs] from departments. So, it would just be a different college, a different place if we didn't have those funds for departments. So, they [SSMPs] play, I think, a huge role in the continued health of the college.

Ever since its conversion to an SSMP in 2012, the program has been expanding, with enrollment doubling from 50 in 2013–2014 to 114 in 2017–2018, while selectivity was cut in half, from an acceptance rate of 40 percent in 2013–2014 to 81 percent in 2017–2018 so that more "profitable" students could be enrolled. Overall, the master's students enrolled in all the SSMPs in the College of Engineering doubled since the Great Recession, and the net revenue from them was able to offset the loss of state funding and continue the development of the college. The dean explained,

> We've gone from about 300 master's degrees awarded annually before the Great Recession to over 700 now. I think I said that's a great service to the community, but the financial incentive is a big part of that growth, and that money has replaced a chunk of the money that the state withdrew during the recession that hasn't been returned.

Additionally, all other SSMPs in the sample took advantage of the existence of the self-sustaining funding model, but they had other motivations for establishment compared to the mechanical engineering program at the University A.

Table 5

Comparison of Primary Rationale to Establish SSMPs Across All Sample Programs

	University A			University B	University C	
	Information Management	Mechanical Engineering	Statistics	Statistics-Data Science	Software Engineering	Economics
Serving Non-traditional-student population					X	
State budget cuts	X					
International student supply			X	X		
Learning from peer institutions						X
Existence of self-sustaining funding model		X				X
Labor market demand	X		X	X	X	X
Revenue generation			X	X	X	

To conclude, none of the theories can comprehensively explain the universities' rationales for establishing SSMPs (see Table 5). They are helpful in explaining the rationale in different proportions. Resource dependence theory is appropriate in explaining the motivations of programs to cope with financial constraints, such as state budget cuts. This theory is also instrumental in explaining the motivation of revenue generation for some programs, considering that establishing an SSMP meant more net revenue was flowing into the departments. It gave them and the college and school that housed them more power to self-regulate and more freedom from the state and the central university administration. However, resource dependence theory is only sufficient to explain the motivation of programs that were established during a time of unstable state funding or in preparation for a potential loss of state funding. Garbage can decision-making theory and institutional isomorphism filled this explanatory gap and explained how some master's programs became self-sustaining without strong financial incentives but through observation of other successful academic programs and the existence of a self-sustaining

funding model. Further, due to the revenue-generating nature of SSMPs, international student availability and labor market demand also served as necessary conditions for departments to establish SSMPs to seek revenue.

6.2 The Establishment of SSMPs—Universities' Perspective

The second research question aimed to investigate the different pathways universities undertook to establish SSMPs. Based on the management process in each university as well as the historical accounts and institutional contexts, I grouped the most salient traits of the organizational processes sample universities adopted in the SSMP establishment into three categories: decentralized and reactive, as in the case of University A; centralized and proactive, as in the case of University B; and hybrid (a mix of centralized proactive and decentralized reactive), as in the case of University C. The characteristics of each category are influenced by the state higher education governance structure, the roles of university or college/school continuing education units, and other factors like institutional history and culture (Knott & Payne, 2004).

The distinction among the different degrees of centralization was largely determined by the role state higher education governing structure played in the SSMPs' establishment process. In state A, prior to 2012, when all the sample SSMPs were approved, the higher education coordinating board played a weak role in approving programs (Lacy, Jr., 2011), compared to university system governing boards in states B and C; within University A, graduate education is governed in a decentralized manner where deans of colleges/schools hold a substantial amount of power. In state B, the university B system is one of the most centralized governing boards among all 50 states, so it influenced the institutional governance of university B (Lacy, Jr., 2011). In state C, the state higher education coordinating board plays a similar role to that of state A

regarding program approval, but the university C system holds the final decision-making power regarding SSMP establishment; within University C, due to the organizational structure of continuing education units housed within colleges/schools, the SSMP establishment process also presents elements of decentralization. In the following, I will explain these three ways of governing the SSMP establishment process in institutional contexts that were implemented prior to the end of my data collection, in June 2019. Policies and procedures might have changed since then; thus, I use the past tense in describing the SSMP establishment processes.

6.2.1 Decentralized and Reactive Approach: The Case of University A

University A has the longest history of SSMP establishment compared to the two other sample universities. The approach University A adopted in governing and managing the SSMP establishment process was decentralized and reactive with the following features. First, faculty and leadership in academic departments or schools and colleges are responsible for initiating program proposal ideas and making decision to move forward in consultation with the central Graduate School and university extension unit. Second, given the increase in the number of SSMPs shortly after the 2008–2009 economic recession, the Registrar's Office published online a frequently-asked-question section on SSMPs targeted to external stakeholders, mainly prospective students, in 2011, including an updated list of SSMPs, after many questions surrounding SSMPs got brought up by students and departments. Third, although the history of SSMPs at University A was traced back to the 1980s, the Graduate School only published an SSMP report in 2014 to share with internal and external stakeholders (e.g., students, faculty, local community) the history, development, and key features of SSMP enrollment, and SSMPs' alignment with the innovation and flexibility mission of the university. Fourth, due to the involvement of the university extension unit in the financial aspect of the SSMP establishment

process, the university extension unit published a policy and procedure handbook describing the recommended financial practices for establishing SSMPs in 2014 and updated it in 2017. Fifth, being responsible for coordinating new academic program proposals, the Graduate School published a procedural document (in 2015) after a substantial number of SSMPs were already established on campus. Based on the times of publication, all these relevant policies, reports, and online information were produced after more than 50 SSMPs or SSMP options already existed. These documents are more guidelines and recommendations than policy requirements. Viewed from the perspective of the university's top administration, this is a reactive approach in response to the emergence of SSMPs, rather than an approach that entailed actively promoting and governing them based on an initial vision or approach.

According to the Graduate School policy of University A, all new graduate degree programs go through the same academic review process with the Graduate School and must receive approval from the dean of the Graduate School as well as from college/school deans if applicable, the provost, and the university's Board of Regents. Establishment of new SSMPs not only requires the formal academic review process but also requires a separate budget proposal that is negotiated among the program, college/school that houses the program, and the university extension unit, and is signed off by the provost. The budget proposal serves as the initial financial blueprint of the program, mainly describing how the revenue from student tuition covers the expenses of the program.

In the case of SSMPs, academic departments consulted with academic affairs staff in the Graduate School to formalize the academic program initiation process and with the staff at the university extension unit to discuss the financial planning of the potential SSMP. According to the 2014 SSMP report published by the Graduate School, the university extension unit has

become the business arm of University A for such programs and is responsible for administering the majority of the SSMPs, including monitoring their annual financial situation. As stated earlier, it does so in return for a fee that covers marketing, student enrollment management, and reporting services. The university extension also provides a loan to new SSMPs to help with the start-up cost. University A has several successful SSMPs that date back to the 1980s, so this model was not a brand-new idea on the University A campus as a sole response to the recession in 2008–2009. Regarding the earliest two SSMPs at University A, the engineering program was administered by the university extension unit, but the business program was not.

After negotiation, the academic department interested in starting an SSMP, then signed a memorandum of understanding (MOU) with the university extension unit for a defined period (such as 5 years). The MOU included the following components: program name and description, faculty staffing and funding arrangements, student requirements for program completion, registration policies, services provided by the academic unit and the university extension unit, program administration fees charged by the university extension, terms of loan repayment if applicable, procedure for handling program financial surpluses and deficits, and procedures for resolving issues not explicitly discussed in the MOU. During these MOU discussions, two important topics that required the most attention are faculty compensation and resolution of any program deficit. According to one program manager of SSMPs at the university extension, this MOU, a basic form of efficient management practice, is enforced by the university extension unit mostly to guarantee the financial health of both the SSMP and the university extension unit.

To summarize, the decentralized aspect of this approach features: initiatives and responsibilities taken by the academic departments and college/schools; negotiations among the initiating department, the Graduate School, and university extension unit concerning academic

standards and financial sustainability; symbolic approval from the provost for SSMP proposals that have been approved by the Graduate School; and notification to the Board of Regents. The reactive aspect of this approach highlights how the university established policy and practice recommendations only after the emergence of more SSMPs and when questions arose regarding the rationale for a public university to offer SSMPs. Based on the history of SSMPs at University A, with the first SSMP started as early as the 1980s and a gap of 25 years before SSMPs became prevalent, a policy governing the program establishment procedure would have had more influence on the development, if issued in the 1990s. Academic reviews of new graduate programs are typically done 5 or 10 years after their establishment by the Graduate School, but the unit of evaluation is the college or department, not the individual program. For example, all graduate programs in the Department of Statistics will be evaluated together, including master's and doctoral programs. Since the initiation of SSMPs was at the department or college/school level, the department mainly took on the responsibility for demonstrating the potential sustainability of these programs. The university extension unit gave out loans to academic departments, so they mainly care about the financial outcomes of SSMPs. These loans are typically on a 3-to-5-year term to allow new SSMPs several years to test out their market and operations and reach a break-even financial status. As a result, the central university administration is not bearing any financial risk in these programs. Considering the reactive approach the university central administration took as well as the decentralized manner in which academic departments and schools and colleges initiated SSMPs and governed them, SSMPs have been emerging at a fast pace, from 35 programs in 2008 to 81 programs in 2013 and to more than 120 programs in 2018.

6.2.2 Centralized and Proactive Approach: The Case of University B

The approach University B adopted in managing the SSMP establishment process was centralized and proactive, heavily influenced by the centralized consolidated University B System Board of Regents. At University B, the graduate faculty executive committee, known as the Graduate Assembly, issued a policy on the governance of SSMPs as early as 1999, when the first SSMP was established. The policy served as the guiding document for the establishment and governance of SSMPs and required all departments to comply. The language in this policy centers around "must," "should be," and "required." In particular, the policy set parameters around the financial status of an SSMP. First, all SSMPs should have substantial opportunity for scale (e.g. a minimum of 30 FTE entering students per year). Second, the revenue of any SSMP must exceed its expenses. The policy did not delineate any limitations on the allowable net revenue or on its use. Similar to the role of the academic affairs unit in the Graduate School at University A, the same unit in the Graduate School at University B also serves as the gatekeeper of academic program creation and review.

These terms in the policy explicitly reflected how closely SSMPs were governed and monitored by the University B Graduate School. The Graduate School and the university extension units are the units that are responsible for the establishment of SSMPs. The function of the university extension unit at University B is very different from that of the unit at University A. The university extension unit at University B is part of the budget planning committee working with potential SSMPs to set up a sustainable budget plan, including the minimum number of students needed to enroll. This is similar to the work of the unit at University A but what is very different is that the university extension unit at University B does not provide financial support or a loan to departments to cover program start-up costs, nor does it evaluate

and manage the financial status of SSMPs. The college/school that houses SSMPs takes the full financial responsibility.

At University B, the process of establishing an SSMP usually started from the department or college/school and the Graduate School. The most recent policy governing SSMPs, dated February 2018, stated that departments that are interested in exploring the possibility of establishing an SSMP or an SSMP option must first discuss this intention with their college/school, then consult with the Graduate School concerning academic planning and with the college/school budget office, the university budget office, and the university extension unit for detailed budget planning. The program must receive final approval from the Graduate Assembly and the university academic planning unit and will be signed off by the provost. Also, if the proposing SSMP is an online program, the department will have the option of working with the university academic technology unit that supports online curriculum design and technology for a fee. Schools/colleges are fiscally responsible for the program start-up cost and ongoing support. SSMPs do not receive central funds for start-up costs or loans. The University B System only gets involved when the proposing SSMP is a new degree program, the sample SSMP option in my study did not require approval from the University B System.

