Service and Reputation: An Examination of the Growth in Graduate Education at Public Master's Universities

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Abstract

Service and Reputation: An Examination of the Growth in Graduate Education at Public Master's Universities

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Public Master's granting universities have long been viewed as a sector "caught in the middle" between their much more prestigious research university counterparts and the more numerous community colleges. The little research that exists on this sector of institutions has suggested that the Master's university classification merely represents a way station to becoming a research university. Attainment of research university status is appealing because with it come significant resources, access to high quality faculty and a research enterprise, and legitimacy through increased political clout and, for many institutions, national rankings.

Over the last several decades, public Master's universities have evolved rapidly from their heritage as largely state teacher training academies. Just as their undergraduate enrollments have grown, so too, have their graduate enrollments. Alongside booming enrollments has been a slow increase in undergraduate selectivity, steady growth in state and federal grants and contracts

for research, and the addition of new Master's programs—and occasionally doctoral programs–at public Master's universities. While many of these trends seem to indicate that institutions in this sector have been evolving towards the research university model, the volatile resource environment that these universities now operate in raises questions about the extent to which this is a viable strategy in the long-run.

Using graduate enrollments as one indicator of pursuit of the research university model, this dissertation applies a mixed methods approach to create an enhanced understanding of the role and motivations behind the growth in recent decades of graduate enrollments at public Master's universities. Drawing from institutional theory, resource dependency, and competitive strategy literature, and taking account of recent shifts in sources of financial support, this dissertation explores the extent to which graduate enrollment patterns at public Master's universities serve as an indicator of their pursuit of the research university model or some other strategy. Below are the research questions guiding this mixed method study:

1. *Pursuit of prestige*: Are public master's institutions making a strategic decision to grow graduate programs in order to raise their prestige and social legitimacy relative to other universities? Or, are there other important motivations behind this trend?
2. *Resource dependency*: Given the high costs associated with supporting graduate programs, are universities choosing to grow these enrollments in order to replace lost state support? Does revenue from graduate enrollment growth represent a sustainable business strategy?
3. *Labor market*: Is the growth in graduate enrollments the outcome of these traditionally regionally focused universities simply filling an unmet labor market need that is seen as consistent with their basic mission of teaching and local service?
4. *Competitive strategy*: To what extent are these universities growing graduate enrollments to compete more successfully with neighboring institutions? Or, to carve out a unique niche in the region that is currently underserved?
5. *State/System governance*: To what extent does an institution's autonomy as measured through the policies of the state or system's coordinating or governing board enable or impede the addition of new graduate programs at public Master's universities?

I find from this research that the factors enabling, and the motivations behind, the growth in graduate enrollments are a complex mix of the institutions' resource environment, state policies and governing structures impacting institutional autonomy, and the condition of the state and local economy. The statistical analyses demonstrate evidence that public Master's universities continue to rely on traditional sources of revenue (state funding and undergraduate tuition) in order to grow graduate enrollments. Likewise, the case studies highlighted the necessary conditions to grow graduate enrollments such as the importance of non-traditional revenue streams, for example self-sustaining program tuition revenue, as well as the significant challenges associated with growth. Taken together, this research emphasizes the difficulty of achieving pursuit of the research university model in the context of the current financial environment and establishes it as an exceptionally difficult and risky strategy to follow that is only likely to work in very particular circumstances.

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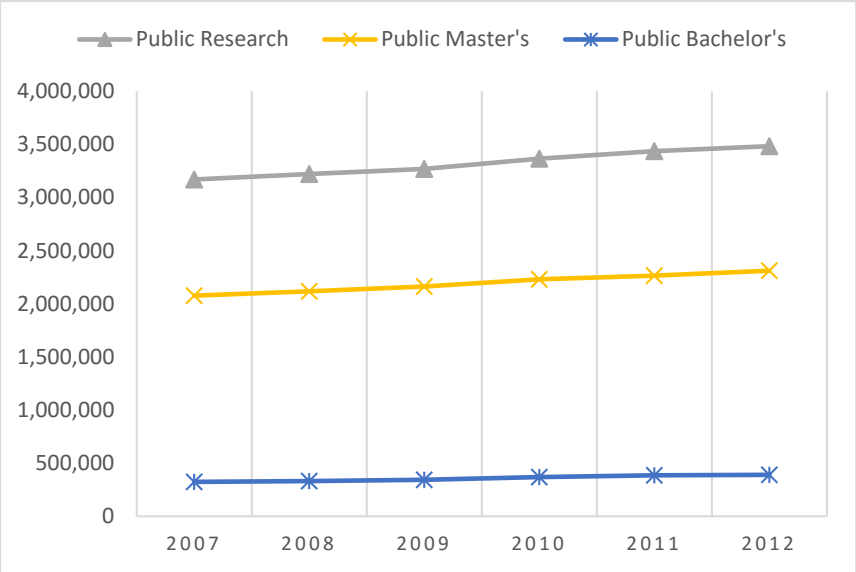
Chapter 1 A Sector "Caught in the Middle"

Introduction

Public master's-level universities are institutions that award the master's degree but few if any doctoral degrees. These universities are often described as the sector that is "caught in the middle" between research universities and community colleges (Henderson & Kane, 1991). In many cases, these institutions are described more by what they don't do than by what they do offer. Public research universities have a research mission, command significant resources, and are often the institutions at the top of the university rankings. These universities command much of the available prestige and wealth while their community college counterparts are often dispersed throughout their states (and consequently may carry considerable political influence) and have carved out an important niche in the workforce development agenda (Kasper, 2003). In many cases, the undergraduate and teaching mission of the public Master's level university is overlooked by both researchers and policy makers for the unique roles these institutions play in states.

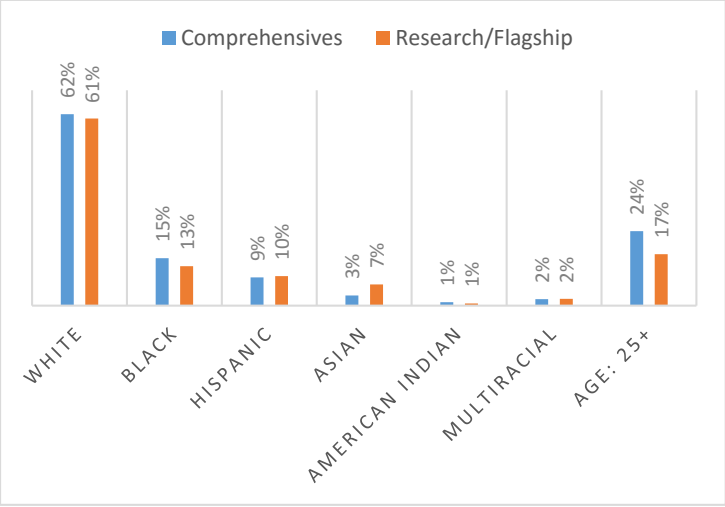
According to the Carnegie Foundation's definition, "Master's granting universities" are institutions that awarded at least 50 Master's degrees in 2003-04 but fewer than 20 doctoral degrees" (Carnegie Foundation for the Advancement of Teaching, 2010). As Figure 1 shows, over the last twenty years public Master's granting university enrollments have grown by over half a million students and at a rate equivalent to their research university counterparts. Master's granting universities in public higher education number 232 institutions in 2012, compared to 155 public research universities, and enroll about two-thirds as many students.

Figure 1. Undergraduate Enrollment Across Sectors[1]



As enrollments have grown, public Master's university enrollments have become increasingly diverse—especially when compared to their research university counterparts. As Figure 2 shows, Master's universities serve greater numbers of students of color as well as non-traditional age populations. In 2014, public Master's universities enrolled 85 percent of all African American undergraduates, 70 percent of all Hispanic/Latino undergraduates, and 70 percent of all American Indian undergraduates at all public four-year universities. Further, public Master's universities enroll 58 percent of all non-traditional aged students (over 25) and over half of their undergraduates are PELL grant recipients.

Figure 2. Racial and Ethnic Enrollment Shares at Public Master's and Research Universities



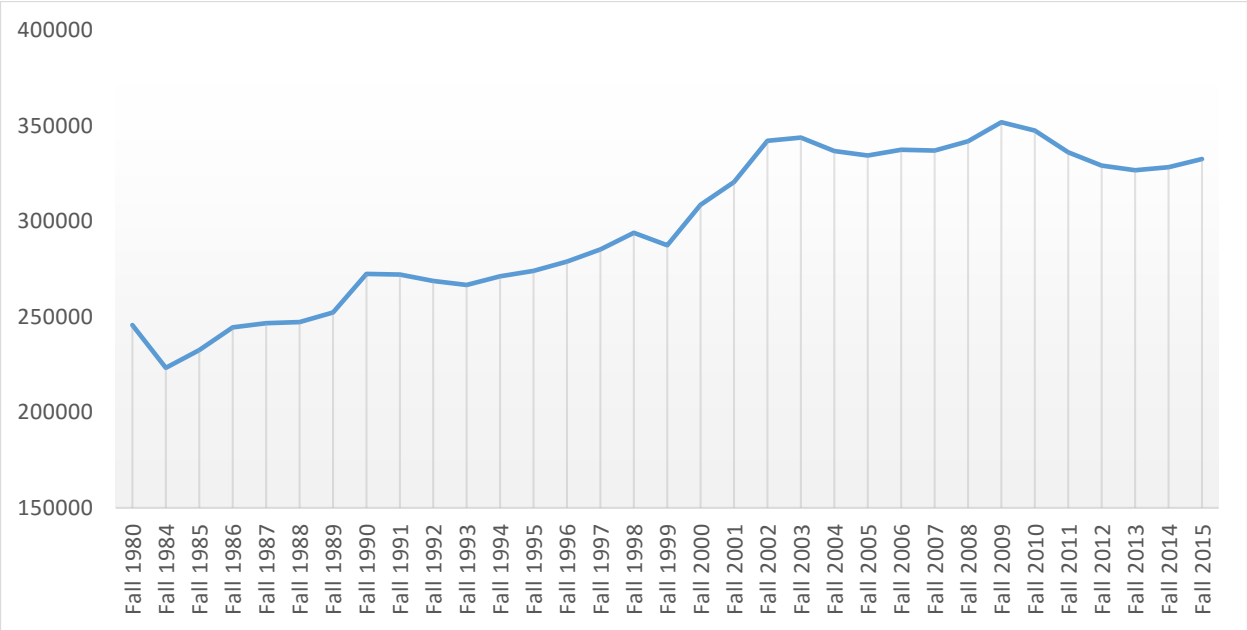
Despite their numbers, aggregate enrollments, and the different populations of students these institutions serve, Master's granting

[1] Source: American Institutes for Research. (n.d.). Delta Cost Project Database 1987-2013. Washington, D.C. Retrieved May 12, 2016, from http://www.deltacostproject.org/delta-cost-project-database.

universities have garnered relatively little scholarly attention. This study is motivated by the need for a better understanding of how these highly state appropriations-dependent institutions are coping with a long trend of declining state support. With an increased reliance on tuition and a likely permanent downward trend in per student state funding, I would like to provide insights into how these institutions' are changing, what opportunities for revenue growth the leaders are seeking, and if their traditionally undergraduate-focused missions are becoming more inclusive of other types of degree programs such as graduate education.

As Figure 3 shows, from 1980 through 2015 public Master's granting universities saw significant growth in graduate enrollments. Using IPEDS data that spans that same time period, graduate enrollments at public Master's granting universities nearly doubled. During this same time span,[2] nearly all public Master's universities experienced growth in graduate education with over two dozen institutions awarding Master's degrees for the first time and only two universities seeing modest declines in graduate enrollments. Overall, the average growth in Master's degree

Figure 3. Graduate enrollments at public Master's universities, 1980 through 2015



[2] Used IPEDS data from 1992 through 2012 which captures the early 1990's recession, early 2000's recession, and the most recent "Great Recession."

production among public Master's granting universities was 78 percent for this 20-year span. Yet, 2009 was the peak in graduate enrollments among this sector. Over the next six years, from 2009 through 2015, graduate enrollments at public Master's universities dropped by nearly 10 percent, to levels last seen in the early 2000's and have yet to recover to their pre-recession highs.

Despite the sharp uptick in growth prior to 2010, public Master's universities still confer less than one-third of all Master's degrees awarded by public universities in the United States. The vast majority of graduate enrollments continue to be at the public research institutions and at some prestigious private universities. While Master's level universities have significantly diversified their Master's degree offerings since their early iterations as teaching institutions, the majority of their graduate enrollments continue to be in education and business. Of the 111,000 Master's degrees awarded by public Master's granting universities in 2012, more than 50 percent were in these fields. The remaining degrees were awarded in a range of fields including engineering, the liberal arts, and public administration. Public Master's granting universities also confer a limited number of doctoral degrees. Of the 177,000 doctoral degrees awarded in the United States in 2012-13, only 3,974 were conferred by public Master's granting universities and almost all of them were in applied doctorate fields such as physical therapy and the educational doctorate (Ed.D.).

Of the limited research that exists on public Master's granting universities, nearly all of it suggests that these universities are in pursuit of the research university model (Aldersley, 1995; Brewer, Gates, & Goldman, 2002; Cyrenne & Grant, 2009). Just recently, an article in the *Chronicle of Higher Education* wrote about the dilemma facing public regional universities and why the research university model may be tempting for so many,

> "Without the athletics or research activities that draw public and legislative attention to [research] universities, regional publics have often been left to flourish, or falter, on their own. Unlike flagships, regionals can't count on significant research funding, large endowments, or abundant out-of-state tuition to insulate them from the kind of budget cuts most state have handed down since the recession hit, in 2008" (Gardner, 2016).

To date, there has been limited research on the growth of graduate education in American higher education (Bowen & Rudenstein, 1992; Clark B. , 1995; Gumport & Snydman, 2002; Jaquette, 2011), and no research on what factors affect fluctuations in graduate enrollments at public Master's granting universities specifically.

Conceptual Framework

While the growth in graduate education at public Master's institutions largely began with the passage of the G.I. Bill, it has been steepest in the last two decades (Geiger, 2005; Bowen & Rudenstein, 1992). The growth in graduate enrollments at Master's level institutions is consistent with the notion that many of the faculty at these institutions who were trained at research universities may seek to replicate that experience—including the training of graduate students—at their current universities (Cyrenne & Grant, 2009).

Beyond the desire of faculty to train graduate students, there is broad recognition that many jobs now require an advanced degree (Carnevale, Smith, & Strohl, 2013). Between 2010 and 2020, 11 percent of all jobs, or over 18 million jobs, will require a master's degree or greater, according to these authors. This compared to only 7 percent, or less than 6 million jobs, requiring a Master's degree or greater in 1973 (Ibid, 2013, p. 21). Some of the fastest growing jobs are in the managerial and professional category and include managers, self-employed professionals, and teachers—among others. These jobs have grown from 21 percent of the

workforce in 1967 to 35 percent of the workforce in 2012 (Carnevale & Rose, 2015). Not only are these the best paying jobs, but they are also the most likely to be full-time and include benefits such as health insurance and retirement (Ibid, 2015). As Carnevale and Rose write,

> "The consequences of occupational upgrading (more managers and professionals) and educational upgrading (more workers with BA and graduate degrees) altered the composition of top managerial and professional jobs (Figure 3.3). In 1967, fewer than half of such workers had a BA or graduate degree and 34 percent had at most a high school diploma. By 2007, the share of those with a Bachelor's degree or higher rose to 66 percent (just under two out of three) while the share with at most a high school diploma fell to 12 percent" (Carnevale & Rose, 2015, p. 60).

The relative "upskilling" of these good paying jobs, coupled with managerial and professional jobs being some of the fastest growing occupations in the country, exacerbates the need for advanced degree prepared workers. It's possible and even likely that the growth in graduate education at traditionally undergraduate universities is responding mainly to the credentialing needs of their local and regional economies, as well as the needs of their own bachelor's graduates.

Closely related to the idea that Master's level universities have grown their graduate degree programs in response to regional economic needs and their local service mission is the notion that these institutions are also growing these programs in response to the increased threat from local and regional competition, including public and private universities and also the for-profit sector. Michael Porter's competitive strategy frameworks suggest that how college and university leaders of Master's granting institutions position themselves within the competitive environment is influenced by how they see the higher education markets in which they are

situated and their competitors, as well as projected demand for the services they provide, their desire for legitimacy, and the viability of entrepreneurial strategies in defining their mission and purpose (Porter, 1980).

Research Questions and Methods

In the chapters that follow, this dissertation seeks to understand the growth in graduate enrollments at public Master's universities. Drawing from institutional theory, resource dependency, and competitive strategy literature, and taking account of recent shifts in sources of financial support, this dissertation explores the extent to which graduate enrollment patterns at public Master's universities serve as an indicator of their pursuit of the research university model or some other strategy. This dissertation uses a mixed methods approach to create an enhanced understanding of the role and motivations behind the growth in recent decades of graduate enrollments at public Master's universities. In this mixed method design the quantitative research and analysis informs the selection of case study locations and areas of qualitative inquiry. Below are the research questions guiding this mixed method study as well as a brief description of each of the chapters that follow.

Research questions

1. *Pursuit of prestige*: Are public master's institutions making a strategic decision to grow graduate programs in order to raise their prestige and social legitimacy relative to other universities? Or, are there other important motivations behind this trend?
2. *Resource dependency*: Given the high costs associated with supporting graduate programs, are universities choosing to grow these enrollments in order to replace lost state support? Does revenue from graduate enrollment growth represent a sustainable business strategy?
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5. *State/System governance*: To what extent does an institution's autonomy as measured through the policies of the state or system's coordinating or governing board enable or impede the addition of new graduate programs at public Master's universities?

Which factors help explain the last two decades of changes in graduate education enrollment patterns in the public Master's sector—both across institutions and across states? During the Great Recession, while a majority of institutions were experiencing significant budget cuts most also experienced declines in graduate enrollments. How do state appropriations impact the ability of public Master's universities to pursue graduate enrollments? As resource dependency theory would contend, do graduate enrollments represent a viable strategy to replace more traditional forms of revenue such as lost state support? Or, are institutions growing graduate enrollments primarily as part of a strategy of emulating the prestigious research university model? Or, to consider another plausible explanation, are enrollments increasing primarily in response to the changing economic landscape and "up-skilling" of available jobs? Finally, to what extent does state or multicampus system governance structure help explain the variation across states and institutions in graduate enrollment changes? Do institutions in states where campuses have relatively more autonomy choose to expand graduate enrollments at different rates than those in states where institutions have less programmatic decision-making authority relative to state-level governance bodies? *The purpose of this study is to better understand what explains the growth in graduate education at traditionally undergraduate focused public institutions classified as master's granting universities.*

In the chapters that follow, I will attempt to shed some light on the growth in graduate enrollments at public Master's-level universities and some of the possible explanations for this growth. Chapter 2 will provide an overview of the history of public comprehensive universities—their evolution from teacher's colleges in the latter half of the nineteenth century,

through the explosive growth immediately following the passage of the GI Bill, and into the present day as these broad access institutions have evolved to offer a wide range of bachelor's and master's degree programs and some a few doctoral degrees. Finally, this chapter examines trends in the financing of public Master's level institutions and some of the external pressures on them, such as the long-term trend of declining state support and a changing economy with greater demand for advanced degree holders.

Chapter 3 takes a close look at the theoretical underpinnings of this work. To date, most of the research on public Master's universities has focused on their presumed pursuit of prestige (Aldersley, 1995; Bowen & Rudenstein, 1992; Brewer, Gates, & Goldman, 2002; Clark B. R., 1978; Cyrenne & Grant, 2009; Henderson & Kane, 1991; Jaquette, 2011; Morphew, 2002; Sanford, 2011). There is some evidence that, generally speaking, Master's universities are constantly in pursuit of the more prestigious research university model. In order to approach research university status, Master's level universities would have to substantially grow their graduate programs and eventually add PhD programs. The institutional theories of rational choice, game theory, isomorphism, and path dependence lend important lenses in helping to understand organizational change and pursuit of "legitimization" among Master's level institutions.

In addition, resource dependency theory suggests that institutions need resources to survive and pursue their goals and they depend on manipulation of, or at least successful relations with, their environments and politics in order to acquire those resources. The declines in state support for public Master's universities may mean that these institutions pursue graduate enrollments (and associated tuition revenue) primarily as an alternative source of revenue. Relatedly, competitive strategy (Porter, 1980) suggests that institutions may pursue niche-

seeking behavior in order to differentiate themselves from their competitors in order to secure resources. This suggests that some Master's level universities may be pursuing graduate education (or specific graduate programs) as a way to set them apart from other universities perceived as competition.

Finally, the ability of institutions to pursue new graduate degrees may be limited by the state governance structure. State and university system governance structures play a significant role in informing how institutional leaders define their missions and what opportunities they have to grow revenue or enter new markets and hence affect the strategies they choose to pursue. Both Michael Porter and Ronald Heifetz assert that context is important to how leaders shape their strategies (Heifetz, Grashow, & Linsky, 2009; Porter, 1980).

The next two chapters build on the theoretical framework developed in Chapter 3 through quantitative (Chapter 4) and qualitative exploration (Chapter 5). In the quantitative portion of the study I use multiple linear regression to identify the best predictors of graduate enrollments over three different time periods (1992 through 2000, 2001 through 2012, and all years of data, 1992 through 2012). Using recessionary periods as key breaks in time, I attempt to identify not only the best predictors of graduate enrollments in each period and overall but also, if the strength of these predictors varied over time.

Following the statistical results, I identify two case study universities with exceptionally strong growth in graduate enrollments. Institutions in the top five percent for graduate enrollment growth were chosen because they seemed most likely to be engaging in the prestige-seeking strategy, which has been the focus of prior literature. Of particular importance, each case study university is in a different state with a different state governance structure, which allows me to assess the extent to which institutional autonomy and state governance policies impacted the

ability of university leaders to pursue growth in graduate education. Across both the quantitative and qualitative studies, I probe the extent to which prestige, resources, competition, and governance structures influence the ability of public Master's universities to grow graduate programs and for what purposes.

Finally, Chapter 6 ties the quantitative and qualitative research together in an attempt to answer the overarching question of what best explains the rapid expansion in graduate enrollments at public Master's level universities in the two decades immediately prior to and including the Great Recession of 2008-2010. Further, what does the "new normal" of reduced state support and a slowly recovering economy mean for the future of graduate enrollments at these universities? Lastly, the conclusions section posits some areas for future research not just in regard to graduate education, but regarding public Master's universities and their institutional strategies more broadly.

Chapter 2 Background: From Normal School to Regional Comprehensive

From State Normal Schools to State Colleges, years 1800 to 1960

The mid-1800's into the early twentieth century were years of tremendous growth in education in the United States. During this time, state normal schools opened at record rates with the singular purpose of training the nation's teachers. Schools like the University of California, Los Angeles, first opened as a state normal school in 1919 (University of California, Los Angeles). More common is the story of the University of Northern Colorado, a state regional comprehensive that began as a normal school.

> "On April 1, 1889, the governor of Colorado signed the bill creating the State Normal School to train qualified teachers for the state's public schools. Greeley citizens raised the necessary money for the first building, and the cornerstone was laid on June 13, 1890. The school opened its doors on October 6 with a staff of four instructors and 96 students. Certificates were granted upon the completion of a two-year course.
> In 1911 the school's name was changed to Colorado State Teachers College by the state legislature. The college was then offering four years of undergraduate work and granting the Bachelor of Arts degree. In 1935 the name of Colorado State College of Education was adopted to recognize the fully developed graduate program, which was started in 1913. Early in 1957 the state legislature approved shortening the name to Colorado State College. Again, to recognize the further growth of programs and offerings, in 1970 the name was changed once more, this time to the University of Northern Colorado" (University of Northern Colorado, 2015).

Today, former normal schools like the former State Normal School in Colorado, account for almost 50 percent of all modern-day regional comprehensives (Hicklin Fryar, 2015). Due in large part to the limited credentials offered by normal schools in the early twentieth century, enrollment growth in these institutions was slow compared to the boom at their more prestigious counterparts—the state research universities.

When the federal Office of Education began collecting education data in 1869-1870, only 63,000 students were attending higher education institutions throughout the United States, which accounted for about 1 percent of the 18-24 year old population (National Center for Education

Statistics, 1993). As of 1920, there were over 14 million students enrolled in postsecondary education across more than 3,600 institutions (Ibid, 1993). By 1930, enrollment in public higher education accounted for more than half of college students and participation rates in public higher education when compared to private higher education skyrocketed from 1 in 100 18-24 year olds at the start of the 20th century to 9 in 10 young adults by 1930 (Ibid, 1993). By the late 1940's college enrollment was surging as large numbers of World War II veterans entered college assisted by the Serviceman's Readjustment Act (the "GI Bill"). By 1949, 2.4 million students were enrolled, accounting for 15 per 100 18 to 24 year olds. Enrollment remained concentrated at 4-year colleges with less than 10 percent of students at 2-year colleges (Ibid, 1993).

In the years prior to 1944 and the GI Bill, enrollments grew almost exclusively at the nation's public and private research universities. According to historian Roger Geiger,

> "The postwar embrace of limitless expansion of higher education was premised on the historical dynamics of American colleges and universities. During the interwar years, pundits in foundations and government expressed concerns that too many students were going to college. They would have preferred higher standards for fewer students and possibly diverting the "less fit" into terminal programs. Such wisdom had no effect (Minnesota's General College notwithstanding) on the ballooning of enrollments to 15 percent of age cohorts. Colleges and universities, acting independently, sought students in order to serve their constituencies and balance their budgets. After the war, these institutional imperatives, heightened by the deluge of GI Bill students, evolved into a national consensus. The President's Commission argued in 1947 that one-half of all students were capable of benefiting from higher education and should, by 1960, have such opportunities" (Geiger, 2014, pp. 550-551).

By the mid-1960's, a second wave of enrollment growth was hitting higher education and the more prominent state universities could no longer absorb all the demand. Henderson writes, "as the state colleges continued to broaden their offerings into the 1960's and 1970's, the growing number of middle and lower class baby boomers wanted and expected access to higher education. The elite universities could take some students by growing, but the numbers were too

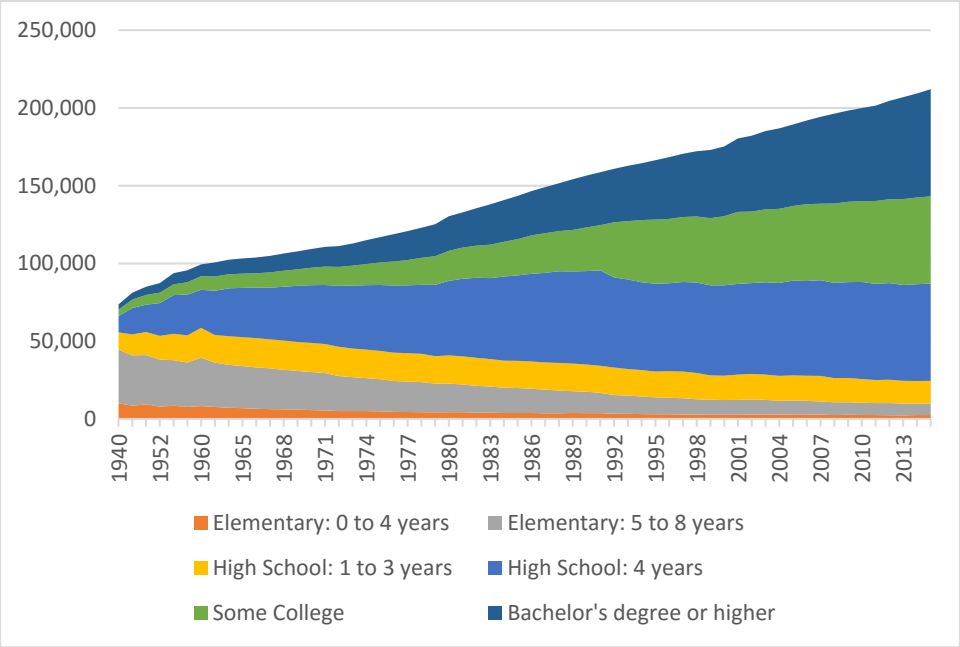
great even for the research oriented mega-universities to accommodate them" (Henderson, 2009).

Between 1950 and 1960 enrollment boomed in public higher education with a massive expansion in the numbers of public colleges. College enrollment rose by 49 percent in the 1950's and, with the onslaught of the Baby Boom generation, by 120 percent in the 1960's (Ibid, 1993). By the late 1960's, public colleges accounted for nearly three-quarters of all college enrollments and about one-quarter of these students were at two-year colleges. By this time, many two-year teacher's colleges had broadened their offerings and established themselves as four-year state colleges with more comprehensive offerings (Hicklin Fryar, 2015).

The pattern of growth in the number of master's degrees conferred is similar to that displayed by bachelor's degrees. In the later part of the 19th century, master's degree holders amounted to 6 for every 100 bachelor's degree holders. By the 1920's, this ratio had increased to 16 master's degrees for every 100 bachelor's degrees and had doubled to 33 per 100 by 1970 (National Center for Education Statistics, 1993, p. 70). Doctoral degrees have experienced much slower growth than both master's and baccalaureate degrees. The numbers of doctoral degrees conferred by U.S. colleges remained very small until the 1920's. By the 1960's, doctoral degrees began to surge along with the growth in bachelor's and master's degrees. The ratio of doctoral degrees to bachelor's degrees climbed to 78 for every 1,000 by the 1970's and is presently about 100 for every 1,000 (United States Census Bureau, 2014; National Center for Education Statistics, 1993).

Just as enrollment in postsecondary education boomed, so did educational attainment for the country as a whole. As Figure 4 shows, college participation and bachelor's degree attainment continued to grow rapidly over the later part of the 20th century and into the 21st century.

Figure 4: US Educational Attainment, 1940 to 2015[3]



This growth in postsecondary participation occurred alongside the rapid change in the labor market from what was once an economy based on manufacturing to the new knowledge economy (Goldin & Katz, 2010). This new knowledge economy is driven by technologies based on knowledge, information production and dissemination which have since the 1950's dramatically transformed the U.S. economy (Powell & Snellman, 2004). A key component driving the evolution to a knowledge economy is a greater reliance on intellectual capabilities. This reliance on intellectual capital and the rewards the labor market provides for it has led individuals to upgrade their skill attainment. As long as access to the most desirable occupations depends on high educational attainment, students seeking to maximize their competitive advantage must participate in and attain greater levels of education to secure the necessary credentials (Walters, 1984). As Table 1 shows, the wage premium for graduate credentials across the various majors ranges from a low of 13 percent to a high of 50 percent.

[3] US Census Bureau. (2015). Years of School Completed by People 25 Years and Over, by Age and Sex: Selected Years 1940 to 2015. Retrieved from Current Population Survey Data: Educational Attainment: https://www.census.gov/hhes/socdemo/education/data/cps/historical/

Table 1. Education Attainment and Wage Premiums by Major Group[4]

Major Group	Majors per 10,000 college graduates (age 25-59)	Median annual wages of college-educated workers (ages 25-59) (2013 $)	Graduate degree attainment of college graduates (ages 25-59) (%)	Graduate degree wage premium for college-educated workers (ages 25-59) (%)
Agriculture and natural resources	154	56,000	27.9	32.1
Architecture and engineering	77	67,000	33.9	13.4
Arts	479	49,000	23.2	22.4
Biology and life sciences	333	56,000	57.7	64.3
Business	2609	65,000	22.2	33.8
Communications and journalism	516	54,000	20.8	25.9
Computers, statistics, and mathematics	557	76,000	33.3	26.3
Education	938	45,000	44.6	33.3
Health	746	65,000	33.8	29.2
Humanities and liberal arts	864	52,000	41.4	34.6
Industrial arts, consumer services, and recreation	267	52,000	24.2	25.0
Law and public policy	257	54,000	24.2	35.2
Physical sciences	247	65,000	50.0	49.2
Psychology and social work	516	47,000	45.3	31.9
Social sciences	689	60,000	41.2	45.0

State support of public higher education has been unable to keep up with demand

Yet, despite a multitude of public and private benefits to attaining a postsecondary credential, and for many, a graduate credential, state support for higher education has been unable to keep up with demand. In the era immediately following the passage of the GI Bill, states and the federal government were investing heavily in state support as well as building up

[4] Carnevale, A., Cheah, B., & Hanson, A. R. (2015). The Economic Value of College Majors. Washington, DC: Georgetown Center of Education and the Workforce.

