BUILDING ORGANIZATIONAL CAPACITY AROUND THE RESEARCH ENTERPRISE: A CASE STUDY ON ORGANIZATIONAL MODEL AND SUCCESSFUL GROWTH

by

JAMILA R. EDWARDS

(Under the Direction of JAMES HEARN)

ABSTRACT

Decreasing levels of state funding and increased competition for students and tuition dollars have forced institutions of higher education to become more entrepreneurial and seek other means of increasing their resources. One of the ways in which institutions attempt to secure additional resources is by expanding their research enterprise and growing their sponsored research portfolio. In doing so, institutions often find that they must change their organizational model to build the capacity for this pursuit. This study examined the forces which influence the choice in organizational model when an institution restructures to build capacity to grow their research enterprise. I expected to see isomorphic forces at work on the organizational structure of Georgia State University's capacity building process, and potentially the use of merger strategies by the institution to gain financial autonomy. What I further sought to understand was if other forces specific to institutional environment and culture were at work in their restructuring process as well. These expected influences and forces were found at Georgia State, but not always in the ways initially anticipated.

INDEX WORDS: Organizational Structure, Research, Isomorphism, Resource Dependence, Capacity Building

BUILDING ORGANIZATIONAL CAPACITY AROUND THE RESEARCH ENTERPRISE: A CASE STUDY ON ORGANIZATIONAL MODEL AND SUCCESSFUL GROWTH

by

JAMILA R. EDWARDS

BA, University of Georgia, 1999-2003

MA, Georgia State University, 2009-2011

A Dissertation Submitted to the Graduate Faculty of The University of Georgia in Partial Fulfillment of the Requirements for the Degree

DOCTOR OF EDUCATION

ATHENS, GEORGIA

2017

BUILDING ORGANIZATIONAL CAPACITY AROUND THE RESEARCH ENTERPRISE:

A CASE STUDY ON ORGANIZATIONAL MODEL AND SUCCESSFUL GROWTH

by

JAMILA R. EDWARDS

Major Professor:	James Hearn Sheila
Committee:	Slaughter
	Libby Morris

Electronic Version Approved:

Suzanne Barbour
Dean of the Graduate School
The University of Georgia
December 2017

DEDICATION

This Dissertation is dedicated to my family and friends who have been the best support system I could have asked for through this process. Most especially, this is dedicated to my grandmother whom I lost during the first semester of the EDD program. She always believed I could do anything I set out to do, and I am completing this dissertation and doctoral program in her honor.

ACKNOWLEDGEMENTS

I would like to acknowledge Dr. James Hearn whose guidance and expertise made the completion of this dissertation possible. I would also like to acknowledge the faculty of the Institute of Higher Education each of the classes and professors I encountered throughout this program provided me with pieces of knowledge that provided the building blocks to complete this dissertation.

TABLE OF CONTENTS

Page

ACKNOWLEDGEMENTS v

LIST OF TABLES viii

LIST OF FIGURES ix

CHAPTER

1 STATEMENT OF THE PROBLEM 1

2 LITERATURE REVIEW AND THEORETICAL FRAMEWORK 10

Changing Role of Research in Modern Universities 10

Trends in University Organization and Finance 13

Dominant Organizational Models in Research Administration 18

Organizational Theories 23

Organizational Systems 24

Institutionalism 27

Resource Dependence 31

Theoretical Framework 34

3 RESEARCH DESIGN 37

Research Questions 37

Qualitative Research Approach 41

Sample 42

Data Collection Tools & Procedures 46

Data Analysis 48

Validity 49

Potential Research Bias....50
4 FINDINGS....51
Setting the Stage for Change....53
Influential Forces in Research at Georgia State University....54
Executive Leadership Matters....54
Georgia State Plans for a New Identity....56
Consultants Prescribe Solutions to Create Capacity....57
Peers Provide Models....60
Research Administration Takes a New Organizational Structure....61
Central Research Administration Structure....61
Colleges and Department Structures....62
Short-Term Outcomes and Looking Forward....64
5 CONCLUSION....70
Influential Forces in Restructuring....72
How GSU Chose a New Model....74
How the Research Enterprise Has Been Effected....77
Limitations....77
Recommendations for Future Study....79
Implications for Other Institutions....80
REFERENCES....86
APPENDICES
A Interview Protocol....92
B Organizational Chart for Research Administration....94

LIST OF TABLES AND CHARTS

Page

Chart 1: Research Funding by Performer 7

Table 1: Research Administration Functions and Responsibilities 19

Table 2: Research Administration Functions and Responsibilities Continued.....20

Table 3: Table of Participants.....52

Table 4: List of Peer Institutions.....60

LIST OF FIGURES

Page

Figure 1: Centralized Model 39

Figure 2: Service Center Model 40

Figure 3: Dual Reporting Structure 40

Figure 4: Huron's Recommended Organizational Structure 58

Figure 5: Georgia State University FY 2010 Federal Research Expenditures 68

Figure 6: Georgia State University FY 2016 Federal Research Expenditures 69

CHAPTER 1

STATEMENT OF THE PROBLEM

As state governments face shrinking budgets, competing priorities, public resistance to increased taxes, and prohibitions on deficit spending, state legislators are forced to make decisions on the relative essentiality of state services, including higher education (Cheslock & Gianneschi, 2008). "Higher education, a discretionary budget item in most states, has often been moved to the end of the state funding queue resulting in state governments allocating a smaller share of their spending towards higher education," (Cheslock & Gianneschi, 2008). This fiscal environment has forced institutions to become more industrious and seek ways to bolster their budgets with additional revenue sources such as externally funded research.

While research has long been a part of the activities conducted on college campuses in the United States, in recent years it has taken on an expanded role at colleges and universities in the U.S. and around the world. Institutions have shifted their expectations of faculty engagement in research, and universities themselves are investing significant resources into growing their research enterprise as well. “Total research and development expenditures per faculty member across 228 American research and doctoral universities increased from about $70,000 per faculty member in 1970-1971 to about $142,340 per faculty member in 1999-2000," (Ehrenberg, Rizzo, & Jakubson, 2003). The federal government’s investment in research and development has grown as well, going from $24.3 billion to $45.7 billion between 1997 and 2005 (Leslie, Slaughter, Taylor, & Zhang, 2012) indicating that this increased focus on research has implications beyond the changing landscape of higher education.

As the United States moved out of the Cold War and into an economy that favored competitive markets and privatization in the 1980s, public policy around science and technology shifted toward competitive uses of federal funds to commercialize science and technology in order to increase the U.S. share of global markets and to increase the number of high-technology, high-salary jobs in the domestic economy (Slaughter & Rhoades, 1996). Changes in policy such as the Bayh-Dole Act of 1980 opened up potentially lucrative possibilities for colleges and universities engaging in research and has created a culture in which academic capitalism is on the rise.

Bayh-Dole was created to incentivize national technological and economic competitiveness by allowing small businesses and non-profits (such as universities) to patent the outcomes of federally funded research and development (Owen-Smith, 2005). This is not to say that institutions were not previously involved in patenting activities, but this was the codification of the federal government's vision for the involvement of institutions of higher education in the shifting U.S. economy.

> "While many campuses were deeply involved in commerce prior to Bayh-Dole, the act standardized rules for university technology transfer, dramatically increased university patenting and licensing efforts, and accelerated the diffusion of organizational arrangements for the identification, management and marketing of intellectual property on campus,"(Owen-Smith, 2005).

The United States was shifting from an industrial to post-industrial economy to be anchored by information, service and technology based industries (Barrow, 1996). This policy

shift hoped to incite the development of applied science and technology that would spark such industries.

Jason Owen-Smith's (2005) study of the effect of institutional environment on university patent activity found that institutions which had established technology transfer offices prior to Bayh-Dole had an advantage and ability to set the rules for how these activities would function on campuses. New entrants to the technology transfer market would mimic those earlier institutions despite having fewer resources and lacking certain important competencies which points to the fact that institutions were and are eagerly entering the research market regardless of their preparedness to do so. (Owen-Smith, 2005)

As further evidence of increasing activity in the area of technology transfer at colleges and universities, "In calendar year 2012, the USPTO issued 253,155 utility patents, of which 4,797 (1.89%) were assigned to a U.S. college, university or association of U.S. colleges and universities," ("U.S. Colleges and Universites Utility Patent Grants 1969-2012," n.d.). In 1985 shortly after Bayh-Dole was passed only 594 or .83% of all utility patents were assigned to U.S. Academic Institutions. The institutions which received the largest numbers of patents in 2012 were the University of California, followed by the Massachusetts Institute of Technology, the University of Wisconsin, the University of Texas, Stanford University, and the California Institute of Technology. The University of California was the top academic institution in receiving patents from 1992-2012. ("U.S. Colleges and Universites Utility Patent Grants 1969-2012," n.d.)

While some of the institutions who have been prolific in patent activity have federal laboratories tied to their institution, there are also indicators that the institutions at some point adopted research as an important part of their mission and invested in growing the enterprise at

their institution. The University of California system which has been consistently prolific in its patent activity manages three national laboratories for the Department of Energy and has five medical centers among its campuses to leverage federal funding, but the system has also developed four institutes for science and innovation and several multi-campus and system wide research programs. As a result, in 2014 the UC system produced 1,727 inventions. ("The UC System," 2017.)

Similarly the University of Wisconsin spends over a billion dollars on research each year and touts 17 research and service centers as a part of its research enterprise ("About the UW," 2017). Stanford University also has a $1.6 billion budget for its research enterprise with 18 independent labs, centers and institutes ("Research-Stanford University," 2017). The University of Texas is a system with multiple campuses across the state, much like the University of California System. UT has six medical centers to leverage as part of its research enterprise, but it is facilities like the JJ Pickle Research Campus at UT Austin with 26 laboratories, institutes and centers including a technology incubator and global commercialization group that illustrate the systems commitment to research and particularly applied science and technology transfer. ("Off-Campus Research Sites," 2017)

The California Institute of Technology is a small institution that manages some NASA facilities including the Jet Propulsion Laboratory and boasts several space telescopes. However, it also has the nation's leading labs for solar fuels and 14 facilities and centers dedicated to "revolutionary instruments for chemistry and biology," ("Caltech Research," 2017).

The Massachusetts Institute of Technology is a small private institution that boasts a long history of interdisciplinary research and applied science that lead to the creation of such innovations as the electronic spreadsheet, radar and GPS systems ("About MIT," 2017). They are

different from many of the other schools who are productive in technology transfer because this type of applied research activity has been a part of the institutional identity almost since its inception.

The common thread for all of these institutions is a deep institutional commitment to their research enterprise and large investments in facilities to carry out these activities and facilitate future innovation. The breadth of their technology transfer activities and the scope of their research enterprise is evidence to how integral research has become to the mission of colleges and universities across the country.

State governments have also used colleges and universities as a tool to drive economic development for their respective states. Politicians have enacted laws and higher education policy that encourage capitalism, drive business creation, and lead to heightened human capital serving to attract business to the state (Warshaw & Hearn, 2014).

Examples of these state policies include the model for the development of the Centennial Campus at North Carolina State University. The institution was developing a new plot of land into the College of Textiles and an Engineering Graduate Research Center leveraging federal funds including three National Science Foundation Center Grants. The state assisted in the creation of additional research infrastructure by authorizing the institution to float self-financing bonds for further development which made it possible to develop research space for private tenants. Buildings constructed on this basis had to generate income to cover these costs, whether occupied by companies or university units. Several private companies leased space there and by 2002, the campus accommodated sixty-five corporate and government entities. (Geiger, 2004)

Another example of state policy which facilitated growth of the research enterprise are policies created by the state of Georgia. The Governor's Research Consortium supported the

creation of several specialized university centers from 1986 to 1990, usually by providing buildings and equipment. As the project expired, a group of Atlanta businessmen sought to sustain the effort, and also to rekindle the state's interest. They created the Georgia Research Alliance as a non-profit corporation directed by the CEOs of twelve Georgia Corporations and the presidents of the state's six principle universities. By 1999, over $300 million in state (79 percent) and private (21 percent) funds had been expended to create chairs for "eminent scholars" and support for research infrastructure (Geiger, 2004).

Later a group of scientists, consultants, universities and civic leaders met to devise a strategy for a focused development of high-tech industry and employment. The group concluded that the design of broadband telecommunications systems, devices and chips was the critical technology in which Atlanta and Georgia might develop a comparative advantage and international leadership. Atlanta possessed a large industry base, and design engineers were in short supply. If Georgia’s universities could supply technology and human capital they speculated, the industry would develop around these resources. The state committed $100 million over 5-7 years, and the program began in 2000. The bulk of the funds were dedicated to the creation of 84 faculty chairs at 8 institutions. (Geiger, 2004)

Along with increasing the commercialization of research, institutions have also increased the amount of federal research and development funds they are receiving.

Chart 1.

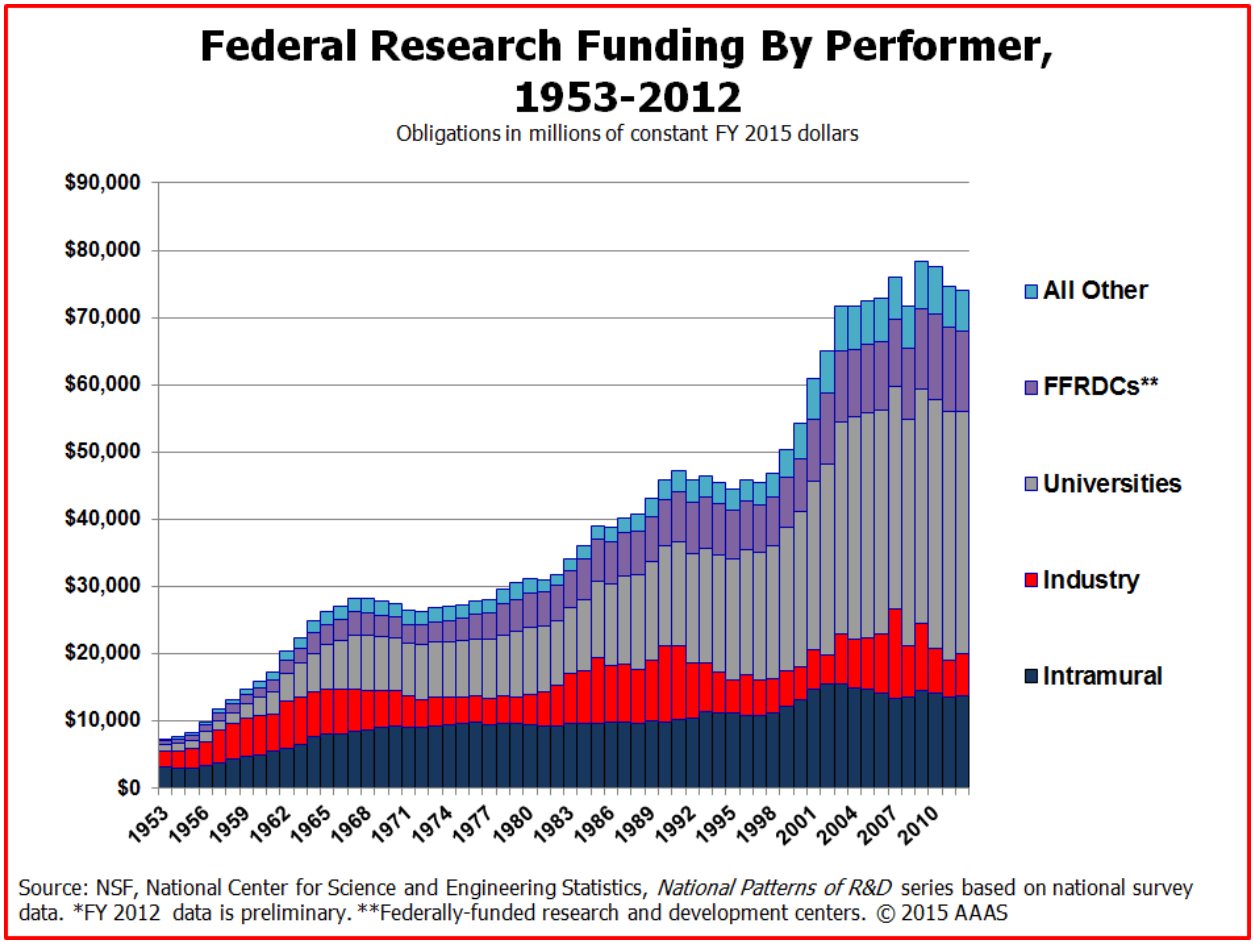

Chart 1 illustrates the steady increase in the share of federal research and development dollars going to U.S. colleges and universities between 1953 and 2012. The percentage of federal research and development dollars to higher education increased from .8% in 1953 to almost 19% in 2012. Federal spending on research and development has gone up significantly as well since the late 1970s making more funds available for colleges and universities to receive and leverage. Federal R&D spending increased from $76.1 billion in 1976 to over $150 billion in 2011 and 2012 in constant 2016 dollars ("Historical Trends in Federal R&D," 2017).

Institutions which have successfully increased their federal research funding over time have likely received another important commodity in higher education along with the money—prestige. Institutions often cite their level of federal research funding as a measure of quality and even state governments are using this statistic as a measure of institutional productivity (Brewer, Gates, & Goldman, 2009). Howard Bowen's revenue theory of costs suggests that universities spend all of the money they raise and can never raise enough because they seek to maximize excellence, prestige and quality (Leslie et al., 2012). Excellence and productivity in research has the ability to increase an institution's resources on many levels and it is therefore not surprising that institutions have prioritized research in recent decades.