In terms of program structure, the policy requires all SSMPs to have a live website, their handbook completed, a faculty director identified, and the program coordinator and other key staff hired before launching the program. The 2018 university policy also included a recommended admission letter template for SSMPs, which highlights two policies that are pertinent to students: their ineligibility for a graduate assistantship that would result in a tuition waiver and zero flexibility for taking courses outside of the program.

According to institutional reporting requirements in 2018, all relevant data about SSMPs at University B are reported separately from state-funded programs. Further, if the proposing SSMP requires sharing instructional resources, courses, or infrastructure with another department, school/college, or division, the proposing SSMP or department is recommended by the policy mentioned earlier to complete a MOU with the other unit. The Graduate School provides two separate MOU templates on new course development and new program development that aim to bring all stakeholders to the same level of understanding about resource allocation and intellectual property ownership.

Colleges/schools provide a certain amount of start-up funds for program development and loan any additional financial support above that amount to the SSMP. The loan is expected to be paid back by the time the program is well established at planned scale. Each SSMP negotiates with their college/school for their specific financial arrangements. Although the university extension unit lists all the SSMPs at the university online as a marketing strategy, the admission to all SSMPs is administered by the Graduate School, and the admission selection is completed at the department/program level. At University B, the university extension unit is also the gatekeeper for VISP, the program previously described in which international students who are senior undergraduates complete courses or a selection of courses in a particular program, often for the purpose of preparing for entry to a SSMP. In this case, the university extension unit provides assistance to the SSMPs with the budget proposal and marketing needs, the admission process for undergraduate students that enter VISP and services to graduate students in VISP without an extra fee to academic departments.

Given the centralized mandatory process and clear procedural requirements, all departments and colleges/schools are following the same university policies in establishing new

SSMPs. The waves of SSMP creation also follow the strategic suggestions from the university leadership. For example, according to the former assistant dean for academic affairs at the Graduate School of University B, since 2017, online program offerings have slowed down while more one-year accelerated SSMPs were added. This change was guided by the advice from the provost and the Graduate Assembly, for the purpose of giving students more on-campus experiences. Also, due to the centralized process, the university policy and institutional data present a relatively thorough picture of how SSMPs are established at University B, and this is fairly uniform across all SSMPs at this university.

6.2.3 The Hybrid Approach: The Case of University C

By hybrid approach, I am referring to a process that involves elements of both centralized proactive and decentralized responsive approaches. Historically, at University C, after the initial establishment of several SSMPs in professional schools, the former provost, while still a dean, started working with several deans to help them build SSMPs. Leaders can drive institutional change (Bolman & Deal, 1991) as is illustrated by how the former provost played a crucial role in advocating for SSMP establishment and driving policy changes at University C. He served as an advocate who spent a lot of his time networking with deans to create coalitions and initiated the first guidelines regarding SSMP establishment based on his experience. However, the initial guideline document was used internally among the provost and deans as a conversational tool. During his tenure as the provost, 2007 to 2013, six SSMPs were approved and launched, adding to the existing six SSMPs at the University C. The later policy updates were driven by practices implemented at the department level. After the former provost left in 2013, the Graduate School served as the gatekeeper of the updated SSMP policies and made the policies public.

The Graduate School at University C is responsible for the overall administration and coordination of all SSMPs. In the program proposal, besides the same academic requirements as other state-funded programs, SSMPs are obligated to submit a financial proposal with details of proposed revenue and expenses. Every year, SSMPs need to submit a report to the Graduate School delineating both their academic and financial status, including but not limited to student enrollment and the program's financial sustainability. SSMPs can only operate using fees collected from their students. Their net revenue may be used for curriculum and program development and faculty development elsewhere within the college/school, or at the department's discretion, including addressing general departmental financial needs.

Usually, the program proposal starts with a department chair or college dean, who is interested in developing an SSMP, consulting the Graduate School to explore the possibility. Then the Graduate School works with the department to develop financial and academic proposals and then moves things forward. Departments and/or schools or colleges invest in starting up new SSMPs, along with the development of business plans to meet the financial targets of the SSMP which includes an estimate of the revenue per student needed (i.e., from tuition and fees) to cover the program development and operating cost.

At University C, the initial policy delineating the process of establishing SSMPs was created after the initial wave of SSMP development, although it was not made public. The policy was subsequently updated several times after more SSMPs were in place. The updates were made due to unexpected issues in SSMPs that the previous policies did not address adequately, such as whether junior faculty are allowed to teach in SSMPs, as will be explained later. The Graduate School served as a convening unit and governing body over the academic quality of these graduate programs. As of 2019, University C had the least number of SSMPs compared to

Universities A and B. It also just launched its first online SSMP in 2019, much later than University B. Due to its shorter history with SSMPs, University C is still in the evolving phase concerning developing and updating of procedures for establishing SSMPs compared to the other two sample universities. The development of SSMPs is strongly supported by the University C system administration, mainly for the reason that the former provost, the staunch advocate and successful implementer of SSMPs, moved to the University C system administration and has been in charge of approving SSMP establishment at the system level.

Initially, the former provost emphasized the necessity of developing a feasible business plan for any SSMP before a unit could submit a new program proposal. Developing a business plan includes market research into demand from and supply of the potential student clientele in the region, assessment of costs for operating the program, and decisions on enrollment and tuition rates needed to cover the cost. When assessing potential student clientele, a key consideration is whether this population would be capable of paying for the education from either personal savings, employee benefits, or student loans since SSMP students are not eligible for university and most government aid. The former provost reiterated that having a well-developed business plan is essential for the success and sustainability of an SSMP but also voiced concerns about the lack of understanding in the academic community of what such a business plan entails.

> I would say that one of the biggest issues with SSMPs is that the foundation really needs to be the business model. All the things [selectivity of the program, whether enough students will apply] need to be done very carefully and accurately, both in terms of costs of establishing the program . . . the most significant issue with SSMPs . . . is making sure that you can revenue generate in order to operate the program . . . but faculty and administrations on academic campuses have little or no experience in these areas . . . The stressful part was that when they were trying to recruit students, they had no experience on the marketing side . . . These are big limitations with SSMPs. Having people [directors of SSMPs] at the beginning and understand all the elements [both business and academic]

> that are necessary in order to put the program in place, and [to ensure that the program] from a financial and programmatic standpoint [will] be sustainable.

Part of the required organizational structure of SSMPs at University C is that each program have a director who understands both the business and academic sides. A distinctive feature of SSMPs at University C is that all the tenured faculty who teach in these programs are working on an overload basis, meaning that faculty are allowed to work beyond 100 percent FTE and get paid for it. The pay rate depends on policies of the course offering department or college. According to the Assistant Dean for Academic Affairs at the Graduate School, there was no limitation on the overload teaching that one faculty member could take on. Some colleges, such as the College of Engineering, according to the Associate Dean for Academic Affairs, only allow one course of overload teaching per semester. At University C, it is not uncommon for faculty members to take outside employment given the low compensation in some colleges or schools compared to others. Another factor in allowing faculty to be compensated beyond 100 percent FTE was the rising living expenses in the area (which is a fast-growing technology center). At University C, teaching in SSMPs can be a financial incentive for some faculty. The assistant dean of the Graduate School quoted an example from the School of Liberal Arts:

> Their [faculty's] outside employment is very much a part of their profession, and what they do, and what they bring to their teaching. And it's also a critical part of how they support themselves financially because of the [relatively low] salaries in the college of fine arts.

When a department proposes an SSMP, faculty buy-in is critical, since the teaching force usually comes from those already part of the department. Due to SSMPs requiring full-time faculty to teach on an overload basis, not all faculty members are interested in teaching in an SSMP. To protect faculty research time, a policy update from the Graduate School limits the participation of junior faculty (e.g., tenure-line assistant professors) in teaching in SSMPs, as this

may affect their research productivity, thus negatively influencing their tenure review. The department chair of economics, who started the SSMP in economics, shared his concerns:

> But the problem is, since it's outside the standard state tuition model, it's not that easy to get faculty to teach the courses. They have to teach on an overload basis. So, it wasn't clear that there would be that many faculty interested in doing that. And if you don't have your own faculty teaching and you start hiring adjuncts and lecturers, it's a slippery slope. We don't want to put the university name on the degree if it's not really the [university's] economics faculty teaching the courses. So, I think that was one big concern.

The assistant dean of the Graduate School voiced similar concerns to those of the dean of the College of Liberal Arts, namely that faculty might need to decide between teaching in SSMPs and pursuing other professional activities outside of the university that might benefit them.

> She [the dean of the College of Liberal Arts] said, I would hate for faculty in our department to have to make a choice between teaching an SSMP course that could really benefit the university and this other outside employment that's critical to their professional development because I'm afraid they would decide not to teach in SSMPs.

This worry of not having enough faculty to teach in SSMPs was brought up during an SSMP task-force meeting, convened by the Graduate School in 2018, to discuss practices, strengths, challenges, and lessons learned. The task force was composed of representatives from all colleges and schools, including those that did not offer SSMPs at the time. The task force met once a month to share experiences and, for those that did not offer SSMPs, to learn about this funding mechanism and its potential. The discussion during task-force meetings and follow-up email communication allowed the dean of the Graduate School to learn more about challenges SSMPs are facing and thus make policy updates to address these challenges. For example, the restriction on junior faculty participating in teaching in SSMPs was not in the initial policy document but was added to the policy later, after concerns were raised by faculty in SSMPs. However, the remaining problem at University C is still the dilemma that faculty face in having

to choose between outside employment or teaching in an SSMP. Faculty having the choice of multiple professional opportunities is desirable for their career advancement, but for some departments or colleges that are starting SSMPs, securing enough faculty to teach can be challenging.

The hybrid approach of University C, in summary, features an initial centralized and proactive policy-design and implementation process and a later decentralized, responsive, policy-update process by the Graduate School. This can be a pretty standard management practice when trying something new, as there are always adjustments needed, similar to what Robert Behn called "managing by groping along" (Behn, 1988). Although a policy is in place, it is updated nearly on an annual basis, as least in early years, to address new challenges brought up by SSMP stakeholders at the college/school level. The Graduate School at University C plays a convening role in facilitating the SSMP establishment process and updating the policy. In contrast, concerning SSMP establishment, the Graduate School at University A takes on more of a coordinating role in developing guidelines, and the Graduate School at University B takes on a strong governing role in regulating the SSMP establishment process and make more minor changes based on experiences.

The sample institutions presented different characteristics of their SSMP establishment and development. There are five main similarities across the sample. First, the earliest SSMPs established were in professional fields like business and engineering. Second, during a period of 10 years, from 1995 to 2005, only one SSMPs was established. Third, each university's Graduate School serves as the gatekeeper of academic standards during the program proposal and review processes. Fourth, the university extension or the college/school extension unit plays an essential

role in the budget development process. Fifth, none of the universities offered scholarships or fellowships for students from underserved communities to apply to and enroll in SSMPs.