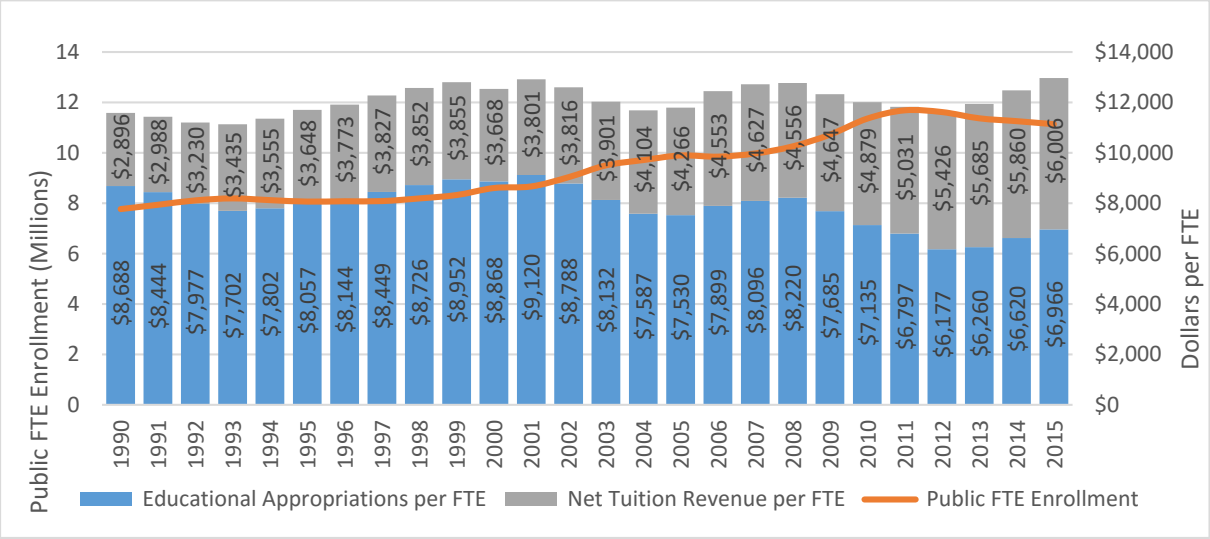
capacity at postsecondary institutions (Trow, 2000; Zumeta, 2004; Thelin, 2004; Thelin, 2011). As Thelin (2011) describes, “Following World War II, American higher education enjoyed a quarter century of support marked by the ‘three P’s’ of prosperity, prestige, and popularity” (Thelin, 2011, p. 260). It was during this period that the selective research university was born, many public teachers colleges became universities, and the public junior college flourished (Ibid, 2011).

Yet, investment in higher education as a share of state spending reached its peak in the mid-1970’s (Grapevine, 2016). After a period of tremendous growth marked by total spending on higher education in excess of $21.5 trillion ($98.1 trillion in 2000 dollars) in 1970, an increase of a bit more than $9 trillion in less than five years, the Carnegie Council on Policy Studies in Higher Education declared that higher education was on the brink of a “new depression” (Thelin, 2011, p. 318). Despite financial challenges, higher education continued to grow through the 1970’s and 1980’s—particularly among the inexpensive local commuter colleges—what are now many of today’s public Master’s universities. It was during this time that state governments began the move towards the “privatization” of higher education finance with an increased reliance on tuition (Ibid, 2011, p. 338). As the economy of the early 1980’s recovered from a sharp recession, states began to reinvest in higher education. Numerous states began to partner with universities and private industry to sponsor and subsidize “research parks” and institutional ambition and prestige continued to further stratify the range of higher education institutions (Ibid, 2011, p. 341). By the early 1990’s another recession hit the United States and marked the beginning of a progressively more volatile and largely downward trend in state support.

Since the 1990’s there has been a dramatic shift from the public financing of public

colleges and universities through state appropriations to private payments—particularly student tuition dollars. Between 2000-01 and 2010-11, the College Board estimates that inflation adjusted state support per-student fell by 23 percent (Zumeta, 2012). As a result, tuition at public four-year colleges and universities increased on average 5.6 percent annually over this same time period (Ibid, 2012). As Figure 5 below shows, state appropriations per FTE across all sectors of public higher education have largely declined over the prior two decades while enrollment has boomed and tuition has increased commensurate with the losses in state support. At public Master's Granting Universities, tuition rates were $1,896 in 1980 and had grown to $6,257 by 2010. At research universities, the shift was equally dramatic—tuition rates increased from $2,818 in 1980 to $7,953 in 2010 (Zumeta, 2012, p. 34). As of 2010, student loan debt in America surpassed all other non-mortgage debt for the first time in recorded history, including all credit card debt and car loans (Federal Reserve Bank of New York, 2011).

Figure 5. United States Public FTE Enrollment and educational appropriations per FTE, FY 1990-2015[5]



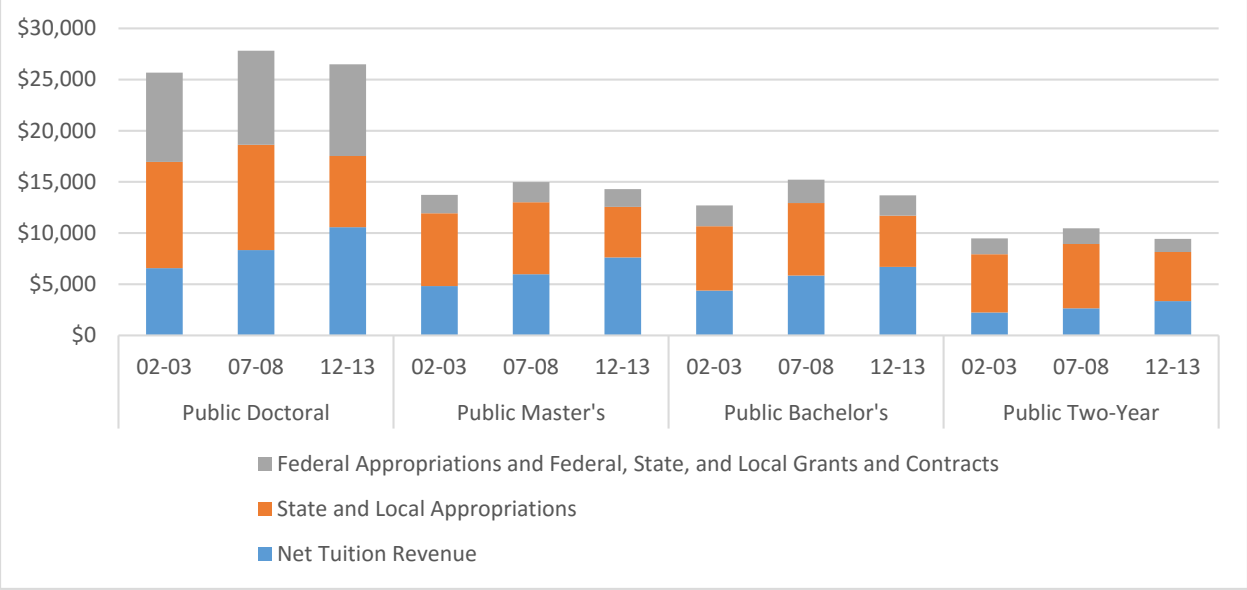
As Figure 5 shows, net tuition as a share of total revenue has increased across all sectors of public

[5] State Higher Education Executive Officers. (2016). SHEF: FY 2015. Boulder: State Higher Education Executive Officers. Retrieved from http://sheeo.org/sites/default/files/project-files/SHEEO_FY15_Report_051816.pdf

higher education.

Between 2008 and 2011 state revenues from all tax sources declined significantly. While the recession had officially ended in late 2009, states felt the most significant effects in the following three years (Dadayan & Boyd, 2013). As Figure 6 shows, despite the increases in tuition during the Great Recession, none of the public higher education sectors recovered to prior per-FTE funding levels overall. This is due in part to the fact that, at the same time institutions were taking some of the deepest state budget cuts in their history, they were also coping with record enrollments.

Figure 6. Sources of revenue by sector, 2002-03, 2007-08, and 2012-13



Declining state support has a significant impact on public Master's universities

The primary mechanism that public higher education has to cope with loses in state support is the ability to increase tuition. Prior research suggests that the primary drivers of tuition prices are state appropriations (closely tied to the unemployment rates), student-aid policies, and state wealth (McLendon, Hearn, & Hammond, 1996). Chakrabarti et. al. look at tuition growth at private institutions (which are largely privately funded) to see if they experience similar trends in pricing relative to reductions is state funding (2012). They found that private sector institutions

raise tuition independent of state appropriations, as expected, and at roughly two-thirds the rate [of what?]. This implies that tuition growth in public institutions is likely (and logically) a response to shrinking state support. Other research suggests that state governance structures and political characteristics play an important role in determining tuition prices (Lowry, 2001; Cheslock & Hughes, 2011; McLendon, Hearn, & Mokher, 2009).

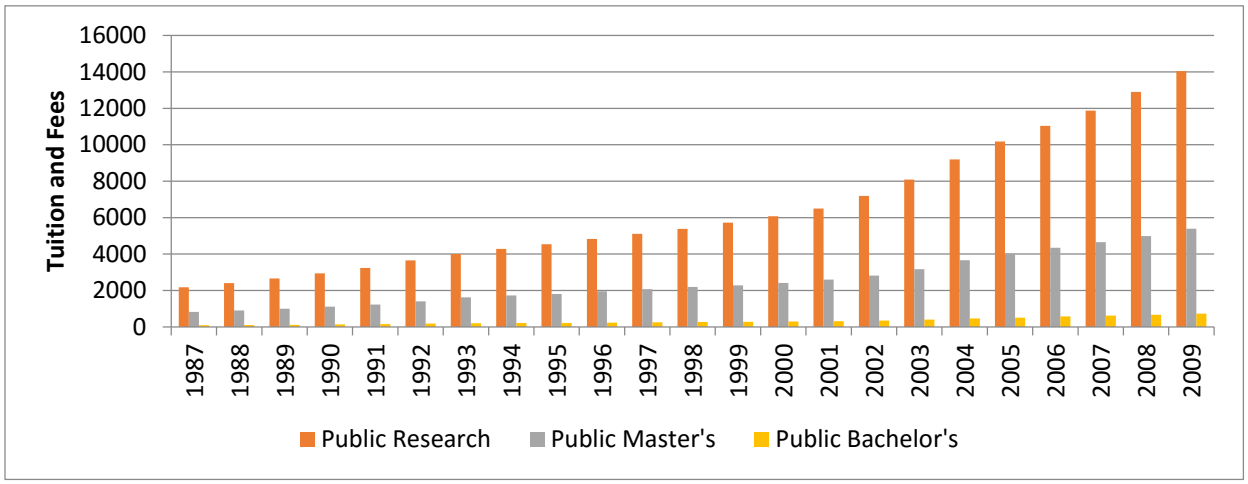
Like Ehrenberg (2004), McLendon et al (1996) finds strong evidence that higher unemployment rates–presumably signifying a weaker state economy–equate to higher tuition charges and that high rates of tax revenue per capita are strongly correlated with lower tuition rates. Further, a higher share of young people (18 to 24 year olds) in the population also correlates with lower tuition (Ehrenberg & Rizzo, 2004; McLendon, Hearn, & Hammond, 1996). Related to this study, McLendon found that the popular election of public institution trustees is associated with lower tuition while the presence of a weak[6] state board is associated with higher tuition (McLendon, Hearn, & Hammond, 1996, p. 19). In other words, there is evidence that institutions with more autonomy are more likely to charge higher prices. While degrees of campus autonomy vary across states, they also vary within states and higher education sectors as will later be described.

Increases in real dollar amounts in state appropriations and tuition, as well as enrollment numbers, have varied considerably between Public Research, Master's, and Baccalaureate granting institutions. Over the last two decades, research universities have seen much steeper increases in state appropriations per FTE and tuition rates—especially when compared to their Master's and Baccalaureate-level counterparts. As Figure 7 shows, between 1987 and 2009, public research and Master's granting universities saw tuition increase to approximately 5.5

[6] State higher education board with little or no authority over institutional operations, budget, or planning **Invalid source specified.**.

times its original rate, not adjusted for inflation.

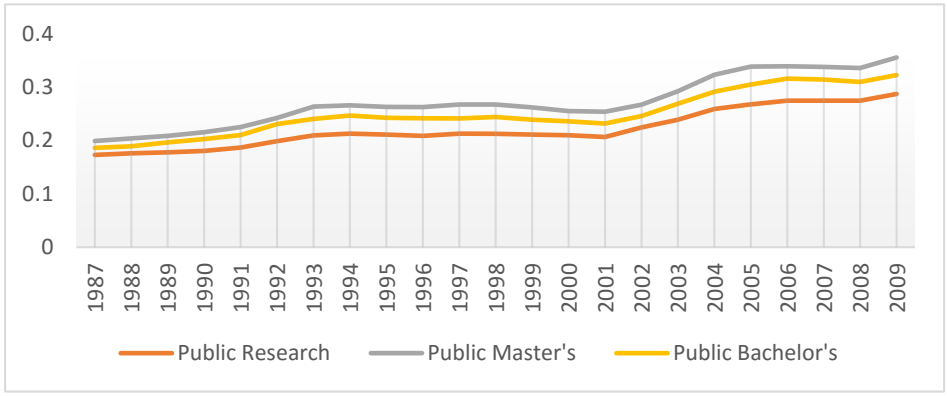
Figure 7. Average CPI-U Adjusted Tuition and Fees by Sector



Over this same time span, tuition reliance,[7] as measured by the share of operating revenues from net tuition, increased across all sectors, showing the greatest changes during recessionary periods.

As Figure 8 shows, Master's granting universities have consistently had the greatest reliance on tuition when compared to the other sectors. This reliance on tuition makes these institutions particularly vulnerable to changes in demand as well as state budget cuts. Further, the increased tuition reliance across

Figure 8. Tuition Reliance by Sector



[7] The net tuition share of operating revenues from basic revenue streams; sales and services of educational activities; and auxiliary enterprises, but excluding endowment earnings and investment income (net tuition; federal, state, and local appropriations, grants, and contracts; private gifts, grants, and contracts; sales and services of educational activities; and auxiliary enterprises).

all sectors has led institutions to argue for a changed relationship with governments, seeking fewer state regulations. While most states are beginning to see tax collections grow and cuts to higher education level off and reverse several years after the end of the Great Recession, it is unlikely that the trend of high tuition reliance among colleges and universities will be reversed. While Master's granting universities do not deviate significantly from the trends seen across higher education in financing, the loss of state support and increasing tuition raise serious concerns for the groups of students these institutions are largely intended to serve. Further, it is likely that the price elasticity of demand for Master's granting institutions is greater (students are more price responsive) than for their more expensive research university counterparts. Thus, high and increasing tuition rates to replace lost state support are unlikely to represent a long-term solution for meeting enrollment and degree attainment goals for the future for the master's sector.

Conclusion

Taken together, the losses in state appropriations for public Master's universities have likely severely constrained their ability to invest in pursuit of the research university model. Deep state appropriations cuts coupled with significant increases in tuition have made Master's granting universities increasingly reliant on tuition for operations. This trend is particularly challenging going forward given the cost averse student populations that these institutions currently serve. Given the long-term trend of declining state support and the most recent declines in per student funding, I seek to evaluate in this dissertation how public Master's universities have been able to make the necessary investments to grow graduate education and what has motivated the growth in their graduate programs and enrollments.

In the next chapter, I examine multiple different theoretical frameworks that may help us understand the growth in graduate enrollments in this sector. Is it possible that, despite reduced

resources, institutions are still interested in pursuing the research university model and the prestige that comes with it? To what extent are universities interested in the pursuit of prestige as a means of legitimacy and the presumed additional financial resources that come with prestige? Is it possible that the surge in graduate enrollments represents a new revenue stream for these resource-dependent institutions pursued primarily to cope with losses in their more traditional revenue streams? Or, is the growth in graduate enrollments just the inevitable evolution of public higher education to meet the new demands of population growth and the knowledge economy? Lastly, to what extent are graduate enrollments and programs an effort by public Master's universities to differentiate themselves in order to compete for the scarce resources of tuition dollars and students? Overlaid across all of these potential explanations for the growth in graduate enrollments is the question of to what extent state higher education governing and coordinating boards attempt to restrict or enable the broadening of these traditionally undergraduate focused institutions' missions.

Chapter 3 Theoretical Foundations for the Growth in Graduate Enrollments

There are several different theories that lend themselves well to understanding the changes in graduate enrollments among public Master's granting universities. Isomorphism is the imitation of or development of an organization to be similar to another organization. Pursuit of prestige is defined as the act or process of emulating the most successful institutions in order to… (Cyrenne & Grant, 2009) Pursuit of prestige and isomorphism might suggest that public Master's granting universities are increasing graduate degrees in response to a desire to imitate the "more successful" research university model. Specifically, graduate education may be viewed as a means to enhance the reputation of an institution—particularly among external peers. Further, prestige and the research university model are generally linked to both an increase in and the diversification of revenues and master's programs are seen as a step in this direction (Aldersley, 1995).

Alternatively, resource dependency theory might suggest that public Master's granting universities are increasing graduate enrollment and degree production primarily in response to declines in traditional sources of revenue such as from undergraduate enrollments and state appropriations since master's programs can normally command higher tuition with relatively little institutionally funded student aid. (Pfeffer & Salanick, 2003; Jaquette, 2011). From another perspective, Michael Porter's competitive strategy frameworks suggest that how college and university leaders of Master's granting institutions position themselves within the policy environment is influenced by how they see the higher education markets in which they are situated and their competitors, as well as projected demand for the services they provide, the desire for legitimacy, and the use of entrepreneurial strategies in defining their mission and purpose (Porter, 1980). Finally, the extent to which a public Master's university can pursue

prestige or isomorphism, or that resource dependency can influence change in strategy and mission, is likely impacted by the higher education governance structure of the state within which an institution resides.

Pursuit of Prestige in the Public Master's Sector

Throughout their histories, Master's granting universities have had "a special responsibility for teaching, research, and public service with a vocational orientation" (Henderson, 2009, p. 6). These institutions provide valuable public service and economic development assistance within their regions—yet, this role is often under recognized and rewarded as it does not command the prestige of their research university counterparts (Henderson, 2010; Cyrenne & Grant, 2010). Consequently, several authors have suggested that Master's granting colleges and universities are often in pursuit of the research university model (Clark, 1978; Cyrenne & Grant, 2010; Henderson & Kane, 1991; Lovett, 2005) whereby potential professional, status and financial rewards are seen to be greater. Yet, as Henderson & Kane (1991) have suggested, the pursuit of the research model leads Master's granting institutions to have less well-defined purposes that confuse their important roles and missions within their states and fail to differentiate them clearly in the minds of key stakeholders from their research university and community college counterparts.

To date, Master's granting universities have garnered relatively little attention in higher education research (Henderson & Kane, 1991; Henderson, 2010; Geiger, 2005; Thelin, 2004). Yet, public Master's granting colleges and universities educate over two million students annually–more than 10 percent of all U.S. higher education enrollments and X [Note!] percent of graduate enrollments–and offer a wide range of undergraduate and graduate level academic programs (Henderson, 2009, p. 7). Most Master's granting colleges "began as state normal

schools and evolved into teachers colleges where they provided education for a broad segment of the population—especially women" (Geiger, The Ten Generations of American Higher Education, 2005, p. 58). With the passage of the G.I. Bill and the unprecedented attendance at higher education institutions of returning soldiers, many of these state teachers colleges became regional colleges and universities. Their roles and missions were expanded to include a variety of programs and some graduate education, usually limited to the master's level (Ibid, p. 62), while research universities retained the broadest and most prestigious missions including doctoral education and research.

As Burton Clark wrote in the 1970s, "In general the chief form of academic drift in American higher education over the last 3-4 decades has been that of public 4-year colleges moving away from the unwanted role of teaching teachers, and otherwise concentrating on bachelor's-level career preparation, and toward the standing of a university" (Clark B. R., 1978, p. 256). Over time, the community college and university roles were legitimized within society while the less well-understood baccalaureate and master's sector was not. As a result, Clark argues that Baccalaureate and Master's granting universities have moved towards the more legitimated role of the research universities (Clark B. R., 1978), which is often associated with more prestige, selectivity, resources, and a better reputation (Aldersley, 1995; Morphew, 2002). Institutions also pursue prestige because it has been linked to increased funding (Cyrenne & Grant, 2010; Sanford, 2011). The pursuit of prestige is costly because it generally requires an investment in research, physical capital and high quality, including highly paid faculty among other things. But, the attainment of higher prestige is [may be?] linked to a reduced dependence on traditional revenue sources including undergraduate tuition, fees, and state appropriations, which may be particularly appealing given the downward trend in state support and the

emergence of increased resistance to undergraduate tuition increases (Bowen, 1980; Sanford, 2011).

Using U.S. Federal Integrated Postsecondary Education Data System (IPEDS) data over a period of 21 years, Sanford (2011) analyzed the impact of rising prestige in research universities on diversification of their funding sources, using a multi-level model. The author found that institutions moving from the Carnegie Research II university category to the Research I category did not see significant changes in funding diversification but those institutions remaining in the Research I category continued to further differentiate their funding sources and gain prestige (Sanford, 2011). In part, the author reasoned that this may be because the elite universities continue to become more elite and the gap between those elite institutions and others may be widening (Sanford, 2011, p. 123). The implications for Master's granting institutions are apparent: the main gains from increased prestige are only evident among those institutions that are already among the elite. Given this finding, I am interested in this study in understanding whether or not the pursuit of prestige is still a viable strategy for Master's granting universities or if presidents are choosing to pursue new and different entrepreneurial strategies to maximize resources and legitimacy.

At the core of pursuit of prestige is what organizational theory calls institutional isomorphism. Institutional theory suggests that institutions are internal and external pressures for institutions that are pursuing prestige and seeking to become more like research universities. Internally, institutional leaders or faculty may be seeking to duplicate the more successful research university model as a way to attain legitimacy. Externally, states for state governance structures may be imposing policies that coerce institutions to be more like the more legitimate research university.

Institutional Isomorphism

Institutional theory has often stressed the durability of organizations over time. Yet, organizations over their lifetimes tend to be both stagnant and changing. My analysis applies institutional theory as a frame to help gain a better understanding of what leads Master's granting universities to pursue the research university model or an alternative model. Additionally, I apply institutional theory to help explain the role of external factors such as higher education governance arrangements, state policies and policymakers, and the economy in organizational change among public Master's institutions. Below, I consider the implications of rational choice, game theory, institutionalism, and path dependence theories for organizational change in this sector of higher education. Further, I apply these theories in order to better understand the role of external influences in institutional and organizational change. Taken together, these theories provide a variety of perspectives for understanding change and stability over time and in a variety of contexts.

In order to explore these topics, we first need an understanding of institutions. In this context, institutions are conceived as comprised of the rules within which an organization operates. Institutions are broader forces in society that are shaped by people, ideas, and laws. Organizations, on the other hand, pursue a strategy that is [may be?] about changing the institutions (North, 1990). In contrast, institutions of higher education are colleges and universities as organizations so the term is not used interchangeably with the political science concept of institutions as presented above.

First, I consider institutional durability in the context of historical institutionalism and path dependence as described by Elizabeth Clemens & James Cook (1999) and Peter Hall (2010). Both these articles make a case for understanding institutional change and durability

through organizational learning and the diffusion of ideas. In "Politics and Institutionalism: Explaining Durability and Change," Clemens and Cook document the conditions under which institutions change or maintain the status quo. The authors assert that institutions should not be viewed as static—rather, they are often responding to forces of disruption and reproducing the traits of other institutions around them in response (Clemens & Cook, 1999, p. 443). These institutions often arise out of complex schemas of resources and networks. Under some circumstances, these institutions may become stagnant because political or resource constraints make change difficult.

In higher education, we see evidence of both change and static behavior across time. The economy, availability of resources, governance structures within which higher education institutions operate, and the political context are all significant factors which affect and influence change in postsecondary institutions. Among Master's granting universities, change is often described in the context of these institutions emulating the behavior of other successful universities around them (Aldersley, 1995; Cyrenne & Grant, 2009; Henderson & Kane, 1991). For some universities, change is made more difficult by tightly controlled higher education systems, which define the roles and responsibilities of each university within the system.

Historical Institutionalism and Path Dependence

In "Historical Institutionalism in Rationalist and Sociological Perspective," Peter Hall also challenges this notion that institutions are static and attempts to explain forces of institutional change (Hall, 2010). Hall takes a similar approach to Clemens and Cook (1999) when he asserts that institutional change can be understood through coalitions of actors and resources. Further, he agrees that these same forces that shape institutional change may also prohibit it. Hall asserts that both change and stagnation are context specific—they are driven by

the settings, beliefs, and conditions of a particular organization (Hall, 2010, p. 208). As a result, historical institutionalism is important for understanding what shaped the beliefs and conditions under which the institutions endure or change.

In both Hall and Clemens and Cook's works the authors assert that institutions are durable to the extent that political actors prohibit change. Clemens and Cook argue that institutions are limited to change to the extent that political actors bound the mobilization of resources or suppress alternative ideas (Clemens & Cook, 1999, p. 458). Likewise, Hall cites the dilemma of collective action in reference to the political challenges facing institutional change. Political actors may face capacity challenges to enacting change. In addition, the opportunity costs for political actors in foregoing change may be lower than those for enacting change (Hall, 2010, p. 209). As a result, actors must consider an array of conditions which may, in sum, be prohibitive of change.

Despite the constraints facing institutional change, policies and political possibilities are constantly reshaping institutions. In part, just as institutional durability is understood through historical institutionalism, so may institutional change be. Hall asserts that the "likelihood of institutional change in one direction or another, at any point in time, is affected by the outcomes of previous episodes of change" (2010, p. 209). In other words, in understanding institutional change and the impetus for it, one must not only have an understanding of the context within which the change occurred but also the context that led to the development of the political attitudes, schemas, and networks shaping the change. For higher education, the governance structure, political climate, and financial circumstances, as well as the motivations of actors within universities, all shape the context within which change occurs and inform the available options for change.

Historical institutionalism and path dependence offer that change can be, and often should be, explained by more than a single instance or causative mechanism. Change is better understood through a longer-term examination of the context in which the change occurred. Just as networks of political actors, schemas, and resources may serve to constrain change—they also influence it. The people and beliefs that laid the groundwork for the current context have also influenced the future direction of the organization.

Historical institutionalism and path dependence provide a framework for considering the context of the changes happening within higher education. What these theories assert is that change cannot be understood without first considering what factors contributed to that change. Related to understanding how the context and history affects organizational change is the need to understand what motivates the decision makers. Game theory suggests that hierarchy, in this case higher education governance structures, exists to correct for market failures in higher education systems. In many states, the higher education governance structures have been created to limit competition among public institutions and maximize efficiency across the system (Clark, 1978).

Game Theory

Robert Axelrod's book, *The Evolution of Cooperation* (1984), is a study of how cooperation can emerge and persist as understood through the application of game theory and the prisoner's dilemma. In it, Axelrod asserts that cooperation arises when it is mutually beneficial for both parties. Further, Axelrod argues that players who employ the dominant strategy of not to cooperate are unsuccessful in the long run. Using Tit for Tat, Axelrod demonstrates that those players who are never the first to defect and cooperate when cooperation is given, yet defect when the other player defects, are most likely to be successful. In the long run, it seems that efficiency will be maximized in a market economy where the players are free to compete with

one another and no market failures are present. In the presence of market failures, hierarchy may be necessary to maximize the greater public good. In addition to the presence of market failures, it is possible that a hierarchy is necessary to influence the decision mechanisms in the short-run so as to resolve the problem of individual preferences outweighing group efficiency. In higher education, state governing boards were originally established to prevent unnecessary duplication of higher education programs in order to maximize the efficiency of state funds and the public good (McGuinness, 1985). In the absence of a body such as a state governing board, or in states where control over institutions is more loosely exercised, market and state policy pressures may induce institutions to cooperate.

According to Axelrod, Tit for Tat is stable in the long run because the possibilities of future interaction with the other party induce the participants to cooperate. Assuming that every party is using Tit for Tat and that the next move is sufficiently important, then the participant can do no better than to cooperate. In contrast, if the future is not important, than it will pay to defect on the next move. When a party defects, the individual benefit is [may be?] great but, in many circumstances, the social marginal benefit is likely less than if the parties had cooperated. Said another way, individual self-interest may lead to an inefficient Nash equilibrium[8] (Miller, 1992, p. 27). Thus, hierarchy can play an important role in changing the decision-making rules such that defection is less attractive to individual players in the short run.

In a hierarchy, incentives may be realigned so as to alter the decision making process (Miller, 1992). Once a hierarchy is introduced, as is the case with government intervention in the higher education market, the payoffs for cooperation and defection change because the

[8] The Nash Equilibrium is a concept of game theory where the optimal outcome of a game is one where no player has an incentive to deviate from his chosen strategy after considering an opponent's choice. Overall, an individual can receive no incremental benefit from changing actions, assuming other players remain constant in their strategies.

incentives have changed (Axelrod, 1984, p.156). Under ideal conditions, the penalties for defection would be set such that they would induce repeated voluntary compliance to establish the maximum social benefit. Market failures, such as imperfect information, may have significant consequences on social welfare in the short run if they are not corrected for. For example, the higher education institutional accreditation requirement is an attempt to protect consumers from paying for low quality education by restricting student aid eligibility to accredited institutions. Institutions comply with the accreditation process because accreditation is necessary to be eligible to offer students federal and state financial aid. Further, it is intended to signal to consumers that the institution offers a quality education (Burke, 2005).

In some cases, the market failure is so great that even long-term cooperation is unlikely to correct for it—as is often the case with externalities such as…. When externalities are present, hierarchies are necessary to negotiate a solution that changes the incentives of the decision-makers to either prevent negative externalities or encourage positive externalities (Miller, 1991, p. 30). Miller asserts that hierarchy may be necessary to alter individual incentives in order to maximize group efficiency (ibid, p. 33). Yet, hierarchy may be an imperfect mechanism to resolve the tension between self-interest and group efficiency. Successful hierarchy relies upon a known set of preferences in order to induce the appropriate behavior. When preferences are not known then hierarchy does not present a usable solution.

In higher education, individual university preferences are rarely known and group efficiency is seldom the goal. For states with centralized higher education systems in which the state systems have authority over determining degree offerings, tuition rates, and entry requirements, the justification has generally been to increase efficiency across the system. It is presumed that in higher education systems where the institutions are relatively autonomous there

is unnecessary duplication in practices such as degree offerings and the types of students served with less concern for overall efficiency. On the other hand, autonomy has been widely cited as key to the success of many American universities with few states displaying the political will to prioritize group efficiency over institutional autonomy (Slaughter & Leslie, 1997). In the broader picture of limited state resources, all states have attempted to compromise between these seemingly competing goals of group and individual efficiency.

The most recent wave of performance funding in several states has elicited cooperation between policymakers and institutional leaders with an explicit goal of promoting both group and individual efficiency. In states such as Virginia, state legislatures have exchanged increased autonomy (in the areas of tuition setting and capital project contracting) for institutional commitments to increase degree productivity (Kinne-Clawson & Zumeta, Forthcoming). These relatively new agreements have conceded some elements of central control in hopes that better cooperation between the state and higher education institutions will create more efficiency across the system as a whole.

In practice, hierarchy can create a situation where cooperation may be more costly than defection. As a result, the individual incentives to comply are sufficiently low that the party would instead choose to defect at the expense of group efficiency. For a variety of reasons, government intervention to prevent externalities may not produce the desired level of social efficiency because it is imperfectly implemented or the incentive is not of an appropriate magnitude to change behavior. In the original wave of performance funding for higher education, the incentives provided by states generally represented less than five percent of a given institution's state budget. As a result, most performance funding systems failed to achieve the results desired by state policymakers because institutions had insufficient motivation

(Dougherty, Natow, & Vega, 2012).

According to Axelrod, group efficiency is maximized when all players agree to cooperate. Such cooperation is most likely to occur when both players have a long-run view and future interactions are likely because "the other's success is virtually a prerequisite for doing well yourself" (Axelrod, 1984, p. 112). Given this long-term likelihood of future interactions, why would colleges and universities choose not to cooperate—even if the incentives were small? The answer is that a necessary condition for the maximization of group efficiency and long term cooperation is that the players are participating in a [somewhat interdependent?] market economy with clearly specified property rights and the ability of market participants to negotiate for their own best interest (Miller, 1991, p. 27). Taken together, when the conditions of a market economy and likely future interactions are not met, participants are likely to defect to the detriment of group efficiency. Thus, hierarchy is important not only to correct for market failures but also to correct for short-run thinking, which prioritizes individual gains over group efficiency.