The emphasis on research as a driver for national competitiveness in the global economy, an economic driver in the regional and local economy, and mechanism for achieving prestige contributes to tremendous growth of the research enterprise of colleges and universities. While studies have been done to examine what this growth has meant for faculty workload, academic departments, institutional budgets, and government spending and policy (Cheslock & Gianneschi, 2008; Gumport, 2000; Leslie et al., 2012; Rhoades & Slaughter, 1997; Slaughter & Rhoades, 1996; Warshaw & Hearn, 2014), little attention has been paid to the staff and various support functions involved in the research enterprise. We know that, "faculty represent a decreasing proportion of the professional workforce on college and university campuses: the growth category is non-faculty, 'managerial' professionals," (Rhoades & Slaughter, 1997). However, the role of these professionals and staff known as research administrators in growing the research enterprise is largely overlooked in the literature.

In this study I am seeking to understand how the increased focus on research at higher education institutions has affected the organizational structure of the research administration and support units at these institutions. The primary research question of this study is:

How has the increased focus on research at universities affected the organizational structure of the research administration and support units?

I examine the ways in which these offices are adapting and changing to manage larger portfolios and increase their capacity for continued growth of the research enterprise.

CHAPTER 2

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

There have been several studies on the rise of academic capitalism at institutions of higher education and the subsequent effect it has had on faculty, institutional resources and spending, and the academic structure of institutions. The area where the literature to date is lacking is in the examination of administrative structure and activities at institutions as they have ramped up their research activities.

Changing Role of Research in Modern Universities

In recent years, universities around the world have focused extensive resources on building their research capacity. In 2002 the expenditures for research at U.S. universities were estimated at 36.3 billion (Kulakowski, Chronister, & Research Enterprise, 2006). "With over 283 billion dollars in all sectors invested in research, including academics, government, and the private sector, external support for research has become a major source of revenue for institutions and a large percentage of research institution's total expenditures," (Kulakowski et al., 2006).

Gary Rhoades and Sheila Slaughter have done several studies on the rise of academic capitalism and higher education's shift from a focus on basic research to more applied science and technology transfer activities. In a 1996 article on the commercialization of academic science they noted that the narrative around the impetus to excel in research had changed significantly. As they put it:

> "With the breakdown of the traditional epics- 'winning the cold war,' 'the fight against disease'-that justify spending on science and technology, the rhetoric of

> ‘global competitiveness’ is an effort to create a new narrative of heroic proportion that serves similar purposes,” (Slaughter & Rhoades, 1996).

Rhoades and Slaughter’s (1996) study also sought to understand the political coalitions that worked to advance the research and development policy focused on national economic competitiveness and what the consequences of those new policies are for institutions of higher education.

Research and development policies such as the Bayh-Dole act of 1980, the Federal Technology Transfer Act of 1986, the Omnibus Trade and Competitiveness Act of 1988 and others served to change the face of how research is conducted at colleges and universities (Slaughter & Rhoades, 1996). Slaughter and Rhodes (1996) indicated that the effects of these policies included shifts in institutional rankings as institutions with more patents rose in the rankings, shifts in academic hierarchy as the salary of faculty who were able to engage in commercialization grew significantly and certain departments such as engineering and other applied sciences made significant moves in the institutional hierarchies. Another noted change was the move by federal agencies to fund more collaborative teams rather than individuals (Slaughter & Rhoades, 1996).

Research and development policy changes were not limited to the federal government. Historically, government, industry, and more recently, nonprofit foundations have been the primary supporters of research. However, the portfolio of sponsors has expanded to include state and local governments which are seeking university research support in the areas of health, transportation, agriculture, public service and utilities and the environment (Kulakowski et al., 2006). "Many states have sought to penetrate and open markets internationally, to shape demand

for and reap high profits from untried technologies," (Warshaw & Hearn, 2014). States have several levers they can pull to affect research activities at institutions of higher education, particularly public institutions. States can contract with universities and fund R&D, and they can adjust governance of public institutions to make it more or less decentralized among their means to incentivize increased R&D activity. Warshaw and Hearn (2014) found that the states in their study viewed research and development activities engaged in by universities to have a direct link to economic development in their respective states as they compete with other states in their region. This has resulted in the passing of legislation and the creation of state agencies and corporations in order to funnel state dollars toward encouraging private industry and university collaboration and engagement in research and development activities (Warshaw & Hearn, 2014).This is evidence that the impetus for institutions of higher education to be actively growing their research and development activities to spur economic growth is coming from all levels of government.

In a later study on academic capitalism, Rhoades and Slaughter (1997) examined the issue of academic restructuring and the changes to faculty roles and responsibilities as a result of the emphasis on commercialization and technology transfer. Some of the outcomes noted were increased investment in technology transfer activities on the part of universities, disparities in support, resources, and salaries for faculty and students in different fields, and highly differentiated job functions and security for some faculty (Rhoades & Slaughter, 1997).

Rhoades and Slaughter (1997) extensively examined the ways in which the shift to capitalist culture in colleges and universities have affected faculty. They observed that university managers are more frequently reorganizing faculty lines in the budget and hiring more part-time instructors to lessen faculty salary expenses and increase their flexibility without having to fire

too many people. Staff and other professionals are acknowledged in the study, but only to illustrate the resources being moved away from faculty and instructional spending.

> "The model here is one of hiring various technicians, clerical personnel, and some non-faculty professionals to staff these highly capitalized units… Not just numerical but in functional terms as well, faculty are being decentered as the sole professional production workers on campus," (Rhoades & Slaughter, 1997).

What is not discussed is the direct ways in which increased commercialization requires more professional staff to manage the ancillary activities of the research. The article also fails to address any issues of reorganization for staff or new roles and responsibilities in the face of an increased research and commercialization focus.

Trends in University Organization and Finance

In an attempt to take advantage of the opportunities presented by commercializing research, institutions are investing increasingly more of their funds and resources into growing their research enterprise (Ehrenberg et al., 2003). Studies have been done to examine the effects of these increased expenditures, some have looked at which area(s) of institutions are bearing the costs of these investments while others have examined whether research activities are being subsidized by other revenues at the institution.

In one study focused on determining who was bearing the cost of these increasingly large institutional investments in research, Ronald Ehrenberg (2003) and his colleagues found that undergraduate students were baring at least some portion of the cost of this investment although the magnitude was relatively small. The study noted the role of revenue from licensing

in potentially offsetting some of the expenditures but argued that this only held true at some universities. When reasoning through the increased spending the study discussed the costs of laboratory start-up and decreases in the indirect costs fees received from externally funded research as a motive for additional spending on the part of the university. This discussion of research administration costs and facility start-up and maintenance is one of the few times that auxiliary functions of research are mentioned in the literature on this topic (Ehrenberg et al., 2003).

In another study by Larry Leslie, Sheila Slaughter, Barrett Taylor and Liang Zhang (2012), the effect of revenue variations in U.S. research universities was examined to determine if the source of revenue influenced how funds were spent, or if other institutional priorities determined spending patterns. The study operated on the premise that institutions prioritized research over other functions at the institution and would therefore be reallocating funds from other areas to invest in the institution's research enterprise. Leslie, Slaughter, Taylor and Zhang's (2012) study found that public institutions generally paired their revenue with the matching expenditure categories while private institutions were prioritizing research and investing revenues from other categories into the research enterprise. This finding supports the idea that institutions are prioritizing research, as private universities have the most flexibility to reallocate funds across categories (Leslie et al., 2012).

Along with declining state appropriations and an increased focus on commercialization of research, there has also been a shift in federal funding practices and a broadening of funding sources for many institutions' research portfolio. Government, industry, and in more recent years nonprofit foundations have been the primary supporters of research. However, for many universities the portfolio of sponsors has expanded to include state and local governments which

are seeking university research support in the areas of health, transportation, agriculture, public service, and utilities and the environment (Kulakowski et al., 2006).

While the federal government remains the primary sponsor of university research, it has shifted its focus with respect to the type of projects it funds causing institutions to rethink their research strategies. Rhoades and Slaughter (1996) briefly discussed the increased funding by federal agencies of multiple-principal investigator and team grants in their article on growing an emerging research university, but Birx, Anderson-Fletcher, and Whitney (2013) more fully examined this shift.

The Birx, Anderson-Fletcher, and Whitney (2013) study was rooted in the idea that excellence and economic development can be created at an institution by developing and investing in research clusters with cross-disciplinary teams of researchers and community-partners focusing on one specific theme or broad focus area to build strategic areas of excellence. The advantages of this strategy included building partnerships with industry, the opportunity to take advantage of increased federal funding in these areas, and the additional strategic focus that these cores provide the larger university community. These research clusters are an example of structural change in response to a shift in federal funding priorities. Birx, Anderson-Fletcher, and Whitney (2013) discussed the hiring strategies for these clusters and the training opportunities for younger faculty, but very little attention was given to the complexity of managing and facilitating the research of such clusters. There was, in fact, no discussion of the support functions that are needed to develop and maintain these types of clusters and centers of excellence (Birx, Anderson-Fletcher, & Whitney, 2013).

Creso Sa´ (2008) studied the move toward more interdisciplinary research paying particular attention to strategies and organizational structures that could reinforce those multi-

discipline research activities. The Sa´ study involved site visits to five institutions which had distinctive strategies for facilitating the interdisciplinary research now so favored by the federal government and other research funders. The study found institutions like Pennsylvania State University were creating interdisciplinary research institutes that were funded by the university rather than being expected to run purely on external funding as such models had been in the past. This additional commitment by the university would certainly be appealing in attracting researchers to such institutes. Sa´ (2008) also found that a few institutions had changed their faculty recruitment and evaluation policies and practices in order to foster more interdisciplinary work. Some institutions even changed their traditional reward structure to incentivize this work.

> "Duke University and the University of Southern California have reformed their faculty promotion, evaluation and recognition policies to account for interdisciplinary interests. Both institutions now require colleges and schools to accommodate the interdisciplinary work of faculty in the evaluation, promotion, and tenure processes," (Sá, 2008).

Sa´ (2008) also discussed cluster hiring practices as a means of reinforcing interdisciplinary research. The Sa´ (2008) study focused on the ways in which institutions are engaging in academic restructuring and policy changes in order to support cross-discipline research, but there was still no mention of the additional challenges and needs that arise for all of the auxiliary research services in order to make these research institutes and large multi-site, multi-investigator projects possible (Sá, 2008). The role of research administration in these models was once again overlooked.

A study by Bercovitz, Burton, Feldman and Feller (2001) attempted to look at the effect of organizational structure on academic patenting and licensing behavior as a measure of increased academic capitalism and research activity. The study was a multiple-case study which looked specifically at patenting and licensing activity at Duke University, Johns Hopkins University and Pennsylvania State University. Bercovitz, Burton, Feldman and Feller proposed that technology transfer activities were shaped by the resources, reporting relationships, autonomy, and or incentives of technology transfer offices (Bercovitz, Feldman, Feller, & Burton, 2001).

The Bercovitz, Burton, Feldman and Feller (2001) study examined organizational structure models in each of three institutions and compared the level of technology transfer activity at each. This was an effort to see if a particular model would be a determinant of technology transfer productivity. Johns Hopkins was found to have decentralized technology transfer operations with four different technology transfer offices for each division of the institution and little central administrative control. Penn State had a more centralized model with one central technology transfer office that reported to the vice-president of research. Duke University had a far more complex matrix organizational model where there was centralization of oversight and reporting structure, but responsibilities for specific segments of activity were broken up and spread out. While Johns Hopkins was the most productive of the three institutions, the researchers noted that they were early adopters of technology transfer offices and likely had some advantage as a result. (Bercovitz et al., 2001)

It would be difficult to draw generalizable conclusions from the Bercovitz, Burton, Feldman and Feller (2001) study. However, as they were discerning which organizational models each institution most closely matched, it became evident that the organizational models

frequently reflected the history of the institutions, their individual institutional strengths and weaknesses, and environmental contexts (Bercovitz et al., 2001). It was also evident that the exclusion of the other functions of research administration in their consideration of models could impair their ability to draw conclusions from their findings as the functions are so interrelated and leadership often overlapped.

Dominant Organizational Models in Research Administration

The existing literature on organizational structures in research have focused very narrowly on particular aspects of the research enterprise. However, the research enterprise encompasses all units of the university that advocate, fund, manage, practice or report on research (Kulakowski et al., 2006).

> "When an institution is significantly engaged in the research enterprise, research administration is woven into the very fabric of the organization: nearly every operation within the institution is impacted in some way or another by the conduct and support of research," (Kulakowski et al., 2006).

On the campus of any given research institution the offices involved in the research enterprise can go by a variety of names, but have common responsibilities and activities they are engaged in. Table 1 and Table 2 identify the major functional areas of research administration and the activities encompassed in each area.

Table 1: Research Administration Responsibilities

Capacity Building and Marketing	Proposal Development and Submission	Award Negotiation and Acceptance	Research Protections and Regulatory Compliance
Identification of Faculty Expertise and Institutional Research Facilities	Budget Building	Award Review and Approval	Protection of Human Research Participants
Identification and Dissemination of Funding Opportunities	Proposal Writing, Editing, & Assembly	Contract Negotiations	Humane Care and Use of Animals
Identification of Infrastructure Elements	Proposal Compliance Reviews and Representations, Certification and Assurances	Award and Account Establishment	Conflict of Interest
Industrial Research Development and Management	Coordination of Multi-Institutional Proposals		Security and Export Controls
International Research Development and Management	Proposal Review, Approval, & Submission		Research Integrity
Marketing Research Capacity			Health and Safety

Derived from (Kulakowski et al., 2006)

Table 2: Research Administration Responsibilities (Continued)

Project Management	Financial Management	Intellectual Property and Technology Transfer	Research Administration Support and Institutional Research Administration Infrastructure Management.
Human Resource Management	Expenditure Monitoring	Invention Disclosures	Institutional Policy and Procedure
Purchase Requisitions	Accounting and Financial Reporting	Licensing	Electronic Research Administration
Subaward and Subcontract Administration		Technology Transfer	Property and Facility Management
Payroll/Effort	Cash-flow management	Copyrights	Records Management and Retention
Monitoring Project Deliverables	Project Closeout		F&A Rate Development
Technical and Administrative Reporting	Audit		Training
Clinical Trial Management			

Derived from (Kulakowski et al., 2006)

As institutions respond to the imperative to grow their research portfolio and engage in more research and development activities that lead to commercialization, they must consider their institutional capacity to manage these activities. Institutions will need to re-examine the organizational structure of their research administration to seek the increased efficiency, expanded services and additional capacity necessary to grow their research enterprise.

Beginning in the 1990s there was a noticeable shift of the consolidation of what is known as the pre-award and post-award financial responsibilities of research administration into a central Office of Research. The rationale for this stems from greater need for accountability and

coordination of all research related administrative activities (Kulakowski et al., 2006). While those functions can be consolidated in both a centralized and diffuse model of research administration, policy and oversight of the research enterprise generally remain a central office function. The choice between a centralized or a decentralized model tends to rest heavily on the size of the institution and their research portfolio (Kulakowski et al., 2006).

Smaller research institutions have a greater need for a centralized structure as it helps them to avoid redundancy and promote consistency. Larger institutions will often have a central research office, but they may decentralize some of its functions. Each department in Stanford's medical school has its own sponsored programs officer with signatory authority. Johns Hopkins and Ohio State have Sponsored Programs personnel in either Departments or Colleges. With decentralized functions the Office of Research assumes even greater coordinating and policy oversight responsibility (Kulakowski et al., 2006).

In a survey conducted for performance benchmarking of sponsored research in 1999 William Kirby and Paul Waugaman (2000) looked at reporting structures for sponsored research offices at universities. They found that the largest percentage of institutions in the sample had vice-presidents for research and the sponsored programs office reported to that office. The second largest reporting structure was a sponsored programs office reporting to the vice president for administration, but this occurred in primarily very small institutions. These structure tendencies were found whether an institution's model was centralized or diffused (Kirby & Waugaman, 2000).

In a subsequent collection of performance data for benchmarking Kirby and Waugaman (2005) sought answers to questions such as, "how well does the institution foster an environment that results in increased research activity and revenue (Competitiveness)?"; "how well does it use

and leverage available resources (Efficiency)?"; and "how well does it serve its faculty in the support of research competitiveness (Responsiveness)?" In addressing those performance issues they were able to document several trends in the organizational structure of research-intensive institutions. First they noted a trend toward decentralization of research administration activities from central administration to academic units. Decentralization appeared to be a key factor in improving responsiveness and fostering an environment that promotes faculty involvement in sponsored research and in return helps faculty recruitment. A second and related trend was the devolution of certain authorities from central offices to administrators in academic units. This movement of authority closer to where decisions are made may also be a key factor in both responsiveness and efficiency (Kirby & Waugaman, 2005).