Three major differences across the samples are: different units at the three universities provide start-up costs and funds for continuing development, the level of involvement of state higher education governing bodies in the three states is not the same, and the role of the university extension units varies. In evaluating SSMP establishment processes, I found that each university's approach has its strengths and weaknesses, which are associated with the historical development of SSMPs and their institutional contexts across the sample. With regard to strengths, University B has the most unambiguous policies on the evaluation criteria as to whether or not the proposed program fits into the requirement of the self-sustaining funding model and the definition of the role of each unit that participates in the process. The policy of University B also requires SSMPs to provide student services tailored for the non-traditional student population they target. These clear policies and guidelines, if enforced, can make sure that all new SSMPs are following the same standards of establishment and are well-equipped with supporting services before accepting their first cohort of students. University A's extension unit provides loans with interest for graduate departments to start an SSMP, which alleviates the financial pressure for each college or school. This service helped to result in the fast rate that SSMPs have been growing at University A, and in 2019 the university experienced the most substantial proportion in the university history, more than 50 percent of its newly admitted graduate students, enrolled into SSMPs. University C is still at the developing phase in terms of implementing SSMPs. Although newer to the SSMP business, University C learned from existing policies and practices of other institutions as well as engaged leaders from across the campus to participate in the policy-update process. By involving academic departments with and

without SSMPs in this process, the Graduate School at University C was able to encourage transparency in sharing the benefits and setbacks at a campus level.

With regard to challenges each institution in the sample faced in establishing SSMPs, although SSMPs at University A have been developing at a fast pace, the involvement of central university administration is minimal consistent with the university's overall governance approach that emphasizes local initiative and autonomy. Program development happens at the departmental or college/school level, and the financial loan for start-up comes from the university extension unit. Programs vary drastically in their size, acceptance rate, and program outcomes. The measurement of success is not universally defined. All these differences among SSMPs at University A make it challenging to hold them accountable to one academic quality standard despite the initial prospective academic program review that led to proposal approval, not to mention that the university's top leadership is not much involved in ensuring that the pursuit of revenue is not compromising academic quality. At University B, only the procedure for SSMP establishment is heavily governed centrally, not the outcomes of programs. For example, information on students' program outcomes, either gaining employment or pursuing advanced degrees, are not publicly available. Although somewhat unavoidable, the unforeseeable future of student clientele numbers, such as heavily relying on international student enrollment, may put the financial stability of some of the SSMPs at University B at risk.

At University C, given the heavy involvement of the university system in the program proposal phase and that they are relatively inexperienced with SSMPs, new SSMPs at University C took a longer time to be established and to launch compared to the relatively well-developed processes at Universities A and B. What also makes SSMP development slower at University C is the practice of faculty teaching on an overload basis in SSMPs permanently, which means not

all faculty want to teach in the SSMPs and not all departments are in a position to offer them. Thus, it took a more substantial amount of time to ensure a sufficient number of teaching faculty was available in many cases. As mentioned earlier, some senior faculty prefer to pursue additional compensation from outside employment opportunities to teaching in SSMPs, as the outside employment is usually more beneficial to their professional development within their disciplines. In addition, the practice of teaching on an overload basis is not sustainable for faculty in the long term, at least not without compromising quality or research output, and can potentially place students at risk.

In conclusion, University A adopted a decentralized and reactive approach in governing SSMP establishment, where departments or college/schools took initiatives and formed a lateral collaboration with the Graduate School and university extension unit to move the process forward, while no centralized policy or guideline was in place until the number of SSMPs became prominent. Then the Graduate School, university extension unit, and the Registrar's Office published summary information on SSMPs, including enrollment and degree trends, a budgetary planning process, and stated rationale for program establishment. University B adopted a centralized and proactive approach, where a policy was in place before SSMPs started to grow systematically. The policy governed the development of SSMPs in a uniform way. University C adopted a hybrid approach: initially it adopted a centralized and proactive process, due to a strong advocate of SSMPs' presence in a leadership position, but later used a decentralized and responsive approach due to the departure of the provost and continuous active engagement from departments and colleges/schools in matters of SSMPs.

6.3 Implications of Establishing and Expanding SSMPs on Diversity and Inclusion

The third research question of this study calls for examination of whether or not the expansion of SSMPs undermined the diversity and inclusion mission of the sample public research universities. If SSMPs did pose a threat to the diversity and inclusion mission of these public research universities, in what way was it exemplified, and why was this potential threat not addressed? In the literature review chapter, I discussed the importance of research universities embracing diversity and inclusion in their practice and institutional decision-making processes, rather than merely adopting it in institutional rhetoric.

It is widely accepted that the mission of public research universities centers around research, teaching, and service. Some universities add elements to enrich this mission, such as patient care, if the university has an affiliated hospital. The public mission of research universities revolves around four questions: "What they owe in return for funding at public expense, what they may provide as public goods, how they may work in distinctively public ways, and how they may nurture public discourse" (Calhoun & Rhoten, 2011, p. 3). Calhoun & Rhoten (2011) also emphasize the vitality of situating the understanding of a public research institution's public mission into historical, geographical, and cultural contexts, as well as to consider the audience addressed. Higher education is not simply divided by the "public" and "private" in the institutions' names, because many private not-for-profit universities also serve the public good, such as by investing in research to tackle world and regional problems. Therefore, at the institutional level, public research universities should be responsible for addressing state needs, including educating qualified candidates for state workforce needs. Beyond a state's borders, public universities also have to serve the market demands at the national and international levels (Rhoads & Liu, 2009). For example, driven by globalization,

more university presidents have highlighted in their discourse the importance of internationalizing their campuses and cultivating international collaboration (Liu, 2007).

Public universities are funded, supported, or assisted by the states (McGuinness, 2011). States' funding of higher education in part ensures that these institutions pursue public missions: "opening access, educating civil servants, teachers, and practitioners of the 'helping professions'; and conducting research on problems of national need" (Calhoun & Rhoten, 2011, p. 4). Advocates for more state funding to public universities stress the indispensable role these universities play in serving the public good, such as providing access to students from underprivileged backgrounds. Although more minority students are entering the higher education system, the distribution of these students by disciplines or programs has received little attention (Oseguera & Astin, 2004; Mullen, 2010). At the societal level, having a diverse student body can potentially diversify the workforce in a particular sector and help level society's inequalities.

The privatization in public higher education has placed public research universities under scrutiny regarding the implications of university entrepreneurial activities and the impact of these activities on students as well as on their public missions. Some of the concerns raised by higher education scholars are discussed in the literature review chapter. Given the fee-paying nature of SSMPs, one might share similar concerns with Calhoun (2011) that universities would be tempted to focus their course offerings on training students for high-paying jobs, since these programs rely on student fees for survival. This can be problematic for two main reasons, one regarding students from low socio-economic backgrounds who might have neither the financial means to attend these programs, nor have purely economic aspirations for graduate school; another one concerns the ongoing debate about the primary purpose of education, whether it is

more a private than a public good, that could potentially serve as the justification for a further retreat of state funding to public higher education.

My research found that diversity, with respect to domestic minority students, is neither the mission nor the priority of SSMPs, despite the fact that all three sample universities clearly included and elaborated on "diversity" in their mission and vision statements. This finding corroborated Hagigi (2014)'s observation with evidence based on data on student demographics and my informants' account of re-investment of the generated revenue. Students who enroll in SSMPs are either capable of paying the tuition (sometimes by relying on loans) or they are receiving a subsidy from their employer. Interviewees generally referred to SSMPs as "revenue-generating programs." Their primary tasks were to maintain financial sustainability and generate additional net revenue to fund other activities, which were at the discretion of the college or the school. Increased resource allocation for diversity might reflect universities' commitment to diversity, access, and affordability for all students (Santos et al., 2014), yet the choices about investment of revenue generated by SSMPs, as determined by colleges or schools, does not reflect the value of diversity. None of the SSMPs in the sample invested the revenue into diversity-related efforts, as reflected in the following areas expanded on below: admission of students, student experiences, funding and financial support, and career planning and placement.

6.3.1 Admission

One of the design principles of SSMPs at the sample institutions is to attract either a new student population or a student population that has not been served traditionally. These student populations are supposed to be a new source of students in the market that has not previously been tapped by higher education institutions regionally or nationally. Table 6 below shows the breakdown of accessible information on student demographics for the entry classes in the sample

SSMPs in the 2017–2018 academic year. I marked unavailable information as "-", and the URM column is a subset of students in the U.S. column, due to the concern from the institution staff that URM students in sample SSMPs at the University C might be identifiable. The last column represents percentage of new URM student enrollment in all master's programs in the particular university, serving as a reference column.

Table 6

Select Student Demographic Information in the Sample SSMPs: 2017–2018

University	SSMP	Total	International	U.S.	URM (%)	University URM %
University A	Statistics	23	20	3	0 (0%)	12.9%
	Information Management	96	58	38	6 (6%)	
	Mechanical Engineering	128	72	56	4 (3%)	
University B	Statistics–Data Science	46	46	0	0 (0%)	8.6%
University C	Economics	61	28	33	-	17%
	Software Engineering	60	7 (work visa)	53	-	

When asked during the interviews, no informants from any SSMP voiced concerns about not enrolling diverse domestic students into their programs. Comments regarding student admission and enrollment fall into two major categories. The first category included comments about making sure enough students filled the classes in the future. The second included comments about enrolling as many students as possible, if the program has a track record of being popular among applicants.

The director of the data science program at University B has monitored the relationship between China and the U.S. closely and projected its potentially catastrophic impact on China's student supply to U.S. universities and specifically the demand for this program, considering all students in the program came from China.

> Should there be a slow-down [of student supply] in these programs, it is not going to be abrupt all of a sudden. Unless China says we don't like the trade deal, and we're going to shut our borders. The students want the training, and they're coming here because they can't get that kind of training in China or wherever. So, we're filling a need, and that need might gradually taper off. And if it tapers off, then, they will have to reallocate in various ways, and presumably, there'd be a couple of years to figure that out.

Some SSMPs have been more popular among applicants than others, resulting in the increasing size of the student cohort and thus more revenue from the students' tuition payments. The mechanical engineering program at University A serves as a good example. The institutional data for this program revealed a drastic increase, almost three-fold, in the numbers of applicants receiving offers from 2013–2014 to 2017–2018, from 109 to 400, despite the much smaller increase in the number of applicants over the same period, only 80 percent compared to nearly three-fold. In the institutional profile chapter, I also mentioned that the increase in enrollment in this program was primarily due to international students. The director of the mechanical engineering program at University A described this occurrence: "That the revenue is tied to the number of students . . . we've gone out of the way to expand the number of master's students . . . and you can see the increase in revenue has really gone up with that."

Although the former dean of the information school at University A did share his concern about not enrolling enough American students into the information management SSMP since every cohort enrolled at least 50 percent international students. He was the only one who expressed concerns over student diversity composition and the purpose of serving the state. We have to remember that the information management program has been operating for more than a decade—and the length of the program's history has allowed for more scrutiny over different aspects of the program. When asked what he wishes he had done differently were he to start the program again, the former dean responded,

> We might've expanded it a little differently in terms of the daytime program. We would have had more detailed discussions [regarding] reaching a proportionality between domestic students and international students that looks and feels right for the experience for everybody within it.

In contrast, when asked about this responses from other sample SSMPs reflected their priority of having a continuous supply of students over enrolling diverse candidates that could positively affect the learning experience of each cohort.

6.3.2 Student Experiences

The literature review section detailed how working and learning from diverse peers in higher education would contribute to students' learning outcomes. In addition, public research universities are tasked with providing access to all qualified students regardless of their background. Given the historical underrepresentation of particular student populations in higher education institutions even in the 21st century, it is more pivotal than ever to recruit the most diverse students into higher education. SSMPs are established under the premise of preparing students for the future workforce and equipping students with more employable skills or, in some cases, with academic skills to pursue advanced graduate education such as a doctoral degree.

Having a diverse student composition is the first step in creating a space where diverse perspectives are appreciated. Research in graduate education has proved the value of having a diverse team working on problem-solving or project development (Harvey & Allard, 2014; Page, 2007). Based on the review of documents and interviews, faculty and administrators in sample SSMPs have not considered diversifying students, i.e., underrepresented minority students from the U.S., in their programs as a priority. They are simply proud of the fact that they have students' interests in mind after students join the program but, in fact, only made efforts to address some logistical issues brought up by students.