Scholars have argued that Master's granting universities pursue the research university model as a long-run strategy to increase prestige and ultimately resources. While it may be less efficient for states to have multiple universities pursuing the research mission, [hierarchical?] state policies have not served to adequately discourage this ambition (Brewer, Gates, & Goldman, 2002). As described above, the market failures, such as imperfect information and low incentives for cooperation, under some circumstances have led institutions to choose to maximize self-interest to the detriment of group efficiency. This coupled with the absence of a strong hierarchical structure governing higher education in most states has enabled institutions to pursue models they see as being in their individual best interests. Thus, game theory also offers

some helpful insights as to why mission drift among Master's granting universities is so common.

Institutional Isomorphism

To better understand the phenomenon of the pursuit of prestige among Master's granting universities, I also apply DiMaggio and Powell's theory of isomorphism. "Following Meyer (1979) and Fennell (1980), [DiMaggio and Powell] maintain that there are two types of isomorphism: competitive and institutional" (Dimaggio & Powell, 1983, p. 149). In competitive isomorphism, organizations must exist in a system where they are free to compete and engage in niche behavior. In contrast, institutional isomorphism applies most closely when the primary factor "organizations have to take into account are other organizations" (ibid. 150). In higher education, institutions likely engage in both competitive isomorphism and institutional isomorphism. For the purposes of part of my analysis, I am primarily concerned with institutional isomorphism—how the universities perceive of their environment and take into account other organizations.

DiMaggio and Powell contend that organizations are engaging in isomorphism as a consequence of a desire to attain legitimacy. Prior research has also suggested that the [which?] organizations were becoming more homogenous as a result of competition and a desire for more efficiency (Dimaggio & Powell, 1983, p. 147). In 1983, DiMaggio and Powell contended that organizations were increasing in homogeneity as a result of a number of isomorphic pressures that are unrelated to efficiency (ibid, 1983, p. 148). The three mechanisms that induce isomorphic change are coercive, mimetic, and normative isomorphism (ibid, 1983, p. 150).

Coercive isomorphism results from pressures from organizations that the organization in question is connected to or dependent on. These might be government mandates or the

requirements that a supplier makes. In higher education, these may take the form of government mandates or policy changes within the state legislature or higher education systems. Normative isomorphism stems from the professionalization of organizations. Here, members of an organization tend to hire people with similar educational backgrounds that will tend to approach problems in similar way. As a result, these organizations will import norms that push the organization to adopt particular processes and routines or forms. In contrast, mimetic isomorphism is the result of organizations modeling themselves on one another. Mimetic isomorphism is often a consequence of uncertainty—whether it is ambiguous organizational goals or an uncertain policy or fiscal environment. Under such pressures, organizations might model themselves on other organizations that they perceive to be more successful or legitimate in the given policy environment.

Coercive isomorphism

Master's granting universities are likely subject to all three types of isomorphic pressures at different times and under various conditions. Given the state policy context and higher education systems that public universities operate in, these institutions are often explicitly subject to coercive pressures from a variety of different stakeholders which may affect the institution's decisions about how to seek legitimacy. Michael Harris writes that, "Given the current dialogue in policy and higher education circles emphasizing increasing efficiency and accountability … mission creep appears particularly problematic" (Harris, 2012, p. 9). The accountability rhetoric generally defines the norms of achievement in relation to the research universities—thus forcing homogenization across institution types (McLendon, Hearn, & Deaton, 2006).

Accountability and efficiency mandates create coercive isomorphic pressures across

institution types. Said another way, these mechanisms often establish norms that are closely tied to the more prestigious institutions and compel less prestigious institutions to adopt them. The adoption of accountability mechanisms in states has typically included the use of financial incentive or budget mandates directly related to outcomes such as degree production and graduation rates. In Indiana, the adoption of performance based budgeting has shifted the funding structure from being entirely based on enrollments to institutions in part being funded based on the numbers of associates and baccalaureate degrees they produce (Zumeta & Kinne,, 2011). For Master's granting universities, this focus on degree production likely induces a move towards more selectivity and away from the broad access mission. As institutions who have historically served less well prepared students, performance funding based on degree production places pressure on Master's granting universities to either seek to become more selective or lower academic standards in the short run in order to produce more baccalaureate degrees.

In contrast, state governance structures for higher education may serve to protect higher education diversity across institutional types but exert isomorphic pressures within types of institutions. These bodies create legitimating rules and structures within which the institutions operate. For example, California was among the first states to recognize a need for institutional diversity and differentiation of roles with the creation of its Master Plan in 1960. The Master Plan allocated the roles of the institutions very deliberately so that the University of California campuses and California State Colleges, now the CSU's…, would only serve the most qualified students – UC the top eighth of high school graduates and CSC's the top third. Thus, the system was designed to allow both broad access to higher education and pursuit of the highest pinnacles of academic quality (California, 1960).

Unlike the isomorphic pressures across institution type as exemplified with

accountability, however, the California Master Plan exerts isomorphic pressures within institutional type. Policies are generally targeted to a single group of institutions such as the mandate that the California State Universities only serve the top one-third of graduating seniors. Thus, nearly all of the lower performing students are funneled into the California Community Colleges. Gesier and Atkinson argue that this has resulted in low baccalaureate degree attainment in California—particularly among African American and Latino students who are less likely to ultimately transfer to a four-year school where success rates are much higher (2010, p. 15). As a result, the CSU's tend to all serve the same populations of students with none truly serving (or having the opportunity to serve) a broad access mission (Geiser & Atkinson, 2010). Further, the California Master Plan, passed by the legislature in 1960, established into state law differential functions, including degree granting authorizations and admissions standards, for each of the sectors of higher education in the state. Consequently, the legitimacy seeking behaviors of the Master's granting universities in California are largely shaped by state law that explicitly describes who these institutions can serve.

Lacking outside policies or structures to prevent homogenization across higher education, coercive isomorphic pressures have served to create similarity both across institutional types and within types of higher education institutions. In many ways, state mandates, laws, and budgeting policies have induced more uniformity between community colleges, Master's granting universities, and research universities. At the same time, the homogenization of higher education can also be explained by normative pressures within the highly professionalized culture of colleges and universities.

Normative isomorphism

Colleges and universities are highly professionalized organizations and as a result, are

likely responsive to normative isomorphic pressures. DiMaggio and Powell explain that, “Two aspects of professionalization are important sources of isomorphism. One is the resting of formal education and of legitimation in a cognitive base produced by university specialists; the second is the growth and elaboration of professional networks that span organizations and across which new models diffuse rapidly” (Dimaggio & Powell, 1983, p. 152). Both of these sources of isomorphism are applicable in higher education but the former is perhaps the most salient.

In the case of Master’s granting universities, normative pressures created by university specialists and the source of their formal education are most evident among the faculty whom often aspire to more closely model research university academe. In many ways, faculty ambitions reflect the pursuit of prestige and normative pressures most closely as most faculty were trained within the research university and understand success through the elite model of research and publication productivity (Henderson & Kane, 1991). Michael Harris writes that, “By developing organizational structures and degree programs that mirror their own doctoral experience, faculty members transform their current institution along research university norms regardless of the institutional mission and values of their current department or university” (Harris, 2012, p. 11). Thus, the faculty play a significant role in academic drift as they seek to translate their academic preparation norms into the professional norms of the institutions they work for.

Such norms are further entrenched as they are developed into faculty rewards systems. Even at teaching institutions such as Master’s granting universities, faculty promotion and tenure systems remain largely based on research over teaching (Rhoades, 2000). While institutional values may differ, many of the external professional incentives for faculty production have not changed to reflect these evolving priorities. These normative isomorphic pressures are further

evidenced through academia by the significant gains over time in research funding within Master's granting institutions despite the fact that these colleges and universities are rarely competitive for large federal and private research grants (Henderson, 2009; Brewer, Gates, & Goldman, 2001). In part, gains in external funding may be reactions to coercive pressures to support institutional budgets with additional sources of revenue due to constrained state resources. Yet, they have significant implications for academic drift.

Mimetic isomorphism

Similar to the professional pressures felt by institutions from faculty to model the institutions they were trained at are mimetic pressures for universities to copy other successful colleges and universities. Academic drift and the pursuit of prestige are premised on institutions of higher education copying the behaviors of their more successful counterparts. Mimetic isomorphism is especially relevant during periods of uncertainty as institutions model the behavior of other organizations that have been comparatively more successful in attaining resources. Master's granting universities occupy a poorly understood niche between community colleges and research universities. Because few good models for Master's granting institutions exist, these colleges and universities have a tendency to drift towards the research model (Morphew, 2002; Clark, 1978).

According to DiMaggio and Powell, these universities are responding to mimetic pressures to copy successful higher education structures and thus are contributing to increased homogeneity among all higher education institutions (Dimaggio & Powell, 1983). In California, the California State University system has been particularly concerned with securing authority to offer doctoral degrees. In 2006, the state legislature authorized the system to offer doctoral degrees jointly with the University of California. By 2012, the CSU's gained additional approval

to offer Ed.D. degrees as well as professional doctoral degrees in fields such as nursing and physical therapy (Swisher, 2012). The CSU's argued that authorization to confer more graduate degrees was necessary in order to meet the needs of the California economy. Yet, these institutions may not be the best equipped to grow graduate degree capacity when compared to their research university counterparts.

According to mimetic isomorphism theory, Meyer and Rowan argue that institutions will adopt the dominant organizational form, regardless of whether or not it is most efficient, because it is perceived to be coupled with legitimacy (Meyer & Rowan, 1991). The decisions of leaders at Master's granting universities to pursue the research university model are likely motivated by this desire to seek legitimacy and model the relatively more successful research university sector. Coupled with legitimacy is thought to be increased political power as well as social and economic fitness (ibid. 150). Consequently, despite the costs associated with pursuit of the research university model, many institutions still choose to engage in what Clark called "academic drift."

As mentioned earlier, using U.S. Federal Integrated Postsecondary Education Data System (IPEDS) data over a period of 21 years, Sanford (2011) analyzed the impact of rising prestige in research universities on diversification of funding sources, using a multi-level model. The author found that institutions moving from research II universities to research I universities did not see significant changes in funding diversification but those institutions remaining in the research I category continued to further differentiate their funding sources and gain prestige (Sanford, 2011). In part, he reasoned that this may be because the elite universities continue to become more elite because they are best equipped to compete and the gap between those elite institutions and others may be widening (Sanford, 2011, p. 123). Nonetheless, the attainment of

higher prestige seen as being linked to a reduced dependence on traditional revenue sources, including tuition, fees, and state appropriations, may be particularly appealing to Master's granting universities given downward trends in state support (Bowen, 1980; Sanford, 2011).

Institutional isomorphism offers several explanations for why Master's granting universities tend to drift towards the research university model. These include state and governmental regulations that inadvertently induce universities to become increasingly similar to one another as well as professional norms such as U.S. News rankings which guide the directions and decisions of university leaders. In addition, Master's granting universities may be uncomfortable in their less well-defined roles within the states and as a consequence, may seek to pursue the more legitimated role of research universities. Yet, there are some behaviors by institutions that seem contrary to these isomorphic tendencies. Why would an institution choose to become less selective? Or choose to not pursue federal research grants?

Market Driven Behavior and Stability

Contrary to the traditional understanding of pursuit of prestige, I have found some evidence that institutions may instead choose to ground their missions in a specific niche. At a Master's granting university in Washington, the president and other institutional leaders chose to become open access and serve as many students as possible. He was motivated in part by a desire to define the institution as unique from other universities in the state. Likewise, university leaders at a campus in Wisconsin chose to pursue a traditional liberal arts mission. While portions of this mission such as selectivity reflected the common understanding of prestige, the focus on a teaching mission made this institution distinct from traditional research universities in the state (Kinne, 2012). To help understand the desire of organizations to differentiate themselves from their peers and break from the pursuit of prestige framework, I apply Cyert and

March's (1992) decision making framework as well as Clemens and Cook's theory of organizational change and stability (1999).

Institutions may choose not to pursue the research university model and to instead differentiate themselves from other types of institutions in the state because it is more efficient to pursue an alternate model. Said another way, institutions may evaluate the costs and benefits of pursuing the research university model and decide that they have more to gain given their particular values and circumstances by being different from research universities. This decision making model for organizations is described by Cyert and March in their classic, *A Behavioral Theory of the Firm,* as organizational leaders working together to identify the best possible way to meet the business goals of production; inventory; market share; sales and profits (Cyert & March, 1992). Within higher education, these goals exist in the form of markets for resources, grants and contracts, students, high quality faculty and administrators, and the goods and services institutions produce in the form of many types of degrees and other outputs (Brewer, Gates, & Goldman, 2001; Slaughter & Rhoades, 2004).

It is this decision-making model that Cyert and March argue organizational leaders use to prioritize goals and understand resources and constraints (Cyert & March, 1992). Given what is knowable, institutional leaders may decide pursuing the research university model is too costly compared to the likely benefits to be received. Here, leaders weigh the feedback of various different stakeholder groups and institutional values in deciding the direction of the organization. As a result, university leaders may instead of mimetic isomorphism choose rather to fulfill a specific niche which would meet the above goals.

For many Master's granting universities, this niche is a focus on serving the local community within which the institution is located. Michael Porter has suggested that higher

education institutions should pursue strategies that add value to their local communities (Porter, 2006). Likewise, Henderson (2009) has argued that Master's granting institutions play unique and often unrecognized roles within their community. It is possible that contrary to the narrow notion of traditional academic prestige, leaders at Master's granting institutions are clarifying their roles and differentiating themselves from research universities through emphasizing new strategies such as community service, local economic development, and serving niche student populations.

The decision to pursue a niche—or one that differentiates a university from others in the state—may be a response to "multiplicity." Here, strategic actors are playing off competing alternatives—some of which may cause instability and reduce duplication (Clemens & Cook, 1999). Multiplicity is possible when institutions are no longer perceived as inevitable (ibid, 1999, p. 449). In the context of Master's granting universities, some of these colleges and universities may have chosen to pursue an alternative to prestige generating behaviors because the success of and stability of research universities through the recession was not inevitable. Further, pursuit of prestige requires a significant investment of new resources that simply have not been available to public Master's universities since at least the 1990's.

Resource Dependency Theory

Organizational theory suggests that organizational behavior is in part accounted for by the context within which the organization exists. Pfeffer and Salancik (1978) further this understanding by suggesting three principles related to interorganizational partnering and interdependence: (1) organizations need resources to survive and to pursue their goals; (2) organizations acquire resources from their environments; and (3) power plays a key role in understanding interorganizational roles (Malatesta & Smith, 2014). For public colleges and

universities, resource needs include state appropriations, students and their tuition, faculty, capital, and other forms of external support including public and policymaker good will and research money and endowments. For public Master's institutions in particular, state appropriations represent a substantial share of the resources these institutions depend on; yet, they have little control over the terms of acquisition of these resources and their amount.

Pfeffer and Salancik (1978) suggest that the interdependence of organizations on one another exerts a unique form of influence or set of social control processes. According to them, "interdependence exists whenever one actor does not entirely control all of the conditions necessary for the achievement of an action or for obtaining the outcome desired from the action" while another actor does rather than just the environment (Pfeffer & Salancik, 1978, p. 40). The unbalanced and unpredictable relationship between states and public higher education institutions, particularly in recent decades as state funding has been quite volatile, has induced these institutions to seek more predictable sources of revenue over which they have more control.

Pfeffer and Salancik (1978) assert that organizations tend to be influenced by those that control the resources that they require. For public higher education institutions, states have control through the appropriation of state resources and a range of state policies. In a study by Volkwein, et al (2006), the authors find that, "in states where the public institutions enjoy greater levels of both administrative and academic flexibility [from the state] they tend to have lower public enrollment rates, confirming their hypothesis that 'a college or university with relatively loose regulations can devote more resources to activities for which there is weak demand but which, nonetheless, are important to its staff (e.g., nonfunded research or providing spaces for relatively high cost graduate and professional students)'" (Volkwein, 2006). In particular, more

institutional autonomy likely gives institutions more flexibility to pursue alternate, more stable sources of revenue over which they have more control, such as graduate tuition revenue.

In contrast to competitive strategy where the primary goal of organizations is profit maximization or its equivalent (Porter, 1980), in resource dependence theory the primary goal is better assurance of organizational survival or stability. Thus, institutions desire a predictable flow of resources because uncertainty undermines survival (Jaquette, 2011). Public Master's granting universities are highly dependent upon two primary sources of revenue: state appropriations and undergraduate enrollments, the latter both because of the associated tuition revenue and because in many states enrollments affect state support. In recent years, the volatility of state appropriations may have led institutions to seek alternate and more stable forms of resources such as tuition revenue from nontraditional sources (out-of-state and international students, on-line enrollments, etc.) (Delaney & Doyle, 2007; Zumeta, Breneman, Callan, & Finney, 2012). As Jacquette asserts, the asymmetric power relationship between public institutions of higher education and the states that provide crucial appropriations is particularly problematic for Master's granting universities when compared to research universities. The more "prestigious public [research] universities have many revenue sources and may enjoy countervailing power over the state in that the state depends on these institutions to attract high-innovation industries and to retain high-ability individuals" (2011, p. 135).

For public Master's granting universities, the primary alternate source of revenue to state appropriations is tuition dollars since they have limited research and private fund raising capacity. States vary widely in which body has the authority to set undergraduate tuition. Generally speaking, undergraduate tuition rate control either rests with the state legislature, state boards of education, higher education coordinating boards or system boards, or with the

individual institutions themselves (Bell, Carnahan, & L'Orange, 2011). In several states, primary tuition control is shared among several bodies. "As such, decisions about tuition changes occur where there is a broad based shared responsibility between government and higher education, rather than the authority to act unilaterally, which is clearly held by one side or the other. This means that tuition decisions are political, and that a number of interest groups try to influence the process" (Institute for Higher Education Policy, 1999).

Other research suggests that state governance structures and political characteristics play an important role in determining undergraduate tuition prices (Lowry, 2001; Cheslock & Hughes, 2011; McLendon, Hearn, & Mokher, 2010). Further, Lowry argues that "institutional arrangements for the governance of public universities matter because they affect the ability of different actors having different preferences to influence decisions about prices and spending" (2001, p. 846). Lowry correctly hypothesized (and then empirically demonstrated) that public university prices would be lower in states where the decision makers are appointed by elected officials or directly elected because they have a general preference for lower prices for constituents. Said another way, Lowry hypothesized that public university prices depend in part on the capacity of state government officials to oversee the university system (Lowry, 2001, p. 850).

Given that public Master's granting universities are highly dependent on state appropriations; it is logical that when state appropriations decline these institutions would turn to an alternate source of resources—in the first place undergraduate tuition. Yet, in recent years escalating tuition rates at public universities have garnered the attention of state policy makers as they have sought ways to control the rising cost of a college education. As a result, many states have implemented policies to restrict tuition increases—despite lagging state appropriations

(American Association of State Colleges and Universities, 2014). Given the power of state policy makers over both state appropriations and tuition prices, increasing income from graduate tuition then, might appear to be a more viable resource strategy over which public Master's granting universities have more control. Further, the ability of institutions to control both changes to graduate enrollments and changes to graduate tuition varies with state governance structures. In most states, institutions have significantly more flexibility in pricing graduate education than they do with undergraduate tuition (Lenth, 1993). In general, graduate education is much less salient to state policymakers than is undergraduate education.

Competitive Strategy

Michael Porter's "five competitive forces that shape strategy" is fundamental to my analysis of public Master's granting colleges in considering (1) how institutional leaders understand and manage their strengths; (2) the environment in which the institutions are situated; and (3) the strategic decisions that college presidents pursue within this environment (Porter, 2008). Michael Porter's competitive strategy framework has been developed and honed in reference to business strategy. Yet, there are many lessons which translate from the for-profit sector to the non-profit sector in which higher education operates. Most importantly, higher education institutions operate in markets for resources that include students, research dollars, state appropriations, and high quality faculty. Frederick Balderston (1995) wrote, "Alert faculty members and university leaders need to determine which opportunities must be pursued out of the precious margin of internally available resources; which ones should be initiated if new external resources can be attracted; and which ones are not of high priority or not truly appropriate to the university's self-funded mission" (Balderston, 1995, p. 271).

In order to compete in the market for these resources, institutions must understand current

and emerging trends and forces shaping these markets and plan accordingly (Grizzell & Burell, 2008; Porter, 2011; Porter, 2008). According to Porter (2008), there are five forces which shape competition and strategy within industries: threat of new entrants, bargaining power of buyers, threat of substitute products or services, bargaining power of suppliers, and rivalry among existing competitors (Porter, 2008, p. 80). Among these, the strongest competitive force (or forces) is what shapes the profitability and strategy formulation of [competitors within?] an industry. Among higher education institutions, revenue generation is most analogous to profitability. Further, some of these forces are likely more salient than others and which ones are most applicable varies across institution types.

From the early part of the twentieth century up until the mid-1970's the numbers of public institutions of higher education increased rapidly. Since then, higher education has seen steady growth not in the numbers of institutions, but in the enrollment of students within existing institituons (Geiger, The Ten Generations of American Higher Education, 2005). In public higher education today there are significant barriers to entry into the market such as high capital requirements, the availability of government subsidies [and basic authorization!] (Robst, 2000), the presence of scale economies (Koshal & Koshal, 1999), and real or perceived quality advantages from the long-term existence of institutions (de Groot, McMahon, & Volkwein, 1991). Recently, higher education has seen few new entrants, particularly in the public 4-year sector, with the exception of the growth in for-profit higher education sector. Yet, the for-profit sector has presented a legitimate threat of substitute products and services to traditional higher education delivery models because it provides students with easy access online, grants credit for work and life experiences, and tailors curriculum to individual learners (Bennett, Lucchesi, & Vedder, 2010). Fifteen years ago, only 3 percent of graduate students attended for-profit

schools—today it is 11 percent (National Association of Student Financial Aid Administrators, 2016). The power of "suppliers" is particularly relevant in higher education where institutions restrict access to the goods through entrance requirements and selectivity (Webber, 2000, p. 56). Likewise, the power of "buyers" (students, parents, state governments, etc.) is also a key force in higher education. As a result of products being differentiated across colleges and universities (Porter, 2008, p. 83), the buyers have a significant amount of choice in where they attend college and where state dollars are allocated for support. On the other hand, the power of buyers is reduced as research has shown that, with the exception of low-income students, most are not price sensitive when it comes to tuition (Leslie & Brinkman, 1986; Heller, 1997; Heller, 1999). Thus, the supplier is given more latitude to increase prices without significant risk of a drop in demand. As has been shown for the last two decades—despite significant increases in tuition, student enrollment has continued to grow (Hemelt & Marcotte, 2011).

The final and most significant element informing an institutions strategy is likely to be rivalry among competitors. As Porter describes, "Rivalry among existing competitors takes many familiar forms, including price discounting, new product introductions, advertising campaigns, and service improvements" (Porter, 2008, p. 85). In the business sector, the level of rivalry has a significant impact on profitability and strategy. In nonprofit higher education, this translates roughly to growth in resources, prestige, and legitimacy. For the purposes of this analysis, I am primarily interested in rivalry's impact on strategy. Rivalry is particularly relevant to higher education because overall industry growth is slow—thus, there is constant competition for financial resources, students, and faculty. Likewise, rivalry is intensified when competitors are highly committed to the business and have aspirations for leadership or prestige (Porter, 2008, p. 86). As Cyrenne & Grant (2009) argued, the pursuit of prestige is particularly relevant among

institutions of higher education and in many ways drives the strategies that they pursue in their various markets. An important aspect affecting competition within an industry is government intervention (Porter, 2008, p. 86). In the higher education marketplace, government operates at many levels that affect the policies which govern, finance, and fundamentally change the markets in which higher education operates.

In public Master's granting universities, the strategies that institutions pursue are informed by the views of key external stakeholders, the policy environment, competitors, the state and regional context, and the fiscal climate. The findings detailed below are framed within? Michael Porter's competitive strategy framework, and focus on understanding how higher education leaders understand and define the factors that shape their institution's strategy. The findings suggest that how college and university leaders of public Master's granting institutions position themselves within the policy environment is influenced by decisions about the higher education markets they are situated in and who they compete with, the desire for legitimacy, and the availability of alternative strategies in defining their mission and purpose. The remaining theories below inform this framework for understanding how college presidents think about and deploy their strategies to pursue prestige and (or) to maximize legitimacy and stabilize resources. In a study by Hemelt and Marcotte (2011) that spanned the period 1991 through 2006, the authors found that on average, a $100 increase in tuition [in 2006 dollars] led to a 0.25 percent drop in enrollment (Hemelt & Marcotte, 2011). Yet, the magnitude of the price sensitivity was greatest at Research I universities (where, presumably, the students who apply have more enrollment choices and can afford to discriminate) and smallest at the less selective Research II and comprehensive institutions whose students have fewer choices. As has been shown for the last two decades—despite significant increases in tuition, student enrollment has continued to

grow (Hemelt & Marcotte, 2011).

State governance structures

State governance structures in higher education were first established to serve as buffers between the institutions and the states (Tandberg D. , 2013). Tandberg (2013) summarizes the need for the establishment of state governing and coordinating boards as, “the growing size and complexity of public higher education caused increased political infighting for resources and increased lobbying by institutions. In response, legislators demanded expert, neutral evaluation of institutional needs” (Tandberg D. , 2013, p. 510). The impact of these coordinating and governing boards has changed over time—particularly as it relates to academic planning, approval of academic programs and changes in mission. In the 1950’s through 1970’s, state intervention into higher education took multiple forms—yet, as McLendon et al writes, “institutionalized control of public campuses was achieved mainly through the creation and subsequent strengthening of statewide coordinating boards and consolidated governing board” (McLendon M. , 2003, p. 480). By the 1990’s, the centralization of power saw significant restructuring with more authority for financial decisions and academic planning being directed to the local and campus levels (Ibid, 2003).

As Table 2 below shows, McGuinness (2016) has documented a long-term trend of weakening of the role of governing and coordinating boards in the control of institutional missions. Said another way, over time, institutions have gained increasing amounts of authority over decisions relating to new program approvals—opening the door for graduate education at public Master’s universities (McGuinness A. C., 2016).

Table 2. Changes in Postsecondary Academic Program Regulation over Time[9]

Major Phase	As of 1972	End of 1970's	1980's through mid-1990's	200s to 2008	2015
Function: Regulation	Focus on rational expansion of capacity, and curbing unnecessary duplication primarily in the public sector. Regulation of new academic programs, campuses, branch campuses, and ensuring mission differentiation between public research universities, teaching colleges/universities, and community colleges.	Strengthening state regulatory authority related to new academic programs, campuses, and branch campuses, and ensuring mission differentiation. New emphasis on state review of existing academic programs for unnecessary duplication and/or low-productivity – including in some cases state authority to discontinue programs. State mandates for external review of academic program quality.	Weakening of state regulations enacted in previous decade for approval of academic programs, both new and existing, and for review and approval of changes in institutional missions.	As states cut funding of state agencies in the economic crisis, continued weakening of state regulations for approval of academic programs, both new and existing, and for review and approval of changes in institutional missions.	As states cut funding of state agencies in the economic crisis, continued weakening of state regulations for approval of academic programs, both new and existing, and for review and approval of changes in institutional missions.

[9] Adapted from Appendix A: Six state-level functions: summary of change over phases in McGuinness, A. C. (2016). *State Policy Leadership for the Future: History of state coordination and governance and alternatives for the future.* Washington, D.C.: Education Commission of the States. Retrieved from http://www.ecs.org/state-policy-leadership-for-the-future-history-of-state-coordination-and-governance-and-alternatives-for-the-future/

Beyond academic program regulation, state governance structures play a significant role in informing how institutional leaders define their missions and what opportunities they have to grow revenue or enter new markets. Both Michael Porter and Ronald Heifetz assert that context is important to how leaders shape their strategies (Heifetz, Grashow, & Linsky, 2009; Porter, 1980). State higher education agencies fall into two basic categories: consolidated governing boards and statewide coordinating boards—and, even within these categories there is significant variability across states in mission, policies, and regulatory authority. In governing board states, campuses are governed under a central board which is empowered with many of the day-to-day decisions over institutions (McLendon, Deaton, & Hearn, 2007; Berdahl, 1971; McGuinness A. C., 1985). In contrast, "coordinating boards [are] intermediary organizations with responsibility for planning throughout the state but lack authority over individual institutions" (McLendon, Deaton, & Hearn, 2007, p. 647). These differences in governing structures may enable or prompt the presidents of Master's granting institutions to pursue different institutional strategies, or conversely prevent them from doing so. In California, for example, there is no statewide coordinating or governing board; but, instead, several system level boards with their responsibilities established through state statute and the California Master Plan (California State Department of Education, 1960). Yet, the statutory and system-level constraints on approval of graduate programs look like some of the most centralized governing board states. In contrast, the Idaho State Board of Education, a statewide centralized governing board, has many of the same program approval constraints that exist in California but the system leaders have chosen to place few restrictions on Boise State University in the growth and addition of new graduate programs.

In the chapters that follow, I take a deeper looks at the nuances between states such as

California and Idaho and attempt to assess the extent to which state governance structures (coordination boards versus governing boards and some nuances within those categories) impact the ability of institutional leaders to grow (or restrict growth) in graduate programs. Beyond the policies and state governance structures restricting or enabling the growth in graduate enrollments are the motivations of institutional leader to pursue growth in graduate education. In the statistical chapter that follows, I use 20 years of data across over 200 public Master's universities to examine the variables related to and explanations of institutional theory and isomorphism, pursuit of prestige, resource dependency, and competitive strategy. Building on these findings, the qualitative chapter probes deeper into the motivations of institutional leaders to pursue graduate enrollments and the extent to which these programs provide a viable revenue strategy—as resource dependency would suggest; are part of a broader strategy to pursue the research university model; or are perhaps a response to local economic conditions or fulfilling an unmet need as competitive strategy may conclude.

Chapter 4 Quantitative Study: Predictors of Graduate Enrollment at Public Master's Universities

The growth in graduate enrollments at public Master's universities has been largely ignored by scholarship except to note that the addition of graduate programs is one part of the larger context in these institutions' pursuit of prestige and movement towards the research university model (Aldersley, 1995; Bowen & Rudenstein, 1992; Brewer, Gates, & Goldman, 2002). Yet, all of the research on the pursuit of prestige reflects a different time when states were investing much more robustly in higher education. The pursuit of prestige and attainment of the research university model is expensive and requires substantial, sustained spending across multiple areas of the university including in attracting high quality students (with merit based aid), building capacity in faculty research (through both the addition of high cost research facilities and research-oriented faculty as well as the acquisition and administration of federal, state, and private grants), and finally through the addition of graduate programs—ideally Ph.D. programs (Carnegie Foundation for the Advancement of Teaching, 2010).

The long downward trend in state support of higher education, and ultimately the total resources available on a per student basis, suggests that the growth in graduate enrollments over the last twenty years at these traditionally undergraduate institutions may be motivated by something other than attainment of the research university model, which seems less attainable now. What follows is a multiple regression analysis to understand what factors are correlated with graduate enrollment over the last two decades and to what extent pursuit of prestige still explains the growth in graduate education at public Master's universities. I theorize that while prestige may be one possible outcome of growth in graduate programs, attainment of the research university model is unrealistic for most public Master's universities with limited access

to the new revenue streams that would enable investment in this pursuit. Below, I test the extent to which variables associated with the pursuit of prestige, as well as those reflecting other possible explanations such as resource dependency and competitive strategy are correlated with the growth in graduate enrollments. Further, I test the extent to which institutional autonomy—as measured by different types of state governance structures that affect this, is correlated with graduate enrollments.

Analysis Design Strategy

The purpose of this study is to better understand what factors best explain robust graduate enrollments at public Master's universities in recent decades. I have chosen to use multiple regression to select the most parsimonious model built from variables reflecting pursuit of prestige, resource dependency theory, and competitive strategy frameworks, while taking account of governance factors to explain the variation in the variable of interest, graduate enrollment. In order to explain the variations in graduate enrollments among public Master's granting universities from 1992 through 2012, I derive testable hypotheses from the theoretical perspectives described below. The hypotheses are not mutually exclusive and institutional behavior may be influenced by more than one of the factors.