The data from the subsequent benchmarking survey also showed a trend toward a combination of pre- and post-award functions under a single executive. "The reasons for doing so usually included: 1) better integration between financial and non-financial aspects of research administration, and 2) improved service by presenting a single face to the "researcher customer" and creating a more seamless process," (Kirby & Waugaman, 2005). Thirty-four percent of the institutions reported a structure that combined central pre-award and post-award financial functions in FY2000. This was up from 25% in FY 1998. In FY 2002 over 40% of respondent institutions reported having a research administration structure with some form of combined pre- and post-award functions, and most of the mid-sized institutions reported combined offices (Kirby & Waugaman, 2005).

While some institutions in the Kirby and Waugaman study (2005) reported increased capacity to manage their research portfolio as a result of the trends toward combined research offices and decentralization, others purported to be struggling with technology and infrastructure

in those models, lack of clarity with respect to roles and responsibilities and ineffective training (Kirby & Waugaman, 2005). It is clear that these organizational models for research administration are not one-size fit all. This makes the process of choosing an organizational model crucial to an institution's ability to build capacity around its research enterprise.

Organizational Theories

When an institution embarks on a mission to reorganize the structure of its research administration for capacity building, or otherwise, there are many approaches it can take to determine what the new iteration of the organization should look like. When the University of Hawaii realized that their current research infrastructure wasn't working well a task force was formed that derived from an ad hoc committee of faculty researchers called the University of Hawaii Association of Research Investigators to study the infrastructure. That committee was charged with studying the current structure and making recommendations to address the areas of concern (Chun, 2010).

The HARI made a report in 2001 suggesting several changes that could be made to research administration to improve the process of applying for and managing grants for faculty. Five years later the central research office at the University of Hawaii conducted a needs assessment to get feedback from the colleges and departments on what functions of research administration could be decentralized and delegated down to their units. Then in 2007 the Medical School at the University of Hawaii set a policy to delegate certain administrative responsibilities to the department (Chun, 2010).

It was in this environment that the Department of Surgery in the Medical School at the University of Hawaii decided that it needed to engage in more externally funded research and build a larger portfolio of sponsored projects. The department chair mandated that half of the

department's 46 compensated faculty members submit a competitive grant proposal to contribute to its evolution into a mature academic surgery department, fulfilling the tripartite mission of patient care, education, and research. The associate chair of the department responsible for administrative and fiscal matters was charged with determining how to build support around this initiative for the department and developing an organizational structure for this support (Chun, 2010).

There are a few theories of organizational structure which are relevant to this type of activity, particularly those theories which address the process of restructuring. I used these theories to frame my research on the ways in which institutions go about making the decision to restructure the administration of their research enterprise and choose an organizational model. It is important to first understand the organizational structure of colleges and universities in general, and then how theories such as institutionalism, neo-institutionalism and resource dependence factor into the restructuring process. These theories demonstrate how factors such as organizational culture, institutional environment and normative standards affect the decision process by which organizations determine the need for restructuring and what their new models should look like.

Organizational Systems

Robert Birnbaum's *How Colleges Work* (1988) describes the organizational structure of colleges and universities as a system with two subsystems; a technical subsystem and an administrative subsystem. In his model the technical subsystem is comprised of the elements of the university that turn inputs into outputs, such as faculty and research labs that turn students, books, and chemicals into graduates, knowledge, and status. The administrative subsystem is

made up of things like deans, regulations, and budgets that help to coordinate the organization (Birnbaum, 1988).

These two subsystems have elements in common such as department chairs, and they will overlap, interact and affect one another (Birnbaum, 1988). Birnbaum (1988) uses the example of Huxley College which he notes is an open system with relatively permeable boundaries as exemplified by the complex inputs of the college (i.e. people, ideas and tangible resources) which can't be accurately assessed or controlled and may have uncertain interactions. Further, outputs in this system aren't consumed; they return to the environment where they may again become inputs. It is also a dynamic non-linear system since the system parts are themselves systems; they constantly change as they interact with themselves and with the environment, and the system evolves overtime (Birnbaum, 1988).

The most important concept from Birnbaum's (1988) model of organizational systems at Huxley College is the model for how systems interact. He illustrates this interaction as black boxes with the mechanical make-up of an input rotor and an output rotor. In one box there is a predictable interaction where turning the input rotor would cause movement in the output motor at a one-to-one ratio. However, he said that systems at Huxley operated more like a second box in which a turn of the input motor would get you a movement of about half as much in the output motor, and when you turned the input rotor a second time you might get a three-quarter turn from the output rotor. The second box returned an unpredictable level of output for each input; almost random. The first model is an example of a tightly coupled system and the second a loosely coupled system (Birnbaum, 1988).

It may not be easy to readily identify whether a system is tightly or loosely coupled, but:

> "Conceptually they can be differentiated on two criteria: the extent to which subsystems have common variables between them and the extent to which the shared variables are important to the subsystems. If the subsystems have a great many components in common (like the gears on our predictable black box), and if those elements are among the most important in the subsystems, the subsystems are likely to be relatively tightly coupled, and changes in one should produce clear changes in the other," (Birnbaum, 1988).

On the other hand, the instructional and administrative subsystems of the simple School System of Huxley College had only one element in common, the department chair. If the chair is tightly coupled to one subsystem, it is almost certainly loosely coupled to the other (Birnbaum, 1988).

"Loose coupling has often been attacked as merely a slick way to describe waste, inefficiency, or indecisive leadership and as a convenient rationale for the crawling pace of organizational change," (Birnbaum, 1988). This is because changes in one subsystem might lead to changes in the other, but not always and certainly the amount and type of response are unpredictable as well.

Birnbaum's (1988) Huxley example is not very different from most colleges and universities. This makes it difficult to know if changing something in a university's organizational structure will produce a desired change, if any change at all, which can be a

confounding issue for administrators trying to determine how best to structure their research enterprise.

Institutionalism

Institutionalization is described as a rule-like framework for actions within an organization that are independent of a technological imperative (Scott, 2008). These aspects of the organization are independent of any one individual and situation and become the basis for organizational reproduction that allows an institution to sustain itself over time (Scott, 2008). Much of institutional theory is rooted in the work of Philip Selznick and his students at the University of California, Berkeley (Scott, 1987). Selznick viewed organizational structure as an adaptive vehicle shaped by the people who participated in it and the influence and constraints of the external environment (Scott, 1987). Contemporary theories of institutionalism tend to focus less on the causes of institutionalism and more on the consequences, particularly the establishment of permanence (Zucker, 1987).

The two elements that both traditional and neo-institutionalism have in common is the imitative or mimetic and normative processes by which they adapt. Where they differ is on the motive, source and locus of outcome of institutionalization (Zucker, 1987). The most notable work on the mimetic and normative processes by which institutions adapt is Paul DiMaggio and Walter Powell's (1983) article "The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields." According to DiMaggio and Powell (1983), "highly structured organizational fields provide a context in which individual efforts to deal rationally with uncertainty and constraint often lead in aggregate to homogeneity in structure, culture and output." They contend that several factors lead to institutional isomorphism, but isomorphism is by their definition the constraining process that forces one unit in a population to

resemble other units that face the same set of environmental conditions (DiMaggio & Powell, 1983).

DiMaggio and Powell (1983) define three methods of institutional isomorphic change: (1) coercive isomorphism that stems from external political influence and issues of legitimacy; (2) mimetic isomorphism resulting from uncertainty in the market; (3) normative isomorphism, which is associated with professionalization of an industry. It is important to note that coercive isomorphism can result from either formal or informal pressures placed on an organization by another organization which they depend on for resources or cultural expectations of the organization.

Uncertainty in the market is a powerful force in isomorphism. “When organizational technologies are poorly understood, when goals are ambiguous, or when the environment creates symbolic uncertainty, organizations may model themselves on other organizations,” (DiMaggio & Powell, 1983). This modeling after other organizations in their field which are perceived to be more legitimate or successful is the mimetic process of isomorphism. However, while organizations may mimic other organizations that they think are particularly successful, they are even more likely to emulate those that they trust (Morphew & Huisman, 2002).

DiMaggio and Powell (1983) stated that normative pressures stem primarily from professionalization. The education and cognitive base produced by the specialization of university staff along with the growth of professional associations and networks produce this normative pressure. Normative isomorphism also results from the filtering of personnel that occurs through the hiring of individuals from firms within the same industry from a narrow range of institutions; through common promotion practices such as always hiring top executives from

financial or legal departments; and from skill-level requirements for particular jobs. (DiMaggio & Powell, 1983)

DiMaggio and Powell (1983) present several predictors of isomorphic change that work either at the institutional level or the field level. At the institutional level they posit:

- The greater an organization's dependence on another organization, the more similar to that organization it will become in structure, climate and behavior.
- The more centralized an organization's resource supply, the greater the extent to which it will change to resemble the organizations on which it depends for resources.
- The more uncertain the relationship between means and ends, the greater the extent to which an organization will model itself after organizations it perceives to be successful.
- The more ambiguous the goals of an organization, the more likely that organization is to model itself after organizations it perceives to be successful.

The field level predictors they identified are as follows:

- The greater a field depends on a single source for resources, the higher the levels of isomorphism in the field.
- The greater extent to which the organizations in a field interact with agencies of the state, the greater the isomorphism in the field as a whole.

- The fewer the number of visible organizational model alternatives, the faster the rate of isomorphism in the field.
- The greater extent to which technologies are uncertain or goals are ambiguous, the higher the rate of isomorphic change in the field.
- The greater the extent of professionalization in the field, the greater the amount of institutional isomorphic change.
- The greater the degree of structuration in the field, the greater the degree of isomorphism. (DiMaggio & Powell, 1983)

This theory of institutional isomorphism is relevant to the study of organizational restructuring in research because it looks to explain why organizations are structured the way they are. More specifically it speaks to the institution's view of itself and its position in the market along with its competitors and other external influences that shape the institutions view of how it should be structured to be a successful and legitimate organization. We know "Organizations do not necessarily conform to a set of institutionalized beliefs because they 'constitute reality' or are taken for granted, but often because they are rewarded for doing so through increased legitimacy, resources, and survival capabilities,"(Scott, 1987).

Characteristics of this theory such as the uncertainty of the relationship between the means and the ends and the heavy dependence on one organization (i.e. the federal government) for resources are also hallmarks of the research enterprise at many colleges and universities. It is not clear if the way an institution's research administration is structured and its ability to get more external funding is connected, but an institution seeking to grow their external funding might look at the ways in which other institutions with high levels of external funding are

structured and mimic them in effort to achieve similar success. The federal government is the largest external funder of research and there are certain requirements imposed by federal agencies in order to receive their funding, therefore it is likely that many institutions will have similar structures in order to satisfy these requirements and to appeal to federal funding agencies. The administration of research is also a field that requires a great deal of professional knowledge with regard to finance, animal use, human subjects, biohazards and other areas that leads to a relatively small group of professionals who are often certified by and participate in the same professional organizations and move around amongst universities spreading common practices and ideas about how the research enterprise should be structured. In this way organizations of research administration are reproducing themselves.

Resource Dependence

Resource dependence theory is important to this study because “as in the case of institutional environments, it is difficult to separate the institutional and resource dependence arguments,"(Zucker, 1987). Stanford University professor Jeffrey Pfeffer is credited with the development of resource dependence theory. Pfeffer’s discussion of interorganizational relations, power and dependence, and how organizations use their power to manage their dependence in the 1978 book *External Control of Organizations* is where resource dependence theory was born (Davis & Cobb, 2009).

Resource dependence theory was developed to provide an alternative to economic theories of mergers and board interlocks.

> “The motivation of those running the organization was to ensure the organization's survival and to enhance their own autonomy, while also

> maintaining stability in the organization's exchange relations. These were the drivers behind many of the organization's observed actions… power often trumped profits, an insight distinctly at odds with the dominant economic approaches of the time," (Davis & Cobb, 2009).

The three core ideas of the theory are (1) social context matters; (2) organizations have strategies to increase their autonomy and pursue their interests; (3) locus of power is important to understanding the actions of an organization (Davis & Cobb, 2009). These interdependent relationships and dependence on a sole provider of a resource are all forces DiMaggio and Powell (1983) discuss as a factor in coercive isomorphism. Resource dependence theory provides a continuum of tactics to deal with this dependence or interdependence that ranges from least to most constraining. Basics of the theory suggests that managers "Choose the least-constraining device to govern relations with your exchange partners that will allow you to minimize uncertainty and dependence and maximize your autonomy," (Davis & Cobb, 2009).

The least entangling of these responses is to join professional associations or business organizations. Organizations might create an alliance with one another to pursue joint objectives. Theory also suggests that an organization can manage uncertainty by inviting a representative of the source of constraint onto its governing board, thus trading sovereignty for support (Davis & Cobb, 2009). "The expectation is that having a representative serving on the board provides the source of constraint with a vested interest in the dependent organization's survival," (Davis & Cobb, 2009). This form of networking is also critical to mimetic processes discussed in the theory of institutional isomorphism as organizational decision-makers are more likely to mimic

those organizations to which they have some interpersonal tie via boundary-spanning personnel (Morphew & Huisman, 2002).

The most constraining method of dealing with the uncertainty and interdependence is to absorb it within the organization through acquisitions and mergers. In his original study on mergers as a response to organizational interdependence Pfeffer wrote:

> "There also exists the possibility for organizations to deal with uncertainty or interdependence by absorbing it completely, through merger. First, companies may employ merger as a means for integration, by merging either forward or backward in the production process. This is an attempt to deal with symbiotic interdependence," (Pfeffer, 1972).

Pfeffer (1972) also suggested that companies may outright purchase other companies to reduce competition; or at least to the extent that the anti-trust laws will allow for that. The final strategy that he suggested organizations might employ to deal with resource dependence is a strategy of growth through diversification. He said, "If a firm is too dependent upon a portion of the environment for absorbing its output, or for providing an important input, it may diversify into other product or service areas, and thereby hopefully reduce its dependence on the portions of the environment with which it previously dealt," (Pfeffer, 1972).

Mergers generally take three forms: vertical (buying suppliers or buyers), horizontal (buying competitors) and diversifying (buying organizations in a different domain). Vertical integration represents an attempt to control exchanges vital to the organization's operation. Horizontal integration tries to increase power and decrease competition by limiting the number

of competitors. Diversification is a method for decreasing dependence on other dominant organizations (Davis & Cobb, 2009).

Resource dependence theory, much like institutional theory, speaks heavily to the interaction of organizations and the external environment of organizations. The particular focus in resource dependence theory is on competitors and those organizations on which your firm depends for resources. In research administration this would be representative of the interaction between colleges and universities and other centers and institutes that conduct research and the interaction with funding sources including government, foundations and industry.

As Pfeffer (1972) described, colleges and universities create alliances with one another as well as independent research centers and industry in the joint pursuit of external funding for their research. We also see the appointment of people in industry and from government and foundations to positions on the boards of colleges and universities. In some cases we see the reverse situation where faculty from institutions build similar relationships by serving on review boards or study sections for funders. We don't often see merger as a response to the external interdependence of the research enterprise at colleges and universities, but within the university there is the possibility that functions of the research enterprise are merged as the administrative structure is developed or restructured in an effort to consolidate control over certain functions or for efficiency and better use of resources.

Theoretical Framework

The theories of organizational behavior discussed highlight the ways which peer and aspirational institutions can influence the choices a university makes regarding structure. They also illuminate the influence that institutional environment and competition for the limited

resources from the same funding sources might have on universities when making decisions about how to adapt their organizational model to support the growth of their research enterprise.

As Cheslock and Gianneschi (2008) noted, the inability of decreasing state appropriations to cover the rising costs of educational inputs can substantially influence resource inequalities across public institutions and the other revenues raised by public institutions, these potential outcomes are often obscured and offset by increases in tuition and fee revenues. However, "when tuition dollars cannot be increased further, public higher education institutions will become especially reliant upon alternative sources of revenue," (Cheslock & Gianneschi, 2008). Add to this funding equation for public institutions that many do not have the ability to set their own tuition and fee rates and I would expect that public institutions in particular will exhibit behaviors in line with resource dependence theory and the associated strategies as they look to research commercialization as a means to decrease their dependence on state appropriations.

In particular universities would be likely to employ growth through diversification strategies to decrease their dependence on state appropriations. Similar to strategies described by Pfeffer (1972) they would enter into new fields of research or expand in areas they were only minimally involved in previously in order to expand their sponsored research portfolio. Additional resource dependence strategies used might also include networking strategies such as joining professional organizations and having staff at the institution serve as peer reviewers with sponsor organizations.

In a world of aspirational shoppers, where purchases so often express envy or anxiety about social status, prestige almost always manifests itself as the aura around any expensive commodity: a house, a car, a watch, a pair of shoes, or a college. In the United States colleges and universities market themselves by establishing a relationship to prestige (Donoghue, 2008).

"While reputation is achieved by institutions meeting specific consumer demands, prestige is less tangible, but generated through "prestige generators" such as student quality, research, and sports,"(O'meara, 2007). Of those prestige generators research is an area where change can more easily be affected. Prestige, once attained, can increase enrollment demands, student quality and other revenue streams such as alumni giving (O'meara, 2007).