The director of the economics program at University C shared how he encountered the logistical challenge of identifying classrooms for students in SSMPs, due to the competing class schedule with state-funded programs:

> The university wants to keep SSMPs from taking away any state-funded resources. So, we have no priority in terms of reserving rooms on campus . . . That's created a lot of headaches. We were actually renting space from a conference center this year . . . Even though we already paid the university some sort of overhead for facilities this year, we couldn't actually find rooms for two of our required classes. So that's been an issue.

Similar to the topic of classroom space, the director of the mechanical engineering program at University A shared his concern over program enrollment expansion: "We ran a little bit into trouble with room space for a couple of classes . . . We've probably grown to the point where it would be hard to grow further mainly because of logistical constraints." The director also shared that his solution to an SSMP class that exceeded capacity was to split one cohort into separate classroom spaces. Students in one classroom would listen to the lecture from the instructor while students in another classroom would watch the live lecture on T.V. He doubted this solution would work for other similar situations in the future.

To provide professional development services to Chinese students in the data science program at University B, the director of the program hired a staff member who offers a one-credit professional preparation course to all students in the program. This course provides information on the cultural differences between the professional worlds in China and the U.S. as well as provides information on typical job application materials and one-on-one advising on career exploration and job searching in the U.S. The staff member, relatively new to her job, shared how she was highly aware of the cultural differences between American and Chinese cultures:

> Our program currently consists of entirely students from China . . . The first learning curve for me was really trying to understand some of the Chinese cultural norms,

> professional norms, and include that in the career information in particular that I'm working with students on. Because there are very different things culturally in China versus the U.S., and even as simple as putting your picture on a resume is a very different thing.

This one-credit course was the only professional-development service offered as part of any of the sample SSMPs' curricula that addressed the needs of the international students in that SSMP.

6.3.3 Funding and Financial Support

At the doctoral level, providing funding packages to attract underrepresented students is a standard and effective practice among universities. Master's students who are enroute to doctoral programs are eligible for this type of funding as well. For conventional stand-alone master's programs, such as the MBA or master's of law, professional schools tend not to fund their students but provide merit-based scholarships for a few select students (Glazer-Raymo, 2005). The assumption that terminal master's degrees lead to certain well-paying professions is the foundation of many SSMPs, and students may pay their tuition or take out loans in the hope of earning a rewarding post-graduation salary. However, most first-generation graduate students in the U.S. come from low-income families and consider funding an essential factor in the pursuit of higher education (Terenzini et al., 1996; Holley & Gardner, 2012); as such, having no financial support creates a financial barrier for students from underrepresented communities. By not identifying proper resources to provide funding opportunities to underserved student populations, I suspect that the founders of SSMPs either subtly accepted that they were denying access opportunities to students from low-income backgrounds or were oblivious to the needs of these students to upgrade their skills for a particular profession.

The prevalent messages on the websites of SSMPs include the ineligibility of students for state-subsidized funding opportunities, such as teaching or research assistantships. The available financial support for students with insufficient funding includes all types of student loans, from

federal to private sources. Yet, international master's students are ineligible for any federal student grants or loans. While some colleges or schools offer a very limited number of merit-based scholarships, to which students from all graduate programs, both state-funded and self-sustaining, are eligible to apply, no SSMPs in the sample offered non-merit-based scholarships.

6.3.4 Career Planning and Placement

Many SSMPs in the sample have exit surveys, which partially capture where their graduates became employed, except for the mechanical engineering program at University A. SSMPs collect this information not only to inform future program development but, more importantly, to use some of these data points for marketing to potential applicants. The staff administrator for the statistics program at University A shared how the program was collecting and using the information from the alumni survey:

> This is the [alumni] survey that we did in August [2018] [for the 2016 cohort] . . . I sent this to all prospective students who inquire. The information includes the job title, the company, where they went, and if they went on for a PhD . . . People always ask [for this information]. . . The ones that I didn't put down were those who were indecisive of what to do, or were looking for jobs, or those who had nothing to report.

The economics program also collected alumni placement data and published it online; however, the information only shows a list of companies and Ph.D. programs that alumni have pursued since 2014, without including all graduates. The information management program at University A also publishes such a list of employers of alumni on its website. However, the alumni information that some SSMPs published did not capture the full picture of alumni career placement. Except for the mechanical engineering and statistics programs at University A and the economics program at University C, some SSMPs in the sample were more concerned with students' program outcomes (e.g., career placement) especially when they have already experienced a decline in enrollment but reticent about providing me with specific data. For

example, the software engineering program at University C has experienced a decline in enrollment since 2015, from double-digit to single-digit entry cohort enrollment, with a similar acceptance rate to the rate from pre-2015. The program director collected very detailed information from students' exit surveys but was only willing to share the survey instrument, not the results, with me. I speculated that the students were not very satisfied with their experiences and that the program planned to undergo some changes. So far, based on available and accessible information, most of the sample SSMPs are not equipped with professional development opportunities well tailored to students in the programs. Also, none of the programs reported degree non-completion rates. The information accessible to the public or prospective students is all positive but does not reflect the full picture.

To summarize, although public research universities claim to uphold diversity and inclusion at the center of their missions, SSMPs within these universities are operating without attending to these aspects of university missions. The lack of diversity-informed practice makes one suspect that diversity and inclusion is simply institutional rhetoric not reflected in actual policies and practices. The findings of this study suggest that the expansion of SSMPs did undermine the mission of diversity and inclusion in the sample public research universities, at least with respect to these programs. If SSMPs can get by without adhering to a university's mission or values in this important respect, I argue that public universities should attend more meaningfully to the diversity and inclusion mission throughout all of their programs.

Chapter 7. Discussion and Implications

The previous chapter addressed responses to the three research questions of this study. During the data analysis, various aspects illuminated specifically the answer to the third research question, namely: the neglect by the SSMPs studied of diversity and inclusion reflected in the admission processes, potential negative impacts on student experience, lack of financial support for needy students, and broadly inadequate career services and possibly the potential impact of student career placement on workforce diversity. In this chapter, I will further evaluate the current state of SSMPs in the sample universities and discuss additional findings on the tension between pursuing the goals of financial sustainability and academic quality and the lack of transparency and an adequate accountability system in place. Although nontraditional revenue-generating strategies in public universities (Hillman, 2012; Jaschik, 2006; Priest & St. John, 2006) and their positive and negative implications (Archibald & Feldman, 2010; Bok, 2003; Ehrenberg, 2002; Slaughter & Rhoads, 2004) have been noticed and discussed in higher education research for several decades, the core design principle of SSMPs presents an inherent tension—assuring both financial sustainability and all aspects of academic quality standards. The following three questions guide the discussion in this chapter: (1) Can master's programs that were designed for purposes of education and revenue generation appropriately balance the needs of both? (2) Can self-sustaining programs maintain the same level of academic quality as traditional programs? (3) Given that states do not directly invest in SSMPs through appropriations, who is holding SSMPs accountable and who determines their measures of success?

7.1 Master's Programs: An Educational or Financial Opportunity?

As the literature review section discussed, the purpose of master's education has been changing since the introduction of the degree and has required redefinition since doctoral degrees launched and became more prominent beginning in the late 19th century. Master's education is not the core activity of a research university, considering its focus on meeting the specific needs of professional sectors rather than training researchers (AAU, 1998). SSMPs in the sample are not primarily research master's programs and are not traditional professional programs like those in the fields of medicine, law, or business, but are programs with newer professional foci. Connecting master's education to workforce needs is not a new concept, as evidenced in the PSM programs I described in Chapter Two. Master's programs are more convenient to establish when research-focused doctoral programs and teaching-focused undergraduate programs already exist in the same academic department (Sowell et al., 2010). The creation of master's programs in these departments does not normally require making substantial personnel changes to the existing teaching and research faculty. For example, master's programs can provide additional opportunities for doctoral students to be teaching assistants, such as in the case of the data science program at University B and the economics program at University C.

Master's programs, in general, have not found a common structure and purpose in graduate education, unlike Ph.D. programs that signify preparation to undertake research and unlike professional programs that signify preparation for select, specific career tracks. Among master's programs, there are one-year accelerated programs, online programs, part-time programs, competency-based programs, cohort-based programs, and academic- and professionally-focused programs. The diversity in modality and curriculum of master's programs makes it impossible to measure the success of these programs using one standard. To clarify the

desirable characteristics of candidates for master's programs, a recent CGS study investigated the importance of three broad criteria that master's programs were using in evaluating potential candidates. Among the three, the potential for program completion was rated as the most important among all surveyed master's program directors, followed by students' fit with program goals and potential for professional success (Okahana et al., 2018). This finding comes from responses of directors from both research- and professionally-focused master's programs. Directors from professionally-focused master's programs rated student potential for degree completion the highest; next came the importance of the degree for student professional success, including potential for continuing to work or securing employment. Without knowing whether or not any of these professionally-focused master's programs are self-sustaining, I cannot extrapolate these findings to SSMPs. However, the survey results did show that many of the professionally-focused master's programs are keener on seeing their students graduate than making sure they enter a desirable career.

As the findings of the present study showed, the founding idea of SSMPs is to equip students with necessary knowledge and skills in the hope of meeting an unmet demand from employers in a particular sector. However, by not sharing the program outcomes of all alumni publicly, SSMPs in the sample were not fully transparent with prospective students regarding the career placements of program alumni. The expansion of SSMPs has further convoluted the already ambiguous definition of master's education. Review of university websites and findings from this study as well as Hagigi (2014)'s study suggest that self-sustaining programs only mushroomed at the master's level. There are examples at University A where the institution tried but failed to implement self-sustaining programs at the bachelor's level due to the pushback from the state, but master's programs seem to have become the most successful format to implement

the self-sustaining funding structure. For example, University A established a self-sustaining program at the bachelor's level and later abolished it due to low enrollment and difficulty in managing a four-year program in this way. At University B, some popular self-sustaining graduate certificate programs became master's programs, with added courses to meet credit requirements for a master's degree.

The convenience of establishing master's programs in research universities and market demand for master's degree holders, coupled with the nebulous definitions and purposes of master's education, produced the opportunities for the contemporary expansion of SSMPs. Master's education is still like a jack-of-all-trades and now it has gained a new skill of revenue-generation for public research universities.

7.2 When Academic Quality Clashes with Financial Sustainability

The previous chapter described that the involvement of a university's graduate school in the SSMP establishment process is the same across sample institutions: it served as the gatekeeper for the academic quality standard of SSMPs in collaboration with the proposing academic department. However, financial gatekeepers among sample universities varied. It is the university's extension unit at University A, the college or school that governs the proposing department at University B, and the college or school extension units and the college or school itself at University C. One key characteristic successful master's programs share is sufficient institutional and departmental student support to students (Conrad, et al., 1993). Based on interviews and document reviews, all sample universities claimed to adhere to the same academic standards in establishing an SSMP as they used in the state-funded graduate program. However, the commonly high acceptance rates, low yield rates of admitted students, rapid

enrollment expansion of SSMPs, and lack of appropriate student support services represent areas that deserve more strict institutional scrutiny for their potential impact on academic quality.