Table 3: Quantitative Hypotheses

Hypothesis I	Public Master's granting universities have increased graduate enrollments in pursuit of the research university model, i.e. prestige.
Hypothesis II	The increase in graduate enrollments at public Master's granting universities is a response to declines or stagnancy in state appropriations and/or undergraduate enrollment and associated tuition revenue.
Hypothesis III	The increase in graduate enrollments at public Master's granting universities is a competitive strategy that seeks a niche within identified economic needs in the state.
Hypothesis IV	Decentralized higher education governance structures are significantly and positively related to larger increases in graduate enrollments because institutions with more autonomy will have more flexibility to

	pursue graduate programs.

From the theoretical frameworks found in *Table 3* and associated hypotheses, I have identified variables of interest and sources of data for the period 1992 through 2012 and two sub-periods within this timespan. The universities included in this analysis are Carnegie classified public Master's granting universities in the United States as of 2012. These are institutions that "award at least 50 master's degrees and fewer than 20 doctoral degrees" per year (Carnegie Foundation for the Advancement of Teaching, 2010). There are 261 institutions within this category. This study will rely on a mix of IPEDS, U.S. Census Current Population Survey data, Bureau of Labor Statistics data, and state data sources.

Variables

Graduate enrollments are a useful measure for analysis of emphasis on graduate education because they are more readily available than data on graduate programs and are a better indicator of institutional emphasis and the existence of healthy programs. Graduate degrees were considered as an outcome variable of interest but would likely be much slower to respond to changes in the independent variables than enrollments. A log transformation of the variable graduate enrollments was chosen to normalize the variable's distribution. The year over year percent change in graduate enrollments was considered as this also normalized the graduate enrollments, but the natural log of graduate enrollments provided a substantially better model fit. Below, *Table 4* summarizes the variables contained in the model. Detailed descriptions of each variable follow.

Table 4: Variables by hypothesis

Hypothesis	*Variables*	*Variable Definition*
I: Pursuit of prestige and	ResearchRevenue	Logged value CPI-U adjusted total state and federal grant and contract revenue in year *i* in state *j* at

isomorphism		institution *k*
	Selectivity	Percent of total applicants who are admitted in year *i* in state *j* at institution *k* [only available for years 2001 through 2012]
II: Resource dependency theory	UndergradEnroll	Logged value of total FTE undergraduate enrollment in year *i* in state *j* at institution *k*
	StateAppropriations	Logged value of total CPI-U adjusted state appropriations in year *i* in state *j* at institution *k*
III: Competitive strategy	BADegree	Percent of adults with at least a baccalaureate degree in year *i* in state *j*
	PopulationChange	Year over year percent change in the number adults (age 18+) in year *i* in state *j*
	Urbanicity	Dummy variable where 0 equals an institutions location is a suburb or city and 1 equals an institutions location in a town (at least 35 miles from a suburb) or rural area in year *i* in state *j* at institution *k*
	InstOpportunity	Ratio of the number of adults per number of public, private, and for-profit four-year institutions in year *i* in state *j k*
IV: State governance structures	WeakCoordinating	Categorical variable classifying state governance structures with limited budgetary authority and limited or no statewide planning authority in year *i* in state *j*
	StrongCoordinating	Categorical variable classifying state governance structures with limited budgetary authority but with statewide planning authority in year *i* in state *j*
	GoverningBoard	Categorical variable classifying state governance structures with either statewide or systemwide budgetary authority as well as state or system planning authority in year *i* in state *j*
Control	Unemployment	Percent of state labor force who are unemployed in year *i* in state *j*

Pursuit of Prestige and Isomorphism

For the first hypothesis, pursuit of prestige via isomorphism, it is assumed that increases in research expenditures are indicative of public Master's granting universities pursuing the research university model. Henderson (2010) suggests that Master's granting universities may be inclined to pursue prestige via graduate programs and research as it is indicative of the best known and most successful higher education model—the research university. Thus, the pursuit

of prestige is often linked with growth in research activity because of its alignment with faculty ambitions—as most were trained within research universities and understand success through research and publication productivity (Henderson & Kane, 1991). Public Master's universities have nearly tripled their revenue from federal grants and contracts over the last two decades—but still make up less than one-tenth of the total of federal research spending at academic institutions. I hypothesize that more robust revenue for research (federal and state grants and contracts revenue) is positively correlated with larger graduate enrollments.

Finally, for the pursuit of prestige hypothesis, I include a measure of undergraduate selectivity—percent of undergraduate applicants who were admitted. Undergraduate selectivity is included as an indicator of prestige and I hypothesize that increases in selectivity (lower percentage of applicants admitted) will be correlated with an increase in graduate enrollments.

Resource Dependency

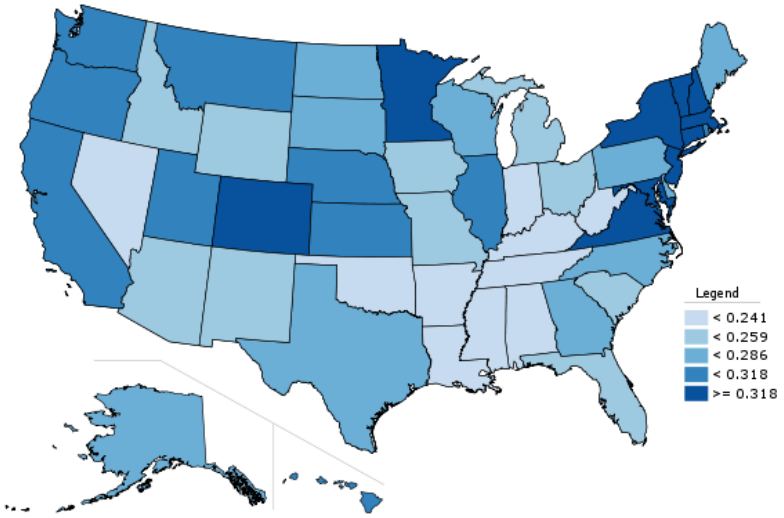
For hypothesis II, I test the extent to which variables associated with resource dependency theory (Pfeffer & Salancik, 1978) explain the change in graduate enrollments. Consistent with Jaquette's (2011) research, I include a logged variable for undergraduate enrollment, and a logged variable for state appropriations (CPI-U adjusted). Similar to what Jaquette (2011) found in examining colleges that became universities, I expect state appropriations to be inversely correlated with graduate enrollments (Jaquette, 2011). This is consistent with the theory that graduate enrollments are used as an alternative revenue source to offset losses from stagnancy or declines in more traditional sources of revenue. Jaquette (2011) hypothesized that declines in undergraduate enrollments would be correlated with growth in graduate enrollments; but he found that graduate enrollments were significantly and positively correlated with undergraduate enrollments—across both public and private universities (Ibid, 2011, p. 163). Consistent with Jaquette's hypothesis and contrary to his findings, I hypothesize

that at public Master's universities specifically, undergraduate enrollments will be inversely or only weakly correlated with graduate enrollments given that these institutions are highly dependent on traditional sources of revenue.

Competitive Strategy

For the third hypothesis, the theory of competitive strategy would suggest that the share of state population that has already obtained a baccalaureate degree may be related to an institution's decision to increase graduate enrollment. *Figure 9* below shows significant variation across the states in college degree attainment of adults aged 25 and over.

Figure 9. College Degree Attainment by State[10]

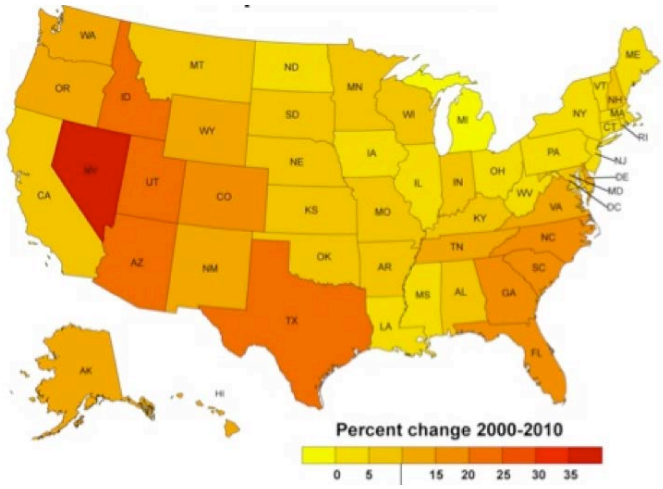


I expect that, in states with a relatively large portion of the population without a postsecondary credential (the lightest blue states), graduate enrollments at public Master's granting universities will tend to be smaller because providing access at the undergraduate level is a more promising competitive strategy. Conversely, in states where there is a relatively large proportion of the population that has already obtained a bachelor's degree, graduate enrollment growth should be greater, all else equal. Relatedly, I expect that in states where the adult aged (over 18) population is growing, there may be greater graduate enrollments. Using data from the 2010 census, noted

[10] Source: Renn, A. M. (2011, October 1). A Decade in College Degree Attainment. Retrieved from New Geography: http://www.newgeography.com/content/002464-a-decade-college-degree-attainment

economic geographer Richard Florida notes that, "The Sunbelt states (darker orange and red in Figure 10) Nevada, Texas, Arizona, Florida, Georgia, North and South Carolina, as well as Colorado, Idaho, and Utah in the Rocky Mountain West -- grew their populations at the fastest clip over the past decade" (Florida, 2011). I expect that adult population growth will be positively correlated with stronger graduate enrollments as institutions respond to this trend by adding capacity.

Figure 10. State population growth, 2000 through 2010

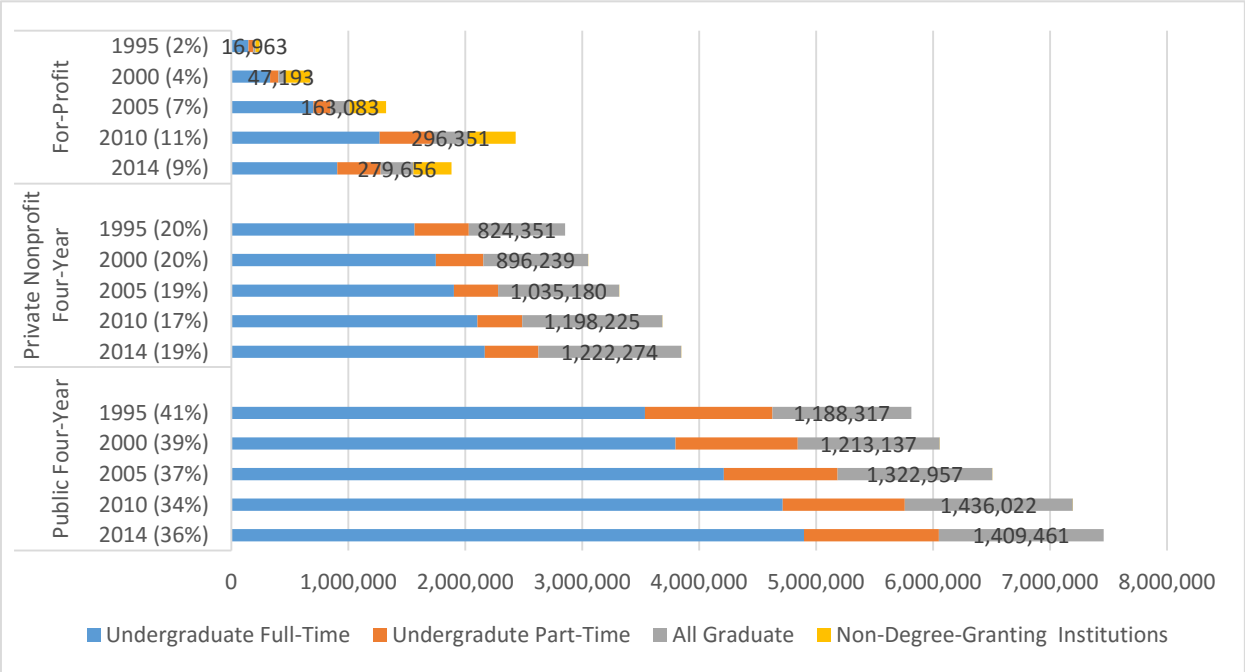


In addition, I include a dummy variable for urbanicity to indicate whether the institution is located in an urban or rural area where 1 equals rural and 0 equals urban.[11] I hypothesize that institutions in rural areas have lower opportunity (and less demand) for expansion of graduate degree programs and will be correlated with lower graduate enrollments.

The final variable, institutional opportunity, is a ratio of the total state population of people over aged 18 to the number of public, private, and for-profit colleges and four-year universities in the state. This measure of institutional opportunity is intended to capture how many adults reside in the state compared to the number of institutions. As Figure 11 shows, graduate enrollments have grown across the for-profit, private non-profit, and public four-year sectors in the last two decades.

[11] Rural institutions are defined as those institutions whose locations are more than 10 miles from an urbanized area.

Figure 11. Postsecondary Fall Enrollment by Attendance Status and Level of Enrollment (with Percentage of All Students Enrolled in Each Sector), 1995 to 2014, Selected Years



The entrance of for-profit institutions into the market is captured in the years covered in this analysis and has impacted the market that public master's universities are competing in for students in some states. Further, while the private non-profit four-year institutions educate a far smaller number of undergraduate students when compared to the public sector, they are not far behind the public institutions in their enrollments of graduate students and have aggressively expanded them. I hypothesize that, in states where the ratio of adults to graduate degree granting institutions is high, there may be less competition for students and larger graduate enrollments.

State Governance Structures

Hypothesis IV, state governance structures, seeks to capture institutional autonomy in strategic decision-making. I expect that in states with centrally controlled systems of higher education, other things equal, there will be less growth in graduate enrollments at Master's granting universities. Said another way, I expect that in states where the institutions are relatively autonomous, there will be more growth in graduate enrollments since institutions tend to prefer

these more than state policymakers do (McGuinness A. C., 2016).

In this analysis, the institutions are divided into three classifications of statewide control, as described by Aims McGuinness (2016) and adapted here to account for relevant features related to institutional autonomy. The two main categories are statewide governing versus coordinating boards. David Tandberg (2013) describes the difference between these two as: "Statewide governing boards have direct responsibility for personnel decisions, institutional operations, and all of the duties of coordinating boards" (Tandberg D. , 2013, p. 508). With the existence of a system governing board, institutions would generally not have their own local governing boards (institution-specific boards of trustees). In the vast majority of cases, institutional appropriations requests go to the state or system higher education board where they are aggregated and submitted to the governor and/or legislature. Under some circumstances, this may have important implications for graduate enrollments. In states where systems leaders have made programmatic decisions to prohibit or restrict graduate enrollments, these same leaders make use of their budgetary powers to allocate resources in ways that limit or prevent the expansion of existing graduate enrollments at public Master's universities.

Separate from the cases of state governing boards, nearly half of states have multiple governing boards for different institutional types such as in California: The University of California System for the state's research universities and the separate California State University System for public Master's level universities, and, the California Community College System. For the purposes of this analysis, both statewide governing boards as well as system governing boards are grouped together in a single "governing board" variable because they have similar characteristics and responsibilities related to limiting institutional autonomy. I hypothesize that graduate enrollments will be negatively correlated with the presence of state

systems governing boards as these types of boards generally have the most control over the authorization and appropriation of funds for new programs—including graduate education. Historically, states with strong governing board structures have exercised the most control over program authorization and have been chiefly concerned with preventing duplication and mission drift, such as at the graduate level (McGuinness A. C., 2016).

Table 5. Authority of State Boards and Agencies of Higher Education, 2015[12]

Type of Board	Coordinating Boards/Agencies with Authority to Coordinate all of Higher Education Multiple Governing Boards for Systems and Public Institutions		System Governing Board for All Public Institutions or Two or more System Governing Boards and Several Institutional Governing Boards
Statewide Planning Authority	Yes		Yes, state-level entity charged with authority for statewide planning/public agenda for all higher education or planning for individual systems or institutions
Budget Role	Consolidated or Aggregated Budget	Limited or Review/ and Recommend	Budget role for governing systems and public HEIs under each board's jurisdiction
Classification	Strong Coordinating Board	Weak Coordinating Board	Governing Board
	AL, AR, CO, IL, IN, KY, LA, MA, MD, MO, NM, OH, OK, SC, TN, WV	MI, NE, OR, TX, VA, WA	AK, AZ, CA, CT, DE, FL, GA, HI, IA, ID, KS, ME, MN, MS, MT, NC, ND, NH, NJ, ND, PA, RI, SD, UT, VT, WI, WY

McGuiness's application of the coordinating board definition states: coordinating board responsibilities include planning, budgeting, authorizing, and/or reviewing of new programs. However, "they generally either have very limited or no role in personnel and institutional operations. Such responsibilities are generally the purview of the institutions' local boards"

[12] Source: Appendix C of McGuinness, A. C. (2016). *State Policy Leadership for the Future: History of state coordination and governance and alternatives for the future.* Washington, D.C.: Education Commission of the States.

(Tandberg D. , 2013, p. 508). Within the coordinating board typology are two distinct categories that affect the budgetary role of the board: consolidated or aggregated budget coordinating board states and states with limited budgetary roles. The type of governance structure and its responsibility for budgetary matters is significant because it often informs whether or not the state approves new degrees and programs including at the graduate level, and how institutions are regulated. I classify states with consolidated or aggregated budget authority as strong coordinating board states. Further, I classify states with limited budgetary authority as weak coordinating board states. I hypothesize that in states with weak coordinating boards, graduate enrollments will be higher as institutions in these states have to most room to maneuver to pursue their own goals.

Control Variables and Additional Considerations

The final variable included in each of the three statistical models is a control variable for the state's unemployment rate. In 2008, Bedard and Herman found that increases in the state unemployment rate increased the likelihood of males enrolling in PhD programs but decreased the likelihood of men enrolling in Master's programs (Bedard & Herman, 2008). Women's graduate enrollments at both the Master's and PhD level were unresponsive to changes in the business cycle (Ibid). Further, Bell and Blanchflower (2011) found that college enrollment (at the undergraduate level) was responsive to changes in the unemployment rates—but these effects were almost exclusively isolated to 18 to 24 year olds (Bell & Blanchflower, 2011). Given these findings, state unemployment rate is included as an indicator of competitive strategy. Though somewhat counter to the effects Bell and Blachflower (2011) found with undergraduate enrollments, I include state unemployment rate for the same year as graduate enrollment and expect an increase in unemployment to have a negative effect on graduate enrollment—consistent with Bedard and Herman's (2008) finding.

Finally, because I hypothesize that business cycles have important and different effects (depending on the severity and length of the recession), I test my hypothesis over three periods using the same variable set described above. The first model examines the years 1992 through 2000. This is the period immediately following the recession of 1990-91 and a time of historic economic expansion in the United States. Second, I test the period 2001 through 2012. In contrast to the first period, this time span includes two recessions including the second worst downturn in modern American history. Finally, I test all years (1992 through 2012) together to evaluate which variables are not (or minimally) impacted by economic conditions. I apply forward stepwise regression across all variables to assess the factors which best explain changes in graduate enrollment for each of the periods identified.

Data

All institutional level data including: tuition revenue, undergraduate enrollment, state appropriations received, research expenditures, undergraduate selectivity, the urbanicity of an institution, as well as the number of four-year colleges or universities in a state come from the Delta Cost Project database which is maintained by the American Institutes for Research (American Institutes for Research, 2014). The Delta Cost Project (DCP) integrated data from multiple IPEDS survey components into a public-use longitudinal dataset. The challenge with this database is the "DCP Database often collapsed data from state systems, which consist of multiple Title IV institutions, into a single observation. For example, the University of Texas-Austin observation contained data from all Title IV Institutions in the UT system (e.g. UT-Dallas, UT-Brownsville)" (Jacquette & Parra, 2015). For the purposes of this research, this means that some institutions that would be classified as public Master's universities are not included as they were miscategorized in the database under the flagship research university

category. Jaquette and Parra (2015) estimate that about 9.8 percent of public Master's universities are excluded from the Delta Cost Project database because of this "parent-child" reporting error. Despite this, there are still 261 public Master's level universities included in this dataset for the years 1992 through 2012.

Current Population survey data was used for the state unemployment rate variable (United State Census Bureau, 2012a). United States Census estimates were used for state level population data and changes for the periods 1990 through 1999, 2000 through 2010, and 2011 through 2012 (United State Census Bureau, 2012a; United States Census Bureau, 1999; United States Census Bureau, 2012). Institutional opportunity was calculated by using current adult aged populations from the data above as a ratio of the number of four-year institutions in the state from the Delta Cost Project database. Governing structure classification was assigned using McGuiness's methodology as shown in *Table 5* (McGuinness A. C., 2016). Baccalaureate educational attainment data by state comes from US census Current Population Survey (United States Census Bureau, 2014).

Research Design and Model

Initial analysis of the data revealed a high level of extreme outliers in the outcome variable of interest, graduate enrollments. Because multiple regression is very sensitive to outliers, I used Mahalanobis distance (Tabachnick & Fidell, 2007) to remove cases outside the critical value.[13] Finally, I checked any remaining outliers against their Cook's distance[14] value

[13] Mahalanobis distance is the distance between a data point and a multivariate space's centroid (overall mean). Use the Mahalanobis distance in principle components analysis is to identify outliers. It is a more powerful multivariate method for detecting outliers than examining one variable at a time because it considers the different scales between variables and the correlations between them (Tabachnick & Fidell, 2007).

[14] Cook's distance is useful for identifying outliers in the X values (observations for predictor variables). It also shows the influence of each observation on the fitted response values. An observation with Cook's distance larger than three times the mean Cook's distance might be an outlier (Tabachnick & Fidell, 2007).

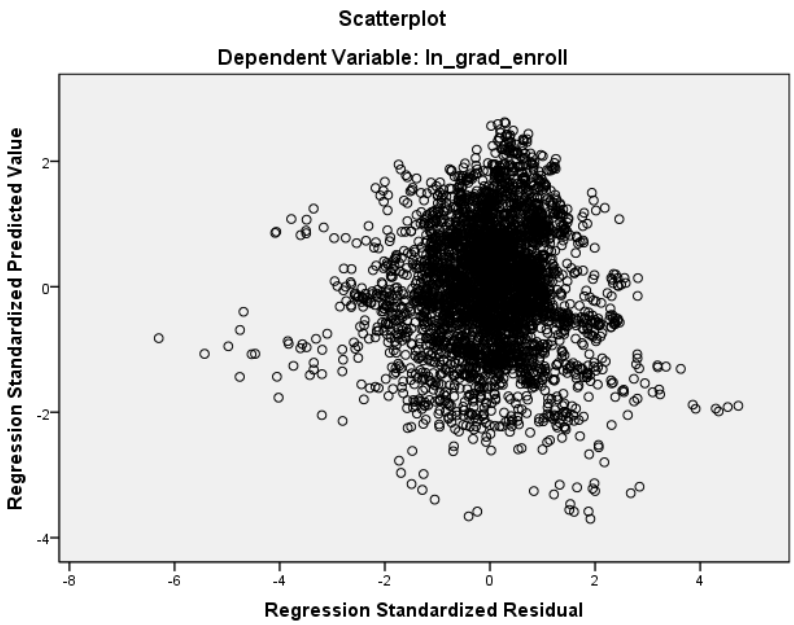
and removed those with values larger than 1 as these cases would be expected to have undue influence on the results of the model (Tabachnick & Fidell, 2007). The initial dataset contained 5900 observations for 261 institutions across 21 years of data. After removing incomplete cases and extreme outliers, the final dataset includes 3,995 cases from 1992-2012 including 48 states[15] and 242 institutions. Unfortunately, many of the California public Master's granting universities are excluded from this analysis because of incomplete reporting on the financial variables of interest.

At the variable level, initial analysis revealed that none of the variables were highly correlated with one another, so all were retained. The undergraduate selectivity variable is only available from 2001 through 2012 as IPEDS did not require reporting of this variable until the 2001 academic year. As a result, this variable is only included in the analysis of that period. Finally, this data set uses time series data from IPEDS. A risk with time series data is autocorrelation—the correlation of a time series with its own past and future values (Kutner, Nachtsheim, & Neter, 2004). To test for autocorrelation in in my data, I ran the Durbin-Watson test for autocorrelation as recommended by Kutner, et al (2004). The Durbin-Watson tests for autocorrelation in the residuals. I included this test on each of the three models (i.e. for time periods 1992-2000, 2001-2012, and all years). The Durbin-Watson test statistic fell into the "inconclusive" range on two of the three models and the null hypothesis that autocorrelation is not present was confirmed in the final model. I then applied the remedial steps recommended by Kutner et al (2004) to confirm or deny the presence of autocorrelation in my data and was able to confirm the null hypothesis that autocorrelation is not present in any of the three models tested. Consistent with this finding, Figure 12 below shows no linear trend in the residuals for the model

[15] Alaska and Hawaii are excluded because the institutions state appropriations data is only reported at the system level and not for individual institutions.

containing all years of data.

Figure 12. Scatter plot of residuals for Model III: All years



Limitations

There are several limitations to the analysis conducted in this chapter. The first is that the production of graduate degrees is a function of both supply of graduate programs (and enrollment space) by institutions and of demand by students. Yet, true student demand is difficult to capture as application and admittance data is not reported for graduate programs. For the purposes of this analysis, I assume that the variation in graduate enrollments is a function of demand—and not supply. To the extent possible, several of my independent variables attempt to capture these different supply and demand effects but it will ultimately be impossible to parse them out entirely.

In designing this study, I choose to use multiple regression without a fixed effects model that accounts for time varying effects across panel data. As discussed above, a limitation of

IPEDS and Delta Cost Project data is a significant amount of missing data—particularly as it relates to the reporting of financial variables. Multiple regression enabled me to omit a single institution-year where multiple variables were missing. Had I taken a panel data approach, the number of institutions observed in these models would have been drastically reduced because of missing years of data for many institutions. In Jaquette's (2011) work, the number of public universities observed using complete panel data was limited to 135 public four-year universities—less than 40 of which were public Master's universities. The use of multiple linear regression means that some time varying effects are unaccounted for in the models that follow. Below, I describe some of the procedures used to attempt to mitigate these effects.

Results

Model I: Years 1992 through 2000

Multiple regression was used to predict graduate enrollments. The period of 1992 through 2000 was selected to capture one of the longest periods of economic expansion in U.S. history. This period begins immediately after the 1990 recession that ended in March 1991 and does not include any economic troughs (National Bureau of Economic Research, 2010). For the years 1992 through 2000, the analysis included variables for: total research revenue, undergraduate enrollment, the percent of the state population with at least a baccalaureate degree, the number of adults per four-year university in the state, year-over-year change in state adult aged population, a dummy variable for urbanicity, and categorical variables for state higher education governance structure.[16] Consistent with the recommendation in Kutner, Nachtsheim, and Neter (2004) for time series data, the Durbin-Watson test is used to evaluate autocorrelation in the model and

[16] Categories are strong coordinating board, weak coordinating board, and governing board. Strong coordinating board is the omitted category.

determined that the null hypothesis is true—no autocorrelation is present.

Using multiple regression, the best fit model was:

$$GradEnroll_{ijk} = \alpha + \beta_0 StateAppropriations_{ijk} + \beta_1 Urbanicity_{ij} + \beta_2 GoverningBoard_{ij} + \beta_3 PopulationChange_{ij} + \beta_4 UndergraduateEnroll_{ijk} + \beta_5 Unemployment_{ij} + \beta_6 ResearchRevenue_{ijk} + e$$

The above regression equation was significant, $R^2 = 0.367$ and the adjusted R^2 is 0.3644 $F(7, 1701) = 140.220$ and $p<0.01$, indicating that the variables representing pursuit of prestige and institutional isomorphism, competitive strategy, resource dependency, and the state governance structure all had a significant impact on graduate enrollments during this period.

For the analysis including years 1992 through 2000, the strongest predictor of the dependent variable, graduate enrollments, is state appropriations[17]. State appropriations explain 33.4 percent of the variation in the dependent variable and are positively correlated with graduate enrollments—contrary to expectations. The next best predictor of variation in graduate enrollments is urbanicity. An institution being located in a rural area explains 1.3 percent of the variation in the dependent variable and such location is negatively correlated with graduate enrollments, as expected. An institution being located in a governing board state is also significantly and negatively correlated with graduate enrollments and explains an additional 0.7 percent of the variation in the dependent variable. This is also consistent with expectations. Year over year changes in the population are significantly and negatively correlated with graduate enrollments and explain 0.6 percent of the variation. Undergraduate enrollments are significantly

[17] The effects of state appropriations and enrollments may be overestimated as a result of omitted variable bias. This large coefficient is also the result of using the stepwise procedure that attributes any shared variance to the variables that enter first. Omitted variable bias occurs when a model incorrectly leaves out one or more important factors that may be correlated with both the independent and dependent variables. In this case, the omitted variable biasing the results is time or variables associated with it.

and contrary to expectations, positively correlated with graduate enrollments and explain 0.2 percent of the variation in this model. In addition, higher state unemployment rates[18] are significantly and positively correlated with graduate enrollments and explain 0.2 percent of the variation in the dependent variable. The positive relationship between graduate enrollments is unexpected but consistent with the literature on undergraduate enrollments and unemployment rates. Finally, an additional 0.2 percent of the variation in the model is explained by research revenues which are significantly and negatively correlated with graduate enrollments. This is contrary to expectations as pursuit of prestige revenues would seem to be consistent with expansion of graduate enrollments.

Model II: Years 2001 through 2012

The period of 2001 through 2012 was selected to capture both the recession of the early 2000's that began in March of 2001 and ended in November of that year as well as the following brief expansion and then the Great Recession that lasted officially from December of 2007 through June of 2009 but was followed by an extended period of stagnation (National Bureau of Economic Research, 2010). For the years 2001 through 2012, the analysis included variables for: total research revenue, undergraduate enrollment, the percent of the state population with at least a baccalaureate degree, the number of adults per four-year university in the state, year-over-year change in state adult aged population, the percent of undergraduate applicants admitted each year at each institution (selectivity), a dummy variable for urbanicity, and categorical variables for state higher education governance structures.[19] Consistent with the recommendation in Kutner, Nachtsheim, and Neter (2004) for time series data, the Durbin-Watson test was used to evaluate autocorrelation in the model and determined that the null hypothesis is true—no autocorrelation

[18] Recall that this was a control variable
[19] See footnote 16.

is present.

Using multiple regression, the best fit model was:

$$GradEnroll_{ijk} = \alpha + \beta_0 UndergradEnroll_{ijk} + \beta_1 StateAppropriations_{ijk} + \beta_2 GoverningBoard_{ij} + \beta_3 PopulationChange_{ij} + \beta_4 Urbanicity_{ij} + \beta_5 InstOpportunity_{ij} + \beta_6 Selectivity_{ijk} + \beta_7 ResearchRevenue_{ijk} + e$$

The above regression equation was significant, $R^2 = 0.490$ and the adjusted R^2 is 0.488 $F(8, 2217) = 265.145$ and $p<0.01$, indicating that the variables representing pursuit of prestige and institutional isomorphism, competitive strategy, resource dependency, and the state governance structure all have a significant impact on graduate enrollments in this period.

The best predictor of graduate enrollments for the 2001 through 2012 time period is undergraduate enrollments[20]—which explains 43.2 percent of the variation. Undergraduate enrollments are significantly and positively correlated with graduate enrollments. State appropriations explain the second most variation in graduate enrollments and account for 2.7 percent of the variation in the model. Consistent with the findings for the earlier period and counter to expectations, state appropriations are significantly and positively correlated with graduate enrollments. Similarly, as predicted, an institution being located in a governing board state is significantly and negatively correlated with graduate enrollments. The presence of a governing board accounts for 1.5 percent of the variation in the model. Consistent with the findings in the years 1992 through 2000 and also counter to expectations, the adult aged population remains significantly and negatively correlated with graduate enrollments. Population change explains 0.4 percent of the variation in this model for the years 2001 through 2012. As for the earlier period, an institution being located in a rural location is significantly and

[20] See footnote 17. Here undergraduate enrollment is almost certainly absorbing some of the explained variance that it shares with other independent variables.

negatively correlated with graduate enrollments, as expected. The urbanicity of an institution explains 0.4 percent of the variation in this model. Unlike in 1992 through 2000, greater numbers of adults per four-year institution in the state are a significant predictor of graduate enrollments but counter to expectations this measure of institutional opportunity runs counter to expectations and is significantly and negatively correlated with graduate enrollments. Institutional opportunity accounts for 0.3 percent of the variation in the years 2001 through 2012. The years 2001 through 2012 are the only years to include undergraduate selectivity as a predictor and, consistent with expectations, it is significantly and negatively correlated with graduate enrollments (i.e. a higher share of undergraduate applicants admitted is associated with higher graduate enrollments). Higher percentages of undergraduate applicants admitted explain 0.2 percent of the variation in this model. The final significant predictor of graduate enrollments for the years 2001 through 2012 is research revenues. Consistent with expectations, research revenues are significantly and positively correlated with graduate enrollments and explain the remaining 0.2 percent of the variation in the model.