Prestige in this context is synonymous with legitimacy as described by DiMaggio and Powell (1983). For this reason I would also expect to see institutions engaging in the behaviors described by institutional theory. Institutions which are aspirational and working to grow their portfolio will likely exhibit many characteristics of the mimetic and normative processes of isomorphism. These aspirational colleges and universities seeking legitimacy or prestige would be influenced to model themselves after institutions already established as legitimate and successful. In light of the potential networking behaviors exhibited by colleges and universities according to the resource dependence theory, I would also expect them to exhibit some normative isomorphic tendencies as well. The exchange of ideas that would come from that networking would lead to a normative standard of what the organization of research administration should look like. Further, the normative pull that would come from hiring professionals from other institutions in this specialized professional field would also lead to isomorphism in organizational structures.

CHAPTER 3

RESEARCH DESIGN

Research is among the key elements essential to the mission of higher education. “The importance of research cannot be overstated, nor can the importance of research administrators be overstated. In addition to helping investigators create proposals, research administrators ensure the accurate and efficient processing of awards from initial receipt to final closeout and managing research integrity and compliance (Lintz, 2008). However, much of the literature on the growing role of research and increased academic capitalism completely overlooks the role of research administration in this process. Expanding an institution’s capacity to conduct more research and manage more grants and contracts inherently means additional capacity has to be created in research administration. Whether an institution’s focus is on attracting more research faculty, developing innovative research centers, building more laboratory facilities, or a combination of these things and more, it still comes down to growing the amount of external funds coming into the institution for research and capitalizing on opportunities for commercialization. In doing so, institutions are often forced to examine their capacity to manage these funds and all of the requirements and compliances that come along with that external funding.

Research Questions

The research questions in this study are focused on how the research administration units of institutions are affected by commercialization and growth in externally funded research portfolios. In an effort to build the capacity to increase activities, or as a response to growth and increases in work for these offices, many institutions respond by making changes to the organizational structure of these functions at their institution. From my primary research

question "*How has the increased focus on research at universities affected the organizational structure of the research administration and other support units?"* a few sub-questions followed:

1. What influences motivate institutions to restructure the administrative structure of their research enterprise?
2. How do institutions choose a new organizational model when restructuring?
3. What are the steps involved in the process of reorganizing the administrative structure of the research enterprise at institutions of higher education?
4. How does the process of restructuring and the chosen model affect the research enterprise at the institution, particularly with regard to capacity for growth?

This study attempted to discern the ways in which institutional environment, organizational culture, and perceptions about prestige and legitimacy factor into choices about organizational structure. It also sought to understand the effects of the process and choice of organizational model on the institutional research enterprise and the capacity for successful and sustained growth as measured by the volume of projects and the size (in dollars) of the externally funded research portfolio.

At the heart of this study is the organizational structuring or restructuring around the research enterprise at institutions of higher education. That enterprise will look different at individual institutions depending on the nature and types of research conducted at the institution and the size of the research portfolio. It can range from a relatively simple structure to a highly complex one with a multitude of moving parts.

For those institutions seeking to change their organizational model, we know from Kirby and Waugaman (2005) there are a few common characteristics and trends to consider in research administration organization models widely used in recent years. Most institutions with a

sponsored research portfolio will have a Vice President or Vice Chancellor of Research and depending on the level of research intensity the structure may be more or less centralized (Kirby & Waugaman, 2005). Some institutions have some variation of a centralized model, others have more distributed models (often featuring service centers) and still others try models with dual reporting structures to facilitate oversight while gaining efficiencies and increasing responsiveness by having administrators closer to the faculty they support.

Centralized models usually include a central office which manages all of the administrative activity around research.

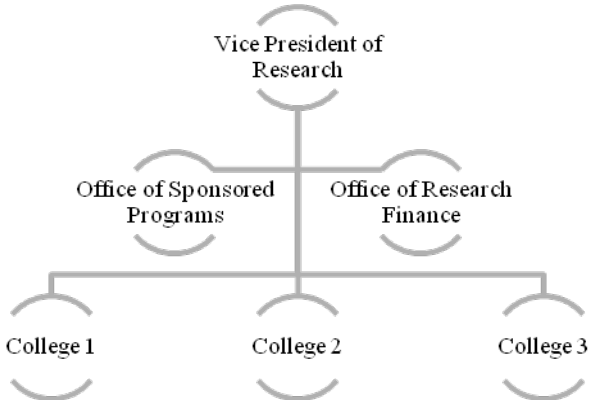

Figure 1. Centralized organizational model for university research administration

Distributed models generally focus on creating a unit which provides a breadth of services out in the colleges or divisions closer to the faculty they serve. There is likely still a central office in these models, but far more activity is occurring at the college or division level.

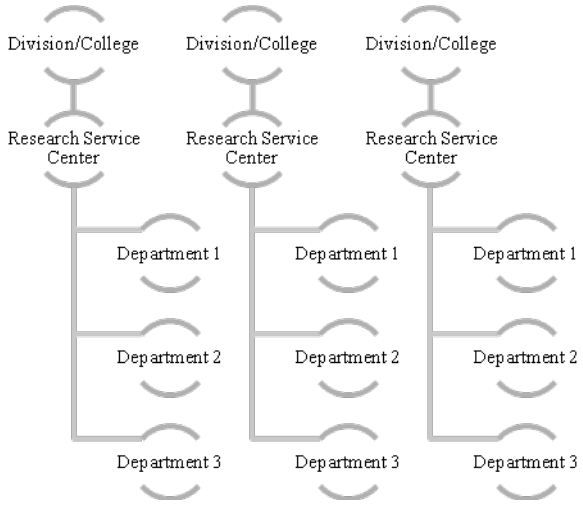

Figure 2. Service center organizational model of university research administration.

Another popular form of distributed model features multiple reporting structures for research administration units. Administrators will report to the department, college or institute which they service as well as a central office of research administration.

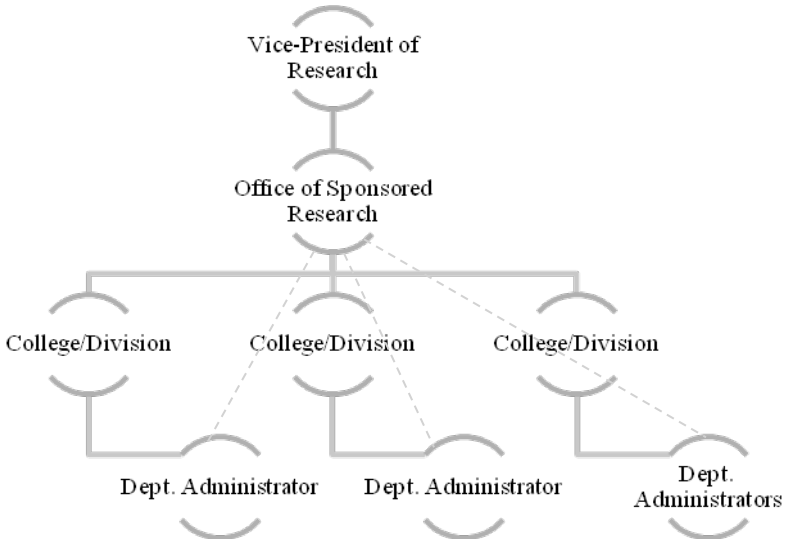

Figure 3. University research administration model featuring dual reporting structures.

Qualitative Research Approach

To better understand how institutions determine where their organizational structure will fall in the range of common models, I conducted as case study of an institution which had recently undergone significant growth in its research enterprise and change to its organizational structure.

"A case study is an intensive, holistic description and analysis of a single, bounded unit." (Merriam & Tisdell, 2016). Therefore, it seemed case study methods were the most appropriate modus operandi for understanding an institution's decision making process with respect to organizational structure and change management in the bounded area of research. By studying the research activities of a single institution I attempted to create an in-depth and holistic depiction of the research enterprise at that institution and the changes made to that enterprise over recent years.

The institution studied served as the 'case' and main unit of analysis for this study, but within that case it was necessary to narrow down the institutional offices and services which fit within the boundaries of the research enterprise. The narrowing down of these offices which constitute and contribute to the research activities and the various faculty and staff positions under that umbrella was based on the specific organizational structure of the institution and its history and culture.

This study sought to understand the decision making process university leadership went through when they chose to undergo an organizational structure change for their research administration.

> "The overall purpose of qualitative research is to achieve an understanding of how people make sense out of their lives, delineate the process (rather than the outcome or product) of meaning-making, and describe how people interpret what they experience," (Merriam & Tisdell, 2016).

Making meaning not just of the choices made, but of the process by which those choices are made was the focus and that line of inquiry was best pursued through this qualitative design.

The constructivist perspective I brought to this study lead me to seek understanding of the way in which individuals at institutions of higher education are interacting with one another when making decisions about how to structure their research administration organization. The study sought to understand how the perceptions that decision makers have of their institutions and their goals have influenced this process. "Constructivist researchers often address the processes of interaction among individuals. They also focus on specific contexts in which people live and work in order to understand the historical and cultural settings of the participants,"(Creswell, 2014).

Case studies are most appropriate for 'how' and 'why' questions (Yin, 2014), and those are precisely the types of questions being asked here. Particularly the questions of why did research administration at the institution change and how was that process born out?

Sample

Non-probability sampling is the method used for most qualitative research, the most common form of which is purposive sampling. Purposive sampling is based on the assumption that the investigator wants to understand and gain insight and therefore must select a sample from which they can learn the most (Merriam & Tisdell, 2016). With my background in research

administration I was able to select a university for this case study that I knew to have recently undergone the type of change I was interested in examining for this study. Further, I had an understanding of the organization that allowed me to sample and choose interviewees who were active in the research enterprise and could speak to the changes that had occurred at the institution. While including multiple cases and using maximum variation could have improved the validity of any findings from the study (Merriam & Tisdell, 2016), a study that seeks to go in-depth on a complex issue does not always lend itself well to a large sample.

There were two tiers to the sampling involved in this study. The first was choosing the institution to be the case studied. The second tier of the study was determining the samples within the case that fit the criteria of the study. The samples within the case were the faculty researchers, and research administration staff and university administrators.

The institution chosen for this case study was Georgia State University, which is located in downtown Atlanta, Georgia. Georgia State University began in 1913 as the Georgia Institute of Technology's "Evening School of Commerce." The school became independent in the 1930s when the Board of Regents was created to run the university system. However, in 1947 it was incorporated into the programs of the University of Georgia and became the "Atlanta Division of the University of Georgia." In 1955 the Board of Regents decided that the school was developing its own identity and separated it from the University of Georgia giving it the title "The Georgia State College of Business Administration." By 1961 the mission of the institution had expanded and it became "Georgia State College." In 1969 the Board of Regents changed the name once more to "Georgia State University," (Libraries, Dec. 8th, 2015).

In the last 20 years Georgia State University has expanded even more to add several additional schools and colleges including, the Andrew Young School of Policy Studies which

was started in 1996;(AYSPS, 2016) the Honors College in 2011; The School of Public Health in 2013; and the Institute for Biomedical Sciences in 2014 (GSU, 2016).

In January of 2015 the Board of Regents of the University System of Georgia voted to merge Georgia State University with Perimeter College (a two-year institution) to create a consolidated institution that would provide Associates through Doctoral degrees. The consolidated Georgia State University now serves over 50,000 students on multiple campuses throughout the metropolitan Atlanta area ("Consolidation," 2017). While this change significantly increased the number of students enrolled at the institution, the change didn't seem to have much bearing on the research enterprise. However, in that same year Georgia State University received the Carnegie Foundation's classification of Research University/Very High Research Activity, the highest classification that can be given to a doctoral granting institution.

The sponsored research portfolio more than doubled in the five-year period from fiscal-year 2011 to fiscal-year 2016, going from $58,186,712 to $121,806,300 ("About Georgia State University Research," 2016). In that time seven different university-level research centers were launched and are all housed in the Parker H. Petit Science Center; a high-tech 350,000 square foot building opened in 2010 to house new research and laboratory space (Craig, n.d.). In the fall of 2016 a new $45 million dollar, five-story building which links to the Petit Science Center was opened as part of phase II of the development of a science park on campus. The new Research Science Center is to support biomedical research as Georgia State looks to foster advancement and entrepreneurship in that field (Mullen, 2016).

After adding a technology transfer office to their research administration services and hiring an Associate Vice-President and Director of the Technology Licensing and Commercialization Office, Georgia State has also launched a biotechnology business incubator

called Collabtech (“About Georgia State University Research,” 2016). This tremendous expansion of the university and its research enterprise along with the growth of the sponsored research portfolio has caused significant change to the organizational structure around these activities as well.

The institution is located in the metropolitan Atlanta area along with Kennesaw State University, Emory University, the Georgia Institute of Technology, Mercer University and the historically black colleges which make up the Atlanta University Center: Spelman College, Morehouse College and Clark Atlanta University. While each of those institutions is quite different from GSU, they make for heavy competition for students, faculty and other resources in the Atlanta area including in the research market. (“About Georgia State University Research,” 2016)

In choosing participants to interview, I began with decision makers at the highest level of the organizational structure around university research administration that I could gain access to; starting with the Vice-Presidents of Research, Research Deans, and Sponsored Programs Directors at the institution. The rationale for choosing these individuals as the starting point is their likelihood to have been involved from the very earliest stages of the restructuring process and their likelihood of deep knowledge of other sources of information on the process.

In conducting interviews of administrators and leadership I inquired about other individuals who might be a good resource to speak with regarding the change process at the institution in a snowball sampling method. Many people pointed me in the direction of others who were already on my list, but in some cases I was able to reach out to interviewees I previously overlooked. The idea was to allow one person to point me toward another potential interview, and then another until the pool of interviewees at the institution grew to a large sample

size and began to yield a significant amount of redundant responses indicating that saturation had been reached (Merriam & Tisdell, 2016). “This idea of saturation comes from grounded theory. You stop collecting data when the categories are saturated: when gathering fresh data no longer sparks new insights or reveals new properties,” (Creswell, 2014). At the point where interviewee responses got redundant, enough subjects had been interviewed for the case and I looked to review documents to support and further explain some of the responses I received.

Data Collection Tools & Procedures

Prior to beginning the data collection process, I conducted an epoche. An epoche is the process by which researchers bracket or isolate their biases in order to be open to the findings of the research; it is essentially a step to help the researcher refrain from judgement (Merriam & Tisdell, 2016). This was an important step as my prior experience with the institution in this case study could have predisposed me to prejudices and personal judgments. “Researchers recognize that their own backgrounds shape their interpretation, and acknowledge how their interpretation flows from their personal, cultural, and historical experiences,”(Creswell, 2014). As the researcher, and primary instrument of the study, it was important not to allow my personal experiences to influence the data collection or analysis and to avoid leading interviewees to the answers I was expecting to receive. Conducting the epoche allowed me to acknowledge and bracket my own ideas about topics such as which parties should be involved in this decision making process, what considerations should be made for institutional identity, and other such elements of the organizational restructuring (Merriam & Tisdell, 2016).

This study relied heavily on interviews and participant accounts of the process which occurred at their institution. However, interviews were supplemented with a review of

documents including the strategic plan, a consulting report, job descriptions and organizational charts, and analysis of online resources and any archival data that was relevant.

For this case study it was important to design a research protocol for the interviews and the recording of data from documents and artifacts that would allow me to collect rich responses that I was able to organize and contextualize for the study (Creswell, 2014). In conducting the interviews I used a semi-structured interview format. I developed a list of questions designed to guide the conversation around the subject, but I used the list (which included a lot of open-ended questions) fluidly so that the flow of the conversation remained natural and allowed flexibility to follow up on interesting topics that were raised by the interviewee.

Only one of the interviewees asked to remain anonymous in the study, but for each of the other participants it was important to collect information on their current role at the institution and any previous positions they held in order to pinpoint their role in the restructuring process and to contextualize their responses. For example, I needed to ask each subject what their position at the institution was when they were first hired, what their specific job duties were, and what their current role and responsibilities are. I also asked each person their overall impression of the research enterprise when they first started at the institution and to compare that to the current environment. This helped to gain some insight into each participants' perspective of the change that has occurred at the institution.

The majority of the questions focused on the changes that each participant witnessed, what they felt were the impetus for that change and the affects they have witnessed on the organizational model. I sought to have people describe what changed about the way the auxiliary research offices do business and how their policy and process have been changed by the growth of the portfolio. Participants were also asked how decisions were made about changing the

model, who was involved, and how it was implemented. Therefore, the strategy of having a script of questions to bring the conversation back to the subject in question when it strayed was an essential part of the study design. Interviews were prolonged case study interviews which took place for 30 minutes to an hour.

I reviewed a significant amount of information online prior to conducting interviews and went back to review documents like the strategic plan once all of the interviews were conducted. These document reviews were done in order to gain some background information about the organization and the institutional history which allowed me to have a more informed conversation with the interviewees. I also reviewed some human resources documents to gain additional insight into the creation of entirely new staff positions and classifications. Finally, I reviewed some of the public curriculum vitae information for interviewees.

Data Analysis

My data set consists of the transcribed interviews of all the subjects, copies of any and all of the documents that are reviewed along with printouts from the websites reviewed. All of this information was stored in NVivo, the computer-assisted qualitative data analysis software (CAQDAS) which I used to assist in the coding and analysis of the data. “The creation of a case study database markedly increases the reliability of your entire case study,” (Yin, 2014). Therefore, I created a case study data base that consists of two separate collections: (1) the data or evidentiary base; and (2) the researcher’s report (i.e. my memos). My notes were kept as memos in NVivo along with the coded transcripts. The coding process occurred on a rolling basis after interviews were transcribed.