The inherent tension within SSMPs is the tug-of-war between maintaining high academic quality and fulfilling a minimum enrollment for financial sustainability. The entire sample of SSMPs have either maintained financial sustainability or acquired additional revenue as a result of frequent financial status reviews of SSMPs, as often as quarterly by the university extension unit at University A and annually by the college/school at University B and college/school extension units at University C. This suggests a strong emphasis on financial objectives, compared to the every 5-10 years cycle of academic program reviews. These financial benefits were attributed in specific cases to a high acceptance rate, an increased acceptance rate, or increased enrollment, which seem to at least raise questions about quality. Due to rapid enrollment expansion, some of these programs ran into logistical barriers of insufficient classroom space, such as the mechanical engineering program at University A and the economics program at University C. Enrollment expansion aimed at increasing revenue but resulted in a decrease in the instructor-student ratio, which, according to traditional thinking about academic quality, would tend to hurt the quality of teaching and learning at the graduate level (Radner & Jamison, 1976). In these examples, in order to generate more revenue, the academic programs enrolled more students than they planned space for, evidently not prioritizing the student learning experience at the time.

The cultural conflict between academic departments that uphold academic quality and the university or college/school extension units that pursue revenue and profits has caused many problems that are well-documented in research about online programs (Lee & Marsh, 1998). In an example about creating online teacher-preparation programs these authors cited, an academic

department that values in-person interaction for training better teachers, while their business partner which provides the online platform upholds revenue for training more teachers as the primary goal of the enterprise. Additionally, there are different characteristics in organizational decision-making processes between academia and revenue-generating units. Academia that is organized by faculty governance tends to seek consensus, and thus takes more time in decision making and curriculum development. Conversely, business decisions and changes are expected to be made more quickly in response to changes in market demand (Lee & Marsh, 1998). In some cases, university academic leaders were not willing to be involved in discussions about financial sustainability or revenue generation (Green et al., 2012), further widening the gap between people who are decision-makers on academic matters and those who are responsible for financial planning.

SSMPs in the sample presented a set of conflicts between the academic departments and the units that provided financial management support. For example, the faculty director of the statistics program at University A complained about the arcane registration process the university extension unit offered prior to 2017, considering the amount of management fees charged by the extension unit. Another example occurred in the software engineering program at University C. The program coordinator voiced his concern over how the weekend SSMP students were treated as second-class citizens in the university. According to him, these students were not able to enjoy traditional student services in the same way as state-funded students; for example, the veteran student services office is closed during weekends.

Bok (2003) has warned that universities' entrepreneurial behaviors may create short-term financial success but can also lead to universities losing public trust and faculty respect if these behaviors undermine academic rigor and equitable treatment of students. It is important to

reiterate that graduates from SSMPs are granted the same university credentials as those in state-funded master's programs; thus, SSMPs should not be sacrificing student services critical to master's student success (Conrad et al., 1993) for the sake of staying financially sustainable or even becoming profitable.

7.3 Who Is Accountable for SSMPs' Successes and Failures?

Without state appropriations, who is holding SSMPs accountable for their academic performance? If external agencies, such as accreditation agencies or other higher education organizations, are not holding SSMPs accountable, why was there only limited internal accountability for these programs at the sample institutions? Typically, institutional accountability serves three purposes: to build trust among institutional stakeholders (students, faculty, staff, alumni), to use limited resources more efficiently, and to be transparent with external stakeholders (such as the state) (Kelchen, 2018). Generally, public universities hold themselves accountable externally through state higher education governing boards, regional and program-specific accreditation agencies and quality measures established by voluntary associations (e.g., the Student Achievement Measure started by the Association of Public and Land-grant Universities), if applicable. Mainly, they do so through internal systems or groups such as the faculty academic senate, systems of program reviews by the graduate faculty council and the office of the provost, and participation of representatives from student governments sitting on university or state governing boards. In the case of SSMPs in the three sample universities, however, the institutional accountability systems were not adequately established.

Based on the governance of examined SSMPs, the department chairs, college deans, and faculty are responsible for academic governance, and the various units I mentioned earlier are responsible for the financial governance of their respective campuses. From an academic point of

view, operating an SSMP should not be different from running a state-funded program. However, some state-funded programs do not close down if they experience low enrollment over a period of time or operate at a loss, especially if they address a particular state workforce need. Compared to the financial requirements of operating SSMPs, states and institutions do not evaluate state-funded programs strictly in profit or loss terms.

Let me summarize the main barriers in holding SSMPs accountable both internally and externally. First, the name and definition of SSMPs are not agreed upon among universities, as mentioned in the previous chapter; SSMPs are referred to as fee-based programs, self-supporting programs, and non-formula-funded programs. The idiosyncratic rhetoric in terminology makes it difficult to track SSMPs at a larger scale beyond a single institution, such as nationally, and naturally limits the governance of SSMPs at the institutional level. Typically, each institution defines SSMPs in its context. Some institutions with multiple campuses, depending on governance structure, coordinate and negotiate an agreed-upon definition, such as in the case of University C. Within an institution, even with a uniform SSMP definition, few people, especially faculty and students, know what they are and how they function differently from state-funded programs. Given the disciplinary nature of graduate education and, in some cases, the decentralized structure of graduate schools in administering graduate programs (CGS, 2019; Golde & Walker, 2006), schools or colleges largely govern their own graduate programs. Without intentional communication from the university central administration, this decentralization tends to result in a lack of campus-wide understanding of a particular type of academic program—in this case, the SSMPs. For example, 25 years after its first SSMP, the Graduate School at University A finally published an SSMP report to describe what these programs are, due to misconceptions within the university community. Similarly, 17 years after

its first SSMP, the Graduate School of University C convened a task force of representatives from schools and colleges to discuss the landscape of SSMPs on campus, due to the lack of knowledge about them around the campus.

Second, the problem of accountability is based on the lack of a clear definition of the appropriate measures of success for SSMPs. Financially, SSMPs are required to be self-sufficient, and desirably profitable, in many cases. To the program itself, financial sustainability guarantees the existence of the program. To the college or school that houses SSMPs, the more revenues that are generated by SSMPs the more items they can check off their wish list that are not necessarily directly related with the SSMP development, such as start-up packages for new faculty hiring at University A, hiring tenure-line faculty to expand a department at University B, or investing in a new building at University C. In this research, no record has shown that a profitable SSMP closed down. Beyond the SSMPs in my sample, Assistant Deans for Academic Affairs in the three sample institutions mentioned closing down of SSMPs for financial reasons. However, a financially successful SSMP does not equate to an academically successful SSMP. Academically, degree completion is not the single measure of success, especially when a couple of hundred students only share one staff academic advisor, with limited or no access to academic advising, as in the mechanical engineering program at University A. Due to lack of transparency in publishing the program alumni's post-graduation outcomes, SSMPs in the sample institutions only relied selectively on successful alumni's information, such as career placements, to attract future applicants. Also, at University C, faculty are teaching on an overload basis in SSMPs. The quality of teaching delivered by faculty to SSMPs, and even to the regular state-funded programs, cannot be consistently guaranteed in the long run when faculty are continuously working on an overload basis.

Third, without a more frequent assessment process regarding all aspects of academic quality, comparable to the schedule of financial review, SSMPs can get away with issues like high acceptance rates, rapid enrollment expansion, and lack of diversity in the classroom. Also, in the institutional academic program review process, SSMPs are typically grouped and reported together with state-funded programs within the same department or school/college considering the unit of review is either the department or college/school. Externally, accreditation agencies focus on the minimum requirements for universities or programs to be accredited, so the accreditation process does not reflect the educational quality of individual SSMPs (Kelchen, 2018).

Fourth, lack of transparency is another problematic characteristic of SSMPs. At University C, enrollment and admission data of SSMPs are excluded in the public institutional report. At Universities A and B, all program data is reported to the public, but the universities provided information without disaggregating the data by SSMPs and state-funded programs.

Fifth, students in SSMPs are experiencing institutional barriers that have not been addressed. For example, according to the academic program advisor in the mechanical engineering program at University A, students in the SSMP are not fully aware of the differences between SSMPs and state-funded programs, and confusion arose when they were trying to get hired for any state-subsidized positions, like research assistants, and found themselves ineligible. The faculty advisor in mechanical engineering at University A shared that, if a particular student in an SSMP has a highly needed skill that state-funded students do not, the university could still hire this student and cover all the expenses. He said as far as he recalled, though, only one student in the SSMP has been hired this way.

Finally, SSMPs are academic programs that rely on financial sustainability to survive. This internal conflict of pursuing both financial and academic success presents tensions in aspects of admission, teaching, funding, and student services. Units that serve the needs of financial sustainability seem to compromise some of these important aspects, due to this tension. SSMPs are taking risks in damaging intuitional reputation in the long run if they are not appropriately managed to guarantee all aspects of academic quality and equitable treatment of students, not to mention access for low-income U.S. students.

Chapter 8. Conclusion

This conclusion section highlights my key findings in searching for answers to the three research questions, as well as lessons learned from the research findings and potential future research topics.

This dissertation research revealed the stated and actual institutional rationales for establishing SSMPs, the procedures for program establishment, and implications of program expansion on diversity and inclusion missions of sample public research universities. Through the multi-site comparative case study and analysis of author-collected qualitative and secondary quantitative data, this research found that one primary purpose of creating SSMPs in public universities was to generate revenue for any purpose the college or school sees fit, ranging from subsidizing doctoral students to constructing a new building. Despite the fact that universities officially stated that SSMPs were created under the constraints of state budget cuts during economic recessions, historical accounts of SSMPs in sample universities told a different emphasis in the stories—a state funding decrease was only one of many factors that contributed to the emergence and expansion of SSMPs. With regard to procedure, the establishment of SSMPs is supposed to meet the same academic standards as state-funded programs. However, due to the reality of financial sustainability that is tied to enrollment, SSMPs were primarily designed to attract particular student populations that are capable of paying for their education, not students from low-income backgrounds. Several SSMPs in the sample were designed only for international students. In some cases, the formula connecting enrollment to revenue led to a high acceptance rate and rapid program expansion. SSMP enrollment data revealed the lack of diverse composition in their student bodies, thus further limiting the learning experiences of students in these cohort-based programs.

The analysis of this organizational study allows me to provide recommendations geared towards the state, institution, and program levels. Besides responding to the three research questions, the many lessons learned from this research could potentially guide higher education leaders to design higher quality professionally-oriented master's programs in public research universities. Recommendations resulting from this study are as follows. First, public higher education leaders should endeavor to secure state funding for innovative master's programs, for example, master's programs in data science, computational chemistry, or innovation management, and should be more cautious when creating any academic programs that requires tying revenue strictly to enrollment. This strict relationship between revenue and enrollment is a threat to academic quality (Bok, 2003), especially when coupled with a high acceptance rate and rapid enrollment expansion. Such innovative master's programs could train qualified candidates, including students from low-income backgrounds who are rarely served when programs must break even from tuition alone, for particular careers that would benefit the state and simultaneously diversify its workforce.

Second, a college or school that operates SSMPs should also actively seek external funding opportunities, such as from private industry, to provide financial packages for students from low-income backgrounds, which would make admission a more equitable process. Academic departments, most likely with the support of the university or college educational extension unit, should engage in a market research process to understand the needs of employers before proposing an SSMP. For example, one SSMP beyond my sample at University A receives funding from Google in the form of student scholarships.

Third, the institutional reporting process should ensure data transparency by disaggregating data about academic programs with different funding mechanisms. Currently, the

enrollment and graduation data published by the federal government (e.g., the Department of Education) does not distinguish between state-funded programs and self-sustaining programs, which is a serious limitation. As a result, the proportion of state-funded degrees out of the total number of degrees produced by public universities is debatable due to the ambiguity in counting degrees produced by self-sustaining programs towards the total number. Additionally, state mandatary reporting requirements vary by states, depending on the role of the state higher education governing body.