Model III: All Years

Finally, multiple regression was also used to predict graduate enrollments across all years in the data set—1992 through 2012. This period captures three recessions and their subsequent recoveries as well as enormously volatile state appropriations at public Master's universities. For all years the analysis included variables for: total research revenue, undergraduate enrollment, the percent of the state population with at least a baccalaureate degree, the number of adults per four-year university in the state, year-over-year change in state adult aged population, a dummy variable for urbanicity, and categorical variables for state higher education governance

structures.[21] The model for all years omits the variable of undergraduate selectivity because it is only available for the years 2001 through 2012. Consistent with the recommendation in Kutner, Nachtsheim, and Neter (2004) for time series data, the Durbin-Watson test is used to evaluate autocorrelation in the model and it is determined that the null hypothesis is true—no autocorrelation is present.

Using multiple regression, the best fit model was:

$$GradEnroll_{ijk} = \alpha + \beta_0 StateAppropriations_{ijk} + \beta_1 UndergradEnroll_{ijk} + \beta_2 GoverningBoard_{ij} + \beta_3 Urbanicity_{ijk} + \beta_4 PopulationChange_{ij} + \beta_5 BADegrees_{ij} + \beta_6 InstOpportunity_{ij} + \beta_7 Unemployment_{ij} + e$$

The above regression equation was significant, $R^2 = 0.422$ and the adjusted R^2 is 0.421 $F(8, 3919) = 150.365$ and $p<0.01$, indicating that variables representing pursuit of prestige and institutional isomorphism, competitive strategy, resource dependency, and the state governance structure all have a significant impact on graduate enrollments. For all years, slightly less of the variation is explained by the variables than was explained in the 2001 through 2012, but the model is a better fit than the one for just the years 1992 through 2000.

As for the years 1992 through 2000, the best predictor of graduate enrollments is state appropriations[22] and it explains 35.9 percent of the variation in the model. Once again, counter to the hypothesis, state appropriations are significantly and positively correlated with graduate enrollments. Likewise, the second best predictor of graduate enrollments is undergraduate enrollments—which is also counter to expectations. Undergraduate enrollments account for 4.0 percent of the variation in the model. Consistent across all models and as expected, an institution being located in a governing board state is the third best predictor and is significantly and

[21] See footnote 16.
[22] See footnote 17.

negatively correlated with graduate enrollments. The presence of a governing board accounts for 1.0 percent of the variation in the dependent variable. Similarly, and consistent with my hypothesis, an institution being located in a rural area is significantly and negatively correlated with graduate enrollments across all years of data. Urbanicity explains 0.4 percent of the variation in the model. Like the two time periods of 1992 through 2000 and 2001 through 2012, and counter to expectation, changes in the adult aged population remain significantly and negatively correlated with graduate enrollments. Change in population accounts for an additional 0.4 percent of the variation in graduate enrollments. The model covering all years of data is the only one where baccalaureate degree attainment is significant. Consistent with expectations, baccalaureate degree attainment is significantly and positively correlated with graduate enrollments but explains only 0.1 percent of the variation in the model. Institutional opportunity—the ratio of the number of adults per four-year institution in the state, is counter to expectations and significantly and negatively correlated with graduate enrollments. Institutional opportunity was also significant in the years 2001 through 2012 and explains only 0.1 percent of the variation in the model containing all years. Finally, the control for state unemployment rate is significantly and positively correlated with graduate enrollments. The unemployment rate was significant in the model containing the years 1992 through 2001 and was not significant in the later period. The state's unemployment rate explains 0.2 percent of the variation in the model for all years.

Table 6. Logged graduate enrollments, by analysis period

Hypothesis	*Variables*	*Model I: Years 1992 through 2000*	*Model II: Years 2001 through 2012*	*Model III: All Years*
		b/(se)	b/(se)	b/(se)
I: Pursuit of prestige and isomorphism	ResearchRevenue	-0.28*** (0.12)	0.023*** (0.008)	0.015 (1.086)
	Selectivity	--	-0.238***	--

			(0.078)	
II: Resource dependency theory	UndergradEnroll	0.105*** (0.048)	0.603*** (0.034)	0.384*** (0.029)
	StateAppropriations	0.816*** (0.050)	0.341*** (0.035)	0.548*** (0.028)
III: Competitive strategy	BADegree	0.031 (1.470)	0.012 (0.679)	0.008*** (0.002)
	PopulationChange	-9.931*** (3.068)	-6.967*** (2.292)	-7.797*** (1.830)
	Urbanicity	-0.196*** (0.038)	-0.111*** (0.026)	-0.136*** (0.023)
	InstOpportunity	-0.008 (-0.354)	-3.43E-6*** (0.000)	-2.46E-6*** (0.000)
IV: State governance structures	WeakCoordinating	-0.017 (-0.743)	-0.25 (-1.311)	-0.028 (-1.879)
	StrongCoordinating	--	--	--
	GoverningBoard	-0.202 (0.039)***	-0.228 (0.026)***	-0.229 (0.023)***
Control	Unemployment	0.030*** (0.013)	-0.011 (-0728)	0.018*** (0.005)

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

Discussion of Findings

Pursuit of Prestige and Institutional Isomorphism

Prior research has suggested that public Master's universities are in pursuit of the research university model. Consistent with this theory, I expected growth in graduate enrollments to be correlated with increases in undergraduate selectivity (for the period available, 2001 through 2012), and increases in federal grant and contract research revenue. Yet, for all years, when only research revenue (among these two) could be included in the model, it was not a significant predictor. However, for the two subperiods 1992 through 2000 and 2001 through 2012, research expenditures was significant and positively correlated with graduate enrollments as expected—but was the weakest predictor in the models—explaining less than 0.2 percent of the variation in graduate enrollments. In 2001 through 2012, the model also included the addition of undergraduate selectivity—but, like research expenditures, this explained a mere 0.2 percent

of the variation in graduate enrollments and loaded into the model just above the research expenditure variable. While the prestige variables were significant and positive predictors of graduate enrollments, they explained the lowest proportion of variation in each of the models.

Notably, selectivity was also a significant predictor of graduate enrollments and in the direction that was expected. Jaquette (2011) found that increases in undergraduate selectivity among both selective non-research universities and liberal arts colleges were negatively correlated with master's enrollments. He also found that this measure of prestige was significantly correlated with graduate enrollments at research universities. One plausible explanation that he posits for the negative relationship he observed between undergraduate selectivity and graduate enrollments at non-selective and liberal arts colleges may be that, "[some universities] choose to limit the growth of master's degrees because they value a brand identity as selective undergraduate institutions with modest graduate enrollments" (Jaquette, 2011, p. 175). The low explanatory power of this variable may mean that undergraduate selectivity is either a weak predictor or some public Master's universities are instead choosing to carve themselves a niche as selective undergraduate institutions as opposed to pursuit of the research university model. This is prestige seeking behavior that tends to look more like private liberal arts colleges than the traditional research university. While significant, particularly in the period 2001 through 2012, the prestige variables examined here explain very little of the variation in graduate enrollments.

Pursuit of prestige theory suggests that institutions invest all or much of their available resources in activities that serve to maximize prestige (Brewer, Gates, & Goldman, 2002; Bowen H. R., 1980). Consistent with this theory, perhaps, this analysis finds some evidence that public Master's universities may be investing revenues generated through undergraduate enrollment

growth, state appropriations, and research dollars in graduate education. Not included as part of this research is the extent to which public Master's universities are choosing to allocate these resources towards traditional prestige generating activities such as Ph.D. programs or research based master's degrees.

Resource Dependency

In contrast to the weak predictive power of the prestige variables, the resource dependency variables accounted for nearly all of the variation in graduate enrollments in each of the three models—yet, in opposite directions than I hypothesized. For the early period, 1992 through 2000, the best predictor of graduate enrollments was state appropriations—which were significant and positively correlated with graduate enrollments. In this first model, state appropriations accounted for 33.5 percent of the variation in graduate enrollments, although this is likely overstated due to the stepwise regression procedure. For the years 2001 through 2012 and in the final model containing all years, undergraduate enrollment was the strongest predictor of graduate enrollments, but state appropriations remained significant. In years 2001 through 2012, undergraduate enrollment explained 43.2 percent of the variation in the dependent variable. For the model spanning all years, undergraduate enrollment explained almost 36 percent of the variation in graduate enrollments. Even in the early period of 1992 through 2000, undergraduate enrollments were the second best predictor of graduate enrollments and explained 1.6 percent of the variation in graduate enrollments.

Yet, as discussed above, a significant limitation of these findings is the likelihood of an omitted variable related to time. Given that state appropriations, enrollments, and the dependent variable—graduate enrollments—vary with time, it is possible that these findings are biased by the model not accounting explicitly for year effects that proxy for omitted variables. As a result, the importance of both state appropriations and undergraduate enrollments may be overstated in

the model.

While the importance of state appropriations and undergraduate enrollment may be overstated—their significance to graduate enrollments is not unexpected. Resource dependency theory suggests that institutions increase graduate enrollments to counter declines in more traditional sources of revenue such as state appropriations and tuition. Counter to this theory, I find that state appropriations and undergraduate enrollments and both positively correlated with graduate enrollments. These findings are counter to Jaquette's finding—and inconsistent with resource dependency theory—that non-prestigious institutions increase graduate degree production when revenues are weak (Jaquette, 2011). Yet, what these findings seem to suggest is that these institutions depend on revenue growth from traditional sources in order to be able to grow graduate revenue. It's likely that public Master's universities dependence on traditional revenue sources necessitates growth in these same revenue sources in order to grow graduate enrollments. This makes sense in light of prior literature that suggests that demand for public Master's universities at the undergraduate level is likely more elastic than that of their research university peers (Sanford, 2011).

As discussed previously, a significant limitation of this study is the inability to examine demand indicators for graduate programs at public Master's universities beyond just raw enrollment numbers. Yet, one can assume that some of the same patterns for demand (and selectivity) as exist at the undergraduate level are relevant at the graduate level for these institutions. As a result of lower demand, graduate degree programs at less prestigious public Master's universities may need to charge lower tuition in order to attract graduate enrollments. Low tuition rates coupled with lower demand than that seen by traditional research universities may mean that many graduate programs at public Master's universities are not net revenue

generating—and may not even be revenue neutral—perhaps, they may have other motivations. The pursuit of prestige is one possible explanation for the positive relationship between undergraduate enrollments and state appropriations. Public Master's universities may depend on traditional revenue streams of state appropriations and undergraduate tuition to subsidize growth in graduate programs—and pursuit of the research university model. These variables seem to suggest that when public Master's universities have additional resources, they do invest them to some extent in graduate enrollments. As discussed above, the extent to which all Master's programs are a function of prestige as opposed to some other function such as local labor market demands remain an unanswered question.

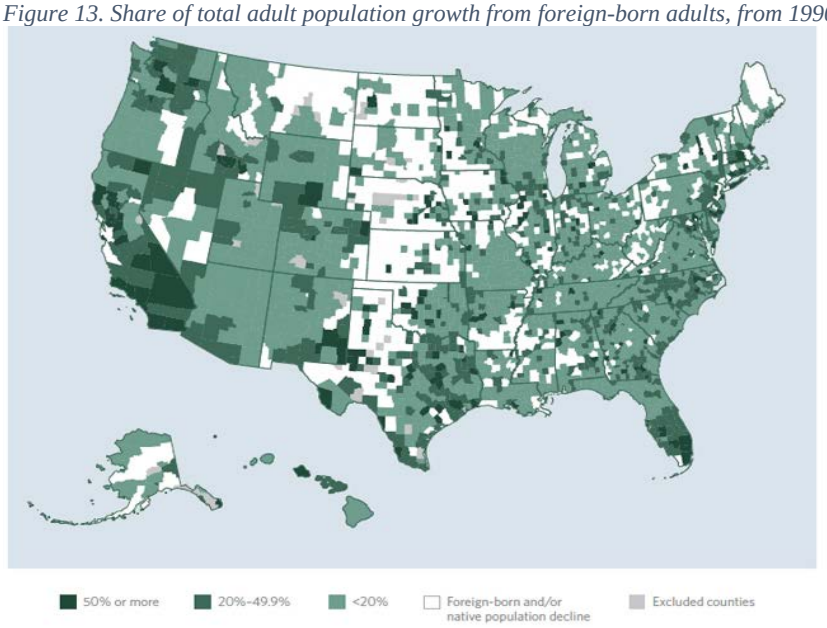
Competitive Strategy

Unlike those variables for resource dependency, the competitive strategy variables of bachelor's degree attainment, urbanicity, institutional opportunity, and population change explain little of the variation in graduate enrollments among public Master's universities. Yet, there are some important findings in this regard that are consistent across each of the three models. First, in the years 1992 through 2000, 2001 through 2012, and in the model including all years, an institution being located in a rural location was significantly and negatively correlated with graduate enrollments. This finding on the disadvantage of rural location of a public Master's university is consistent with Jaquette's (2011) finding on the relationship between an institutional location and Master's degrees. Notably, Jaquette found a significant and negative relationship between a rural location and Master's enrollments at public and liberal arts universities but also found that location was insignificant for both research I universities as well as private, low-selectivity universities (Jaquette, 2011). My finding, coupled with Jaquette's finding, suggests that the more prestigious research I universities can overcome their rural location when it comes to graduate enrollments but public Master's universities cannot. Turning

this finding around, there appears to be several advantages to a public Master's institution being located in an urban area. This may be a function of the different types of graduate programs offered at public Master's universities (professionally oriented) and the greater needs of urban populations to increase their skills to fit local labor market needs.

Also related to competitive strategy, in each of the three time periods, the change in the state adult aged population was significantly related to variation in graduate enrollments. Yet, unexpectedly, this population growth has a small negative relationship with graduate enrollments. One plausible explanation for this finding is that the changes in the adult aged population during the time period analyzed can be accounted for in large-part by foreign born immigrants who traditionally access postsecondary education at lower rates.

Figure 13. Share of total adult population growth from foreign-born adults, from 1990 through 2012[23],[24]



[23] Source: Pew Charitable Trusts. (2014). Changing Patterns in U.S. Immigration and Population: Immigrants slow populations decline in many counties. Washington, DC: Pew Charitable Trusts. Retrieved from http://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2014/12/changing-patterns-in-us-immigration-and-population

[24] Share of county population growth attributed to an increase in the foreign born is calculated by PEW by dividing the population's growth from 1990 to 2008-2012 by total population growth from 19990 to 2008-2012. Excluded counties are those with fewer than 1,000 residents in 1990 or for which no data were available.

As Figure 13 shows, the states with the largest population growth overall also saw the greatest increases in immigrant adults. Further, in states and counties where there was a net migration of native-born adults—much of this effect was moderated by an influx of foreign-born adults.

Relevant to competitive strategy is the number of rivals in a state. I hypothesized that in states with less competition (higher ratio of adults to the number of four-year colleges and universities in the state), graduate enrollments at public Master's universities would be higher. What this study revealed was that in the years 2001 through 2012 and the model containing all years, higher ratios of adults to four-year universities were significantly and negatively correlated with graduate enrollments, which is surprising.[25]

Also, I hypothesized that the state unemployment rate would be significantly and negatively correlated with graduate enrollments. In 2008, Bedard and Herman found that master's enrollments at all university types responded negatively to increases in the state unemployment rate. Counter to Bedard and Herman's (2008) finding but consistent with broader theory on undergraduate enrollments, I found that in the 2001 through 2012 period as well as the model containing all years, an increase in the unemployment rate was significantly and positively correlated with graduate enrollments. The 2001 through 2012 time span was chosen to capture two significant recessions and their impacts on graduate enrollments at public Master's universities. In part, I speculate that this finding can be explained by the depth of the Great Recession which led to a large number of people looking to upgrade their skills during this period in order to be more competitive in the workforce. Perhaps what differentiates this study's findings from those of Bedard and Herman (2008) is the inclusion of the Great Recession period.

[25] The measure of institutional opportunity is crudely measures as a ratio of the number of adults in the state to the number of baccalaureate institutions. A better measure may include competition across state lines.

In periods of growth or during less severe recessions, perhaps the effect on demand for graduate programs—and consequently enrollments—is less than during deeper recessionary periods. This finding of the effect of the great recession on graduate enrollments is consistent with Bridget Terry Long's (2014) finding on the effects of the financial crisis on undergraduate enrollment (Long, 2014). As Long (2014) describes, the Great Recession was distinctive from earlier recessions in the ways in which it impacted higher education. Specifically, college costs and student debt levels were all at record highs while public university finance were more strained than they had ever been. Yet, Long (2014) found that the net effect of the recession was largely positive in terms of college enrollment levels and that the growth in enrollment levels was concentrated in the states that were hardest hit by the recession (Long, 2014, p. 229). I speculate that these same enrollment effects found by Long for undergraduate enrollments also carried over into graduate enrollments.

State Governance Structures

Consistent with my hypothesis, I found that public Master's universities located in states with centralized governing boards were significantly more likely to have lower overall graduate enrollments. This finding was significant across each of the three time periods examined. The effect of state governing boards on graduate enrollments is consistent with their general purpose of preventing mission drift and duplication with the institutions' research university counterparts (McGuinness A. C., 2016). This is consistent with the idea that if institutions are given sufficient autonomy they may choose to pursue prestige via graduate enrollment growth. In states where there are system level controls on mission and programmatic decisions, there is evidence that the state governing board inhibits an institutions ability to pursue graduate enrollments. Further, Tandberg (2010) found that states with governing boards have lower than average spending on higher education (Tandberg D. A., 2010). This, taken together with the importance of state

appropriations in apparently supporting graduate enrollments, may imply that it's not just institutional autonomy and the ability of public Master's universities to pursue graduate enrollments but also access to more robust funding. Tandberg (2010) theorized that the insular nature of governing boards as boundary spanning organizations may mean that individual institutional needs are not communicated to state policymakers and condition the effect of political actors on state support of higher education (Tandberg D. A., 2010).

Discussion

Taken together, the above findings make several important contributions to understanding the growth in graduate enrollments among public Master's universities. First, and perhaps most significantly, there is some evidence that growth in graduate enrollments is at least in part explained by these institutions' pursuit of prestige. Further, it appears that when new resources are available from traditional revenue streams, public Master's universities demonstrate a willingness to invest in graduate enrollments. This quantitative analysis is followed in the next chapter by two qualitative case studies that seek to better understand how institutional leaders view the role of graduate education in the pursuit of prestige and the extent to which it is a motivating factor for growth in graduate enrollments.

Secondly, there is almost no statistical evidence that public Master's universities represent a robust alternative revenue strategy to support my hypothesis related to resource dependency theory. Said another way, these findings do not support the hypothesis that public Master's universities are replacing declines in traditional revenue sources with net revenue from graduate programs. In the qualitative case studies that follow, I endeavor to better understand the extent and the mechanisms by which public Master's universities depend on traditional revenue sources in order to support graduate programs—or, alternatively, if graduate enrollments provide a viable alternative revenue source, consistent with resource dependency theory but not broadly

supported here.

Third, there is some evidence of competitive strategy being at work but not necessarily in the ways predicted. One avenue of competitive strategy is cost leadership—where organizations compete by offering a lower priced product (Porter, 1980). In the case studies that follow, I examine the extent to which tuition pricing of graduate education at public Master's universities is used as a competitive strategy and the extent to which competition from other institutions is viewed as important.

Finally, state economic conditions, an institutions' location, and the amount of autonomy a public Master's university has within the state governance structure all impact graduate enrollments at these institutions. As I hypothesized in choosing to use three separate models to capture different time periods, the recession of the early 2000's coupled with the Great Recession seems to have [26] had a measurable impact on graduate enrollments at public Master's universities. While population change was significant here, but very small and in an unexpected direction, I examine more closely the role of population change in graduate enrollment growth at the two case study universities that follow. The qualitative work that comes next provides an opportunity to examine in-depth some of the unanswered questions from the quantitative study.

In the remaining chapters, I study the motivations for rapid growth in graduate enrollments at two public Master's universities in different states with different state governing structures and policies. Through these case studies, I test the extent to which my statistical findings about pursuit of prestige, resource dependency, and competitive strategy are accurate representations of the institutional motivations behind patterns in graduate enrollments. Further, I probe leaders at these institutions for a better understanding of how each of these ways of

[26] From 2001 through 2012, the volatility in state revenue streams due to two recessions and their subsequent recoveries, likely impacted the ability of institutions to both plan for a and grow graduate programs.

thinking impact how they think about graduate enrollment growth at their particular universities. Finally, I examine the extent to which institutional autonomy and the states governance structure and policies limit or enable institutional leaders to grow graduate enrollments at their universities.

Chapter 5 Growth in Graduate Programs have been Shaped by Regional Demands

The quantitative portion of this study revealed that the best predictors of graduate enrollments at public Master's universities in the years 1992 through 2012 are growth in undergraduate enrollments and increased state appropriations support. Also positively correlated with graduate enrollments was an institution's location in an urbanized setting. Yet, the theoretical literature strongly suggests that institutions of this type that are increasing graduate enrollments are likely making a more strategic decision to pursue the more prestigious research university model (Aldersley, 1995; Brewer, Gates, & Goldman, 2002; Cyrenne & Grant, 2009; Henderson & Kane, 1991; Jaquette, 2011). With no good systemic quantitative measures of prestige of master's-level institutions available, I turn to the qualitative component of this study to better understand the extent to which the pursuit of prestige is a driver or motivator for growth in graduate education at public Master's universities and how it relates to other factors at work. In particular, I examine the extent to which local and regional population and economic conditions affect the delivery of and enrollment in graduate programs. Finally, building on a key finding from my quantitative work, I seek to unravel more precisely the relationship between undergraduate enrollments and graduate enrollments. The following pages describe in detail the qualitative research design used, the case study universities examined, and the key findings from each of the institutions studied.

Research Design

The purpose of the qualitative portion of this study is to examine the role of graduate education in selected public comprehensive universities and to make sense of the motivations behind the growth in graduate enrollments at these institutions. Through a two case study

approach, I examine how different factors, including pursuit of prestige, changing state support, regional economic conditions, local population and workforce needs, and higher education governance structures, impact the growth in graduate enrollments at these traditionally undergraduate-focused institutions. Qualitative case studies are applicable to this need for rich data because they enable the researcher to search for meaning and understanding through an inductive investigative strategy (Merriam, 2009, p. 39).

For this study I chose to use a multisite case study approach to provide the opportunity for cross-case comparisons. In particular, this study draws comparisons of institutions across states to create a richer understanding of how prestige, market, policy, and structural contexts may influence the roles and strategies of two distinct differently situated public Master's universities.

Settings and Participants

This study uses a purposeful sample, which means that, in order to "…discover, understand, and gain insight," the investigator "must select from a sample from which the most can be learned" (Merriam, 2009, p. 77). Case study institutions are selected here to represent different states, policy contexts, and different state governance structures. Each of the case study institutions selected was in the top five percent of public Master's institutions for growth in graduate enrollments for the period from 1992 through 2012. From the outset of this dissertation research, I was interested in understanding the extent to which pursuit of prestige was the primary motivator for public Master's universities in growing their graduate programs. The institutions most likely to be in pursuit of the research university model seemed likely to be those with the largest growth in their graduate enrollments. Of these institutions, I was primarily interested in what motivated them to pursue the aggressive growth in their graduate enrollments

shown in the data and in how they did it. To what extent did the local context (employment markets, population growth) matter and how were their ambitions impacted or supported by the structure of the state governance structure and the financial resources available to them?

For the purposes of qualitative data collection, I honed in on the last five years (2010 through 2015) for multiple reasons. First, this time period was chosen because the data set used for the quantitative portion of this research only extended through 2012—capturing the end of the Great Recession and the beginning of the subsequent recovery. More recent data (2012 through 2015) shows the pattern of aggressive growth in graduate enrollments at public Master's institutions tapering off—including at one of the case study locations. Through interviews and study of pertinent documents, I sought to better understand both the robust growth and the more recent flattening of graduate enrollments at these institutions and the extent to which that was related to changes in the regional economies and state support as compared to a shift in strategy. Finally, it was likely that the leadership at my case study institutions and the subjects I was interviewing were going to be more likely to speak knowledgably about decisions made in more recent years as opposed to strategic decisions made about graduate education many years before.

Each interviewee at the case study sites was selected for their knowledge and participation in graduate education, their professional position as it relates to graduate education, and their formal leadership role in the state, institution, or system. All of the participants are public figures, and were identified through publicly available rosters or directories of their places of employment. In addition, I also used a network approach to identify potential interviewees. I provided each interviewee the option to recommend other people that I should consider for an interview and invited those people to participate. Each participant was interviewed once and people in corresponding roles were selected in each state. All but two interviews were conducted

in person with the remaining ones conducted by telephone.

Overall, 31 people were interviewed across the two study sites. Interviewees' roles included university presidents, academic deans, leaders of graduate programs, financial officers and other administrative roles directly and indirectly related to the delivery of graduate education. There were 19 interviews conducted at California State University—Northridge (CSUN) and 12 interviews conducted at Boise State University (BSU) in Idaho. Part of the reason for the difference in number of interviews at each site was the significant difference in the institutions' organizational structure. Boise State University has many fewer colleges and top-level administrative positions. In many cases, corresponding roles to those at CSUN did not exist at BSU.

Data Sources and Collection

This study involved semi-structured interviews and document analysis.

Interviews. Interviews were conducted during three months in 2015 while documents were collected documenting the last five years of strategies relevant to graduate education of the case study institutions. When possible and pertinent, older documents were collected and integrated into the analysis. All interviews were guided by a semi-structured interview protocol[27] and asked questions about the participant's role within the university, the challenges and opportunities for the institution as they relate to graduate education, the perceptions of the role of the university within the state and region and as it relates to graduate education, and any departmental or institutional strategy around graduate education. The interview protocols included questions that solicited reflection, probed for more information, and challenged current

[27] See Appendix C for a listing of interview questions.

assumptions or views. Most interviews lasted approximately one hour.

Document Analysis. Documents, speeches, and video recordings provided additional data for this study. In addition to the interviews I analyzed text of speeches, newspaper articles, press releases, strategic planning documents, and various other sources about the university being studied and its leaders. Most of the documents were found on the universities' websites while some were gathered at the university from interviewees, or from local news organizations. When possible, I collected additional qualitative and quantitative data from the prior two decades to assist in sense making of the results from the quantitative portion of this study.

Guba and Lincoln suggest that, "The first and most important injunction to anyone looking for official records is to presume that if an event happened, some record of it exists" (Merriam, 2009, p. 140). In this study, nearly all of the subjects who were interviewed are public figures and act within the public domain; thus, the majority of my documents are of public record. Across all documents I analyzed for authenticity and accuracy of the document as well as its origins, reasons for its being written, and any evidence of bias (Merriam, 2009).

Data Analysis

I used both open and analytic coding to capture themes across my data. For the initial stage of analysis I used "open coding" to identify emerging themes. Merriam describes this process as category construction—where the researcher is being open to anything possible and identifying segments of data that may be useful (Merriam, 2009, p. 178). Using the categories discovered during this initial process I then began using "analytic coding" to capture major themes across all interviews and documents. "Analytical coding goes beyond descriptive [open] coding…it is dependent on interpretation and reflection on meaning" (Merriam, 2009, p. 180). The analytic codes I identified emerged from my open codes as well as the conceptual

framework for my study.

The final step in this analysis was to link the codes and categories identified in my data to the larger themes identified in my conceptual framework. By linking the codes and themes in my data to my conceptual framework I was able to make larger, more thematic meaning of the data (Merriam, 2009, pp. 192-193).

Data Quality and Limitations. Throughout this study data analysis occurred simultaneously with data collection. In order to build trustworthiness I used several strategies to strengthen validity, reliability, and objectivity (Lincoln & Guba, 1985) including:

- Triangulation–use of multiple data sources
- Member checks—soliciting of feedback on findings from participants to check for accuracy of understanding
- Audit trail—recording a detailed trail of materials about how and where information was collected
- Peer review—discussions with scholarly colleagues about tentative findings

While I cannot definitively know whether or not interviewees gave me accurate information, the use of triangulation across interviews, observations, and multiple documents allows me to support or challenge their claims and ground them in context. Finally, I sent some of my high level observations to interviewees and solicited their feedback on the accuracy of the claims I have made. One case study institution provided the opportunity for me to return after I had completed my interviews and present my findings. Here, I was able to solicit feedback on some of my conclusions and probe for deeper understanding in other areas.

Not surprisingly, this study presented the potential for more collection of data and

sources than would be possible for a single researcher to interview and analyze. The choice of a purposeful sampling strategy is intentional to capture the main themes via key interviewees to help me understand the relevant context and answer adequately the primary questions in this study. Likewise, I did not reach saturation by exhausting all sources of data at my sites. One of the trade-offs for multisite case studies is that data is often less rich than in a single case study (Merriam, 2009). It was the intent of this study to conduct research at two sites in order to better understand how different contexts and governance structures and policies inform and restrict or broaden the strategies that public Master's university leaders can realistically pursue in defining the role of graduate education. The two universities studied had some of the most significant growth in graduate enrollments and programs of any such institutions in the country. Yet, they existed within quite different states and governance structures with very different motives for growth in graduate education.

Finally, while I conducted a multi-site case study, it is impossible to draw generalizations beyond the institutions I studied. While I can make claims about broad themes and draw comparisons across states that seem to have broader relevance, I am limited in what I can say about other institutions within the same states or higher education generally because all institutions operate in unique and complex sets of circumstances.

Case study institution profiles

In contrast to the rich history of state normal schools described in chapter two, neither of the institutions selected as case studies for this work began that way. For both Boise State University (Idaho) and California State University, Northridge, their histories began well into the twentieth century. Boise State University opened its doors in 1932 as Boise Junior College and did not begin awarding baccalaureate degrees until 1965 when it was renamed Boise College. It

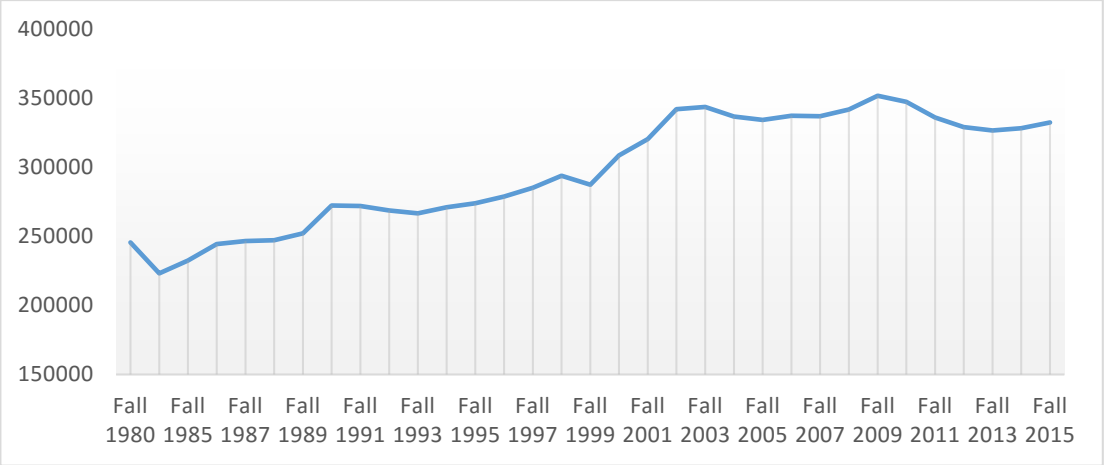
wasn't until 1974 that Boise College became Boise State University and conferred its first master's degrees. Since then, they have expanded to offering graduate degrees in nearly 100 different fields and several doctoral degrees.

CSUN began as a satellite campus expansion of Los Angeles State College in 1955 with the San Fernando Valley being selected by the state Assembly (lower house of the state legislature) as the new site for the next higher education institution (California State University, Northridge, n.d.). By 1958 the Valley campus separated from Los Angeles State College and was renamed San Fernando Valley State College. At first, its highest offering was the bachelor's degree. In 1964, the California State College system was authorized to offer several professional master's degrees and, by 1972, the system was designated with official university status. The first Master's degrees were offered within the CSU system prior to CSUN's establishment. Starting in 1946, graduate instruction was offered in the form of a fifth year of study leading to the secondary teaching credential. By 1949, Master's degrees in teaching were offered at CSU along with the teaching credential. By the time CSUN opened its doors, the CSU schools were authorized to offer M.S. degrees in vocational fields. In 1964 two-year professional master's degrees (e.g., M.S.W.) were first offered by several of the colleges including CSUN.