I used horizontalization when collecting and beginning to analyze my data. Beginning with an open coding process, I went through the documents and interview transcripts identifying

any information or response that seemed useful to answer the research questions or in some way interesting; giving equal value to all of the information coded. An open coding process is normally inductive, but the theories of institutional isomorphism, and resource dependence influenced some of the early codes chosen. Therefore, it was a somewhat deductive process, but other codes emerged as well that were not necessarily expected. Once all of the interviews were complete and I could visualize all of the linkages between the codes, I began the axial coding process to cull down the codes to a smaller number of major themes that make up the central findings of this study. During this process I had to self-check occasionally to make sure my own biases were still bracketed and not affecting the way that I analyzed the data. I tried to use the exact words of the participants as much as possible when creating codes as another measure to keep my biases out of the analyses.

Validity

"Trustworthiness, authenticity, and credibility all speak to the validity of data,"(Creswell, 2014). In an effort to address any questions of validity in the study I employed several techniques at various stages of the study to ensure that the data being collected portrayed as complete a picture as possible of the restructuring process and that any potential research biases were addressed as well. I employed data triangulation by interviewing participants with varying roles and perspectives about the same aspects of the research enterprise. This helped corroborate information that was provided, but when contradictory information was presented it also provided an important foil to the narrative as well. The document review and internet research also allowed me to create rich descriptions that are contextualized so that the results of the study may not be generalizable, but readers will have enough information about the case to determine for themselves if there are similarities with their own institutions that make the findings

meaningful for them. Finally, I built in a significant amount of self-reflection into the process to reduce the extent to which my experiences as a research administrator might bias my data collection or analysis.

Potential Research Bias

The potential biases that existed for me in this project stem from my experience as a research administrator and things that I observed working for institutions that were reorganizing their research administration structure and particularly my prior history with this institution. Those experiences left me with strong opinions about the planning process for such institutional changes, particularly with regard to who has input in those initial conversations and seeking buy-in from the larger research community at the institution. I also have strong opinions about issues created when leadership fails to give full consideration to all of the aspects of the institution affected by the proposed change. In addition, the choice in structure is one that I viewed to be more often decided by the type of institution that one aspires to, rather than modeling according to what is best suited to one's particular institution.

While it was possible that many of my preconceived notions could come to bare in the study, I had to ensure that the appearance of those themes occurred organically and not as the result of me inserting my opinion into the interviews. It was important to ensure that I allowed participants to give me a wide variety of responses rather than guiding the conversation toward my pre-conceived notions.

CHAPTER 4

FINDINGS

The purpose of this study was to gain understanding of the process of restructuring research administration in institutions of higher education. Specifically, it was an attempt to understand how institutions structure their research administration to support the growth of their sponsored research portfolio. To gain this understanding I conducted a case study of Georgia State University, an institution which has seen their sponsored research activity grow by 81% from 2014 to 2017("About Georgia State University Research," 2017).

In this chapter I shall present the findings of this case study as they answered the research questions that served to guide the study. I begin with an understanding of the research environment at the institution prior to this change process and then examining the forces which influenced the restructuring of research administration. Then I discuss the choices made for the new organizational structure and what the outcomes of these changes have been thus far, and also where the institution might go in the future.

In conducting my case study I invited 30 people involved in the research enterprise at the institution to participate and was able to interview 12. My sample consisted of 7 faculty members, 4 staff members and one executive administrator. The sample included people from 5 of the 10 schools and colleges at the university, one of the university research centers and the central research administration offices. Every individual interviewed had been employed at the university for more than five years and therefore had been present for the restructuring of research administration at the institution and the considerable growth in the research enterprise.

Table 3. Participants

School/Division	Faculty/Administration	Staff
Andrew Young School of Policy Studies	1	1
Center for Behavioral Neuroscience	1	
College of Arts and Sciences	1	2
College of Education	2	
School of Nursing	2	
School of Public Health	1	
University Research Services & Administration	1	

Table 3 shows the distribution of participants across the colleges and divisions at the institution. It is important to note that the faculty member from the Center for Behavioral Neuroscience serves as director for that center and has an appointment in the College of Arts and Sciences. Similarly, the Vice-President for Research and Economic Development is also a professor of Neuroscience and Biology. All of the faculty members interviewed serve in leadership roles at the institution and are, or have been, active researchers. The staff members interviewed represent pre- and post-award administration in the colleges as well as a research center and central research administration.

There seemed to be some hesitation on the part of staff members to participate in the study; while several were invited, few were willing to sit down and be interviewed. A couple of staff members initially agreed to participate and later backed out of participating. As a result, the sample is weighted more heavily toward faculty.

Each of the participants in this study was interviewed in person with interviews lasting from 30 minutes to one hour. I also reviewed the university's strategic plan, which was adopted

in 2011, a report from Huron Consulting on a study they conducted of the institution's research infrastructure in 2005, job descriptions and organizational charts.

Setting the Stage for Change

The expansion of the research enterprise at Georgia State came just as the institution began to change its culture and identity. Once a commuter school dominated by non-traditional students, the school began to experience changes in its student body, faculty, and leadership that eventually set the stage for the institution to become a Research I institution with the Carnegie Foundation's distinction of Very High Research Activity. As one faculty member put it,

> "All of our students were commuter students. Most of the students, more than half of them, were in the graduate programs. We taught most of our classes in the evening. So, it was, like, typical downtown commuter, kind of, a school where we would recruit students from businesses downtown."

From those days in the early 1990's, the institution now has 7 campuses with 10 schools and colleges and more than 50,000 students ("About Georgia State University," 2017).

Georgia State University's research enterprise is uniquely positioned due to the institution's location in the heart of Atlanta; the state's capital and largest city. "I felt that Georgia State had no place to go but up because it's in Atlanta. The best airport in the world is here. It's the only full service State University within the metropolitan area," said one faculty researcher of his choice to come to the university in the 1990s. The challenge for the institution was to find ways to leverage the advantages of their location and proximity to the political and business hub of the state.

The research infrastructure in the mid-1990s was lean. A faculty researcher in the neuroscience department stated, “We had one person who was a full-time animal care technician and then we also had a high school teacher who came after school and helped take care of the animals. So we had one and a half persons at that point in time.” A staff member noted that when she arrived at the institution in May of 2000 and began working as a staff assistant in the office of grants and contracts accounting the research portfolio at the institution was beginning to grow, but was hovering around $40 million in annual research expenditures. The research expenditures grew by 39% between 2000 and 2004 (Huron Consulting, 2005). However, by 2010 it was still hovering around the $60 million mark that it had reached much earlier in the decade.

Influential Forces in Research at Georgia State

Having experienced some significant growth of its research portfolio, but beginning to stagnate heading into the Great Recession of 2008/2009, most of the interviewees agreed that the growth in the research enterprise at Georgia State really began to take off with the hiring of Dr. Mark Becker as President in 2009.

Executive Leadership Matters

When Dr. Mark Becker was hired to be the President of Georgia State University the Board of Regents of the University System of Georgia seemed to be making a decision about the direction in which public higher education in the State Capital needed to go. As one faculty member stated:

> “When we hired Dr. Becker as our president, we knew what his agenda was going to be. He was very clear in his interview, he was the provost at the University of South Carolina, so he came from a traditional land grant [sic], research intensive

> institution and our Board of Regents hired him because they wanted the same thing at Georgia State."

The flagship institution of the state is 60 miles away from the center of business and economic growth in the state, and the other major state institution in the Atlanta area already had a strong identity as a specialized school of technology and engineering. Georgia State was growing, but had not yet solidified an identity making it prime for this type of shaping.

Just a couple of years after his arrival Dr. Becker hired a new Vice-President of Research and Economic Development in 2011. Dr. James Weyhenmeyer came to Georgia State University having previously served as the head of Research at the State University of New York system and the University of Illinois. Dr. Weyhenmeyer came to Georgia State as it was wrapping up the strategic planning process and the institution adopted a new strategic plan that same year.

> "I was asked to visit Georgia State at the back-end of their strategic planning exercise to really look at what the opportunities might be in the research area," he said. "The places that I was at previously had billion dollar portfolios. Georgia State was locked in to about fifty-five, fifty-six, fifty-seven million, and had been for some period of time. What I believe the President and Provost were looking for was somebody who would come in and essentially be a change agent as it relates to really dramatically increasing both the quality and the quantity of research that was going on at Georgia State," he explained.

While leadership changes were not the only influence on change in, and the growth of the research enterprise at the institution, it was certainly a major driving force. With Dr. Becker and

Dr. Weyhenmeyer in place it was clear that expanding the research enterprise would be a priority at the institution. As the Interim Dean of the School of Policy Studies put it, "the message here is clear from the president on down and it's in our strategic plan and the university really sets [itself] on the strategic plan and uses it." Another faculty member similarly commented, "We knew that the new president and the new provost were going to put a premium on research."

Georgia State Plans for a New Identity

The strategic plan adopted in 2011 laid out five goals for the institution as it moved into its second century, the third of which was "To become a leading public research university addressing the most challenging issues of the 21st Century," ("Strategic Plan 2011-2016/21," 2016). This research goal in the strategic plan had five associated initiatives: (1) Enhance the research culture; (2) Establish university level research centers; (3) Create a Georgia State Faculty Fellowship Program; (4) Enhance supporting infrastructure for the conduct of research; (5) Enhance Georgia State's contribution to the sciences, and health and medical research and education ("Strategic Plan 2011-2016/21," 2016). Each of these initiatives spoke to capacity building at Georgia State and fostering an environment that would be more supportive of researchers' efforts.

Concrete steps were taken by the institution to support the hiring of new research focused faculty as stated in the strategic plan initiatives. That first program instituted was the 'Second Century Initiative' to hire 100 new faculty between the year 2010 and 2015. The Program's goal was to build nationally and/or internationally recognized strength and critical mass around common research themes to enhance Georgia State University's overall quality, interdisciplinary richness, and competitiveness ("Georgia State Second Century Initiative," 2016). Departments could apply to the Vice President of Research's office for funding to hire faculty in certain focus

areas each of the five years of the program. The successor to the Second Century Initiative is the Next Generation Program which seeks to fund cluster hiring around strategic initiatives and scholarly themes at the institution ("Georgia State Second Century Initiative," 2016). This common strategy of cluster hiring and others such as creating university research centers, require significant capacity building to support the growth in the research enterprise and as the Dean of the Nursing School put it, "They've really put the money where those strategic initiatives are in terms of hiring researchers, building buildings, building infrastructure, improving the graduate college."

Consultants Prescribe Solutions to Create Capacity

In 2005, well before President Becker and Dr. Weyhenmeyer were hired, and also prior to the strategic plan, consultants were brought in from Huron Consulting to examine the research administration structure at the institution and determine what would be needed to increase the institution's research capacity.

> "They came in and looked at other institutions that are of the same size with similar resources in terms of infrastructure; comparing us not just locally but across the state and the southeast. They looked at what the other institutions were doing, what we were doing, and at our staffing and it was decided that there was some changes that were needed and that's one of the things that sparked the staffing changes and the way we are structured," said one central office staff member.

Huron has worked with research institutions across the country and leadership at Georgia State had engaged them with the primary objectives to review and evaluate the operations of the research support units at GSU and provide recommendations that would enable it to improve the service provided to the research community and more effectively manage its sponsored research activities. Huron determined that there were some significant deficiencies in Georgia State's research administration support structure. These areas included information technology, human resources, education and training, and research administration processes (Huron Consulting, 2005).

The report produced by Huron had some very specific recommendations for how to improve the research infrastructure at GSU. The primary problems observed by the consultants were inconsistencies in school and departmental level research administration support which led to inconsistent service levels for researchers and added strain on the central offices. Also, organizational models in the central research administration units were not scalable to handle the increased growth of the research enterprise. As a result a primary recommendation in the report was to restructure sponsored research administration at the institution. As a part of that reorganization Huron not only recommend specific titles and positions to add, but also pay grade increases and the development of training programs for research administrators.

The following organizational model shows the recommended organizational structure for central research administration from the Consulting report:

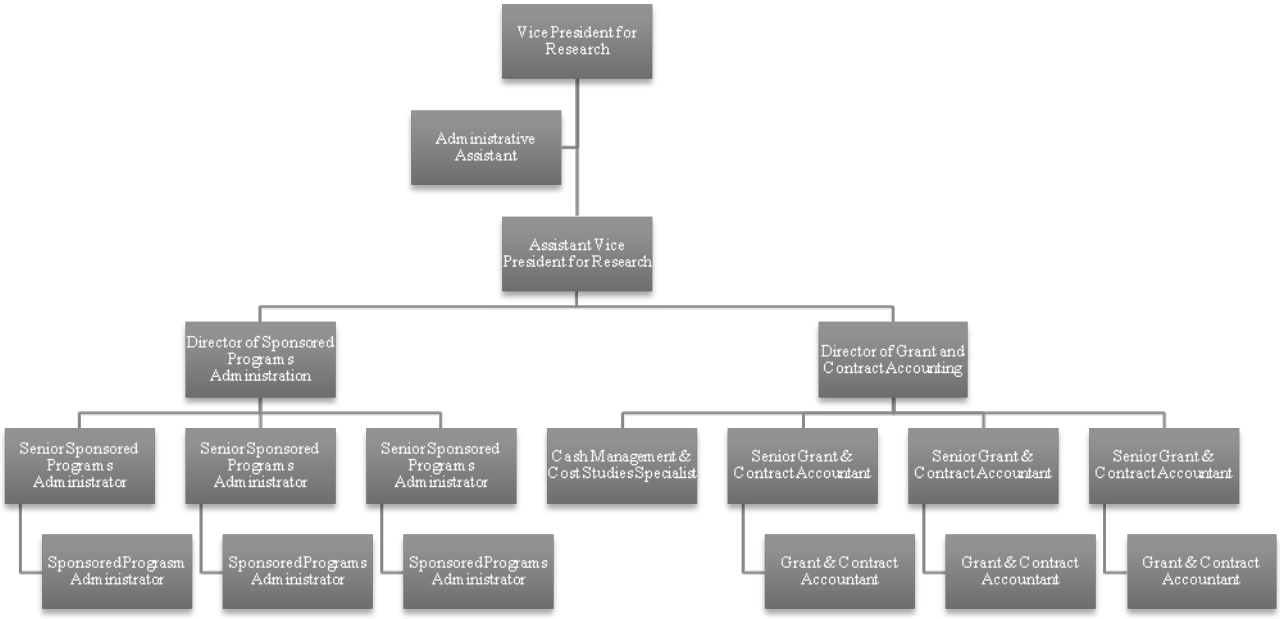

Figure 4: Huron's recommended organizational structure for central research administration from 2005 consulting report (Huron Consulting, 2005).

The Huron report also recommended changes to the central research integrity office which reported to the Vice President of Research. The recommendation was that an Associate Vice President of Research Integrity be hired to oversee the research subjects and IRB office along with the research safety office (Huron Consulting, 2005).

To correct the issues with research administration in the colleges, Huron recommended a "multi-unit support services" model for research administrative support within the academic units (Huron Consulting, 2005). This would allow for academic units which didn't have a large sponsored research portfolio and weren't able to support a full staff position to receive the highly skilled and specialized administrative support needed to assist with their research administration in a shared-service model. The ideas put forth by Huron to build the capacity of research administration at Georgia State reflects the organizational structure which can be seen in successful research institutions around the country and as seen in the Kirby & Wagauman (2005)

benchmarking survey. This is not surprising in light of their work with colleges and universities across the country. Huron has the benefit of intimate knowledge of the organizational structures at a variety of types of institution and can determine peers or aspirational institutions for Georgia State to use as a benchmark and/or model for their research administration.

Peers Provide Models

Increasing institutional research capacity and becoming more efficient is often rooted in utilizing best practices. As one staff member put it, "I believe in looking at the best practices, looking at who's done what, and what's not done to say, 'well, who's done it well?' and see where the opportunity is for us to create our own system or policies and process." Peer and aspirational institutions are crucial in the attempt to develop best practices. Most institutions have an evolving list of peer institutions that shifts as their institution changes. This list is in some cases developed as part of accreditation requirements, but it can be useful for processes like benchmarking the performance of your research administration.

The peer list developed by Huron in 2005 was as follows:

Table 4: List of peer institutions compiled by Huron Consulting for Georgia State University (Huron, 2005)

Florida International University	University of Houston
Kansas State University	University of Idaho
Rensselaer Polytechnic	University of Maine
Rice University	University of New Hampshire
Syracuse University	University of Rhode Island
University of Alabama in Huntsville	Utah State University
University of Alaska Fairbanks	Washington State University

One staff member noted that peer and aspirational institutions were influential in developing a training program for research administrators on campus. She mentioned that the training programs at Arizona State University and Emory University were looked to as Georgia State developed their program.

Research Administration Takes a New Organizational Structure

Despite having recommendations to reorganize the research administration functions as early as 2005, the reorganization of those functions at Georgia State began in earnest after Dr. Weyhenmeyer arrived at the institution in 2011.