Fourth, faculty teaching on a continuous overload basis is not sustainable and might damage teaching quality. One way to encourage faculty to teach in SSMPs is to design a flexible workload credit system so that faculty, even assistant professors, can use the credits cumulated from teaching in SSMPs to exchange for extra compensation or to offset some of their regular teaching load.

Finally, to assure program academic quality and student experience, academic program review for SSMPs should be separated from other state-funded programs in the same department or college, and be implemented at the same frequency as the schedule of financial reviews, to assure that SSMPs are not primarily financially healthy but only secondarily academically sound.

In the future, higher education researchers are encouraged to explore student experiences in SSMPs, in terms of academic and professional preparation and outcomes. Potential research questions surrounding student experiences can highlight the match or mismatch between the official description of the program and the reality of students' experiences, compare the cohort-based learning experiences between less and more diverse student composition, and to what extent international students' expectations are met. Systematic career-path surveys of alumni of SSMPs should be undertaken and analyzed in comparison to state-funded programs in the same

fields. Additionally, researchers should examine further the revenue-generating strategies public universities adopt and how they might improve their accountability system for such programs, including the role the state can potentially play.

Further, in light of the 2019–2020 COVID-19 pandemic, universities are facing unprecedented challenges, including moving instruction online, funding uncertainties from the state and federal governments, and unpredictability in international student mobility (Altbach & de Wit, 2020). Although the impact of this public health crisis on higher education will presumably be ameliorated over time, the short-term impact on students and faculty and the financial sustainability of SSMPs during it are worth examining. Finally, in the hope of holding universities accountable for their promises, I plan to further pursue a line of research that examines the impact of unequal and inequitable practices among other self-sustaining academic programs (e.g., certificate programs) in U.S. public universities as they move towards privatization. I plan to examine the impact on students, faculty, higher education institutions, and these institutions' equity mandate from their states including but not limited to preparing the future workforce.

References

Allum, J., & Okahana, H. (2015). Graduate enrollment and degrees: 2004 to 2014. Council of Graduate Schools.

Altbach, P. G. & de Wit, H. (2020). Postpandemic outlook for higher education is bleakest for the poorest. *International Higher Education*, 102, 3–4. The Boston College Center for International Higher Education.

American Academy of Arts and Sciences. (2015). Public research universities: Changes in state funding. A Publication of the Lincoln Project: Excellence and Access in Public Higher Education. https://www.amacad.org/sites/default/files/publication/downloads/PublicResearchUniv_ChangesInStateFunding.pdf

American Academy of Arts and Sciences. (2016). Public research universities: Recommitting to Lincoln's Vision—An educational compact for the 21st century.

American Association of Universities (AAU) (1998). Committee on graduate education: Report and recommendations. https://www.aau.edu/sites/default/files/AAU-Files/Graduate%20Education/Committee-on-Graduate-Education-Report.pdf

American Council on Education (ACE). (2012). On the importance of diversity in higher education. Retrieved December 2019 online https://www.acenet.edu/Documents/BoardDiversityStatement-June2012.pdf

Archibald, R. B., & Feldman, D. H. (2010). Why does college cost so much? Oxford University Press.

Arizona State University. (2020). *Financial aid and scholarship services*. Arizona State University. https://students.asu.edu/tuition

Association of American Colleges and Universities (AAC&U). (2015). Committing to equity and inclusive excellence: A campus guide for self-study and planning.

Banks, J. 2004. "Multicultural education: characteristics and goals." In J. Banks & C. Banks (Eds.), *Multicultural education: Issues and perspectives* (pp. 3–30). Jossey-Bass.

Baptiste, H. P. & Villa, E. Q. (2012). Affirmative action. In J. A. Banks (Ed), *Encyclopedia of Diversity in Education* (pp. 36–40). Sage Publications.

Becker, G. S. (1994). Human capital revisited. In G. S. Becker, *Human capital: A theoretical and empirical analysis* (pp. 15–28). University of Chicago Press.

Behn, R. D. (Autumn,1988). Management by groping along. *Journal of Policy Analysis and Management,* 7(4), 643–663.

Berelson, B. (1960). *Graduate education in the United States*. McGraw-Hill.

Bok, D. (2003). *Universities in the marketplace: The commercialization of higher education.* Princeton University Press.

Bolman, L. & Deal, T. (1991). Leadership and management effectiveness: A multi-frame, multi-sector analysis. *Human Resource Management*, *30*(4), 509–534.

Borchert, M. A. (2005). Master's education: A guide for faculty and administrators. Council of Graduate Schools.

Bourgois, P. (2015). "Culture of poverty". In J. Wright (Eds*), International Encyclopedia of Social & Behavioral Sciences* (2nd Ed) (pp. 719–721), Vol. 18. Elsevier Ltd.

Bowen, H. R. (1977). *Investment in learning: The individual and social value of American higher education.* Transaction Publishers.

Bowman, N. A. (2010). A college diversity experience and cognitive development: A meta-analysis. *Review of Educational Research*, *80*(1), 4–33.

Brint, S. (1994). *In an age of experts: The changing role of professionals in politics and public life.* Princeton University Press.

Brown, E. R. (1979). *Rockefeller medicine men: Medicine and capitalism in America.* University of California Press.

Bryman, A. (2012). *Social research methods* (4th ed.). Oxford University Press.

Burke, J. C. (2005). Achieving accountability in higher education: Balancing public, academic, and market demands. San Francisco, CA: Josey-Bass.

Burrage, M., Jarausch, K., & Siegrist, H. (1990). An actor-based framework for the study of the professions. In M. Burrage & R. Torstendahl (Eds.), *Professions in theory and history: Rethinking the study of the professions* (pp. 203–225). Sage Publications.

Calhoun, C., & Rhoten, D. (2011). *Knowledge matters: The public mission of the research university*. Columbia University Press.

Cantwell, B. (2015). Are international students cash cows? Examining the relationship between new international undergraduate enrollments and institutional revenue at public colleges and universities in the US. *Journal of International Students*, *5*(4), 512–525.

Carnevale, A. P., & Smith, N. (2012). A decade behind: Breaking out of the low-skill trap in the southern economy, The Georgetown University Center on Education and the Workforce. Georgetown Public Policy Institute.

Carnevale, A. P., & Smith, N. (2014). The Midwest challenge: Matching jobs with education in the post-recession economy. The Georgetown University Center on Education and the Workforce. Georgetown Public Policy Institute.

Carnevale, A. P., Smith, N. & Strohl, J. (2014). Recovery: Job growth and education requirements through 2020. Georgetown Public Policy Institute.

Carroll, G. R., & Delacroix, J. (1982). Organizational mortality in the newspaper industries of Argentina and Ireland: An ecological approach. *Administrative Science Quarterly*, 27, 169–198.

Cassuto, L. (2015, August) The sad story of the P.M.A.: Why the professional master's degree in humanities is on life support. The Chronicle of Higher Education.

Chang, M. J. (2012). Educational benefits of diversity. In J. A. Banks (Ed.), *Encyclopedia of Diversity in Education* (pp. 746–749). Sage Publications.

Chao, C., Hegarty, N., Angelidis, J., and Lu, V. F. (2017). Chinese students' motivations for studying in the United States. *Journal of International Students*, *7(*2), 257–269.

Clark, B. R. (1998). *Creating entrepreneurial universities: Organizational pathways of transformation*. IAU Press & Pergamon Press.

Cohen, M. D., & March, J. G. (1986). Leadership in an organized anarchy. In M. W. Peterson (Ed.), *ASHE reader series on organization and governance in higher education* (pp. 16-35).

Cohen, M. D., March, J. G., & Olsen, J. P. (1972, March). A garbage can model of organizational choice. *Administrative Science Quarterly*, *17*(1), 1–25.

Collins, R. (1979). *The credential society: A historical sociology of education and stratification*. Academic Press.

Conrad, C. F., Haworth, J. G., & Miller, S. B. (1993). *A silent success: Master's education in the United States*. Johns Hopkins University Press.

Conrad, C. R., & Eagan, D. J. (1990). Master's degree programs in American higher education. In J. C. Smart, *Higher education: Handbook of theory and research*, No. 6. Agathon Press.

Council of Graduate Schools (CGS). (2019). The organization and administration of graduate education: A guide for university leaders. Council of Graduate Schools.

Creswell, J. W., & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory into Practice*, *39*(3), 124–131.

Davis, G. F., & Cobb, J. A. (2010). Resource dependence theory: Past and future. *Research in the Sociology of Organizations*, *28*(1), 21–42.

Denson, N. (2009). Do curricular and co-curricular diversity activities influence racial bias? A meta-analysis. *Review of Educational Research*, *79*(2), 805–838.

Denson, N. & Chang, M. J. (2009). Racial diversity matters: The impact of diversity-related student engagement and institutional context. *American Educational Research Journal*, *46*(2), 322–353.

DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, *48*(2), 147–160.

Eckel, P. D., Couturier, L., & Luu, D. T. (2005). Peering around the bend: The leadership challenges of privatization, accountability, and market-based state policy. Paper 4 in the Changing Relationship between States and Their Institutions Series. Washington, DC: American Council of Education.

Eckel, P. D., & Morphew, C. C. (2009a). The organizational dynamics of privatization in public research universities. In C. C. Morphew & P. D. Eckel, *Privatizing the public university: Perspectives from across the academy* (pp. 88–108). Johns Hopkins University Press.

Eckel, P. D., & Morphew, C. C. (2009b). Toward a clearer understanding of privatization. In C. C. Morphew & P. D. Eckel, *Privatizing the public university: Perspectives from across the academy* (pp. 181–192). Johns Hopkins University Press.

Education Commission of the States (ECS) (2019). 50-State comparison. State postsecondary governance structures. https://c0arw235.caspio.com/dp/b7f93000e64a44cfb26442cab2bf

Ehrenberg, R. G. (2002). *Tuition rising: Why college costs so much.* Harvard University Press.

Ehrenberg, R. G. (2006). The perfect storm and the privatization of public higher education. *Change*, *38*(1), 46–53.

Ehrenberg, R. G. (2012). American higher education in transition. *Journal of Economic Perspectives*, *26*(1), 193–216.

Espinosa, L. L., Turk, J. M., Taylor, M., & Chessman, H. M. (2019). Race and ethnicity in higher education: A status report. American Council on Education.

Feldman, D. H. (2012). Myths and realities about rising tuition. National Association of Student Financial Aid Administration.

Fleming, A. S. (1960). The philosophy and objectives of the National Defense Education Act.

Annals of the American Academy of Political and Social Science, 327, 132–138.

Francis, S. K., Goodwin, L. V., & Lynch, C. (2011). Professional science master's: A Council of Graduate Schools guide to establishing programs. Council of Graduate Schools.

Fulton, M. (2019, October). An analysis of state postsecondary governance structures. Education Commission on the States (ECS).

Gallagher, S. R. (2014). *Major employers' hiring practices and the evolving function of the professional master's degree.* (Publication No. 3617780) [Doctoral dissertation, Northeastern University]. ProQuest Dissertations Publishing.

Glazer, J. S. (1986). The master's degree: Tradition, diversity, innovation. ASHE-ERIC Report No. 6. George Washington University.

Glazer, J. S. (1987). Toward a new paradigm. In J. L. Green (Ed.), *The Master's Degree: Jack of All Trades* (pp. 1–12). State Higher Education Executive Officers Association.

Glazer-Raymo, J. (2005). Professionalizing graduate education: The master's degree in the marketplace. *ASHE Higher Education Report, 31*(4), 1–137.

Golde, C. M. & Walker, G. E. (2006). *Envisioning the future of doctoral education: Preparing stewards of the discipline.* Jossey-Bass.