In terms of the pace of their graduate enrollment growth, these universities appear to be more outliers than exemplars of the broader trends among regional comprehensives. Both BSU and CSUN have been in the top five percent nationally among regional comprehensives for growth in graduate enrollments in the last two decades. As Figure 14 shows below, graduate enrollments grew by just over 35 percent between 1980 and 2015. In contrast, graduate enrollments at BSU grew by over 200 percent during this same time period.

I selected institutions that exceeded the national trends for graduate enrollment growth to examine the theory that pursuit of prestige is still a viable strategy for public universities. If any university is pursuing prestige, it is likely to be one of these outliers on graduate enrollment growth? As I will explore further below, there are likely many factors that impact graduate enrollment growth beyond the pursuit of prestige—not the least among them is that both of these institutions are also situated in rapidly growing metropolitan areas where demand for a graduate prepared workforce continues to grow.

Figure 14. Graduate FTE Enrollments at Public Master's Universities, 1980 to 2015



California State University, Northridge (CSUN)

California State University, Northridge (CSUN) was selected as a case study because it has remained among the top five public Master's level institutions nationally for growth in graduate enrollments in each of the last two decades. Not surprisingly, and as my quantitative model would suggest might be true, CSUN has also been among the fastest growing in undergraduate enrollments as well. CSUN operates in one of the largest and fastest growing metropolitan areas of the United States. The San Fernando Valley, in greater Los Angeles County, is home to 1.8 million people. As of 2014, roughly 41 percent of the San Fernando Valley's population is white and another 41 percent is Hispanic. The remaining nearly one-fifth

of the population is African American or Asian American (U.S. Census Bureau, 2014). With one of the most diverse and fastest growing populations in the country—it is also home to five other CSU institutions, two high profile research universities, multiple private colleges and universities, numerous public community colleges, and several for-profit options. Yet, both bachelor's and graduate degree attainment remains below the national average so there seems to be plenty of room to keep growing enrollments (U.S. Census Bureau, 2014).

At present, CSUN enrolls the third largest number of graduate students (almost all at the master's level) in California, behind only UC Berkeley (where many are doctoral students) and CSU San Diego.[28] CSUN currently offers 80 different Master's degree programs as well as two doctorates, in Educational Leadership (Ed.D) and Physical Therapy (D.P.T.).

Figure 15. CSUN Enrollments, Selected years, 1993 to 2015

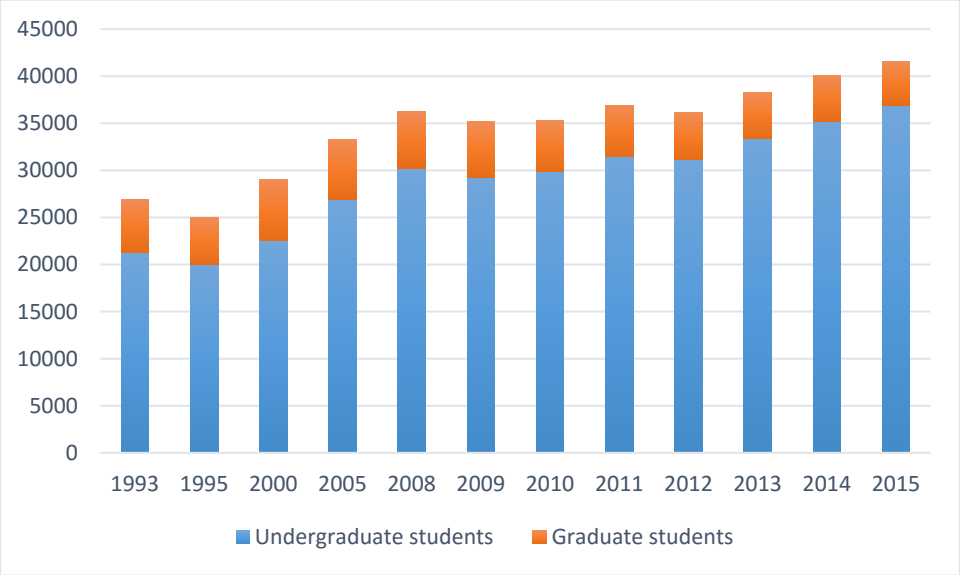


Figure 15 shows the explosive growth in undergraduate enrollments that may mask the growth also happening at the graduate level, at least until recently. Table 7 below shows more precisely that growth in graduate enrollments, especially master's enrollments, was strong until the mid-

[28] The California Master Plan, established in 1960, declared that "CSU's primary mission is undergraduate education and graduate education through the master's degree including professional and teacher education" (University of California Office of the President, 2007). As a result, the primary responsibility for doctoral degrees was placed with the University of California system—the state's primary academic research institution.

2000's before falling off. There was as well a change in the distribution of graduate enrollments—including the addition of doctoral programs in 2010. Not shown here, between 2007 and 2012, the number of Master's degrees conferred soared from 1,431 in 2007 to 2,400 (California State University, Northridge, 2013). From there, 2012 ended up being the high point for both graduate enrollments and graduate degrees conferred for CSUN.

Table 7. Graduate Student Headcount by Level

	1993	1995	2000	2005	2012	2013	2014	2015	2016
Postbaccalureate	648	470	1132	675	507	569	613	437	403
Master's	3,145	2,605	2,980	4,323	3,897	3,667	3,612	3,406	3,175
Credential	1,771	1,913	2,401	1,391	548	553	553	640	652
Doctorate	0	0	0	0	93	123	148	148	134

The bread and butter of CSUN's graduate offerings remain in education. As Table 8 below shows, the largest share of CSUN's Master's degrees are conferred in education—consistent with their mission and the graduate teaching credential requirement in California.

Table 8. Distribution of graduate degrees conferred by college, 2012

Education	36%
Health and Human Development	17%
Engineering and Computer Science	13%
Social and Behavioral Sciences	11%
Science and Mathematics	7%
Humanities	5%
Arts, Media, & Communication	5%
Business Administration & Economics	3%
Other	3%

In the period immediately prior to the Great Recession, CSUN, like much of higher education across the country experienced robust growth at both the undergraduate and graduate levels. Yet, this growth appears to have peaked in 2012 as CSUN was obviously hampered by strict system rules governing graduate program revenues, and the considerable costs of administration of graduate programs. Below, I examine how the CSUN story of graduate

education can be understood through each of the theoretical frameworks presented in Chapter 3. To what extent do resource dependency, institutional isomorphism, competitive strategy, and the pursuit of institutional prestige help us to understand this robust growth in graduate education at a historically undergraduate institution in a time of constrained resources?

Boise State University

Boise State University (BSU) is a rapidly growing university—both at the undergraduate and graduate levels. The city of Boise, Idaho's capital and largest city where the institution is located, has a booming high-tech industry that has become increasingly important to Boise over the years. The regional economy remains diversified with both its government and business sectors continuing to be strong influences. Also in the city of Boise is a wide range of technical schools. The University of Idaho and Idaho State University, which are located in small cities some distance from the capital city, each maintain a satellite campus in Boise (Forbes, 2015).

Similar to CSUN, BSU has remained in the top five percent for graduate enrollment growth among all public regional universities in the U.S. Indeed, the growth in graduate enrollments, as well as the establishment of new programs, moved BSU from a Carnegie classified public Master's university into the doctoral classification in early 2016.

In the press release announcing the new designation, President Bob Kustra said, "'This designation marks a significant transformation of Boise State's graduate and research efforts, but equally or even more important is how these improvements serve our first mission — to provide a signature undergraduate education to students from around Idaho and beyond…Today, our students enjoy access to some of the world's leaders in their fields, to state-of-the-art research opportunities and learning laboratories, and to campus facilities and academic support designed to ensure they achieve their university goals on time and on budget'" (Squires, 2016).

Table 9. The evolution of Boise State University[29]

2001 (FY 2002)	2012 (FY 2013)
General Fund Appropriation: $73,573,800	General Fund Appropriation: $74,104,600
2,940,045 total building square footage	5,340,373 total building square footage
$5,463,691 in research expenditures	$21,830,883 in research expenditures
0 patents issued/0 invention disclosures	16 patents issued/25 invention disclosures
0 license agreements with business entities using our intellectual property	19 license agreements with business entities using our intellectual property
2 doctoral degree programs	8 doctoral degree programs
35 master's degree programs	78 master's degree programs
90 baccalaureate programs	95 baccalaureate programs
6 associate degree programs	4 associate degree programs
23 associate of applied science programs/26 technical certificates	0 associate of applied science programs/0 technical certificates
2 online degree programs	7 online degree programs/ 6 online certificate programs
2,501 online students/10,820 online credit hours	9,415 online students/55,580 online credit hours
412 students/1,409 dual enrollment credit hours	2,366 students/10,542 dual enrollment credit hours

Unlike CSUN and most Master's comprehensive universities, President Kustra set an explicit goal to become a doctoral university. Just over a decade ago, BSU began the journey to become a research university. In the last eight years alone, "…research expenditures at Boise State University have more than doubled, doctoral graduates have more than tripled and the number of doctoral students enrolled has increased to 188 from 82 — a 129 percent increase. In 2016 nearly 2,700 students are pursuing graduate degrees on campus or through one of Boise State's nationally ranked online programs in business administration, nursing, educational technology and more" (Squires, 2016).

Like many public Master's universities, over this same time period Boise State faced stagnant state support despite significant gains in enrollment. Amid a challenging and

[29] Boise State University JFAC Presentation (Boise State University, 2013).

unpredictable resource environment, BSU managed, without an explicit commitment of additional state resources, to make the necessary investments to grow graduate education. What made this growth possible? And how did institutional leaders think about the tradeoffs of this investment in graduate education? Further, to what extent did the Idaho Board of Education—one of the few P-20 coordinating boards in the country—constrain or enable Boise State's growth?

Below, I examine how the CSUN and BSU stories of graduate education growth can be understood through each of the theoretical frameworks in Chapter 3. To what extent do resource dependency, institutional isomorphism, competitive strategy, and the pursuit of institutional prestige help us to understand this robust growth in graduate education at these historically undergraduate institutions whose circumstances are both similar in some ways and also different in important ways.

Findings

Isomorphism and pursuit of prestige

Both pursuit of prestige and institutional isomorphism frameworks contend that institutional change is rooted in a desire for legitimacy on the part of the institution (DiMaggio & Powell, 1983; Brewer, Gates, & Goldman, 2002). As the pursuit of prestige literature contends—success for Master's level universities is often measured against the research university model (Brewer, Gates, & Goldman, 2002; Aldersley, 1995). Through this lens, prestige is measured in research oriented graduate programs, selectivity, and research dollars—among other things. If prestige and legitimacy are defined against the comparatively more successful research university model as a standard, then growth in research oriented graduate degrees and more traditional Ph.D. programs would be one strategy to attain greater legitimacy. At the

programmatic level, the growth in graduate enrollments at CSUN and BSU look very different.

For Boise State, growth in graduate programs and enrollments was part of a decade long strategy to become a "metropolitan research university of distinction." In his first university-wide address in August of 2003, President Kustra challenged the Boise State campus to set its sights on this lofty target. A few years later, the university launched an ambitious comprehensive fund raising campaign, *Destination Distinction*, which exceeded its goal to raise $175 million for the "places, programs and people" that would launch the university into this new tier of peers (Squires, 2016). As Table 10 and Table 11 demonstrate, in many ways, BSU is gaining ground on the peers it identified in 2012.

Table 10. Boise State University Self-Identified Peers

Boise State University Peers
California State University, Fresno
Cleveland State University
Georgia State University
Indiana University--Purdue
Portland State University
San Francisco State University
University of Akron
University of Massachusetts, Boston
University of Memphis
University of Missouri, Kansas City
University of Nebraska, Omaha
University of New Orleans
University of Texas, San Antonio

Table 11. Boise State University Peer Comparison

	Boise State University	Peers
Selectivity	65%	68%
Endowment	$63,895,842	$106,101,237
Enrollment	19,992	22,660
Expenses	$286,773,849	$404,894,224
Graduation Rate	32%	38%
Median SAT	1,040	1,014

When leaders at Boise State spoke about what this growth in graduate programs meant for the university, none of them talked about replicating what the Harvards of the world were doing. One dean described it as, "if you look at the impact of places like Harvard and MIT had in developing how we function as universities, our research agendas, how we teach, faculty governance, how decisions are made, I almost see those as, …chains. The longer you're around the longer your chains are and the less you're able to do things." While BSU may be attempting

to emulate the success of the prestigious research universities, they are going about it with a very different approach that doesn't look like the traditional research university or even traditional programs. For every traditional master's and doctoral degree, such as a Master's in Electrical Engineering or a PhD in Public Policy and Administration, BSU offers a unique graduate program such as a certificate in Workplace Instructional Design or a Master of Arts in Applied Historical Research.[30] For Boise State University, becoming a research university has been about the prestige of the new doctoral university classification and the peers it is now among by finding a way to set themselves apart from the traditional university model.

Table 12. Boise State University Goal 3: Gain Distinction as a Doctoral Research University

Goal 3: Key Performance Measures[31]	Recent Data			Performance Targets		
	FY 2012	FY 2013	FY 2014	FY 2015	For FY 2017	For FY 2021
Total Research & Development Expenditures (as reported to the National Science Foundation	$27.9M	$25.7M	$26.6M	$31.3M	$34.0M	$38.0M
Number of doctoral graduates (PhD and EdD	11	11	34	14	32	40
New doctoral programs	PhD Biomolecular Science; PhD Material Science & Engineering; EdD Educational Technology	Doctor of Nursing Practice; PhD in Public Policy	No new doctoral programs	PhD in Ecology, Evolution, & Behavior	PhD in Computing	
	CY 2008-12	CY 2009-13	CY 2010-14	CY 2011-14	For CY 2013-17	For CY 2017-21
Number of peer-reviewed publications over	1,317	1,411	1,449	1,533	1,750	2,300

[30] See Appendix A for listing of all Boise State University graduate programs

[31] Source: Boise State University Strategic Plan: Focus on Effectiveness Update submitted to OSBE May 16, 2016. https://academics.boisestate.edu/wp-content/blogs.dir/1/files/2012/01/KPI-update-for-website-1.pdf

5-yer period						
	CY 2008-12	CY 2009-13	CY 2010-14	CY 2011-14	For CY 2013-17	For CY 2017-21
Citations of publications by Boise State authors over five year span	5,445	7,264	9,499	11,190	15,000	20,000

DiMaggio and Powell (1983) contend that homogenizing of structure—the evolution towards the research university model—is a means to compete for resources and students as well as political power and institutional legitimacy. In many ways, this is true of the BSU case. In the last ten years they have added several traditional research oriented graduate degrees—including at the Ph.D. level. In other ways though, the Boise State University pursuit of prestige looks quite different. Just as they have added and grown prestigious research degrees, they have also been adding more applied and non-traditional certificates and Master's degrees such as a Master's in Applied Anthropology. In some ways, the former marks of structural isomorphism might be a result of BSU's hiring of faculty from the elite universities in recent years. Brewer et. al. (2001) contend that the pursuit of prestige is a function of hiring faculty who were trained at the elite universities and aspire to replicate that model at their new institutions. Some of Boise State's most recent hires include two top-level administrators from Harvard and most are from institutions among the top 100 research universities in the United States.

The role of the faculty explains a significant amount of California State University—Northridge's (CSUN) growth in graduate enrollments as well. As one dean described it, "This university started as a normal school; developed into a regional comprehensive. As it went along into the 80's and 90's there was more faculty emphasis on faculty contributions to the field. There was a real mix in the earlier days in terms of how many people were active in their fields.

As that became more and more of an emphasis–and there always were some faculty who were engaged–as they start to ratchet up those expectations, and even more recently the research grant expectations, you get a different kind of faculty member coming into the institution. You get people who are more and more inclined to be active. The more engaged they are the more likely they are to want to have a graduate program."[32] For CSUN, the growth in graduate enrollments and programs has followed a very "bottom-up" path. As the faculty member above illustrates—many of the graduate programs came to be because a faculty member developed a curriculum for them and created some cross-institutional buy-in. In contrast, Boise State University has followed a very deliberate path towards graduate education with the next programs in the queue being detailed in their strategic plan.

Across the CSUN campus, the reasons for wanting a graduate program vary. For some in the sciences, graduate students help support the research being done as well as alleviate the undergraduate teaching load by serving as TAs and enabling faculty to focus more on research. Further, the graduate students are integral to supporting the research labs being run by the faculty. One dean described it as, "My faculty really do care about having master's students in the lab with them. It was a big culture shock for me to come here and realize you can't talk to faculty without having them talk about their graduate students. It works. When I came here, funding was $4.5 million in external funds for the college. It is now $11 million." For CSUN, much like BSU, the growth in graduate enrollments has been in part an outgrowth of the hiring of more high quality faculty who are engaged in research and desire graduate students. Unlike BSU, though, CSUN does not have a strategic plan to grow and add new prestigious graduate programs—graduate education isn't even mentioned in CSUNs university-wide strategic plan. In

[32] See Appendix B for a listing of all California State University Northridge graduate programs.

part, this reluctance to develop an explicit strategy around graduate education is rooted in many of the faculty and administrators seeing graduate education as in competition with their mission as an undergraduate institution under the California Master Plan (California State Department of Education, 1960).

If CSUN is pursuing prestige at all, it is only discussed by institutional leaders as being a high quality undergraduate serving institution. As a California State University campus, CSUN has long been a primarily broad access campus—as long as students met minimum course taking and grade point requirements, they were guaranteed admission. In 2011, CSUN admitted 73 percent of first-time freshmen applicants but this number had dropped to 46 percent by 2015 (California State University, 2015). Beginning in 2016, though, CSUN declared impaction.[33] This meant that, for the first time in its history, CSUN could add additional, supplemental admissions requirements to those in the Master Plan. To the extent that prestige is a function of selectivity based on academic criteria, CSUN may be pursuing prestige—particularly as it relates to undergraduate education.

When asked about graduate enrollments and programs as a way to legitimize or raise the profile of CSUN, all leaders were dismissive of the idea. In part, the leaders argued, CSUN has legitimacy by virtue of being a part of the California State University System. For leaders at CSUN, the growth in graduate enrollments and the addition of new programs speaks more to competition for resources—new, more advanced students and new sources of funding—than to a search for legitimacy and political power.

[33] Campus impaction (otherwise known as campuswide impaction) means that a campus has exhausted existing enrollment capacity in terms of the instructional resources and physical capacity of the campus. Because the campus receives more eligible applicants during the initial admission application filing period than can be accommodated, the impacted campus is therefore permitted to restrict enrollment to the campus for a specific enrollment category (i.e. first-time freshmen or transfers) (The California State University, 2016).

Resource dependency

Another lens through which one can view the decisions made by institutional leaders to grow graduate education at CSUN and Boise State University is resource dependency theory. Pfeffer and Salancik (1978) suggest that the need for procurement of external resources is a signficiant driver of an organization's strategic and management decisions. Public Master's universities have two main sources of revenue—tuition and state support. In 0 I theorized that declines in state support or undergraduate tuition revenue may be predictors of growth in graduate enrollments. Said another way, I thought it was possible that institutional leaders were growing graduate programs as a potential revenue source to make up for declines in undergraduate enrollment or lost state support. What I found was that state appropriations were actually a significant and *positive* predictor of growth in graduate enrollments—meaning that increases in state spending at the institution level were also related to growth in graduate enrollments. But, this begs the question: are institutions garnering more state resources through the addition of graduate programs? Or, does more robust state spending at an institution enable them to invest in gradute education when they otherwise wouldn't?

To better understand this finding, I asked interviewees in multiple different academic fields across the two universities' campuses about the "profitability" of their programs. What I heard repeatedly was that graduate education is expensive to deliver and is only possible when institutions have new resources that they can invest in areas outside of undergraduate education. One of the deans at CSUN described the challenge as, "We get funded slightly more for graduate students just in terms of the FTE calculation but we get no economies of scale. For our undergraduate programs we can match large lecture classes to smaller upper division classes specifically for a major so we can manage our resources that way. When you get to the graduate

program you have no capacity to do that…Okay, we can bring in 15 students a year to this program and it will probably be viable. So, where's that money coming from? Its inherently a more expensive way to educate students [because of the small class sizes]."

For CSUN, the financing of graduate education is complicated by the rules governing graduate programs and their financing within the California State University System. As one dean described it, "Graduate programs being funded from the state at a slightly higher rate is relatively new. That only started about 5 years ago. That was a switch from 15 units equals a full time student, same for undergrad and grad, and the system office made the switch to 12 units. That's the only differential we get."[34] For many years, CSU was being funded at the same FTE rate for graduate education as it was for undergraduate education. Similarly, the CSU System closely controls rates across the system for both undergraduate and graduate tuition. With little control over revenue from state supported graduate programs, many university leaders ackowledge that it's almost impossible to run a graduate program "on the state side" that breaks even—the much more likely scenario is that a graduate program is losing money.

Table 13. California State University Tuition Rates[35]

	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Undergraduate	$2,772	$3,048	$4,026	$4,440	$5,472	$5,472	$5,472	$5,472
Teacher Credential	$3,216	$3,540	$4,674	$5,154	$6,348	$6,348	$6,348	$6,348
Graduate	$3,414	$3,756	$4,692	$5,472	$6,738	$6,738	$6,738	$6,738

[34] In spring 2006, the state approved a new formula for determining the FTE of graduate students (i.e., students seeking a master's or doctorate degree). Now, 12 units attempted by a graduate student in a term equals one FTE (California Education Code, 2011).
[35] Source: The California State University System, 2015.

As an alternative to operating graduate programs on the state support side of the house, many of these programs at CSUN have moved to or been created as fully self-supported programs under the leadership of the Tseng College. One of the unexpected benefits of the self support arrangement is that nearly all graduate programs being considered now undergo a thorough market analysis. One dean described the thought process in considering state versus self support as, "[We] will probably never create new state side programs without simultaneously considering whether it would be better on self support. That wasn't something we thought about 20 years ago. In some ways, even if we are looking on the state side, when programs go to the self support side there is a very conscious effort to work out the fees, market [since these costs have to be covered by program revenue]. What's the real demand for this? Are we going to get enough students to come through to make this a viable program?"

As Table 14 shows, CSUN leads the California State University schools in enrollment of self-support students. Nearly all of the growth in graduate enrollments in the last ten years—and especially the last five years—has been on the self-support side. Self-support programs through the Tseng College give institutional and departmental leaders additional flexibility in resources as they have more latitude in pricing tuition rates as long as the tuition can fully cover program costs. Self-support programs are one of the few areas where it is possible for colleges and departments to make a profit. For many departments, the addition of self-support programs has enabled them to start new programs that otherwise would not have been possible.

Table 14. Self-support FTE enrollments, AY 2015-16[36]

Northridge	3,413.5
San Jose	3,221.5
San Marcos	1,978.5
Fullerton	1,710.0

[36] Source: The California State University System, 2016.

East Bay	1,576.7
Fresno	1,410.5
Dominguez Hills	1,161.0
Long Beach	946.5
Los Angeles	843.0
San Bernardino	835.7
Sacramento	748.0
Channel Islands	702.5
Monterey Bay	644.5
San Diego	601.0
Pomona	483.7
Stanislaus	309.0
San Francisco	267.5
Sonoma	261.0
Bakersfield	235.0
Humboldt	175.5
San Luis Obispo	139.7
Maritime Academy	42.5
Chico	42.0

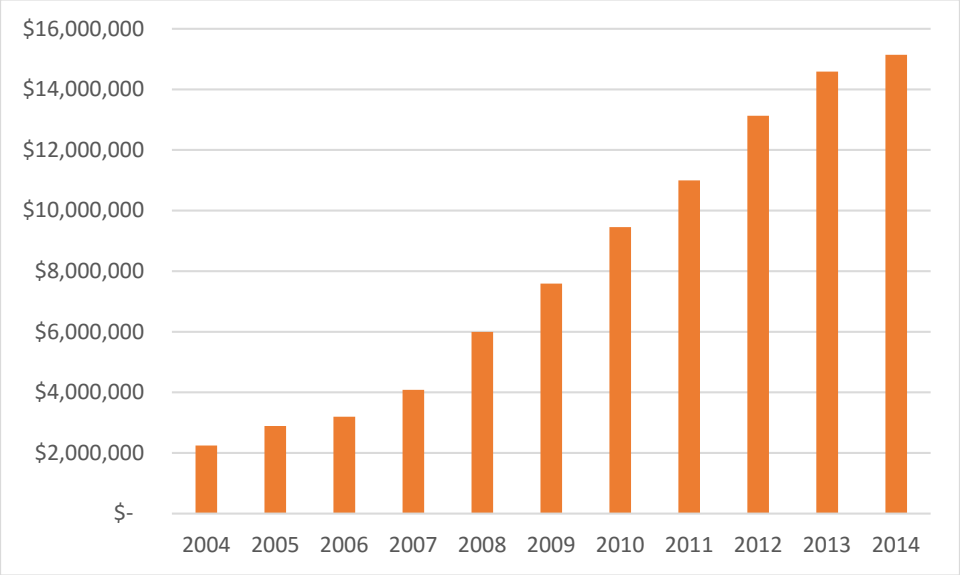
As one dean describes it, the best scenario is when an academic unit can have a symbiotic relationship between its self-support and state-support programs, "…right now, if you're making money on self-support it has to go back into the self-support program or [into] developing more programs. It works really well when you have a program that is operating in both areas like the Master's in social work. We have an on- campus cohort that is state supported and then we have a fully online program and several off site. The online and offsite are self-support. But since it's the same curriculum and same faculty it's easy for them to help support each other through that program."

Yet, the California State University System has rules governing how revenues from state support can be used. California Education Code states that universities cannot supplant state supported programs with self-support programs. This means that CSUN, and other CSUs, cannot make what was once a state-supported program into one on self support status—the new self-support program must be materially different and serve a different type of student. Similarly, rules prohibit using revenue from a self-support graduate program on a state supported undergraduate program (California Education Code, 2011).

Despite these challenges, CSUN is benefiting significantly from the additional flexibility and revenue from self-support programs, "We just recently had an audit of the self-support programs and there was a finding that there was some concern about the misuse of the funds. That we were using self-support funds to support state support programs. Which flies in the face

of what the assumption is. But, if you look at it broader, if you see the building under construction over here, that's being funded totally with self-support programs. There are ways to help support the institution but it has to be at a much more institutional level."

Figure 16. CSUN Revenue from Self-Support Programs

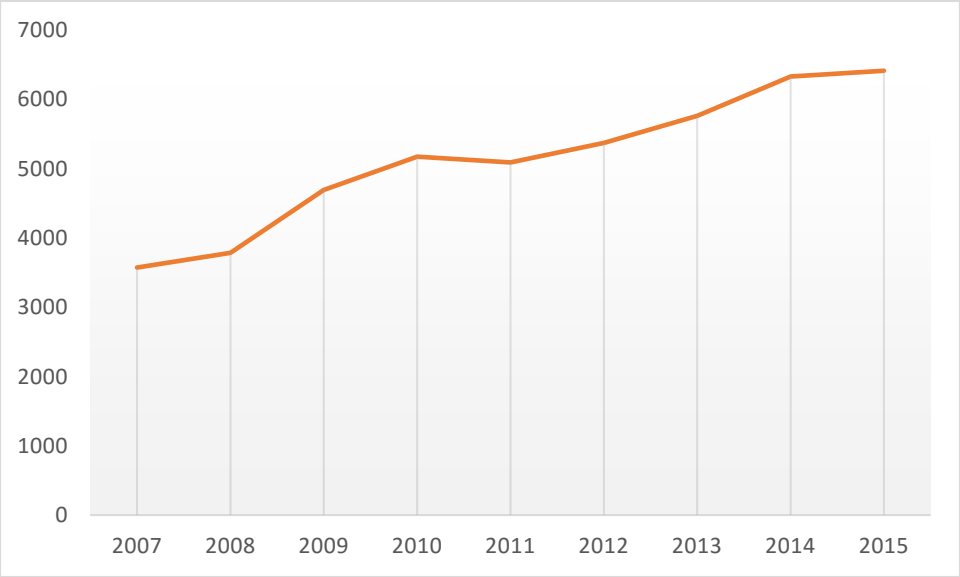


For CSUN, the growth in self-support programs has enabled them to invest in other areas of the institution that weren't possible given the contraints on both the quantity and the ways in which state support revenue can be used. Jeffrey Pfeffer and Gerald R. Salancik (1978) would contend that self-support revenue provides a way for CSUN to reduce its dependence on the external environment—thus reducing the power that the external environment has over the institution. This is most obvious in examples such as CSUN can now purchase memberships to the local chambers of commerce—a budget expense that is otherwise prohibited with state appropriations.

Boise State University's revenue picture differs from CSUN's in several important ways. First, and perhaps most important, is that Boise State faces fewer constraints on its various revenue streams from the Idaho State Board of Education than CSUN does from the CSU system. In contrast to the Cal State System, BSU has control over "online program fees" which

are charged in lieu of tuition (Idaho State Department of Education, 2016).[37] In the last decade, enrollments in the online programs (BSU's self-support programs) have nearly doubled. In a campus report on the Extended Campus and various fee sources, the use of online fees is described as follows: "Currently online program fee revenue is split between eCampus, the academic department offering the program, and the central budget. The eCampus share provides funding for the eCampus Center as well as an innovation fund to encourage the creation of new programs" (Boise State University Office of Budget and Planning, 2016).

Figure 17. Boise State University Online Enrollments--Headcount



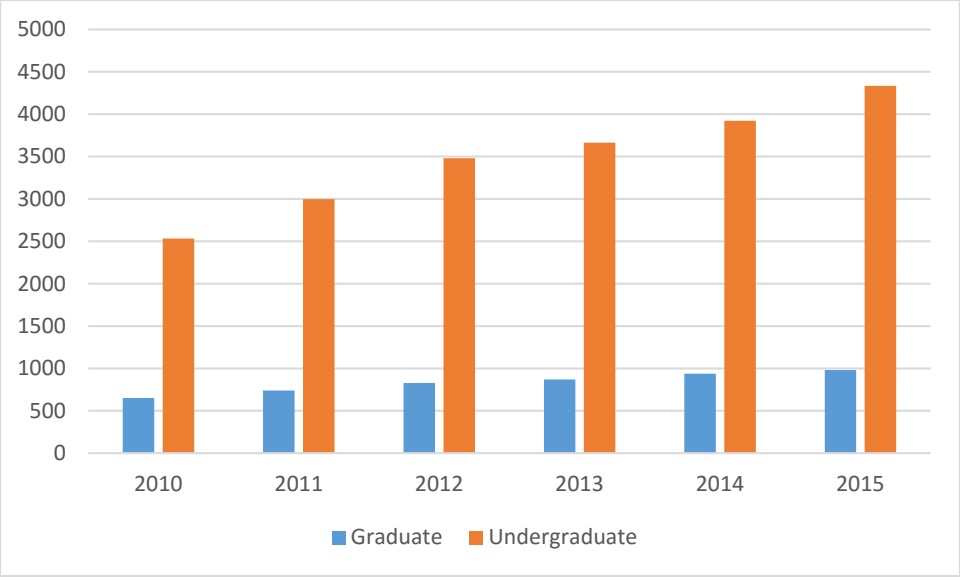
In 2008, Boise State began a new program to deliver an online/distance learning Bachelor of Science in Nursing. "The self-support model or student revenue supported program, which runs on fees generated from student enrollment, has enabled the program to grow and serve students in all parts of rural Idaho as well as nationwide. With more health care institutions and businesses preferring to hire nurses who hold bachelor's degrees, the program's enrollment has grown more than 300% since its inception" (Lusk, 2013). Since then, several departments have eyed the self-support and online programs as a way to generate new resources. As one vice president described, "A lot of our growth has been in self

[37] An online program fee may be charged for any fully online undergraduate, graduate, or certificate program. An online program fee shall be in lieu of resident or non-resident tuition (California Education Code, 2011).

support programs—and online programs. And there's a history there. Like our Ed tech program. There was a push to do self-support because there wasn't much money to do anything with." Like at CSUN, if a college wanted to do anything new, self-support programs became the only viable option with no prospects for new money from the state and resistance in both states to tuition increases.