Central Research Administration Structure

Research administration at Georgia State University is currently lead by Dr. James Weyhenmeyer, Vice President for Research and Economic Development. There are three Assistant and two Associate Vice-Presidents reporting to Dr. Weyhenmeyer; the Assistant Vice-President of the Office of Sponsored Proposals and Awards, the Associate Vice-President for Research Integrity, the Assistant Vice-President for Research Solutions, the Assistant Vice-President for New Ventures and Senior Licensing Agent, and the Associate Vice-President and Director for the Office of Technology Transfer & Commercialization. The AVP of Sponsored Proposals & Awards oversees four teams of pre-award administrators and post-award financial analysts, each lead by an Associate Director. The AVP of Research Integrity oversees a team in charge of human research protection and a team in charge of research safety programs, each lead by a director. The AVP of Research Solutions oversees a team that manages research computing and the computer systems used to manage aspects of research administration including the financial management system, the system used to submit grant applications to Grants.gov for federal proposals, and a research portal for internal reporting. There are also a few directors who

report directly to the VP for Research including the Director of Animal Services and the Director of Facilities. (See Appendix B for the full organizational chart for University Research Services and Administration at Georgia State)

College and Departmental Structures

The structure of research administration in the colleges varies, but each have staff in the role of grants and contracts officer. Those staff members who serve in the role of Grants and Contracts Officer III have dual reporting structures with a reporting line within their college and a line which goes to the central Office of Sponsored Proposals and Awards. Currently, the College of Arts and Sciences which contains all of the basic science departments has the largest sponsored research portfolio and consequently the most research administration staff. The College of Education and Human Development also has extensive research administration staff having established an Office of Research and Sponsored Programs within the college. None of the other schools and colleges has as many staff dedicated to research administration, but most have at least one Grants and Contracts Officer in the Dean's Office of the College or School and business managers in the departments who assist with some of the research administration responsibilities. There is currently one Grants and Contracts Officer who supports the University Research Centers and is supported by other administrative positions.

According to an interviewee in the College of Arts and Sciences, many of the research administrators there started out in departments where there were more research activity and as part of the re-organization they were pulled from their departments and put into one office which supports the entire school. The new office in Arts & Sciences has four Grants and Contracts Officer III positions, and each of them have two Grants and Contracts Officer II positions which report to them. Half of those teams are pre-award administrators and the other half are post-

award. Generally the post-award portfolio is divided so that one-post award team handles the departments that encompass the natural sciences while the other team handles the rest of the college. The pre-award team is not assigned in this same way in order to have more flexibility to control the workload balance.

In the College of Education, administrators had the foresight to set up a service unit for research administration prior to the larger shifts in research administration at the university. One administrator stated,

> "Five years ago, we were doing about 12 million dollars in external funding which is not too bad for a traditional College of Education, but we knew we had to enhance that. So, we changed the name from Educational Research Bureau to The Office of Research and Sponsored Programs. So, any of our externally funded programs goes through that office, and in that office, we have three people who are designated as pre-award, and the pre-award people will do everything from locating a grant to managing – putting it together, all the way to the submission."

He went on to say,

> "We have two post-award people, only two because four of the seven departments have significant numbers of grants and they need something locally within their department. We've embedded a post-award person who manages the grants, and the other three departments that don't have as much research funding going on

including the Dean's office, they're assigned a post award person in the office of research and sponsored projects."

The College of Education and Human Development Office of Sponsored Programs and Awards have three pre-award administrators and two post-award administrators with one administrative assistant lead by a director. A faculty administrator in COHED explained that pre-award sponsored research administrators in ORSP are called ORSP Liaisons and when new faculty are hired they are assigned an ORSP Liaison before they even get on campus who will get to know their research interests and work with them to identify funding opportunities, submit proposals and generally support the process of getting them external research funding.

Short-term Outcomes and Looking Forward

As a result of the organizational changes both centrally and in the academic units, some research administration responsibilities were shifted from the central office out to the colleges and academic units. One sponsored research administrator said that she felt the shifts made the positions in the colleges and departments more attractive to experienced research administrators and as a result several people noted that they felt there was far more skill and experience in those offices than in the past. This has been particularly true for the post-award financial administrators who are far more involved in areas such as cash management and invoicing than they had ever been prior to the reorganization.

Pre-award administrators have found that working in service center units where they serve multiple academic units has led to a broadening of their knowledge and skill set as they have the opportunity to work with a wider variety of faculty research and a wider variety of

sponsors. In addition a staff member also said the new structure creates an opportunity for advancement and development for administrators that is motivating for them. Being able to plot a career path, she said, helps them to be more invested in their profession.

Staff interviewees working in the schools and colleges expressed concerns about staffing levels stating that they felt overwhelmed at times and could probably use additional employees to manage the workload. On the other hand, a staff member in the central offices stated that she was surprised by how much the staff of that office had grown over the last few years in light of the responsibilities that have now been moved out to the academic unit administrators. She also expressed that the institution had invested in several software solutions to assist in the management of research to create some efficiencies in those processes to reduce the need for additional staff. However, the staff had not only increased, an entirely new team was created to manage those solutions.

The other chief concern expressed by staff was about the communication between the central office staff and research administrators working out in the schools and colleges. Changes to the organizational model have not aided in bridging that gap much despite the dual reporting lines for those in the Grants and Contracts Officer III position.

The College of Arts and Sciences decided to hire a new position within their college called the Chief Research Officer who would be responsible for managing all of the research administration staff for the college and coordinating services to faculty. The ability to assess the college's needs and change the structure to create a solution is one of the strengths of the way in which Georgia State University is operated. The ability to be flexible and innovative is a real strength according to the Interim Dean of the School of Policy Studies. The School of Policy Studies has created a mechanism by which faculty in departments without experienced post-

award financial support can shop for assistance from an administrator in another department by sharing a small portion of the indirect costs received on that grant with the other department. These, the Dean said, were small changes that had been effective in helping the faculty to feel more supported in their research and working well for the college thus far.

For the School of Public Health, a newer school on campus, it is still working out the details of its organizational structure. According to their Dean for Research,

> "We've had to reorganize ourselves, we tried to figure out who should do what and where, where they should sit and how they should relate to other people. All those sorts of very detailed issues become very important for the organizational function and we've gone through that and are going through that in a major way and trying to expand the service and the people that we have available to do that."

The model at the School of Public Health has been tested over the past several months as they put in multiple applications for large centers grants that were very complicated and required a great deal of support and expertise. As a result the school is still trying to determine exactly what the best organizational model is for their academic units.

The Deans of each of the schools and colleges at the university have added motivation for finding ways to make the new organizational model work for their division. As a part of the initiatives under the implementation of the strategic plan, each dean was given the goal of growing their individual school's sponsored research portfolio by ten percent each year and their success or failure in that measure was a part of their annual evaluation by the provost.

The overall feeling by the interviewees was that the new model is working well and if you are measuring success by the size of the research portfolio and expenditures there is no arguing that the institution has been growing successfully over the last several years. In fiscal year 2016 grant award funding for the university was up to $120,180,000 (Cherry, Bekaert CPAs & Advisors, 2016) compared to $61,060,312 in FY 2010 (Cherry, Bekaert & Holland, 2010). While the growth itself may not be directly attributable to changes in the organizational model, it would require a significant amount of additional support for faculty to bring in and manage twice as much funding. The type of research being conducted and funded at the institution shifted significantly in that time period going from three federal agencies (the National Science Foundation, the Department of Education, and the National Institutes of Health) making up 83 percent of the federal expenditures with each agency representing similar sized portions of the portfolio in FY2010 to the National Institutes of Health making up 64 percent of the federal expenditures in FY2016.

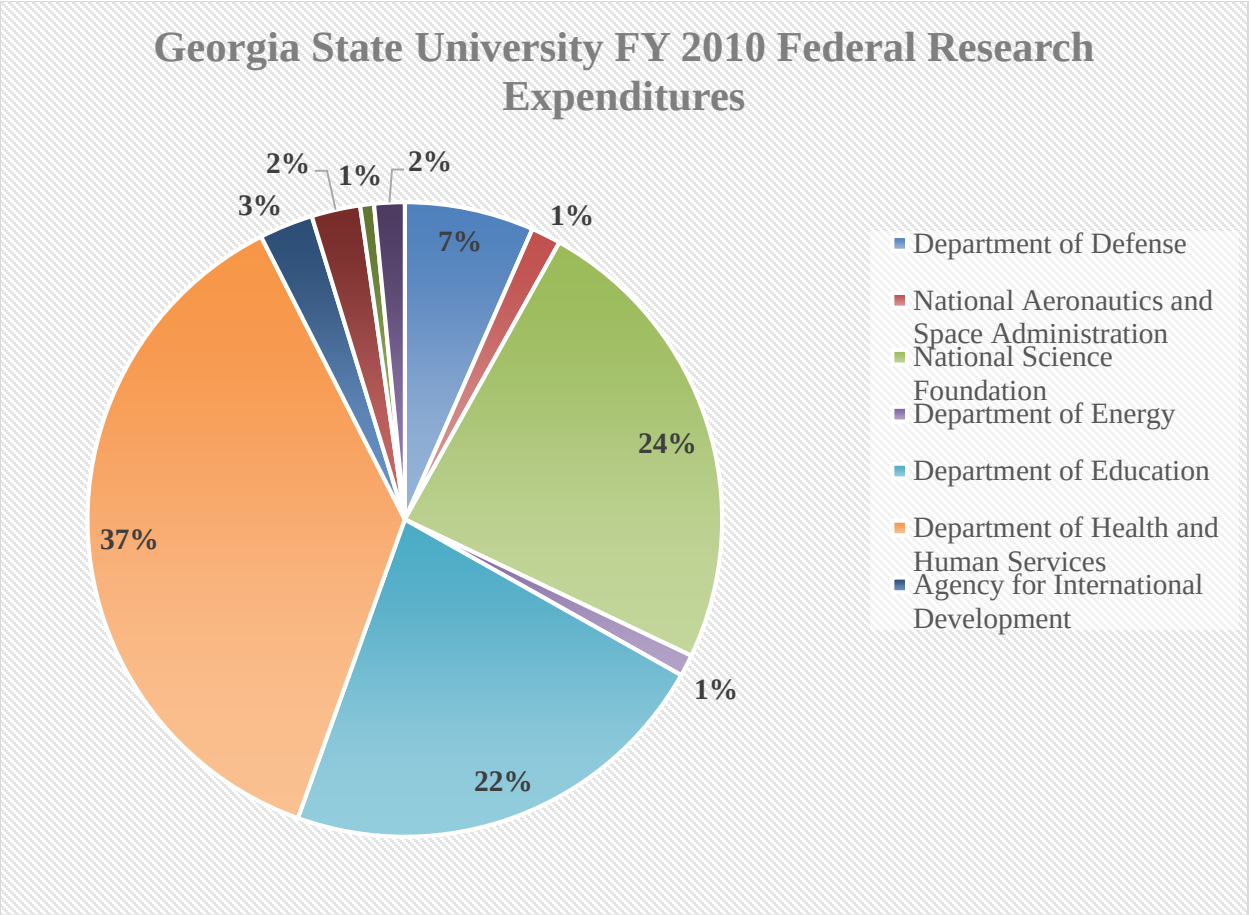

Figure 5: FY 10 Federal Expenditures Derived from the 2010 A-133 Audit (Cherry, Bekaert & Holland, 2010).

The changes in the research portfolio makeup were likely due to the addition of the School of Public Health and the University Research Centers which focus on health related research and the creation of the School of Nursing and Health Professions. The combination of all of these changes were likely to create significant strain on the previous organizational model of research administration. In many ways the reorganization was a response to these other changes.

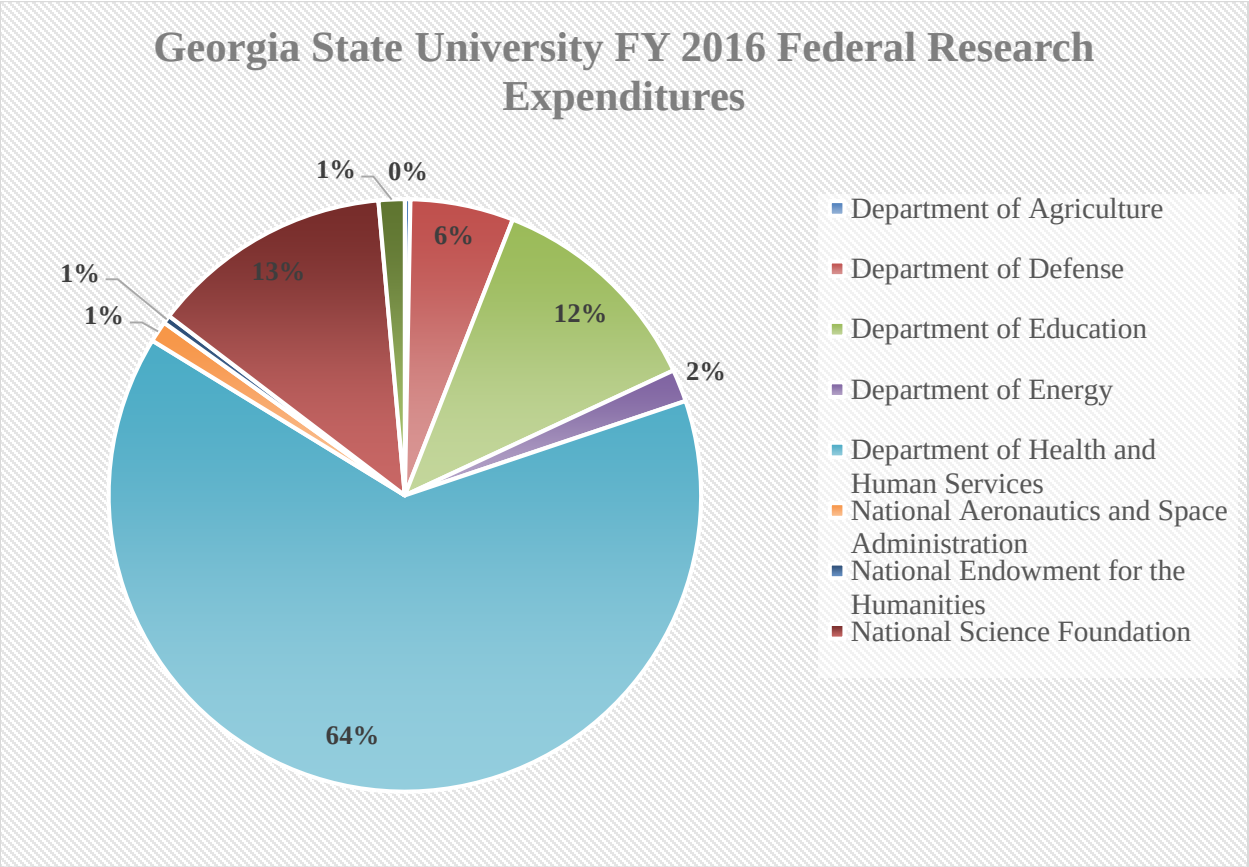

Figure 6: FY 16 Federal Expenditures derived from the 2016 A-133 Audit (Cherry Bekaert CPAs & Advisors, 2016).

Many of those interviewed would agree there is room for improvement with respect to communication between the central offices and the academic units. People also commented on the need for additional staffing and more clarity in the processes, roles and responsibilities of research administrators. However, people were also generally proud of how far the institution has come.

CHAPTER 5

CONCLUSION & DISCUSSION

This case study attempted to understand how colleges and universities go about changing organizational structure around their research administration. Specifically it looked at how institutions restructure their research enterprise in order to accommodate growth. The research questions which guided the study were as follows:

1. What influences motivate institutions to restructure the administrative structure of their research enterprise?
2. How do institutions choose a new organizational model when restructuring?
3. What are the steps involved in the process of reorganizing the administrative structure of the research enterprise at institutions of higher education?
4. How does the process of restructuring and the chosen model affect the research enterprise at the institution, particularly with regard to capacity for growth?

I attempted to answer these questions by interviewing faculty and staff involved in the research enterprise at Georgia State University. This institution was chosen as it had recently undergone the organizational restructuring of its research enterprise and has seen its sponsored research portfolio grow from around $60 million to over $120 million in the six-year period between 2011 and 2017.

I went into this study expecting to find evidence of institutional isomorphism around the structuring of the research administration units and evidence of strategies to increase financial autonomy being employed by the institution as described by resource dependence theory. The study also sought to find if specific aspects of institutional identity, culture and environment

influenced the restructuring process. Lastly, the study sought out linkages between successful growth and the manner in which an institution approached the restructuring of its research enterprise.

In his 2010 book on building organizational capacity, Douglas Toma suggested a few questions which leaders should ask themselves to determine if their institution has the appropriate foundation to support its ambitions. Those questions included (1) Is there an understanding across the institution of the aspirations that the university has articulated, as well as an acceptance that they are consistent with the mission? (2) Is the institution configured correctly to accommodate this new pursuit? (3) Has the university addressed its infrastructure needs, enhancing its human, physical, technological and financial assets? (4) Is the culture of the institution—its norms, values and beliefs—consistent with the goal? (Toma, 2010).

Toma (2010) created a framework for building organizational capacity with eight elements linked to strategic management but made specific to higher education. Each element he said could be indexed according to what constitutes the foundation needed to support the ambitions and functions of an institution. Toma's eight elements are as follows:

1. Purposes—why are we here and where are we headed?
2. Structure—how are we configured to do our work?
3. Governance—who makes what decisions?
4. Policies—what rules do we proceed under?
5. Processes—how do we get things done?
6. Information—what do we need to inform our decision making?
7. Infrastructure—what are our human, physical, technological, and financial assets?
8. Culture—what is our essential character?