Grant, C. and Sleeter, C. 1998. *Turning on learning: Five approaches to multicultural teaching plans for race, class, gender, and disability*. Prentice-Hall.

Green, K. C., Jaschik, S., & Lederman, D. (2012). The 2012 Insider Higher Ed survey of college & university business officers. Inside Higher Ed.

Griffin, K. A. (2012). Access to higher education. In J. A. Banks (Ed.), *Encyclopedia of Diversity in Education* (pp. 1054–1058). Sage Publications.

Grubb, W. N. & Lazerson, M. (2004). The educational gospel: The economic power of schooling. Harvard University Press. Cambridge, MA.

Gurin, P., Dey, E. L, Hurtado, S., & Gurin, G. (2002). Diversity and higher education: Theory and impact on educational outcomes. *Harvard Educational Review*, *72*(3), 330–366.

Hagigi, F. A. (2014). The hybrid public research university: A comparative case study of two self-sustaining degree programs in public health. ProQuest.

Harvey, C., & Allard, M. J. (2014). *Understanding and managing diversity: Readings, cases, and exercises*. (6th ed.). Pearson.

Hawley, A. (1968). Human ecology. In D. L. Sills, *International encyclopedia of the social*

sciences (pp. 328–337). Macmillan.

Haycock, K., Lynch, M., & Engle, J. (2010). Opportunity adrift: Our flagship universities are straying from their public mission. Education Trust.

Hearn, J. C. (2003). Diversifying revenue streams: Opportunities and risks. American Council on Education.

Heller, D. E. (1999). The effects of tuition and state financial aid on public college enrollment. *The Review of Higher Education*, *23*(1), 65–89.

Hillman, N. W. (2012). Tuition discounting for revenue management. *Research in Higher Education*, 53, 263–281.

Hirsch, E. D. (2009-2010). Creating a curriculum for the American people: Our democracy depends on shared knowledge. *American Educato*r, *33*(4), 6–13.

Holley, K. A., & Gardner, S. (2012). Navigating the pipeline: How socio-cultural influences impact first-generation doctoral students. *Journal of Diversity in Higher Education*, *5*(2), 112–121.

Huberman, M. A., & Miles, M. B. (2014). *Qualitative data analysis: A sourcebook of new methods* (3rd ed.). Sage Publications.

Hurtado, S. (2007). Linking diversity with the educational and civic mission of higher education. *The Review of Higher Education*, *30*(2), 185–196.

Hurtado, S., Milem, J., Clayton-Pedersen, A., & Allen, W. (1999). Enacting diverse learning environments. ASHE-ERIC.

Hussar, W. J., and Bailey, T. M. (2019). Projections of Education Statistics to 2027 (NCES 2019–001). U.S. Department of Education, National Center for Education Statistics.

Ikenberry, S. O. (2009). Privatizing the public research university. In C. C. Morphew & P. D. Eckel, *Privatizing the public university: Perspectives from across the academy* (pp. 1–6). Johns Hopkins University Press.

Institute of International Education (IIE). (2009). Academic level and place of origin: 2008/09. Retrieved January 2, 2020 online https://www.iie.org/Research-and-Insights/Open-Doors/Data/International-Students/Places-of-Origin/Academic-Level-and-Place-of-Origin/2008-09

Institute of International Education (IIE). (2019a). Open doors: 2019 international student fact. Retrieved online January 2, 2020 from https://www.iie.org/Research-and-Insights/Open-Doors/Fact-Sheets-and-Infographics/Fast-Facts.

Institute of International Education (IIE). (2019b). Primary source of funding: 2019. Retrieved online January 2, 2020 from https://www.iie.org/Research-and-Insights/Open-Doors/Data/International-Students/Primary-Source-of-Funding.

Jaquette, O. (2011). *In pursuit of revenue and prestige: The adoption and production of master's degrees by US colleges and universities*. (Publication No. 3492917) [Doctoral dissertation, University of Michigan]. ProQuest Dissertations Publishing.

Jaquette, O., & Curs, B. R. (2015). Creating the out-of-state university: Do public universities increase nonresident freshman enrollment in response to declining state appropriations? *Research in Higher Education*, 56, 535–565.

Jaschik, S. (2006). Privatization and public universities. Retrieved online from https://www.insidehighered.com/news/2006/08/10/privatization-and-public-universities.

Kanter, R. M. (1972). *Commitment and community*. Harvard University Press.

Kelchen, R. (2018). *Higher education accountability*. Johns Hopkins University Press.

Kerr, C. (1963). The idea of a multiversity. In C. Kerr, *The uses of the university*, 1–45. Harvard University Press.

Kinne-Clawson, A. M. (2017). *Service and reputation: An examination of the growth in graduate education at public master's universities*. (Publication No. 10261741) [Doctoral dissertation, University of Washington]. ProQuest Dissertations Publishing.

Knapp, M. S. & Yeh, T. L. (2012). Student diversity: Clarifying meanings. In J. A. Banks (Ed.), *Encyclopedia of Diversity in Education* (pp. 2088–2090). Sage Publications.

Knott, J. H. and Payne, A. A. (2004). The impact of state governance structure on management and performance of public organizations: A study of higher education institutions. *Journal of Policy Analysis and Management, 23*(1), 13–30. Wiley.

Komura, K. (2017, Fall). Outcome for PSM alumni: 2015/16. Professional Science Master's, Keck Graduate Institute.

Lacy, Jr., T. A. (2011). Measuring state postsecondary governance: Developing a new continuum of centralization. University of Georgia Thesis and Dissertation. https://getd.libs.uga.edu/pdfs/lacy_thomas_a_201105_phd.pdf

Ladson-Billings, G. (2003). New directions in multicultural education: Complexities, boundaries, and critical race theory. In J. Banks and C. Banks (Eds.), *Handbook of research on multicultural education*, 50–65. Jossey-Bass.

Lee, A. J., and Marsh, T. G. (1998). Joint ventures in distance education: Mapping uncharted terrain. *American Journal of Distance Education*, 12, 44–53.

Li, A. Y., & Zumeta, W. (2015). State support for higher education. In J. Huisman, H. de Boer, D. D. Dill, & M. Souto-Otero, *The Palgrave international handbook of higher education policy and governance* (pp. 463–82). Palgrave Macmillan.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Sage Publications.

Liu, A. (2007, November). State of the university: Presidential perspectives and twenty-first century institutional mission. Paper presented at the annual meeting of the Association for the Study of Higher Education, Louisville, KY.

Mathison, S. (1988). Why triangulate? *Educational Researcher*, *17*(2), 13–17.

McGuinness, A. (1997). The functions and evolution of state coordination and governance in post-secondary education. In *State Postsecondary Education Structure Sourcebook* (pp. 1–48). Denver, CO: Education Commission of the States.

McGuinness, A. C. (2011). The states and higher education. In P. G. Altbach, P. J. Gumport, & R. O. Berdahl (Eds). *American higher education in the twenty-first century: Social, political, and economic changes* (3rd ed.) (pp. 139–169). The Johns Hopkins University Press.

McLaren, P. (1994). White terror and oppositional agency: Towards a critical multiculturalism. In D. T. Goldberg (Ed.), *Multiculturalism: A critical reader* (pp. 45–74). Blackwell.

Merriam, S. B. (2009). *Qualitative research: A guide to design and implementation.* Jossey-Bass.

Meyer, J. W., Ramirez, F. O., Frank, D. J., & Schofer, E. (2007). Higher education as an institution. In P. J. Gumport, *Sociology of higher education: Contributions and their contexts* (pp. 187–221). Johns Hopkins University Press.

Milem, J. F. (2003). The educational benefits of diversity: Evidence from multiple sectors. In M. J. Chang, D. Witt, J. Jones, & K. Hakuta (Eds.), *Compelling interest: Examining the evidence on racial dynamics in colleges and universities* (pp. 126–169). Stanford University Press.

Milem, J. F., Chang, M. J., and Antonio, A. L. (2005). Making diversity work on campus, a research-based perspective. Association of American Colleges and Universities. https://www.aacu.org/sites/default/files/files/mei/MakingDiversityWork.pdf

Morphew, C. C., & Hartley M. (2006). Mission statement: A thematic analysis of rhetoric across institutional type. *The Journal of Higher Education, 77* (3), 456–471.

Mullen, A. L. (2010). *Degrees of inequality: Culture, class, and gender in American higher education*. Johns Hopkins University Press.

National Academies of Sciences, Engineering, and Medicine. (2018). Graduate STEM Education for the 21st Century. The National Academies Press. https://doi.org/10.17226/25038

National Conference of State Legislatures. (2015, July 31). Performance-based funding for higher education. Retrieved from http://www.ncsl.org/research/education/performance-funding.aspx

National Research Council (NRC). (2008). Science professionals: Master's education for a competitive world. Committee on Enhancing the Master's Degree in the Natural Sciences, Board on Higher Education and Workforce. The National Academies Press.

National Science Board (2019, September). Science and engineering indicators 2020: Higher education in science and engineering (NSB-2019-7). National Science Board, National Center for Science and Engineering Statistics. National Science Foundation.

Newfield, C. (2016). *The great mistake: How we wrecked public universities and how we can fix them.* Johns Hopkins University Press.

Nieto, S. (2000). *Affirming diversity: the sociopolitical context of multicultural education*. Longman.

Okahana, H., Augustine, R. M., & Zhou, E. (2018). Master's admissions: Transparency, guidance, and training. Council of Graduate Schools.

Okahana, H. & Zhou, E. (2019). Graduate enrollment and degrees: 2008 to 2018. Council of Graduate Schools.

Oseguera, L. & Astin, A. W. (2004). The declining "equity" of American higher education. *The Review of Higher Education*, *27*(3), 321–341.

Page, S. E. (2007). *The difference: How the power of diversity creates better groups, firms, schools, and societies*. Princeton University Press.

Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Sage Publications.

Paulsen, M. B., & John, E. P. S. (2002). Social class and college costs: Examining the financial nexus between college choice and persistence. *The Journal of Higher Education*, *73*(2), 189–236.

Perna, L. W. (2003, August). The private benefits of higher education: An examination of the earnings premium. *Research in Higher Education*, *44*(4), 451–472.

Perna, L. W. (2005). Benefits of higher education: Sex, racial/ethnic, and socioeconomic group differences. *The Review of Higher Education*, *29*(1), 23–52.

Perna, L. W., Steele, P., Woda, S., & Hibbert, T. (2005). State public policies and the

racial/ethnic stratification of college access and choice in the state of Maryland. *The Review of Higher Education*, *28*(2), 245–272.

Pfeffer, J., & Salancik, G. R. (1978). *The external control of organizations: A resource dependence perspective*. Harper & Row.

Priest, D., & St. Johns, E. (Eds). (2006). *Privatization and public universities*. Indiana University Press.

Professional Science Master's. (2020, March). About professional science master's. https://www.professionalsciencemasters.org/about

Radner, R. & Jamison, D. T. (1976). Faculty-student ratios in U.S. higher education. In J. T. Froomkin, D. T. Jamison, & R. Radner (Eds.), *Education as an Industry* (pp. 415–452). National Bureau of Economic Research.

Rhoads, R. & Liu, A. (2009). Globalization, social movements, and the American university: Implications for research and practice. In J. C. Smart (Ed.), *Higher Education: Handbook of Theory and Research* (pp. 273–315). Springer.

Rivenbark, J., Cummings, J., Kline, D., &Patterson, L. (2019). Are Professional Science Master's (PSM) programs beneficial for graduates? An evaluation of PSM programs. 2019 Proceedings of EDSIG Conference. Cleveland, OH: Information Systems and Academic Professionals.