An additional source of revenue growth for BSU has been non-resident enrollments. Like online enrollments, BSU has significantly grown non-resident enrollments at both the undergraduate and graduate levels. Non-resident tuition and fees are nearly triple tuition and fees for resident students at both levels.

Figure 18. Boise State University Out of State Enrollments, by level[38]



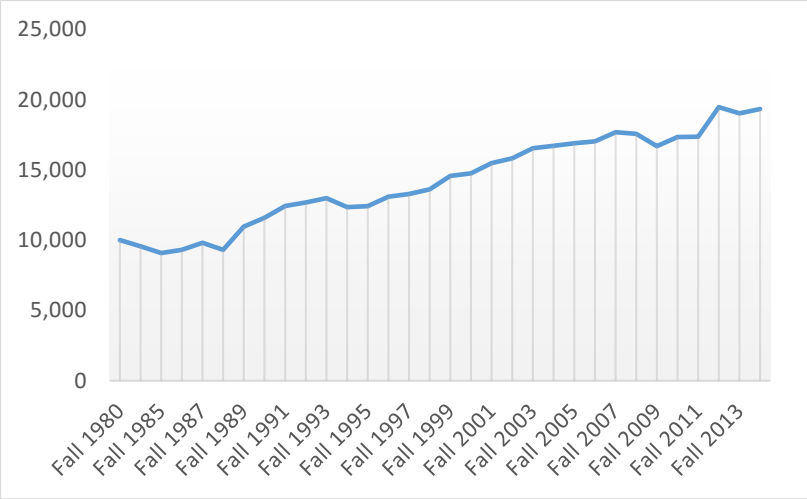
Speaking more to prestige goals perhaps than to resource dependency, Boise State has a generous scholarship program through their endowment meant to attract high quality non-resident graduate students. Out-of-state and international students who are admitted to a traditional (not online or self-support) graduate program and have at least a 3.0 GPA are eligible for a scholarship that reduces tuition to resident

[38] Boise State University. (2013, January). Boise State University JFAC Presentation. Retrieved from Boise State University: https://president.boisestate.edu/governmentrelations/files/2013/04/Boise-State_JFAC_1-21-13.pdf

rates (Boise State University, 2016).

For Boise State University and California State University-Northridge, self-support and online programs have given these institutions the flexibility to make investments in fields that would not have been possible under traditional funding streams. The central tenet of resource dependency theory is that organizations seek to reduce their environmental interdependence and uncertainty by broadening revenue sources and seeking to increase their stability and the organization's control over them (Pfeffer & Salancik, 1978). For both of these institutions, reducing this interdependence [i.e., dependence on state funding] has also come with more flexibility than traditional revenue streams—allowing these institutions to invest in programs outside of their traditional business models tied to state funding and controls.

Figure 19. Boise State University Undergraduate Headcount[39]



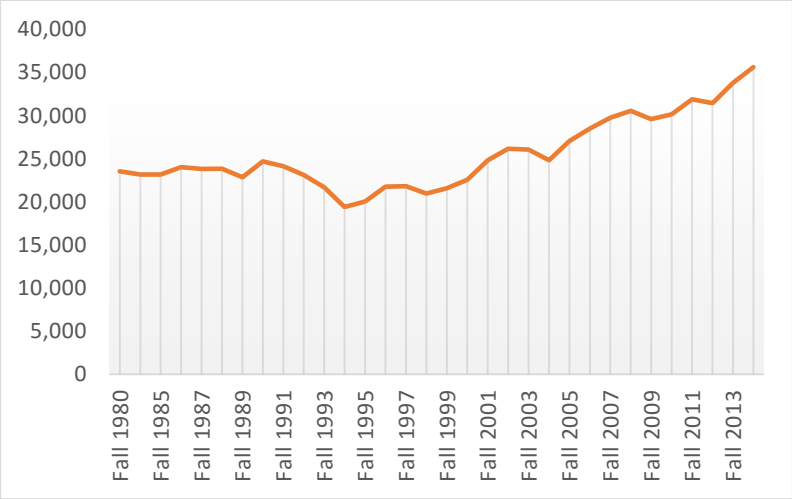
The final revenue piece that is consistent across both BSU and CSUN is explosive growth in undergraduate enrollments. As Figure 19 and Figure 20 show, both institutions have seen undergraduate enrollments grow significantly—particularly in the last two decades. As one dean at BSU described, "If our aspiration is to start a new doctorate program in biology, that means we might need to start a new program in public health in undergraduate because we can generate $2 for every dollar invested

[39] Boise State University. (2013, January). Boise State University JFAC Presentation. Retrieved from Boise State University: https://president.boisestate.edu/governmentrelations/files/2013/04/Boise-State_JFAC_1-21-13.pdf

at the undergraduate program. We know it's needed. There are jobs out there. I know I sound like a corporate manager. But, the revenues that go into that, you know your doctorate programs are always a loss. But, we've created a cash flow that will allow us to do that." Said another way, there is an opportunity on the undergraduate side to create economies of scale that generate enough profit to support graduate education—and BSU has been very deliberate about finding and leveraging high enrollment undergraduate programs where that is an option and then investing the surplus revenue in other areas of the university.

For BSU, the rapid pace of undergraduate enrollment growth seems to be as much a part of the story for making graduate enrollment growth possible as additional revenue streams such as federal grants or self-support programs. Another vice president at BSU described the relationship between graduate and undergraduate education as, "We've come to the realization that graduate programs are either revenue neutral or cost money…that unless we grow our undergraduate programs, we can't grow our graduate programs. Some of them pay. The MBA. The self-support programs have to pay for themselves. But we know that we can't add a PhD program unless we grow our undergraduates. A lot of things are funded by undergraduate enrollments. And we realize that and understand it."

Figure 20. California State University-Northridge Undergraduate Enrollments



For CSUN, the relationship between undergraduate enrollments and graduate enrollments is more complicated. Unlike at BSU, there is not an explicit institutional strategy to grow graduate

programs and enrollments. As a result, there aren't institution-level strategic decisions being made around investing in particular graduate programs or growth. In addition, unlike at Boise State, nearly all of the growth in graduate education at CSUN has been on the self-support side. While undergraduate enrollment growth may in part be an impetus for growing graduate enrollments, it does not seem to be subsidizing growth in graduate programs in any major way. At the end of the day, university economics and the balance between investments in graduate education with undergraduate enrollments are enormously complicated. On one hand, graduate students represent a potentially inexpensive labor force that can free up faculty to engage in research or even just distribute the teaching workload differently at lower cost. On the other hand, running graduate programs is expensive as many have accreditation requirements that restrict class sizes too far below a point that would generate enough tuition revenue to cover the cost—particularly in a relatively low tuition state like California. Given BSU's substantially different enrollment mix (many more profitable non-resident undergraduates) and significantly higher graduate tuition rates, the economics by which undergraduate education can cross subsidize the addition of new graduate programs (and faculty) is not far-fetched. It's also not a stretch to see how in a low-tuition, overenrolled, and resources-constrained state like California the math on leveraging undergraduate enrollments for graduate programs simply wouldn't pencil out without the additional revenue of self-support students.

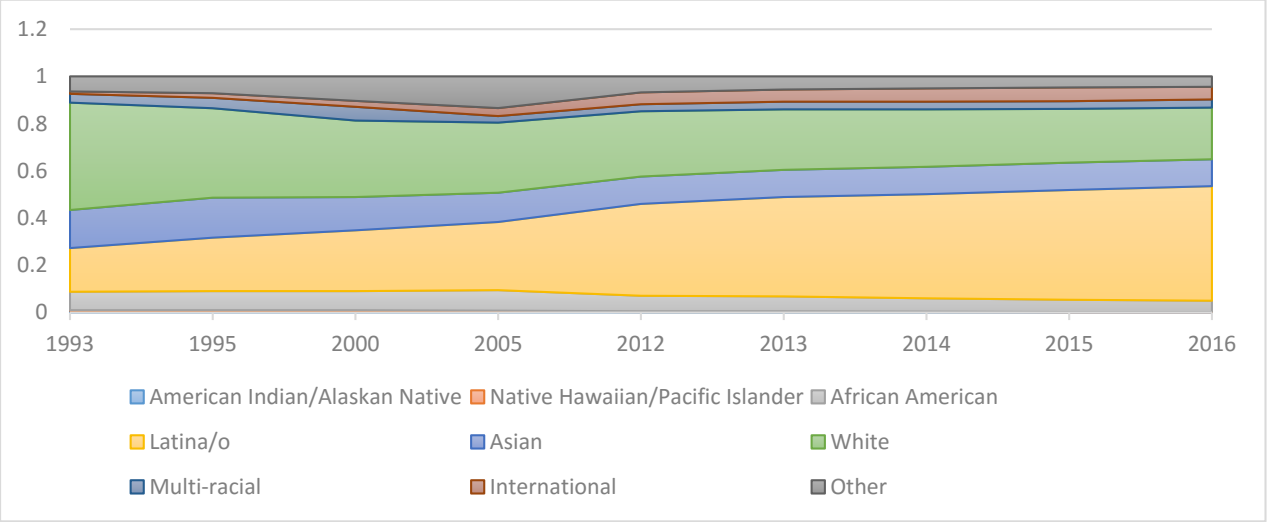
Human capital theory and competitive strategy

Competitive strategy theory suggests that businesses [institutions in the present case] gain an advantage over their competition through cost, differentiation, or focus (Porter, 2008). In a market where all colleges and universities are in competition for scarce resources such as funding and students, it's worth asking how both CSUN and BSU rise to the top, not only in their

states, but nationally, for their growth in graduate enrollments over the last two decades. For both BSU and CSUN, the growth in graduate enrollments is as much about being located in an area with above average population growth and strong demand for highly educated workers as it is about carving truly unique niches for many of their programs (i.e., by focusing on certain student demographics, online education, remote delivery, or unique programs).

For CSUN, several leaders described the highly diverse, first-generation undergraduate demographic that they have served so well as one of the major opportunities for graduate enrollment growth. As Figure 21 below shows, in the last decade CSUN has earned federal designation as a Hispanic Serving Institution (HSI). In 2016, nearly 50 percent of its undergraduate enrollments were Latina/o and 54 percent were students from underrepresented backgrounds.

Figure 21. Undergraduate Student Headcount by Ethnicity[40]



Speaking to this broad access mission for CSUN at the undergraduate level, another

[40] California State University System. (2007, November 28). In Brief: CSU Enrollments are Still on the Rise. Retrieved from California State University System: Office of the Chancellor: http://www.calstate.edu/as/inbrief/inbrief07.pdf

leader stated that, “one of our strengths is graduating students from traditionally underserved backgrounds. If that is a core competency at the baccalaureate level, why wouldn’t we extend it into graduate education?” Likewise, leaders at CSUN saw an opportunity to leverage the pathways they were building from the community colleges straight into bachelor’s degrees and through master’s degrees. One leader described one of these pathways as, “We have linked them with Los Angeles Unified School District and then created a pathway from the community college to the bachelor’s degree and then typically those students go straight into the master’s.” In a state like California, where a Master’s degree is a baseline requirement to become a teacher, these sorts of pathways are essential.

A central theme for leaders at CSUN was that their graduate programs are serving the needs of local communities and generally in direct response to interest from employers. As many leaders articulated, a master’s degree in many fields is replacing a baccalaureate degree as the new standard. This observation is consistent with human capital theory, which suggests that investments in education are consistent with gains in productivity and innovation (Carnevale, 2010; Becker, 1964). In a recent report by Carnevale et. al. (2016), it was found that “Graduate degree holders gained 3.8 million jobs, Bachelor’s degree holders gained 4.6 million jobs, and Associate’s degree holders gained 3.1 million jobs, compared to workers with a high school diploma or less, who added only 80,000 jobs.”

CSUN, like many public regional comprehensives, produces almost exclusively applied graduate degrees, as opposed to research based credentials like the several research I institutions in the LA area. At the graduate level in particular, programs at CSUN have been started and grown largely in response to a need identified by a faculty member. As one faculty member described it, “So, we ask ourselves what the needs are. And they are graduate, or master’s level

students to fill the demand or need of the state of California for more high-level thinkers. We have a master's in TESL, teaching English as a second language. That's a very applied, useful, degree. And there's demand. Nursing… Why? Because we need nurses in California. We have the Ed.D. because the workforce demands are calling for it. That's why we are moving more towards graduate education."

Consistent with the notion that many of CSUN's graduate programs are in response to a specific workforce need or demand is the growth in CSUN's fastest growing program—a Master's in Public Administration. As one of the extended campus executives described, "One of the reasons for the growth in the MPA is because we did connect with the regional public sector. We have a lot of off-site cohorts. We partnered with agencies. You would think that, when we are partnering, they are basically allowing us to offer courses on their site. The public sector sees the need but doesn't have the resources to support it beyond lending space. But, we have taken advantage of that in that we have made those connections." And, all of this has been done on the self-support side.

Yet Table 15 shows the two fast-growing occupations in the greater Los Angeles area requiring a graduate credential are lawyer—a credential limited only to the University of California system—and teacher. While the CSU system used to educate nearly one-half of all teachers in California—and CSUN had the largest teacher preparation program in the state—that number has dropped. One dean described it as, "In the heyday we were producing 2 out of 3 teachers in the state. Now it's less than 1 in 2. Actually the pipeline in teacher production has dropped in the whole state. But that's always been our mission. So, although we are not focusing on full masters and doctorates, the teacher and post baccalaureate program has certainly been the purview of the CSU. And certainly for the public good." Yet, despite this occupational need and

teacher preparation being a central part of the CSU history, growth in teacher education—whether at the graduate level or as a credential—is absent from CSUN's strategic plan.

Table 15. Occupations in Los Angeles with the most openings, 2012-2022[41]

Occupational Title	Total Job Openings 2012-2022 [1]	2014 First Quarter Wages [2]		Education and Training Levels [4]		
		Median Hourly	Median Annual	Entry Level Education	Work Experience	On-the-Job Training
General and Operations Managers	20,710	$51.22	$106,538	BA	<5 years	None
Accountants and Auditors	20,370	$34.33	$71,405	BA	None	None
Elementary School Teachers, Except Special Education	11,480	[3]	$75,150	BA	None	I/R
Producers and Directors	9,610	$50.03	$104,065	BA	<5 years	None
Management Analysts	8,650	$40.06	$83,324	BA	<5 years	None
Market Research Analysts and Marketing Specialists	8,640	$29.52	$61,400	BA	None	None
Secondary School Teachers, Except Special and Career/Technical Education	8,190	[3]	$69,616	Grad	None	I/R
Lawyers	7,890	$73.59	$153,062	Grad/Prof	None	None

When asked about the impact of competition on programs like teacher education, many leaders at CSUN contended that there is such robust demand for education in the San Fernando Valley that they don't feel like they are really competing against other institutions for students.

[41] State of California Employment Development Department. (2012). Employment Projections. Sacramento: State of California Employment Development Department. Retrieved November 2, 2016, from http://www.labormarketinfo.edd.ca.gov/data/employment-projections.html

"In California the UC's can't, don't have the capacity for the numbers of students who want to get a graduate degree. So we are meeting a need. We are continuing to grow too for the same reasons, to meet regional needs." Likewise, on the self-support side, several deans contended that their graduate programs were developed specifically to compete with the for-profit sector in California, "This may be unique to the state of California, we're not in competition. We have more students than we know what to do with. We are the best educational deal in the country. Even with rising tuition it's such a good bargain. We have 40 thousand students. We've had to declare impaction. We will be controlling how many we take. I don't care what UCLA or USC or Cal State LA does, we have enough. The problem for CSUN, as is highlighted in the teacher demand—is securing enough resources to be able to educate the students that they have. As a result of the California State University System's rules on supplanting—CSUN has no flexibility to move their teacher education programs onto the self-support side. As a result, the programs are constrained by resources—not a lack of demand—even with robust competition in the area.

Like Los Angeles, the Boise labor market remains one of the fastest growing economies in the nation. The Boise area's job market is forecast to grow by 20 percent from 2014 through 2024 (Berry, 2016). Annually, the projected growth rate is 1.8 percent per year – three times the national projection of 0.6 percent growth over the same time period. Growth in STEM occupations – Science, Technology, Engineering and Math – is expected to be particularly strong growing at a rate of 2.1 percent, compared with 1.8 percent for non–STEM occupations. Historically, growth in STEM occupations in the Boise area has been below the national average. Over the next ten years, Idaho is expecting growth in STEM occupations to be nearly twice the rate of the U.S. average. Educational attainment projections by occupation reveal that, by 2024, 61 percent of Idaho's new jobs will require an education level greater than a high school diploma

with 29 percent requiring a bachelor's degree or higher (Berry, 2016).

Table 16. Idaho's Fastest Growing, Best Paid Occupations[42]

Rank	Shift	Occupation	2024 Employment	Annual Openings	Percent Change	2014 Median Wage	Typical Entry Level Education
1	↑3	Software developers	6969	259	36.8%	$ 36.35	BA
2	↑74	Lawyers	3315	109	27.2%	$ 37.04	Doctoral
3	↑23	Management analysts	2959	106	34.4%	$ 29.26	BA
4	↑22	Accountants and auditors	5385	229	27.5%	$ 29.33	BA
5	↑19	Civil engineers	2133	96	28.3%	$ 35.31	BA
6	↑25	Personal financial advisors	1141	53	39.3%	$ 33.82	BA
7	↑40	Business operations specialists, all other	3229	99	26.8%	$ 30.03	BA
8	↓5	physical therapists	1347	59	29.8%	$ 37.64	Doctoral
9	↑10	Health specialties teachers, postsecondary	1209	45	30.4%	$ 39.33	Doctoral
10	↓1	Market research analysts and marketing specialists	1949	71	38.3%	$ 24.76	BA

As Table 16 shows, three of Idaho's top ten jobs, in terms of annual openings, require a graduate degree and all of them require a baccalaureate degree. Two of Boise State's newest doctoral degrees were made possible by a donation from Micron. One university administrator describes it as, "New PhD in electrical engineering. New PhD in materials science. All from Micron. Materials science, 9 new faculty lines, it doubled the size of the department. It's the biggest in the Northwest. Because of Micron. They want materials science and the research." In the press release announcing the $25 million gift for materials science research, one faculty

[42] Source: Labor Market Projections for Idaho (Idaho Department of Labor, 2016).

member said, “More than half of materials science graduates find employment in the Treasure Valley [Boise area] (many with Micron) and others continue their education with graduate school or as post-doctoral researchers” (Tuck, 2015). The partnership between Boise State and Micron has existed for more than 20 years. Boise State’s College of Engineering was first established in 1997 with a $6 million donation from Micron to build a new engineering complex. Through generous gifts from Micron and the Micron Foundation, undergraduate and Ph.D. programs were created—all designed to meet urgent needs of the company and the region (Tuck, 2015).

Table 17. Boise State University Remote Campus Locations[43]

Location	Headcount
Boise Campus (Main)	16,389
Electronic Campus	6,417
Boise State Center at CWI	278
Gowen Field	248
College of Southern Idaho	149
LCSC-Coeur d'Alene	52
LCSC-Lewiston	33
Micron Technology	21
Mountain Home Air Force Base	19
Idaho Digital Learning Academy	6

Like California State University-Northridge, one of the things BSU has done well is develop programs in other areas of the state and region where there is an identified need. As one dean described in regard to the MSW program, “The masters of social work is another big, fast growing thing. There was an identified need in other parts of the state. Our program put together remote locations for those students and served that important need.” In sharp contrast to BSU, the California State University System actively works to restrict cross-institutional competition within the system by prohibiting the establishment of programs outside of a designated geographic service area.[44] Even if there were the opportunity to grow, CSUN is limited to serving students within the greater San Fernando Valley area.

For Boise State, the extent to which competition from other universities matters is

[43] https://enrollmentservices.boisestate.edu/enrollment-data/
[44] http://www.calstate.edu/sas/documents/csulocaladmission-serviceareas.pdf

minimal. BSU has been able to grow so rapidly from its origins as a mere community college three decades ago to a doctoral university because it is the only public baccalaureate institution in the state's largest metropolitan area. Idaho's flagship institution, the land grant University of Idaho, is nearly 300 miles northwest of Boise. Local competition includes only a few small private universities and a single community college. While the University of Idaho has had some success establishing university centers in the Boise area, their enrollment of 415 students (including second and third year law students) pales in comparison to BSU's (University of Idaho, 2015).

Conclusion

Both Boise State University and California State University-Northridge were chosen for study because their graduate enrollments were sizable and their growth on this dimension over the prior two decades put them in the top tier of all public master's level universities. If public Master's granting universities are in pursuit of the research university model, then those with the greatest growth in graduate enrollments were likely to be exemplars of this theory in action. As this research highlights, for both BSU and CSUN, the motivations for growth in graduate enrollments are much more complex than just pursuit of prestige. Both universities had access to rapidly growing metropolitan areas with high demand for educated workers—but BSU with fewer regulatory constraints and virtually no competition. Even in the case of CSUN, where competition from other universities seems abundant, university leaders were struggling to keep up with demand. Finally, and perhaps the most important tool that these institutions had to grow their graduate programs, were growing revenue streams from sources outside of stagnant state budgets and state-controlled tuition rates.

Consistent with my quantitative findings, undergraduate enrollment growth is a

significant part of what enabled growth at the graduate level at both these regional universities—but especially Boise State. For BSU, the rapid growth in undergraduate programs created economies of scale in many areas that enabled investments in costly graduate programs. In addition, the rapidly growing non-resident student population, particularly on the undergraduate side, gave BSU resource flexibility that many regional comprehensive universities don't have.

On the other hand, CSUN, in a highly regulated environment that constrained its options, was the first California State University campus to make robust use of self-support graduate programs. Nearly all of the institutional leaders at CSUN spoke of the future of graduate education at the university existing almost exclusively within their extended campus—i.e., on the self-support side. For CSUN in particular, the impact of the California State University System and the California Master Plan's controls significantly constrain the extent to which the university can grow graduate programs and strictly prohibit the addition of research based Ph.D. programs. Everything from the rules and policies governing tuition and fee rates to policies limiting how revenues can be spent across programs, and even the service area that CSUN can market its programs to, has severely impacted the ability of the university to pursue the research model.

Without the constraints of a closely regulated statewide system like that of the California, Boise State has been able to quadruple its number of doctoral degrees and double their master's degree offerings in under 15 years. In many cases, Boise State was able to get statewide buy-in for their new graduate programs by saying they could add them with no new state support and demonstrate success (strong enrollments) within two or three years. Leaders vowed to the state board that if a program didn't demonstrate that commensurate demand was there, they would phase it out within a matter of years. For the Idaho State Board of Education, this meant that

there was little risk in allowing Boise State to grow their programmatic offerings—there was no other in-state competition anywhere near the BSU campus and leaders pledged that they could do it without any new state money, which they did.

In many ways, the growth of BSU to a doctoral university in such a short time frame is unlikely to be something that could be replicated elsewhere. The confluence of a rapidly growing metropolitan area (which is undoubtedly intertwined with the growth of the institution), coupled with an ambitious, politically savvy, and charismatic leader in President Kustra, and the opportunity to pursue innovative educational models (with financial flexibility) granted to them by the Idaho State Board of Education made the progression of BSU to doctoral university status possible.

Consistent with my quantitative findings, there is no single predictor of growth in graduate enrollments at public regional comprehensive universities. For both BSU and CSUN, pursuit of prestige (to the extent permitted by the environment), institutionalism, resource dependency, human capital, and competitive strategy all help to explain their ability to grow graduate education. Just as growing economies and regional population centers generated demand for these programs, willing faculty who were connected to the local employers designed and built the programs. While Boise State University's growth in graduate education was a deliberate, carefully orchestrated march to doctoral university status, CSUN's growth was more ad hoc with growth in individual academic units of the institution that was not centrally directed. While CSUN does not aspire to doctoral university status (because it cannot), in many ways it has been a model for graduate education in the California State University System and probably more closely mirrors the experience of many other regional comprehensives in the United States.

In places where there is local growth similar to that seen in Boise, there may be the

opportunity for another success story like BSU. But, as this case study highlights, it also requires a willing state governance system and smart leadership to respond to the opportunity.

Chapter 6 Conclusion

The sequential explanatory research design used in this study provides an in-depth look at graduate enrollments at public Master's granting universities. The quantitative research investigates the best predictors of graduate enrollments at over 200 public Master's universities in the United States over the years from 1990 through 2012. It examines the impact of variables related to institutional theory and pursuit of prestige, resource dependency, and competitive strategy. Further, the statistical analysis controls for state unemployment rates as well as a measure of an institution's degree of decision-making autonomy within each state. The qualitative strand of this research builds on the findings from the statistical chapter through interviews with public Master's university leaders at two institutions near the top of the list in graduate enrollment gains but operating in different states with quite different oversight environments. The qualitative research sought to better understand the strategies leaders at public Master's universities have employed to grow their graduate enrollments as well as the motivations and impediments to growth. Further, this research sought to better understand how state governance structures and policies related to institutional autonomy enabled or inhibited graduate programs and enrollments at public Master's universities.

To date, nearly all of the research on public Master's universities has asserted that this Carnegie classification represents a way station on the typically desired path to research university status and more legitimacy. When pursuit of prestige first emerged in the empirical literature as a well-defined institutional strategy in the 1970's, the Carnegie Classification system had just emerged. What was then an attempt to create a neutral categorization of institutions, became quickly viewed as a hierarchical ranking scheme. Over the next two decades, many institutions set off in a competitive rush to meet the operational criteria necessary to qualify them

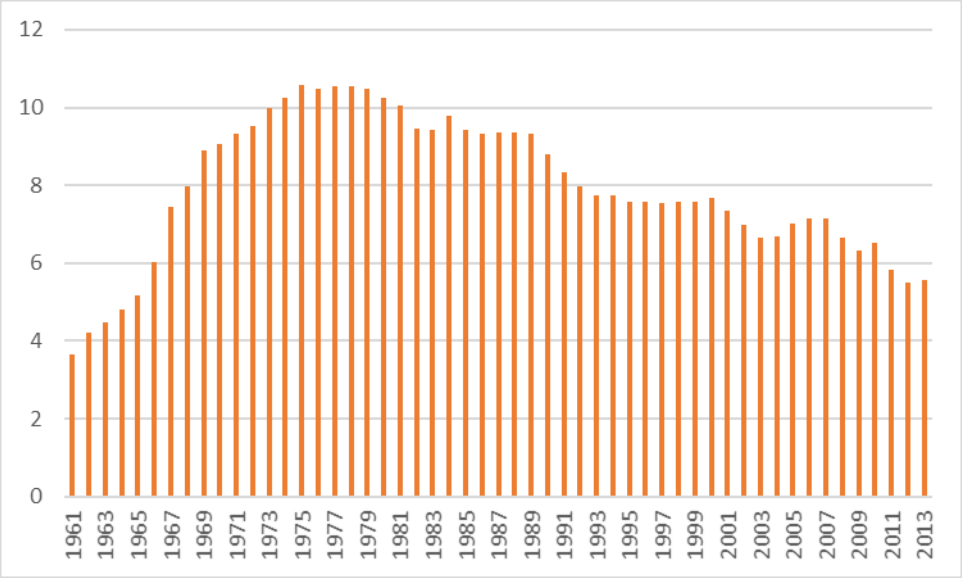
to be placed in another, more prestigious category (Thelin, 2011, p. 320). Later, Brewer, Gates, and Goldman (2002) added to the literature on prestige-seeking with their book, *In Pursuit of Prestige.* Here, they identified three basic taxonomies of institutions: those with prestige, those seeking prestige, and those seeking reputation. The public flagships and research universities generally fall in the first category of institutions. These universities are "focused on the long term, in no small part because they are financially secure for the present" (Zemsky, 2003). Meanwhile, the other end of the spectrum is composed of institutions–reputation seekers–that are more concerned with "becoming successful models of practice," likely an outcome of their resource constrained and tuition dependent nature (Zemsky, 2003). These institutions are often, though not always, in the community college sector and tend to prioritize serving specific populations of students or developing strengths in specific types of programs such as technical education (Brewer, Gates, & Goldman, 2002). Finally, those in the middle, those seeking traditional academic prestige, are those that are actively investing in reputation and prestige generating activities—such as in developing a few selective graduate programs (Brewer, Gates, & Goldman, 2002). Here is where many of the public master's level institutions are thought to fall.

Yet, the emergence of the first empirical research on the pursuit of prestige, following the establishment of the Carnegie Classification system in the 1970's, occurred during a very different era from the present, one of robust state investment in higher education. As Figure 22 below suggests, pursuit of prestige was possible, and maybe even likely, through the 1970's and 1980's as states invested heavily in higher education. (This graphic shows state spending as a share of wealth as measured by personal income, thus suggesting state fiscal capacity.)

In the ten-year period from 1970 to 1980, state spending on higher education operating

expenses grew by an *average* of 202 percent (Chambers, 1980). In contrast, over the most recent five-year period, fiscal years 2010 through 2015, state spending on higher education operations grew by just 11.8 percent (Grapevine, 2016).

Figure 22. State higher education spending per $1000 in personal income[45]



With relatively flat public spending over the last couple of decades, it is hard to imagine a scenario in which public Master's universities would have the financial resources to invest in the pursuit of prestige, which is a very expensive and long term venture. As Brewer, Gates, and Goldman (2002) write, "institutions in pursuit of prestige are taking a risky gamble by investing in not what they are currently doing—but instead driving resources to a new set of activities that may or may not have some later payoff" (Brewer, Gates, & Goldman, 2002, p. 42). If pursuit of prestige is so risky and costly, is it still a viable strategy for public Master's universities?

Summary of findings

From the outset of this dissertation project, I theorized that the growth in graduate enrollments at public master's institutions was likely related to some combination of a pursuit of

[45] Grapevine. (2016). One-Year (FY15-FY16), Two-Year (FY14-FY16), and Five-Year (FY11-FY16) Percent Changes in State Fiscal Support for Higher Education. Normal: Grapevine: University of Illinois College of Education. Retrieved from https://education.illinoisstate.edu/grapevine/tables/

prestige which is coupled with a desire for greater institutional legitimacy (like that of the more prestigious research universities), the drive for additional resources in an era when state support was stagnant or falling, and/or an attempt to differentiate themselves from their competition for competitive reasons. What both the quantitative and qualitative findings from my analyses ultimately showed was that resources (both undergraduate student enrollments and state support) were important predictors of growth in graduate enrollments at public Master's universities but not entirely in the expected ways.

From the multiple regression analyses conducted in Chapter 4, I learned that the two best predictors of graduate enrollments are undergraduate enrollments and state appropriations.[46] Yet, I had hypothesized that graduate enrollments would be inversely related to state support and undergraduate enrollments. Resource dependency theory suggests that graduate enrollments may be one strategy that public Master's universities use to replace declines in traditional forms of revenue such as tuition and state appropriations. Instead, the statistical results demonstrated a strong positive relationship between these two traditional revenue streams and graduate enrollments. Notably, it seems that graduate enrollments may not represent a viable revenue strategy for public Master's universities because they are not "profitable," by and large.

In my two qualitative case studies, I probed deeper into this finding and learned that the mechanisms by which growth in undergraduate enrollments may enable growth in graduate enrollments are somewhat complicated. For Boise State University, financial flexibility comes from the fact that over 20 percent of their undergraduate enrollments are high paying non-

[46] As discussed in chapter 4, the effects of state appropriations and enrollments may be overestimated statistically as a result of omitted variable bias. Omitted variable bias occurs when a model leaves out one or more important factors that may be correlated with both the independent and dependent variables. In this case, the omitted variables biasing the results are likely associated with time (as are appropriations and undergraduate enrollments).

resident students. In addition, astute institutional leaders recognized opportunities to build low-cost, high enrollment undergraduate programs that generated enough surplus revenue to also fund graduate faculty. This, coupled with a relatively unregulated state oversight environment and successful local partnerships with generous private firms, meant that Boise State University had ample opportunity to pursue the research university model.

For California State University, Northridge, the mechanisms behind graduate enrollment growth are far more complicated. Low, state-mandated resident undergraduate tuition, coupled with a negligible (less than 5 percent) out of state student population (due to regulatory restrictions), give CSUN very little flexibility to subsidize growth in graduate programs with "surplus" undergraduate revenue. While there is some opportunity for symbiosis by leveraging graduate students to teach classes or run labs, most leaders at CSUN commented that graduate students still cost more to teach than any potential savings generated. Further compromising the ability of CSUN to generate resources from graduate education to replace stagnant state support were significant restrictions on graduate tuition rates.