No one at Georgia State University referenced Douglas Toma or his BOC framework when asked about their organizational restructuring, but it is interesting to consider the capacity building exercise at the institution through the lens of that framework.

Influential Forces in Restructuring

The first research question asked by this study was about the influences which motivated institutions to restructure their research administration. The findings of this study revealed that Georgia State University sought to change its organizational structure in conjunction with an attempt to expand its research enterprise and grow the sponsored research portfolio. This behavior was seen in response to shifts in funding, resources and other environmental actors on the institution.

The funding model for state appropriations at public institutions in Georgia is based on enrollment numbers ("Georgia Higher Ed Budget Overview for FY2018," 2017). Any sizeable declines in enrollment could have a significant effect on the university's bottom line forcing it to find ways to diversify its funding sources to ensure it can continue to operate. As one participant in this study described, there were changes in enrollment at Georgia State as graduate student enrollment in the College of Education for example began to decline when local school districts stopped incentivizing graduate studies with pay increases. In response to this uncontrollable external force, the college had to begin focusing on growing its graduate programs that were unrelated to teacher training. The College of Education began building up its counseling, school psychology and communication disorder programs. This activity went hand-in-hand with increasing the sponsored research activities at the institution as bolstering those other programs meant hiring faculty who were more active researchers.

In the funding model for the 28 public universities in Georgia, the loci of power lie with

the Board of Regents as an agent of the state and with the students who provide tuition dollars ("Georgia Higher Ed Budget Overview for FY2018," 2017). In order to decrease dependence on these two funding sources and to create some financial autonomy, Georgia State University chose to employ Pfeffer's (1972) merger strategy of diversification. In the case of expanding its sponsored research portfolio, the institution diversified both its inputs (sources of funding) and its outputs (educated students, knowledge, technology, patents).

Thanks in part to the institutional environment, Georgia State was also able to employ merger strategies by merging horizontally with competitors (other institutions) to engage in sponsor-funded research as well. According to its director, the Center for Behavioral Neuroscience at Georgia State University began as a collaborative National Science Foundation funded center for neuroscience research. The director noted that it actually started with relationships developed at the local chapter of the Society for Neuroscience (an international professional organization). Researchers from Emory University, Georgia State University, the Georgia Institute of Technology, Morehouse School of Medicine, Morehouse College and Spellman College came together to form an NSF funded research center originally led by Emory University. Later, when the lead investigator at Emory moved on, Georgia State became the lead institution and after two funding cycles with NSF and later funding from the Georgia Research Alliance it eventually became one of Georgia State University's University Research Centers. This center was formed collaboratively to bring in significant amounts of research and development dollars to the metropolitan Atlanta area rather than the partner institutions competing separately for the funding. The success of such collaborative centers early on certainly contributed to the current structure of research administration at Georgia State. The choice was made to continue to pursue such endeavors and infrastructure had to be devised to

support them.

In resource dependence theory, context matters a great deal; as it does for the choices Georgia State University made in shaping its research enterprise. As a public institution in Georgia, the institution has very little control over its tuition rate (increases are decided by the Board of Regents) and many of the factors affecting enrollment levels are also out of the control of the institution (i.e. discontinuing teacher pay incentives, changes to the lottery funded HOPE Scholarship programs, etc.) ("Georgia Higher Ed Budget Overview for FY2018," 2017). The research enterprise, on the other hand is an area where the institution had some ability to control its own destiny making it a natural choice to focus on as the institution sought autonomy.

Location plays an important role in the context for Georgia State University as well. Being located in the largest city in the Southeastern United States, with the busiest international airport in the country, and a vast array of private industry including several Fortune 500 companies contributes not only to the resources available to the institution, but also to making the university an attractive place to work and study. These are all important factors in attracting top-notch faculty researchers and graduate students needed to expand the research enterprise. Again, the expansion itself influences the organizational structure of research administration at the institution.

How GSU Chose its New Model

In answering the second research question of this study which asked how institutions choose a new organizational model, I found DiMaggio and Powell's (1983) theory of institutional isomorphism playing out in a variety of ways. Many of the interviewees attested to the fact that leadership changes at the institution were a key factor in the push to grow the sponsored research portfolio and the reorganization. Both President Becker and the Vice

President of Research, Dr. Weyhenmeyer, came from other institutions where they held leadership positions. Dr. Weyhenmeyer had led research at two prior institutions with much larger sponsored research portfolios, and both he and Dr. Becker undoubtedly came with ideas about the proper infrastructure to grow research. Their influence on the organizational structure of research at Georgia State is a classic example of normative isomorphism.

Similar to the normative forces exerted by leaders from research intensive institutions coming to Georgia State, the report generated by Huron Consultants served to introduce common practices and organizational structures in research administration to the institution. Many of the recommendations that Huron gave for changes to the organizational structure of research at Georgia State were implemented, and those recommendations came directly from their interactions with other research intensive institutions. DiMaggio and Powell's (1983) theory of isomorphism included several field level predictors of isomorphism. They posited that the fewer number of visible organizational model alternatives which existed in a field, the faster the rate of isomorphism in the field. With only a 115 of the more than 4,000 U.S. colleges and universities currently classified by the Carnegie Foundation as doctoral institutions which are research intensive (only 81 of those are public universities), this condition certainly exists for research administration at institutions of higher education ("Carnegie Classifications of Institutions of Higher Education," 2016).

Another of the field level predictors put forth by DiMaggio and Powell (1983) was that the greater the extent of professionalization in the field, the greater the amount of institutional isomorphic change. Certainly there are few fields more professionalized than higher education, and with all its complexities, the administration of research in higher education has become one such as well (Huron, 2005).

The influence of the new leadership and consultants on the structure of research administration at Georgia State is not only normative in its isomorphic pressure, it is also mimetic in nature since those forces were shaping the institution to be more like others that were already legitimate research intensive institutions.

What is more interesting than the ways in which isomorphism affected the organizational structure at the institution is the ways in which isomorphic pressures were not present. While the funding sources for research have begun to be more diversified in their source, it is still most heavily supported by federal funds ("Historical Trends in Federal R&D," 2017). As a result of this heavy dependence on a single source of funding, One would expect to have seen evidence of coercive isomorphism on the institution from the federal government that would lead to institutions of higher education structuring themselves to meet a requirement of federal compliance, but this study found no instances of that. There may have been some elements of federal compliance imbedded in the models recommended by the consultants, or in the influence of new leadership, but it was not explicit for anyone that was interviewed.

One would also expect a public institution to have had some coercive isomorphic pressure exerted on their organizational structure by the state through the Board of Regents. I would particularly expect to see evidence of this with the state auditing the finances (including sponsored research) of the institution each year. However, there was no mention of any influence by the state in the changes to research administration at the institution. Similarly there was no mention of influence from accrediting agencies. While neither the federal government, nor the state of Georgia had a direct effect on the organizational structure that was noted by any participants in this study, they were likely a contributing factor (albeit indirectly) influencing the

growth of the research enterprise which ultimately lead to restructuring.

How the Research Enterprise Has Been Effected

Although the study yielded no clear themes regarding the third research question of this study about the process of restructuring, there was a variety of answers presented to the final research question about the effect of restructuring on the research enterprise. There was a professionalization of the role of departmental and school-level research administrators as more responsibility was delegated to those roles and the pay was increased in the restructuring process and the positions became more attractive to experienced staff members. There was also evidence that faculty researchers felt better supported in this new model, particularly those who had previously been in departments without specialized support. Further, if you measure success in terms of the ability to manage growth of the sponsored research portfolio, then the new model has been working well thus far.

Limitations

The limitations of this study lie both in the general limitations of a single case-study and the sample of participants included in this particular case study. The scope of this study would be greater if we were able to see the findings come to fruition at more than one institution. Comparing the process of restructuring research administration at multiple institutions would allow us to test the effects of institutional isomorphism and resource dependence theory in varying institutional environments to see how well the effects seen at Georgia State University held.

Unfortunately, it is difficult to find multiple institutions which have gone through this type of change and growth recently enough to have some clear perspective on the process, but long enough to have some sense of stability of structure now and idea of the outcomes of the

changes instituted. If you are able to find multiple institutions in that position, gaining access to faculty and staff to get their perspectives can also be a challenge.

In this study, 30 participants involved in the research enterprise were invited to be interviewed for the study. Many of the staff invited were reluctant to be interviewed; some agreed and then changed their minds. As a result, much of the perspective gained in this study was from the faculty and administrative point of view. If there had been more of a balance between faculty and staff participants, the general sway of the outcomes may have been different. At the very least there seemed to be a difference in faculty and staff perception about how the change process was carried out. This may be attributable to staff being more directly involved in some of the research administration functions and therefore being more directly affected by the change in structure. Further, a couple of the staff members who participated indicated that they did not feel as if staff was included in the decision making about changing the organizational model. They felt that these choices were made at the upper levels of the administrative hierarchy and pushed down to the staff without their input. This may have led some to feel as if they wouldn't have much to say or contribute in an interview and causing them to decline to participate. Whatever the reason, you have to imagine the possibility that there would be additional themes that would have arisen with more staff participants in the study.

Another factor in participation may stem from my former working relationship with many of the research administrators and faculty members. I began my career as a research administrator at the university in 2010 working in a research center in the college of education before a brief stint in the central office of sponsored programs, and finally going on to serve as a grants and contracts officer in the dean's office for the School of Policy Studies over a total of 4 years. As a result of having worked in several areas as the institution I had an opportunity to

work with administrators all over the institution at different times and to serve a variety of research faculty members. It is possible that some of those invited were more or less willing to be interviewed as a result of prior experience with me.

There was a possibility that my experiences as a former employee of the university would influence this study either in the process of selecting and interviewing participants or in the coding and analysis of interviews and the documents reviewed. I made great effort to be unbiased throughout the study, but undoubtedly my prior knowledge of the organization and experiences affected the study some. I chose which participants to invite based on prior knowledge of the organization and the institutions research portfolio and I am sure that it affected the context of interviews as well.

Recommendations for Future Study

The most obvious starting place for future study on organizational structure in research administration would be to conduct a similar study comparing multiple cases. Examining how institutional isomorphism and resource dependence play out across a variety of public and private institutions in different settings would allow for more generalizable results. Expanding to a multiple case study would also allow researchers to parcel out how much of a role institutional culture and environment play in the restructuring and capacity building within research administration.

Another area for potential future study would be to look at the long-term outcomes of organizational restructuring in a longitudinal study. Georgia State University has been in its current organizational model for less than five years, and participants of this study indicated that there were still areas where the kinks were being worked out. This raises the question of what it would take for those rough spots to be smoothed out. Is it possible to fully implement and

maintain the new structure while working out the issues that have arisen, or would an even newer structure begin to take form? Further, the institution has experienced substantial growth in its research enterprise since initially undertaking the restructuring process. If that growth continues, it would be interesting to see what that means for the capacity of this model to sustain and support that growth.

Implications for Other Institutions

It is difficult to generalize the results of a case study and say for sure that what is true for one institution will be true for all. However, comparing the restructuring of research administration at Georgia State University to Chun's (2010) account of the development of research infrastructure in the Department of Surgery at the University of Hawaii's Medical School draws some interesting parallels. Chun's account examined organizational structuring at a micro-level, but the driving forces behind the change were similar. Declining state funding forced the university to diversify and departments that had previously been less engaged in sponsored research were forced to identify other potential sources of revenue to support their operations (Chun, 2010).

Both institutions concluded that it was necessary to create a structure that would place skilled and knowledgeable research administrators in close proximity (a distributed model) to the faculty conducting the research. Both organizations experienced normative isomorphic forces. However, for the department of Surgery at the University of Hawaii that normative pressure came from the Assistant Department Chair attending professional conferences such as the Society of Research Administrators International's annual conference and the National Council of University Research Administrators' annual conference. Research administration staff at Georgia State University mentioned being involved in these organizations, but the normative

pressures on their organizational structures came from the leadership brought in from other research institutions and the consultants brought in to assess their infrastructure.

It could be that the differences in their structuring process were the result of the level of research intensity at the institution at which they occurred, but it could also be due to differences in location, institutional environment and research culture. Future studies on this topic might be able to parse out why isomorphic pressures differ between research institutions.

Many of the changes to the organizational model of the research enterprise at Georgia State University could be linked to the leadership changes and the external influence exerted by consultants since the late 2000s. Other shifts that occurred at the institution were the result of the institution attempting to take advantage of its unique position and strengths. Still other changes were a function of the specific culture and history of Georgia State. The confluence of all of these forces shaped the organization of research at Georgia State University today and helped a once small commuter school to become the number 4 school in the nation for innovation according to U.S. News and World Report.

Georgia State University serves as an example of what is possible for a public university that doesn't have the inherent support and weight of a flagship institution or the prestige of being an internationally prominent STEM focused institution like some of the other institutions in the University System of Georgia. It was a university that looked at its unique opportunities and invested in a specific initiative to grow its research enterprise. The institution invested in the infrastructure to support the growth it was pursuing and it has achieved some success. While no organizational model is perfect and it remains to be seen if the current model will be successful in the long term, other institutions can look to Georgia State's example to see where there might be portions of the model they can adapt as they attempt to grow their research enterprise. A

sponsored research portfolio that was hovering around $60 million in 2011 has now had three consecutive years in which the portfolio is over $100 million ("About Georgia State University Research, 2017); this reflects a sustained ability to get high quality grant proposals submitted and to manage a large number of awards. While this increase in activity is highly dependent on talented research oriented faculty, those faculty must be adequately supported by research administration functions at the institution.

Thinking back to Toma's (2010) BOC framework it was leadership changes that pushed an institution on the cusp to become a very active Research I university. With that change in leadership came a renewed strategic planning process that helped redefine the *purposes* of the institution going forward and set the stage for a shift in the institutional identity and *culture*. The decision by the new leadership to revisit the Huron Consulting report of 2005 spoke to several other elements of the BOC framework including *structure*, *infrastructure* and *processes*. Implementing suggested changes from the consulting report meant major changes to the organizational structure of research administration, and all research support functions at the institution had to take stock of their human, physical and technological resources to determine if they would be adequate to achieve these new goals. This also meant rethinking the processes used by research administration at the institution to make sure that they fit within the new structure and were as efficient as possible

Although it was likely not a conscious choice to follow Toma's (2010) BOC framework in the course of attempting to build capacity for their research enterprise, Georgia State University's process addressed many of the eight elements. It is possible that this employment of strategic management techniques is what allowed them to experience successful growth at the level to which they have. While there are certainly other areas in which this study could be

expanded and taken further, there are some important takeaways from the current iteration. The dominant theme that came out in the participant interviews was that leadership matters to a change process of this scale. Having leadership that was fully invested in seeing the vision of an expanded research enterprise come to fruition was key to keeping the change process moving forward. Leaders at Georgia State made sure that they were consistently communicating to the research and broader university community on campus why this growth was integral to the institution's mission as it moved into its next century.

Beyond leadership emphasizing the importance of restructuring to adequately support the growth they were pursuing, the institution made significant investments in support solutions and facilities upgrades as well. However, the thing that stood out the most about their chosen model for research administration is the flexibility that was given to the individual schools and institutions to make the model work for their needs. In most U.S. institutions of higher education there are gaping differences in the character, culture, structure and research activity of the many colleges and schools that make up a university. Each of the schools and colleges within Georgia State University were able to determine if the new organizational model required a transition or transformation of the activities within their school. "A transition may be minor, involving relatively little movement from one level to another. A transformation, on the other hand, involves a complete reframing of ideals, structure, goals, use of human capital, and resources," (Lintz, 2008). Determining which end of the change spectrum each school was on depended on their current structure and their adaptability.

The ability to modify an organizational model to fit with the particular needs of a school and its research activities was something that many of the participants interviewed in this study attributed to their success with the new model thus far. We saw this flexibility being utilized in

the model described by the Interim Dean of the School of Policy Studies. Many of the departments in their college have only small sponsored research portfolios so they devised a structure that would allow them to share in resources and expertise as needed by buying out staff time to work on projects outside of their home department.

Similarly in the College of Arts & Sciences, where the vast majority of the sponsored research portfolio of the institution is managed, they needed to adjust the structure within their college to better manage the extensive support staff needed for their research administration activities. Most of the other Schools and Colleges within the university will not need their own management structure for research administration, but there was enough activity in Arts & Sciences to warrant coordination of their efforts within the school; separate from the guidance of the central research office.

Finally, other institutions will be able to look at Georgia State University and see what can be gained from capitalizing on the opportunities that are available to you and then supporting those efforts with adequate infrastructure. Not everything Georgia State did would work on a broad scale for other institutions, but public institutions in a similar urban environment could learn from their successes and their mistakes.

In my own experience as a research administrator, I find that an organization which treats research administrators as specialized and highly skilled staff members will attract more talent to those positions; particularly when you create an organizational model that presents a path for career growth. It has also been my experience that the capacity of an institution to support highly active researchers in their pursuit of external funding and management of sponsored research dollars is increased when you have highly skilled professionals in those roles. In the course of this study faculty expressed that they feel better served as researchers when those highly skilled

professionals are located in the departments where they work compared to being housed in a central office far from where the research occurs. A distributed model such as the one at Georgia State provides that type of support to faculty. However, I question what it means for central office staff in the long term.