Santos, J. L., Rhoades, G., & Lucas, S. R. (2014). Mapping the discourse against the ledge: The balance among our enrollment, diversity, quality and revenues.

Slaughter, S., and Rhoades, G. (2004). *Academic capitalism and the new economy: Markets, state, and higher education.* Johns Hopkins University Press.

Sleeter, C. 1996. *Multicultural education as social activism*. State University of New York Press.

Smith, D. G. (2015). *Diversity's promise for higher education: Making it work.* (2nd ed.). Johns Hopkins University Press.

Smith, S. G. & Schonfeld, N. B. (2000). The benefits of diversity: What the research tells us. *About Campus: Enriching the Student Learning Experience*, *5*(5), 16–23.

Snyder, T. D., de Brey, C., and Dillow, S. A. (2019). Digest of education statistics 2018 (NCES 2020-009). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education.

Snyder, T. D., Dillow, S. A., and Hoffman, C. M. (2008). Digest of education statistics 2007

(NCES 2008-022). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education.

Snyder, T. D., Dillow, S. A., and Hoffman, C. M. (2009). Digest of education statistics 2008 (NCES 2009-020). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education.

Sowell, R., Bell, N., Francis, S., & Goodwin, L. (2010). The role and status of the master's degree in STEM. Council of Graduate Schools.

Spence, M. (1978). Job market signaling. *The Quarterly Journal of Economics*, *87*(3), 355–374.

Spurr, S. H. (1970). Academic degree structures: Innovative approaches. Principles of reform in degree structures in the United States. Carnegie Foundation for the Advancement of Teaching.

State Higher Education Executive Officers Association (SHEEO). (2016). State higher education finance (SHEF): 2015.

State Higher Education Executive Officers Association (SHEEO) (2019). State higher education Finance (SHEF): 2018.

Storr, R. J. (1953). *The beginning of graduate education in America*. University of Chicago Press.

Terenzini, P. T., Springer, L., Yaeger, P. M., Pascarella, E. T. and Nora, A. (1996). First-generation college students: Characteristics, experiences, and cognitive development. *Research in Higher Education*, *37*(1): 1–22.

Titus, M. A. (2007). Detecting selection bias, using propensity score matching, and estimating treatment effects: An application to the private returns to a master's degree. *Research in Higher Education*, *48*(4), 487–521.

Toutkoushian, R. (2009). An economist's perspective on the privatization of public higher education. In C. C. Morphew & P. D. Eckel, *Privatizing the public university: Perspectives from across the academy* (pp. 60–87). Johns Hopkins University Press.

Turner, C., Garcia, M., Nora, A., & Rendon, L. I. (Eds.). (1996). *Racial & ethnic diversity in higher education*. ASHE Reader Series. Simon & Schuster Custom Publishing.

Tuttle, B. & Dillard, J. (2007). Beyond competition: Institutional isomorphism in U.S. accounting research. *Accounting Horizons*, *21*(4), 387–409.

U.S. Bureau of Labor Statistics (BLS). (2019). Occupational projections, 2018–28, and worker characteristics, 2018. https://www.bls.gov/emp/tables/occupational-projections-and-characteristics.htm

University of California. (2008). Self-supporting graduate degree programs and policy at the University of California. https://www.ucop.edu/institutional-research-academic-planning/_files/nov08_slfspprtngprog_pol_ppr.pdf

University of Texas at Austin Graduate School. (2018). *Revised guidelines for Option III programs*. University of Texas at Austin Graduate School. https://gradschool.utexas.edu/sites/default/files/Option_III_Guidelines_Revised2018_040518%5B3%5D_0.pdf

University of Texas System. (2019). *Proposing new degree programs*. University of Texas System. https://www.utsystem.edu/offices/academic-affairs/academic-planning-policy/proposing-new-degree-programs

University of Washington (2019). Flowchart for starting a new graduate program. The University of Washington Graduate School. https://grad.uw.edu/wp-content/uploads/2019/06/new-grad-degree-proposal-seattle-flowchart.pdf

University of Washington Communication Leadership Program. (2020). *Communication Leadership team*. University of Washington Communication Leadership Program. https://commlead.uw.edu/team/

University of Washington Graduate School. (2014). *Fee-based program report*. University of Washington Graduate School. https://grad.uw.edu/wp-content/uploads/2019/06/Fee-Based-2014.pdf

University of Washington Graduate School. (2019). *Creating/modifying programs*. University of Washington Graduate School. https://grad.uw.edu/for-faculty-and-staff/creating-modifying-programs/

University of Wisconsin-Madison Graduate School. (2019). *Requirements and processes for academic programs with non-pooled/131 tuition.* University of Wisconsin-Madison Graduate School. https://kb.wisc.edu/apir/98024

Vavrus, M. (2012). Diversity: A contested concept (perspectives in education). In J. A. Banks (Ed.), *Encyclopedia of Diversity in Education.* Sage Publications.

Weerts, D. J., & Ronca, J. M. (2006). Examining differences in state support for higher education: A comparative study of state appropriations for research I universities. *Journal of Higher Education*, *77*(6), 935–967.

Weerts, D. J., & Ronca, J. M. (2012). Understanding differences in state support for higher education across states, sectors, and institutions: A longitudinal study. *Journal of Higher Education*, *83*(2), 155–185.

White, M. D., & Marsh, E. E. (2006). Content analysis: A flexible methodology. *Library Trends*,

55(1), 22–45.

Wiley, J. D. (2006). Why we won't see any public universities "going private." In R. G. Ehrenberg, *What's happening to public higher education?* (pp. 327–336). Praeger Publishers.

Wu, Q. (2014). Motivations and decision-making processes of mainland Chinese students for undertaking master's programs abroad. *Journal of Studies in International Education, 18*(5) 426–444. SAGE Publications.

Yin, R. K. (2014). *Case study research: Design and methods.* Sage Publications.

Zumeta, W. (2012). State and higher education: On their own in a stagnant economy. In the NEA 2012 Almanac of Higher Education (pp. 27–37).

Zumeta, W. (2018). State finances and higher education in Trump year two. In the NEA 2018 Almanac of Higher Education (pp. 57–69).

Zumeta, W., Breneman, D. W., Callan, P. M., & Finney, J. E. (2012). *Financing American higher education in the era of globalization*. Harvard Education Press.

Appendices

Appendix I: Example Invitation Email to Interviewees

Dear Dr. [*Name*],

Greetings!

My name is Ziyan Bai, and I am currently a Ph.D. Candidate in the College of Education at the University of Washington (UW). I am reaching out to seek help for my dissertation data collection on [*Self-sustaining master's programs*] in the [*University C*] System.

Briefly, my dissertation explores the rationale of establishing and expanding [*self-sustaining master's programs*] at [*University C*]. In particular, I am interested in master's programs. This study has been approved by the Human Subject Division at UW (see attached).

I am contacting you to schedule a 30min phone call to learn about your knowledge and experiences about [*self-sustaining master's programs*] at [*University C*]. I learned from [*Name*], Assistant Dean in the Graduate School at [*University C*], that you are the pioneer of [self-sustaining master's programs] on that campus where you were the Provost. Your perspective is unique and critical for me to understand how [self-sustaining master's programs] were started.

Later this year, I plan to travel to [*University C*] to conduct interviews with some select [*self-sustaining master's programs*]. Your insights will help me build foundations for next-step data collection efforts.

If your schedule allows, I would love to find a 30min window in the next month (April 9 – May 6) on your calendar to learn about your perspective. Your input would be essential for my dissertation research. If you do decide to be interviewed, please return the Letter of Consent (see attached) with your e-signature before the interview takes place.

Thank you very much for your time and consideration. I am looking forward to hearing from you!

Best regards,

Ziyan

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Appendix II: Example Interview Protocols

Dean

[1] What changes in terms of master's programs have you experienced since you started working as a dean? Please give me some examples. If you are new to your position, what have you learned from your predecessor about master's programs in the college/school?

[2] In what way were you involved in the establishment of this SSMP?
[2.1] Who were involved?
[2.2] Among the people who were involved within the department (or school or college for deans)], what were examples of supporting arguments, and what were arguments that were against it?

[3] What were your perceptions of the motivation behind the establishment of SSMPs?
[3.1] Who was the primary impetus?
[3.2] What was your rationale for supporting it?

[4] What about some aspects of the implementation of establishing the program?
[4.1] Who designed the budget?
[4.2] Who hired the first instructor?
[4.3] Who is leading the program? (At the outset and now?)
[4.4] How did the program initially fund itself? Has this changed?

[5] How many people were involved (faculty tenured and non-tenured, full-time or part-time administrators)
[5.1] Who designs the curriculum? Who designed it initially?
[5.1.1] Was it approved by the whole department or only the involved faculty? (How about at higher levels?)
[5.2] How did the program recruit students?
[5.3] What was the first year like? E.g., student population, curriculum, and etc.

[6] Did you consult other institutions who have gone through the same process?

[7] Have SSMPs been much discussed in your professional association?
[7.1] If so, in what way were they discussed?
[7.2] If not, what do you think is the reason for that?

Department Chair

[1] What changes in terms of master's programs have you experienced since you started working as a department chair? Please give me some examples.

[2] What have been the changes in the department budget concerning establishing and maintaining master's programs in the past 5–10 years?

[3] In what way were you involved in the establishment of the SSMP?
[3.1] Who were all involved?
[3.2] Among the people who were involved within the department, who were supportive and who were against it?

[4] What was your motivation behind the establishment of SSMPs?
[4.1] What was your rationale for doing it?

[5] How was the program implemented?
[5.1] Who hired the first instructor?
[5.2] Who is leading the program?
[5.3] How did the program initially fund itself?

[6] How many people were involved (faculty tenured and non-tenured, full-time or part-time administrators)
[6.1] Who designs the curriculum?
[6.1.1] Was it approved by the whole department or only the involved faculty?
[6.2] How did the program recruit students?
[6.3] How did the program start the first year?

[7] So far, are SSMPs able to sustain themselves financially?
[7.1] If so, are they generating additional revenue? How is that used?
[7.2] If not, what are the next steps?

[8] Did you consult other departments on campus who have gone through the same process of establishing an SSMP?

[9] Were SSMPs discussed in your professional association?

[10] Knowing what you know now about SSMPs, have your perspectives towards SSMPs changed?
[10.1] How would you describe the change? How do you see their future evolving, generally speaking for all SSMPs that you know?

[11] If you were to do it again (establishing an SSMP), what would you do differently?

SSMP Staff Administrators

[1] How long have you been in this position? (If you are relatively new to the position, at the end of the interview, would you mind referring me to some other colleagues in your program who might have better knowledge?)

[2] Please tell me about your SSMP program (student demographics; faculty; curriculum; professional development activities; budgetary and financial conditions; students' career aspirations & outcomes; alumni profile)

[2.1] Are there additional resources about students or the program that I might not know about? Please advise.

[3] Would you say that your program outcome is career-oriented, meaning that it leads graduates to a specific type of career/career trajectory?

[4] Along the same line, would you agree that your program serves a niche in master's education across the region?

[5] What is your opinion on your program being self-sustained rather than state-funded?

[6] Some people would say that self-sustaining programs aim primarily at generating revenues for the department rather than serving students' needs, what do you think?

[7] Are you involved in the financial decision-making process of the program? If so, in what way?

[8] What do you think are the primary motivations for students to join your program?

[9] Does the program offer targeted support (academic, professional, social, emotional, career) for international students?
[9.1] Does the program have internship opportunities? Are international students equal participants?
[9.2] Does the program have professional development opportunities?

[10] Are there any existing student experience survey results [relevant to SSMPs] that I can get access to?