As the quantitative findings seem to demonstrate, when public Master's universities have new resources from traditional sources, there is some evidence that they invest these resources in the growth of graduate education. While my statistical findings did not suggest that resource dependency in the expected sense of making up for missing state funding was a primary driver of growth in graduate enrollments, the qualitative case studies demonstrate that the mechanisms at work are much more complex and nuanced. Pfeffer and Salancik (1978) contend that organizations seek resources outside of those provided by the traditional sources they depend on (for public higher education: state governments) in order to reduce uncertainty and exercise more control over their revenue streams and ultimately their room for autonomous action (Pfeffer &

Salancik, 1978). While the quantitative findings demonstrated that the resource dependency variables were the best predictors of graduate enrollments, the results were in the opposite direction from what I expected. What the case studies revealed is that the ways in which institutions fund graduate education, and the motivations and benefits associated with growth, are more nuanced than the statistical models alone are able to show.

For Boise State University, reducing financial and decision-making dependence on the state government was critical to freeing up resources that they could use to invest in the pursuit of prestige. One of these new sources of revenue was growth in non-resident undergraduate enrollments. The non-resident tuition rates—at almost triple the price for resident students—created a significant amount of resource flexibility that they did not have with the traditional sources of state appropriations and resident tuition; and, the state did not restrict this source as many states (including California) do. While undergraduate enrollments (and in particular non-resident students) were not a significant enabler of growth in graduate education at CSUN, self-support enrollments were. Due to a lack of national data on revenue from self-support tuition programs, or even tuition revenue by category of fee paying student, there is no way to determine the extent to which non-traditional types of fee paying students matter for graduate programs but there are indications it is on the rise. For CSUN, according to my interviewees, self-support enrollments explain almost all of the growth in graduate enrollments in recent years. Due to the relatively low, state-mandated resident tuition rates for graduate students at CSUN and low state support per graduate student, the only new graduate programs CSUN has added in the last four years have been on the self-support side.

For CSUN, the use of self-support fee revenue speaks directly to resource dependency. The growth in graduate enrollments and programs would not have been possible without the

flexibility provided through their fee-based programs. Growth in these self-support programs not only enabled the creation of new graduate programs but also allowed for the hiring of new faculty and investments in other areas of the university that otherwise would not have been possible. With graduate education not a priority of the California State University System, many leaders described the growth in graduate enrollments as unlikely or impossible without an additional revenue source.

Part of what made CSUN so successful in building their self-support graduate programs was that they were the first CSU System institution to develop a robust array of offerings in fee-based programs. This meant that they benefited from both a relatively lax regulatory environment and significant unmet demand. Even as of Fall 2016, CSUN remained first among the CSU institutions in their fee-based program enrollments. Consistent with Michael Porter's competitive strategy framework, what CSUN did better than any other public institution in the Los Angeles area was recognize the opportunity and demand for applied, professionally oriented graduate (mostly master's) programs. In many cases, CSUN's fee-based programs are online offerings and competing directly with the much higher priced for-profit schools. In other cases, CSUN has been successful in delivering self-support programs both in the traditional model on their Northridge campus as well as at remote locations in the greater Los Angeles area.

While high institutional opportunity (population per institution statewide), my measure of intrastate competition from other colleges and universities, did not prove to be significantly correlated with growth in graduate enrollments in my quantitative model, it was certainly among the most important factors in Boise State University's growth. Compounding the lack of competition from other postsecondary institutions is the fact that the Boise area has been among the fastest growing metropolitan regions in the United States for the last ten years. With the

state's flagship university nearly 300 miles away, BSU had no problem making the case to the Idaho State Board of Education about why expansion in many of their graduate programs made sense. Notably, my national statistical results found that growth in the adult aged population within a state was significant and negatively correlated with graduate enrollments.[47] Yet, for both BSU and CSUN, the rapidly growing local population, coupled with low competition for those students, were the primary reasons demand remained steady and their programs were able to sustain growth over the two decades studied.

Consistent across both my quantitative and qualitative findings was that both the condition of the local economy and the nature of the workforce demand mattered for graduate enrollments. In both the statistical model for all years (1992-2012) as well as model I, covering 1992 through 2000, increases in the state unemployment rate were significantly and positively correlated with graduate enrollments. Consistent with these findings, both Boise State University and CSUN saw their graduate enrollments increase during the Great Recession. The impact of the recession on Boise State University's graduate programs and enrollments was likely buffered by its greater proportion of more traditional, research-oriented programs including at the PhD level. Consistent with Bedard & Herman's (2008) findings, Ph.D. enrollments at BSU were not at all impacted by the Great Recession (Bedard & Herman, 2008). Similarly, despite Boise being one of the hardest hit regional economies in the nation, nearly all of their graduate programs, with the exception of the MBA, continued to see growth through the recessionary period. An area ripe for future research is how enrollment demand across different types of graduate programs is impacted by current economic conditions—particularly at less prestigious, public

[47] A significant limitation of many of the variables in the statistical analysis was that they were measured at the state level as opposed to locally. In both Idaho and California, the overall state population trends are not quite different from the regions each of the case study institutions are located in.

Master's universities.

Contributions to Scholarship

The Relevance of Resource Dependency

When the quantitative and qualitative findings are taken together, they highlight several important contributions of this work. From the outset, I challenged the theory that public Master's university status represented a waypoint on the path towards becoming a research university. While there is arguably a long history where this was true, the changing higher education landscape—particularly as it relates to the finance of public institutions—makes the evolution towards the research university status much more challenging now. As the quantitative findings suggest and the case studies support, significant new revenue is required in order for institutions to grow graduate enrollments and add new programs—and graduate education (certainly at the master's level) is just one piece of the research university strategy. Yet, as the quantitative models demonstrate, there is little evidence that public Master's universities are using graduate enrollments as a strategy to mitigate losses in state support and other traditional sources of revenue.

Part of the explanation for this finding may be that, at most public Master's universities, there is not sizeable enough graduate enrollment demand for these programs to represent a legitimate revenue strategy. At my two case study institutions, which were chosen for their robust and rapidly growing graduate programs, there is evidence of both dependence on traditional revenue streams in order to grow graduate education as well as some promise in graduate enrollments representing a viable (though still limited) revenue strategy. As both CSUN and BSU demonstrate—growth in graduate education was simply not possible with the traditional revenue sources of state appropriations and resident tuition, alone. For CSUN, and to a more limited extent BSU, graduate enrollments, especially on the self-support side, provided a

new revenue source and reduced the institution's dependence on traditional and more restrictive sources. In an era of uncertain state support and substantial constraints on increasing undergraduate tuition, this revenue flexibility provided a critical vehicle for both these institutions to experiment with new programs and invest in activities that might have otherwise been outside their traditional scope.

Local Service Remains a Central Part of the Mission

While CSU and BSU are outliers nationally in graduate enrollment growth, in many other ways they are likely representative of the patterns seen across the public Master's sector as a whole. First and foremost, the vast majority of these institutions' graduate programmatic offerings continue to exist in applied programs that are strongly tied to their respective regions' workforces. Consistent with their original missions, both of these institutions remain firmly rooted in their focus on local service. Even as Boise State University has evolved towards the research university model—a huge part of how they have accomplished this is by establishing relationships with local companies. These symbiotic relationships have enabled BSU to commit to providing the specially trained, graduate prepared workers the companies need in exchange for substantial private gifts. This strategy is not likely replicable everywhere.

For CSUN, institutional leaders were among the first in the Cal State System to recognize a local need for a graduate prepared workforce and deliver programs in a way that made sense for both the workers and the institution. For CSUN, and likely many public Master's universities, competitive strategy remains the single most compelling framework for understanding the growth in their graduate programs. What BSU and CSUN have done especially well is recognize where opportunity is locally around graduate education and fill that niche.

State governance arrangements can dramatically impact graduate education

Both the quantitative analysis and qualitative case studies demonstrated that state

governance structures have a significant impact on graduate enrollments at public master's institutions. Consistent with prior literature on the role of state governance structures and their program approval responsibilities (McGuinness A. C., 2016; McLendon, Deaton, & Hearn, 2007; Tandberg D. , 2013), this study had three primary findings: (1) states with governing boards, whether state-level or system-level as in California, that have program approval responsibilities have significantly lower graduate enrollments; (2) institutions residing in states with coordinating boards (with and without program approval responsibilities) are more likely to have more robust graduate enrollments; and (3) consistent with McGuinness's (2016) findings, there is evidence that governing and coordinating boards are now exercising less authority over academic planning than they did in prior decades.

Consistent with the findings in Chapter 4, the California State University System (governing board) significantly limited the graduate program offerings at CSUN as well as their ability to grow graduate enrollments through the more traditional state-support model. For CSUN, the rules and policies of the CSU system as well as the California Master Plan limited their graduate programs in several important ways. First, and most directly related to the pursuit of prestige, CSUN has no ability to award Ph.D.'s and is strictly limited in the types of applied doctorates they can offer. Second, the current CSU funding model both restricts the amount that institutions can charge in graduate tuition and supports graduate enrollments with state revenue at rates that are just marginally higher than provided for undergraduate education. The impact of this funding model makes it nearly impossible to support graduate programs on the state support side—particularly in the expensive STEM fields. Lastly, the California State University System restricts the CSUN to the greater Los Angeles area for both marketing their degree offerings as well as delivering remote programs. The extent to which CSUN can continue to grow their

graduate enrollments is likely to be limited by the recent growth in competition from other CSU campuses in self-support programs as well as the constraints on where they can market and how they can fund their programs.

While BSU is located in a governing board state, the Idaho State Board of Education has done little to constrain the university's growth in graduate education—despite its formal program approval responsibility. While the Idaho State Board of Education has formal program approval responsibilities for both undergraduate and graduate programs, I can find no evidence—nor could an institutional leader recall—of a recent denial of a program approval at BSU. While the state board counts among its responsibilities preventing unnecessary duplication across institutions, Boise State University has made a concerted effort to demonstrate that their programs are both meaningfully different from those of the state's flagship institution and fulfill an unmet need. Further, BSU's growth has been enabled by less restrictive state policies around fee setting and institutional revenues than apply to CSUN. Boise State has had significantly more latitude in both developing and pricing their graduate programs, both on the state support and self-support sides, compared to CSUN. The case of Boise State is illustrative of a state coordinating board that had the formal authority to restrict the institution's explosive growth in graduate programs and march towards the research university model and chose not to. In the contemporary context, I believe that Boise's unique circumstances make this case relatively uncommon.

Lastly, in 2016, Aims McGuinness documented a long-term weakening of centralized academic planning in states. Where state governance structures once sought to prevent mission drift and restrict the growth in graduate programs at traditionally undergraduate institutions, they have more recently begun granting more authority to individual institutions (McGuinness A. C.,

2016). Consistent with McGuinness's findings, I found that this weakening of centralized planning responsibilities is associated with growth in graduate education at public Master's universities. Even in the highly centralized California State University System, a few campuses received approval to offer Ph.Ds jointly with the University of California in 2002 and doctorates in educational leadership in 2005 (Greenspan, 2007). Further, my quantitative analysis found that the governing board variable had significant and negative association with graduate enrollments in each of the three models: for 1992 through 2000, 2001 through 2012, and all years. Yet, the magnitude of this effect is unclear and likely varies significantly across states. Complicating the interpretation of this finding is Tandberg's finding that governing board states are significantly correlated with overall lower levels of state support (Tandberg, 2010). Given the dependency on traditional forms of revenue for growth in graduate enrollments at public Master's universities, it's possible that even with governing board states not fully exercising their program approval authority, there is still not sufficient revenue available to grow graduate programs at public Master's universities.

As McGuinness found, by 2008 most states had moved away from a statewide emphasis on preventing duplication of degree programs and protecting mission differentiation to long-term planning for realigning the size and shape of higher education to meet new attainment goals. To the extent that statewide degree attainment goals include graduate education, public Master's universities may have a new role to play within state higher education systems. The extent to which the growth in graduate enrollment can be explained by new state goals–and is made possible by more robust state support–is yet to be seen, but early evidence suggests that these institutions may have an expanded role in the new state degree attainment goals.

Pursuit of Prestige is Alive—But Limited

As my quantitative analysis found and the case study institutions illustrate, the factors motivating graduate enrollment growth are complex and pursuit of prestige is likely among the varied explanations. The quantitative models demonstrate clear evidence that public Master's universities continue to rely on traditional sources of revenue in order to grow graduate enrollments. This emphasizes the difficulty of achieving all of these things in the context of the current financial environment and makes the pursuit of the research university model an exceptionally difficult and risky strategy to follow. In almost every aspect Boise State University's successful move from public Master's university to a Carnegie classified research university in two short decades is an exception to the norm. The Boise State University evolution is due to many different circumstances converging at once with a successful and opportunistic leader at the helm who could take advantage of them. Boise State's successful pursuit of the research university model was enabled by being located in a rapidly growing metropolitan area with almost no competition from other nearby universities, significant resource flexibility, and a state coordinating board that gave BSU the freedom to expand and experiment with new degree programs and revenue sources. While it's possible that this same path to pursuit of research university status will be successful elsewhere, it will definitely be the exception and not the norm.

Just as the factors enabling growth in graduate enrollments are complex, so are the motivations. DiMaggio and Powell contend that organizations are motivated to engage in isomorphic behaviors as a result of a desire to attain legitimacy (DiMaggio & Powell, 1983). For Boise State University, reputation and the ability to engage with and attract high quality faculty and researchers was certainly a driving factor. At CSUN, this same search for reputation and prestige was limited to individual departments and faculty. Consistent with what Cyrenne and

Grant articulated, the pursuit of prestige and legitimacy is likely led by the faculty who were trained and may seek to emulate some aspects of the research university model (Cyrenne & Grant, 2009). While graduate enrollments alone do not necessarily represent a path to legitimacy for the institution, they certainly can legitimize and enable the research of ambitious faculty members in parts of it.

Yet, as the case of CSUN highlights, this pursuit of legitimacy and prestige through graduate education is likely limited to individual faculty and departments and is enormously difficult and expensive to scale-up to the university as a whole in most circumstances today. While some public Master's universities may be attempting to distinguish themselves with aspects of the research university model, most institutions are better characterized in the Brewer, Gates, and Goldman (2002) continuum as hybrids of pursuit of reputation as distinct from traditional academic prestige. As some of the faculty at CSUN highlighted, there are aspects of institutional operations wherein some of these public Master's universities are mirroring their more successful and prestigious research university counterparts Yet, for a variety of reasons—not the least of which is a lack of available resources—many are more focused on their local, undergraduate oriented missions. The growth in graduate education that I found across this sector is likely much better explained by competitive strategy in relation to local circumstances and opportunities, than it is by a single minded search for traditional forms of legitimacy or an attempt to become the next research university.

Future Research

Taken together, the statistical and qualitative strands of this research contributed to a better understanding of the nature of institutional motivations behind the recent development of graduate education at public Master's universities. Yet, this sector remains significantly under-

researched in nearly all areas of these institutions' operations. Due to significant limitations in my dataset, I was unable to develop a definitive statistical model for explaining the growth in graduate education in this sector. Significant limitations in the data for public Master's universities makes modeling determinants of long-term trends especially challenging. As a result, while much of the data is time series, and omitted variable bias likely significantly impacted the results. Future research should attempt to mitigate this issue in order to better explain graduate enrollment patterns as well as other trends within this sector. Finally, I hypothesize that the use of more local level variables as opposed to measures at the state level would better explain the changes in graduate enrollments across the sector.

Relatedly, one of the consistent themes throughout this study was the extent to which public Master's institutions contribute to the regions in which they are situated in multiple different ways. More research on the important role these institutions play within their communities could inform a new understanding of the reputation and value these institutions bring—generally quite independent of the research university model.

Finally, with renewed attention on student success and the important role that these institutions play as universities of opportunity for historically marginalized populations, it merits attention as to how well these institutions are serving these same populations in graduate education and their relative success rates both in terms of graduation and employment outcomes. As leaders at CSUN shared, the same mission that drives their work in serving diverse and underrepresented populations at the undergraduate level is important to their graduate education strategy. As states consider how to raise education attainment—particularly among historically underserved populations—it is worth understanding what if any lessons on student success can be leveraged from undergraduate education at these institutions into graduate education. As

occupations increasingly require graduate credentials, these institutions will have to be and are well positioned to be part of the solution.

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Appendix A: Boise State University Graduate Programs

Program	Degree Type	Department/School	College
Master of Science in Accountancy	M.S.	Accountancy	Business and Economics
Master of Science in Accountancy, Taxation	M.S.	Accountancy	Business and Economics
Master of Applied Anthropology	M.A.A.	Anthropology	Arts and Sciences
Master of Arts in Anthropology	M.A.	Anthropology	Arts and Sciences
Master of Arts in Art Education	M.A.	Art	Arts and Sciences
Master of Fine Arts, Visual Arts	M.F.A.	Art	Arts and Sciences
Master of Arts in Biology	M.A.	Biological Sciences	Arts and Sciences
Master of Science in Biology	M.S.	Biological Sciences	Arts and Sciences
Master of Science in Raptor Biology	M.S.	Biological Sciences	Arts and Sciences
Doctor of Philosophy in Biomolecular Sciences	Ph.D.	Biological Sciences/Chemistry and Biochemistry/Physics	Interdisciplinary Programs
Master of Science in Chemistry	M.S.	Chemistry and Biochemistry	Arts and Sciences
Master of Engineering in Civil Engineering	M.Engr.	Civil Engineering	Engineering
Master of Science in Civil Engineering	M.S.	Civil Engineering	Engineering
Doctor of Education in Curriculum and Instruction	Ed.D.	College of Education	Education
Master of Arts in Communication	M.A.	Communication	Arts and Sciences
Health Services Leadership	Certificate	Community and Environmental Health	Health Sciences
Master of Health Science, Health Policy	M.H.S.	Community and Environmental Health	Health Sciences
Master of Health Science, Health Promotion	M.H.S.	Community and Environmental Health	Health Sciences
Master of Health Science, Health Services Leadership	M.H.S.	Community and Environmental Health	Health Sciences
Addiction Studies	Certificate	Community and Environmental Health/Counselor Education	Interdisciplinary Programs
Computer Science Teacher Endorsement	Certificate	Computer Science	Engineering
Master of Science in Computer Science	M.S.	Computer Science	Engineering
Master of Arts in Counseling	M.A.	Counselor Education	Education
Master of Arts in Criminal Justice	M.A.	Criminal Justice	School of Public Service
Victim Services	Certificate	Criminal Justice	School of Public Service
Education Specialist in Executive	Ed.S.	Curriculum,	Education

Educational Leadership		Instruction and Foundational Studies	
Master of Arts in Education, Curriculum and Instruction	M.A.	Curriculum, Instruction and Foundational Studies	Education
Master of Education in Educational Leadership	M.Ed.	Curriculum, Instruction and Foundational Studies	Education
Master of Science in STEM Education	M.S.	Curriculum, Instruction and Foundational Studies	Education
Mathematics Consulting Teacher Endorsement	Certific ate	Curriculum, Instruction and Foundational Studies	Education
Secondary/K-12 Teaching	Certific ate	Curriculum, Instruction and Foundational Studies	Education
Consulting Teacher Endorsement: Behavioral Specialist	Certific ate	Early and Special Education	Education
Master in Teaching in Early Childhood Intervention	M.I.T.	Early and Special Education	Education
Master in Teaching in Special Education	M.I.T.	Early and Special Education	Education
Master of Education in Early and Special Education	M.Ed.	Early and Special Education	Education
Doctor of Education in Educational Technology	Ed.D.	Educational Technology	Education
Master of Educational Technology	M.E.T.	Educational Technology	Education
Master of Science in Educational Technology	M.S.	Educational Technology	Education
Online Teaching	Certific ate	Educational Technology	Education
School Technology Coordination	Certific ate	Educational Technology	Education
Technology Integration Specialist	Certific ate	Educational Technology	Education
Doctor of Philosophy in Electrical and Computer Engineering	Ph.D.	Electrical and Computer Engineering	Engineering
Master of Engineering in Computer Engineering	M.Engr.	Electrical and Computer Engineering	Engineering
Master of Engineering in Electrical Engineering	M.Engr.	Electrical and Computer Engineering	Engineering
Master of Science in Computer Engineering	M.S.	Electrical and Computer Engineering	Engineering
Master of Science in Electrical Engineering	M.S.	Electrical and	Engineering

		Computer Engineering	
Master of Arts in English, Literature	M.A.	English	Arts and Sciences
Master of Arts in English, Rhetoric and Composition	M.A.	English	Arts and Sciences
Master of Arts in Teaching English Language Arts	M.A.	English	Arts and Sciences
Master of Arts in Technical Communication	M.A.	English	Arts and Sciences
Master of Fine Arts in Creative Writing	M.F.A.	English	Arts and Sciences
Technical Communication	Certificate	English	Arts and Sciences
Doctor of Philosophy in Geophysics	Ph.D.	Geosciences	Arts and Sciences
Doctor of Philosophy in Geosciences	Ph.D.	Geosciences	Arts and Sciences
Geographic Information Analysis	Certificate	Geosciences	Arts and Sciences
Master of Earth Science	M.ESci.	Geosciences	Arts and Sciences
Master of Science in Geophysics	M.S.	Geosciences	Arts and Sciences
Master of Science in Geoscience	M.S.	Geosciences	Arts and Sciences
Master of Science in Hydrologic Sciences	M.S.	Geosciences/Civil Engineering	Interdisciplinary Programs
College Teaching	Certificate	Graduate College	Interdisciplinary Programs
Executive Master of Business Administration	M.B.A.	Graduate Studies	Business and Economics
Executive Master of Business Operational Excellence	M.B.O.E.	Graduate Studies	Business and Economics
Master of Business Administration, Full-Time Program	M.B.A.	Graduate Studies	Business and Economics
Master of Business Administration, Online Program	M.B.A.	Graduate Studies	Business and Economics
Master of Business Administration, Part-Time Program	M.B.A.	Graduate Studies	Business and Economics
Master of Business Administration, Part-Time Program Concurrent with University of Idaho Juris Doctorate	M.B.A.	Graduate Studies	Business and Economics
Master of Applied Historical Research	M.A.H.R.	History	Arts and Sciences
Master of Arts in History	M.A.	History	Arts and Sciences
Master of Arts in Interdisciplinary Studies	M.S.	Interdisciplinary Studies	Interdisciplinary Programs
Master of Science in Interdisciplinary Studies	M.S.	Interdisciplinary Studies	Interdisciplinary Programs
Master of Athletic Leadership	M.A.L.	Kinesiology	Health Sciences
Master of Kinesiology, Behavioral Studies	M.K.	Kinesiology	Health Sciences
Master of Kinesiology, Biophysical Studies	M.K.	Kinesiology	Health Sciences
Master of Kinesiology, Socio-historical Studies	M.K.	Kinesiology	Health Sciences

Master of Science in Kinesiology, Behavioral Studies	M.S.	Kinesiology	Health Sciences
Master of Science in Kinesiology, Biophysical Studies	M.S.	Kinesiology	Health Sciences
Master of Science in Kinesiology, Socio-historical Studies	M.S.	Kinesiology	Health Sciences
Master of Arts in Education, Literacy	M.A.	Literacy, Language, and Culture	Education
Master of Education in Bilingual Education	M.Ed.	Literacy, Language, and Culture	Education
Master of Education in English as a New Language	M.Ed.	Literacy, Language, and Culture	Education
Doctor of Philosophy in Materials Science and Engineering	Ph.D.	Materials Science and Engineering/Biological Sciences/Chemistry/Physics	Engineering
Doctor of Philosophy in Materials Science and Engineering	Ph.D.	Materials Science and Engineering/Biological Sciences/Chemistry/Physics	Interdisciplinary Programs
Master of Engineering in Materials Science and Engineering	M.Engr.	Materials Science and Engineering/Biological Sciences/Chemistry/Physics	Engineering
Master of Engineering in Materials Science and Engineering	M.Engr.	Materials Science and Engineering/Biological Sciences/Chemistry/Physics	Interdisciplinary Programs
Master of Science in Materials Science and Engineering	M.S.	Materials Science and Engineering/Biological Sciences/Chemistry/Physics	Engineering
Master of Science in Materials Science and Engineering	M.S.	Materials Science and Engineering/Biological Sciences/Chemistry/Physics	Interdisciplinary Programs
Master of Science in Mathematics	M.S.	Mathematics	Arts and Sciences
Master of Science in Mathematics Education	M.S.	Mathematics	Arts and Sciences
Master of Engineering in Mechanical Engineering	M.Engr.	Mechanical and Biomedical Engineering	Engineering
Master of Science in Mechanical Engineering	M.S.	Mechanical and Biomedical	Engineering

		Engineering	
Master of Music, Music Education	M.M.	Music	Arts and Sciences
Master of Music, Performance	M.M.	Music	Arts and Sciences
Adult Gerontology Nursing Practitioner Acute Care	Certificate	Nursing	Health Sciences
Adult Gerontology Nursing Practitioner Primary Care	Certificate	Nursing	Health Sciences
Adult Gerontology Nursing Practitioner, Acute Care Option	M.N.	Nursing	Health Sciences
Adult Gerontology Nursing Practitioner, Primary Care Option	M.N.	Nursing	Health Sciences
Doctor of Nursing Practice	D.N.P.	Nursing	Health Sciences
Healthcare Simulation	Certificate	Nursing	Health Sciences
Master of Science in Organizational Performance	M.S.	Organizational Performance and Workplace Learning	Engineering
Workplace E-Learning and Performance Support	Certificate	Organizational Performance and Workplace Learning	Engineering
Workplace Instructional Design	Certificate	Organizational Performance and Workplace Learning	Engineering
Workplace Performance Improvement	Certificate	Organizational Performance and Workplace Learning	Engineering
Master of Arts in Political Science	M.A.	Political Science	School of Public Service
Family Studies	Certificate	Psychology	Arts and Sciences
Conflict Management	Certificate	Public Policy and Administration	School of Public Service
Doctor of Philosophy in Public Policy and Administration	Ph.D.	Public Policy and Administration	School of Public Service
Master of Public Administration, Environmental, Natural Resource, and Energy Policy and Administration	M.P.A.	Public Policy and Administration	School of Public Service
Master of Public Administration, General Public Administration	M.P.A.	Public Policy and Administration	School of Public Service
Master of Public Administration, State and Local Government Policy and Administration	M.P.A.	Public Policy and Administration	School of Public Service
Master of Social Work	M.S.W.	Social Work	Health Sciences

Appendix B: California State University—Northridge Graduate Programs

Accountancy, M.S.	M.S.
Anthropology: General Anthropology, M.A.	M.A.
Anthropology: Public Archaeology, M.A.	M.A.
Applied Behavior Analysis, M.S.	M.S.
Art, M.F.A.	M.F.A.
Art: Art Education, M.A.	M.A.
Art: Art History, M.A.	M.A.
Art: Visual Arts, M.A.	M.A.
Assistive Technology Studies and Human Services, M.S.	M.S.
Biochemistry, M.S.	M.S.
Biology, M.S.	M.S.
Business Administration, M.B.A.	M.B.A.
Chemistry, M.S.	M.S.
Chicana/o Studies, M.A.	M.A.
Communication Studies, M.A.	M.A.
Communicative Disorders, M.S.	M.S.
Computer Engineering, M.S.	M.S.
Computer Science, M.S.	M.S.
Counseling: Career Counseling, M.S.	M.S.
Counseling: College Counseling and Student Services, M.S.	M.S.
Counseling: Marriage and Family Therapy, M.S.	M.S.
Counseling: School Counseling, M.S.	M.S.
Counseling: School Psychology, M.S.	M.S.
Education: Educational Psychology, M.A.	M.A.
Education: Elementary Education, M.A.	M.A.
Education: Secondary Education, M.A.	M.A.
Educational Administration, M.A.	M.A.
Educational Administration: Higher Education, M.A.	M.A.
Educational Leadership, Ed.D.	Ed.D.
Electrical Engineering, M.S.	M.S.
Engineering Management, M.S.	M.S.
English: Creative Writing, M.A.	M.A.
English: Literature, M.A.	M.A.
English: Rhetoric and Composition Theory, M.A.	M.A.
Environmental and Occupational Health, M.S.	M.S.
Environmental and Occupational Health: Industrial Hygiene, M.S.	M.S.

Family and Consumer Sciences, M.S.	M.S.
Geography: Geographic Information Science, M.A.	M.A.
Geography: Standard Program, M.A.	M.A.
Geology, Geology, M.S.	M.S.
Geology: Geophysics, M.S.	M.S.
Health Administration, M.S.	M.S.
History, M.A.	M.A.
Humanities, M.A.	M.A.
Kinesiology, M.S.	M.S.
Linguistics, M.A.	M.A.
Manufacturing Systems Engineering, M.S.	M.S.
Mass Communication, M.A.	M.A.
Materials Engineering, M.S.	M.S.
Mathematics, M.S.	M.S.
Mechanical Engineering, M.S.	M.S.
Music Industry Administration, M.A.	M.A.
Music: Collaborative Piano Performance, M.M.	M.M.
Music: Composition, M.M.	M.M.
Music: Conducting, M.M.	M.M.
Music: Performance, M.M.	M.M.
Physical Therapy, D.P.T	D.P.T
Physics, M.S.	M.S.
Political Science: American Politics, M.A.	M.A.
Political Science: Global Politics, M.A.	M.A.
Psychology: Clinical Psychology, M.A.	M.A.
Psychology: General Experimental Psychology, M.A.	M.A.
Public Administration: Geographical Information Systems and Technologies, M.P.A.	M.P.A.
Public Administration: Health Administration, M.P.A.	M.P.A.
Public Administration: Non-Profit Sector Management, M.P.A.	M.P.A.
Public Administration: Performance Management and Productivity in the Public Sector, M.P.A.	M.P.A.
Public Administration: Public Policy Analysis and Management, M.P.A.	M.P.A.
Public Administration: Public Sector Management and Leadership, M.P.A.	M.P.A.
Public Health: Applied Epidemiology, M.P.H.	M.P.H.
Public Health: Community Health Education, M.P.H.	M.P.H.
Screenwriting, M.F.A.	M.F.A.
Social Work, M.S.W.	M.S.W.
Sociology, M.A.	M.A.
Software Engineering, M.S.	M.S.
Spanish, M.A.	M.A.
Special Education: Deaf/Hard-of-Hearing, M.A.	M.A.

Special Education: Early Childhood Special Education, M.A.	M.A.
Special Education: Educational Therapy, M.A.	M.A.
Special Education: Mild/Moderate Disabilities, M.A.	M.A.
Special Education: Moderate/Severe Disabilities, M.A.	M.A.
Structural Engineering, M.S.	M.S.
Taxation, M.S.	M.S.
Teaching English as a Second Language, M.A.	M.A.
Theatre, M.A	M.A.
Tourism, Hospitality, and Recreation Management, M.S.	M.S.
Urban Planning, M.U.P.	M.U.P

Appendix C: Case Study Interview Questions

C-2. INTERVIEW PROTOCOL FOR INTERVIEW WITH UNIVERSITY EXECUTIVES

1. How do you view the role of graduate education in meeting the mission of the regional comprehensive university? How has the role of graduate education changed at your institution in the last twenty years?
2. What does the future of graduate education at regional comprehensives look like?
3. How does the local labor market impact how you think about growth in your graduate programs?
4. To what extent are graduate enrollment strategies and programs developed around local workforce needs? What about state and national?
5. Who is the primary audience for graduate education at your regional comprehensive university?
6. How do you view the impact of state support, unemployment rates, and neighboring universities when considering the growth of graduate programs?
7. What are the biggest threats to growth in graduate education at your university? What are the opportunities?
8. To what extent does graduate education lend the university legitimacy?
9. Do graduate programs help make your university more prestigious? Does prestige matter for your university? Why or why not?

APPENDIX C:

C-2. INTERVIEW PROTOCOL FOR INTERVIEW WITH GRADUATE PROGRAM LEADERS

1. How do you view the role of graduate education in meeting the mission of the regional comprehensive university?
2. How has the role of graduate education changed at your institution in the last twenty years?
3. What does the future of graduate education at your university look like?
4. How does the local labor market impact how you think about growth in your graduate programs?
5. To what extent was your program developed around local workforce needs? What about state and national?
6. Who is the primary audience for your program? Describe your typical student.
7. How do you view the impact of state support, unemployment rates, and neighboring universities when considering the growth of graduate programs?
8. What are the biggest threats to growth in your graduate program? What are the opportunities?
9. To what extent does graduate education lend the university legitimacy?
10. Do graduate programs help make your university more prestigious? What opportunities do graduate programs create that the university might otherwise not have?