A few of the staff members interviewed stated that many of the most experienced research administrators now work in the colleges closer to the faculty and many of the functions which had once been the responsibility of a central office staff member now occur in the colleges. Despite this shifting of responsibility, the central office staff has grown significantly since the organizational model was changed at Georgia State. One staff member I spoke with expressed concern that the level of staffing in the central office will not be sustainable over time. I would expect that eventually, the staff within the colleges will get larger and the central office will downsize as it takes on more of an oversight role.

It is worth repeating that research administration is a support function of the university and in no way could be credited for the expansion of the research portfolio, particularly not growth at the scale which Georgia State has experienced. However, capacity building is an exercise in ensuring that an institution has adequate infrastructure to handle any growth it might experience and, thus far, Georgia State has successfully handled significant growth and continues to reach for more.

REFERENCES

About Georgia State University. (2017). Retrieved September 19, 2017, from http://www.gsu.edu/about/

About Georgia State University Research. (2016). Retrieved from gsu.edu

About Kennesaw State University. (2017). Retrieved from http://www.kennesaw.edu/about.php

About MIT. (2017). Retrieved March 11, 2017, from web.mit.edu/about

About the UW. (2017). Retrieved from http://www.wisc.edu/about/

Barrow, C. W. (1996). The strategy of selective excellence: Redesigning higher education for global competition in a postindustrial society. *Higher Education, 31*(4), 447–469.

Bercovitz, J., Feldman, M., Feller, I., & Burton, R. (2001). Organizational structure as a determinant of academic patent and licensing behavior: An exploratory study of Duke, Johns Hopkins, and Pennsylvania State Universities. *The Journal of Technology Transfer, 26*(1–2), 21–35.

Birnbaum, R. (1988). Thinking in Systems and Circles: The Structure and Dynamics of Academic Organization. In *How Colleges Work: The Cybernetics of Academic Organization and Leadership* (pp. 30–55). San Francisco: Jossey-Bass.

Birx, D. L., Anderson-Fletcher, E., & Whitney, E. (2013). Growing an emerging research university. *Journal of Research Administration, 44*(1), 11.

Brewer, D. J., Gates, S. M., & Goldman, C. A. (2009). *In pursuit of prestige: strategy and competition in US higher education* (2. print). New Brunswick, NJ: Transaction Publ.

Caltech Research. (2017). Retrieved from http://www.caltech.edu/content/research

Carnegie Classifications of Institutions of Higher Education. (2016). Retrieved from carnegieclassifications.iu.edu

Cherry, Bekaert & Holland. (2010). *Georgia State University Research Foundation, Inc. and Affliate (A Component Unit of Georgia State University) Financial Statements* (Audit Report). Atlanta. GA: Georgia State University.

Cherry Bekaert CPAs & Advisors. (2016). *Georgia State University Research Foundation, Inc.. and Affiliate (A Component Unit of the State of Georgia) Financial Statements and Compliance Reports* (Audit Report).

Cheslock, J. J., & Gianneschi, M. (2008). Replacing state appropriations with alternative revenue sources: The case of voluntary support. *The Journal of Higher Education*, 208–229.

Chun, M. B. J. (2010). Building a research administration infrastructure at the department level. *Journal of Research Administration*, *41*(3), 77.

Consolidation. (2017). Retrieved November 5, 2017, from http://consolidation.gsu.edu/

Craig, J. (n.d.). History 101: Petit Science Center A Diverse Location. *Georgia State University Magazine*. Retrieved from http://magazine.gsu.edu/article/history-101-petit-science-center/

Creswell, J. W. (2014). *Research Design* (4th ed.). Thousand Oaks, California: SAGE Publications Ltd.

Davis, G. F., & Cobb, J. A. (2009, April 1). *Resource Dependence Theory: Past and Future*. Ann Arbor, Michigan.

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

Donoghue, F. (2008). Prestige and Prestige Envy.pdf. In *The Last Professors: Corporate Universities and the Fate of Humanities* (p. 172). Fordham University.

Ehrenberg, R., Rizzo, M. J., & Jakubson, G. H. (2003). *Who Bears the Growing Cost of Scient at Universities?* Cornell Higher Education Research Institute Sponsored by the Andrew W. Mellow Foundation.

Geiger, R. L. (2004). *Knowledge and money: research universities and the paradox of the marketplace*. Stanford, Calif: Stanford University Press.

Georgia Higher Ed Budget Overview for FY2018. (2017). Retrieved September 28, 2017, from https://gbpi.org/2017/georgia-higher-education-budget-primer-state-fiscal-year-2018/

Georgia State Second Century Initiative. (2016). Retrieved September 21, 2017, from http://secondcentury.gsu.edu/

Gumport, P. J. (2000). Academic restructuring: Organizational change and institutional imperatives. *Higher Education*, *39*(1), 67–91.

Historical Trends in Federal R&D. (2017). [.org]. Retrieved from https://www.aaas.org/page/historical-trends-federal-rd

Huron Consulting. (2005). *Georgia State University Reasearch Assessment* (p. 66). Georgia State University.

Kirby, W. S., & Waugaman, P. G. (2000). Performance Benchmarking in Sponsored Programs Administration: Results from the 1999 nationwide data collection. Presented at the SRA International Annual Meeting, St. Lois, MO.

Kirby, W. S., & Waugaman, P. G. (2005). Practice Data from the 2002 SRA-BearingPoint Nationwide Benchmarking Survey. *Journal of Research Administration*, *36*(1), 4.

Kulakowski, E. C., Chronister, L. U., & Research Enterprise (Eds.). (2006). *Research administration and management*. Sudbury, Mass: Jones and Bartlett.

Leslie, L. L., Slaughter, S., Taylor, B. J., & Zhang, L. (2012). How do Revenue Variations Affect Expenditures Within U.S. Research Universities? *Research in Higher Education*, *53*(No. 6), 614–639. https://doi.org/10.1007/sll 162-011-9248-x

Lintz, E. M. (2008). A Conceptual Framework for the Future of Successful Research Administration. *Journal of Research Administration, 39*(2), 68–80.

Merriam, S. B., & Tisdell, E. J. (2016). *Qualitative Research: A Guide to Design and Implementation* (4th ed.). San Francisco: Jossey-Bass.

Morphew, C. C., & Huisman, J. (2002). Using Institutional Theory to Reframe Research on Academic Drift. *Higher Education in Europe, 27*(4), 491–506. https://doi.org/10.1080/0379772022000071977

Mullen, B. (2016, October 7). Biomedical Research Facility Opens At Georgia State. Retrieved from http://news.gsu.edu/2016/10/07/new-biomedical-research-facility-opens-georgia-state-university/

Off-Campus Research Sites. (2017). Retrieved from http://www.utexas.edu/research/off-campus-research-sites

Owen-Smith, J. (2005). Trends and transitions in the institutional environment for public and private science. *Higher Education*, *49*(1–2), 91–117.

Pfeffer, J. (1972). Merger as a Response to Organizational Interdependence. *Administrative Science Quarterly*, *17*(3), 382. https://doi.org/10.2307/2392151

Research-Stanford University. (2017). Retrieved March 11, 2017, from https://www.stanford.edu/research/

Rhoades, G., & Slaughter, S. (1997). Academic Capitalism, Managed Professionals, and Supply-Side Higher Education. *Social Text*, (51), 9. https://doi.org/10.2307/466645

Sá, C. M. (2008). "Interdisciplinary strategies" in US research universities. *Higher Education*, *55*(5), 537–552.

Scott, W. R. (1987). The Adolescence of Institutional Theory. *Administrative Science Quarterly*, *32*(4), 493. https://doi.org/10.2307/2392880

Scott, W. R. (2008). Approaching adulthood: the maturing of institutional theory. *Theory and Society*, *37*(5), 427–442.

Slaughter, S., & Rhoades, G. (1996). The emergence of a competitiveness research and development policy coalition and the commercialization of academic science and technology. *Science, Technology & Human Values*, *21*(3), 303–339.

Strategic Plan 2011-2016/21. (2016). Strategic Planning Committee. Retrieved from strategic.gsu.edu

The UC System. (2017). Retrieved March 11, 2017, from www.universityofcalifornia.edu

Toma, J. D. (2010). *Building organizational capacity: strategic management in higher education*. Baltimore, Md: Johns Hopkins University Press.

U.S. Colleges and Universites Utility Patent Grants 1969-2012. (n.d.). Retrieved March 6, 2017, from www.uspto.gov

Warshaw, J. B., & Hearn, J. C. (2014). Leveraging university research to serve economic development: an analysis of policy dynamics in and across three US states. *Journal of Higher Education Policy and Management*, *36*(2), 196–211. https://doi.org/10.1080/1360080X.2014.884678

Yin, R. K. (2014). *Case Study Research: Design and Methods* (5th ed.). Thousand Oaks, California: SAGE Publications Ltd.

Zucker, L. G. (1987). Institutional theories of organization. *Annual Review of Sociology*, *13*, 443–464.

APPENDIX A

Interview Protocol

- What is your name and current role at the institution?
- When did you first come to work for _____University?
- Can you describe the research environment at _____ when you first arrived? (Ex. What kind of research was occurring on campus? How much activity was there? What were the facilities like?)
- The institution has changed over time, what changes have you witnessed to research at the institution?
- What changes have you noticed in the structure and organization of the units which support research activities on campus?
- What was your title or position when these changes began to occur?
- Describe the process of changing these structures at your institution? (Ex. Were consultants brought in? Were their town hall meetings on campus? Was a new strategic plan involved?)
- Who decided what the new organizational model would be?
    - How was this decision made?
- What would you say were some of the influences on the shape your institution's research enterprise has taken? (ex. Economic factors such as potential growth in biotechnology

market, competition from other institutions, expertise present on campus, influence of professional organizations or accreditors)

- Do you think there was an aspirational element to the choice in organizational model?
- Was there another institution you used as a guide or template for how you chose to structure your organization?
- Do you think that the hiring of administrator's from other institutions played a role in the choice to restructure or in choosing the organizational model?
- How do you think the model chosen has affected the current state of research at the institution?
- How has your job or role changed?
- What are some things that went well during this change?
- What are some areas that still require improvement?
- Was there anything you felt was overlooked during the structuring/restructuring process? Was there any aspect of your institution that wasn't given enough consideration during this change process?
- How do you think each group of stakeholders fared in the end? (Stakeholders being faculty, staff, administrators, the community, funders, etc.)
- Is there any lesson positive or negative that you think other institutions could learn from your experience?
- Is there anyone else at the institution you would suggest I speak with?
- Is there anything else you would like to add about the change processes here at _____that we haven't discussed today?

APPENDIX B

ORGANIZATIONAL CHART FOR RESEARCH ADMINISTRATION

URSA
University Research Services And Administration
08/22/2017

VP for Research & Economic Development/Chair, GSURF Board
Dr. James Weyhenmeyer

Assistant VP, Office of Sponsored Proposals & Awards (OSPA)
Dr. Ken Packman

- **Associate Director** (OSPA) Jill Borland
  - **Sr. Research Financial Ofcr** Curtis Bonner
  - **Sponsored Prgm Officer** Vacant
  - **Sr. Sponsored Prgm Officer** Tulani Murphy
    - **Research Financial Spec.** Tony Burnett
    - **Staff Asst.** Benetta Behnzukeh
    - **Sponsored Prgm Spec.** Pamela Pressley
- **Associate Director** (OSPA) Katherine Pope
  - **Research Financial Ofcr** Huiping Du
  - **Sponsored Prgm Officer,** Lawrence Rapier
  - **Sr. Sponsored Prgm Officer** Joseph McLeod
  - **Research Financial Ofcr** Jordan Wilks
- **Associate Director** (OSPA) Margaret Matkins
  - **Sponsored Prgm Officer Senior** Lawrence Mkondya
  - **GCOIII** Vacant
  - **Research Financial Ofcr** Rita Alexander
  - **Sr. Research Financial Spec** Patricia O'Malley
  - **Business Manager II (URCs)** Marcus Tillman
    - **Asst. Director, Sponsored Program** Vacant
      - **Cost Analyst** Ryan Eastwood
      - **Grants & Contracts Ofcr III** Kayron Gilstrap
        - **Business Manager I** Izaura Garrison
- **Associate Director** (OSPA) Michael Mathisen
  - **Sr. Res. Financial Specialist** Nichelle Brooks
  - **Spon.Prgrms Spec. Senior** LaToya Brown
  - **Res. Fin. Spec. Sr.** Sarguetta Ervan
  - **Sr. Research Financial Officer** Teja Singh
    - **Grants & Contracts Ofcr III (URC-Multi)** Belay Tekeste

Assoc VP Research Integrity
Dr. Brenda Chapman

- **Director, Human Research Protection Program** Dr. Shelia White
  - **IRB Compliance Officer** Susan Vogtner
  - **IRB Compliance Specialist, Senior** Tracy Cermak
  - **IRB Compliance Specialist** Deonne McNeill
  - **Admin. Spec. Administrative** Ravi Gandhi
    - **IACUC Associate Director** Margaret Kilcullen-Steiner
      - **IACUC/Biosafety Committee Officer** Casey Brinsfield
- **Director, Research Safety Programs** Vacant
  - **Assoc Director - High Containment Lab** Chadi Filfili
    - **Research Associate Senior** Martin Wildes
    - **Facilities Use Coordinator** Brandon Lee Otwell
  - **BioSaftey Officer SR** Betsy Butler
  - **BioSafety Specialist** Laura Thomas
  - **Radiation Safety Officer** Quintena Tinson
  - **Research Safety Specialist** Secret Rhynes
  - **Sr. Hazardous Materials Spec.** Paul Hysell
  - **Chemical Safety Officer** Jamar Simmons
  - **Research Safety Specialist** Reginald Sanders
  - **Chemical Safety Specialist, Sr.** Stephen Johnson
  - **Research Safety Specialist** Nathan Jennings

- **Director, Transgenic and Gene Targeting Core** Dr. Chengliu Jin
  - **Laboratory Tech II, TGTC** Qian Liu
- **Assoc Dir Animal Resources** Dean Blake
  - **Animal Facilities Supervisor** Michael Morrison
    - **Lab Animal Tech I** Kimberley Bryant
    - **Lab Animal Tech I** Antoinette Jamison
    - **Lab Animal Tech I** Robert Bynes
    - **Lab Animal Tech I** Jessica Weems
    - **Lab Animal Tech I** Chris Barrow
    - **Lab Animal Tech I** Dejah J'Vonne Craig
    - **Lab Animal Tech II** Teresa Deaton
    - **Lab Animal Tech I** Luke Wyrwich
    - **Lab Animal Tech I** Plamen Petkov
    - **Cage Wash Tech** Roosevelt Irby
    - **Cage Wash Tech** Dalton Myrick
- **Director, Dept. of Animal Resources** Dr. Michael Hart
  - **Associate to the DIrector** Matthew Davis
  - **Clinical Lab Animal Veterinarian** Amelia Wilkes
  - **Animal Healthcare Technician** Courtnye Billingsley
  - **Animal Healthcare Technician** Joi Scott
  - **Asst. Dir. Animal Resources - LRC** John Kelley
    - **Animal Facilities Suprv** Evan Hutto
    - **Lab Animal Tech I** Daniel L. Benboe
    - **Lab Animal Tech I** Robert Winfrey
    - **Cage Wash Tech** Erik Thurman
    - **Cage Wash Tech** Tijani A. Osekre
    - **Lab Animal Tech III** Vacant
    - **Custodian I** Nickeya Stewart
    - **Lab Animal Tech I** Cameron Jones
    - **Lab Animal Tech I** Julia Fedorov
    - **Lab Animal Tech I** Kathy Thompson
      - **Retiree** Daniel Rice
- **Assistant VP, Research Solutions** Gregori Faroux
  - **Sr Bus Sys Anal** Tonia Davis
  - **Solution Architect** Brock Davis
  - **Web Development Interm** Cori Fowler
  - **Systems Analyst** Lee Bailey
  - **Systems Analyst** Long Chen
  - **Cloud Architect** Yuriy Lukinov
  - **Research System Admin (IS&T)** Michael Walters
  - **Research Computing Spec.** Semir Sarajlic
  - **Research Computing Spec.** Suranga Edirisinghe
    - **Dept. Technology Mgr.** Rob Poh
      - **PC Specialist Lead** Charles Hampton

Assoc VP & Director, Office for Technology Transfer & Commercialization
Dr. Chester Bisbee

- **Assistant VP for New Ventures & Sr. Licensing Agent** Vincent La Terza
  - **Admin. Spec. Administrative Sr.** Cheryl Hibbler
  - **Assistant to the Vice President** Milan Berhane
  - **Assoc. Director, PR & Communications** Jennifer Marquez
    - **Collabtech Manager** Tim McCann
    - **Research Facilities Director** Rick Parker
      - **Cost Analyst** Ryan Eastwood
    - **URSA Bus Mgr III and HRAC** Jolene Istas
      - **Administrative Assistant** Chantana Dean

- **Associate Director, Special Research Initiatives** Dr. Kelly Stout
  - **Assistant Director, Special Research Initiatives** Candice Ferguson
  - **Admin. Spec. Administrative** Rose Baldwin
- **GSURF Business Mgr** Gary Brennaman
  - **Admin. Spec. Administrative** Donna Scullin