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Project Description I

Title:

The Struggles of Higher Education: The Impact of Competition and Stakeholder Influence on College and University Finances 1980-2010

Statement of the research problem and national importance:

In order to understand the system of higher education in the United States we must first understand the colleges and universities that form the foundation of this system. In order to understand these organizations we must understand the impact of the economic, political, social and market pressures they are subject to. Over the past 40 years higher education has been notably altered by changes in some of these pressures including: increased competition for resources, declining state support, increased vulnerability to economic cycles, changes in the composition and relative power of stakeholders, changes in the nature of financial aid, and shifts in research funding (Altbach, Berdhal, & Gumport, 2005; Brint, 2002; Ehrenberg, 2002, 2006; Gumport, 2007; Gumport & Snydman, 2006; Thelin, 2004). Some of the consequences of these changes have been thoroughly examined, declining state support for example, others, such as increased competition and changes in stakeholder influence, remain relatively unexplored.

In my dissertation research I utilize organizational level data on four year degree-granting higher education institutions from 1980 to 2010 to assess the impact of two of these changes, increasing competition and changing stakeholder influence, on the financial behaviors of universities and the consequences for the higher education industry as a whole. I argue that in order to understand the nature of the financial behavior of universities we must look at the relationships between the revenues and expenditures of universities, and take into account the impact of multifaceted competition and stakeholder influence on these relationships and in determining the financial behaviors of universities.

Three research questions will be answered by my research: (1) How have higher education organizations changed their revenue and expenditure streams over the past 30 years and what does this imply for the higher education industry as a whole? (2) How do differences in competition affect the revenues and expenditures of higher education organizations? and (3) How does stakeholder influence affect the revenue and expenditure streams of universities and the field of higher education as a whole?

My research does not focus on individual revenue and expenditure streams but rather the —setsl of revenue and expenditure streams an institution pursues at a given time. This incorporates the specific revenue and expenditure streams universities draw on and the amount of funding coming from/going to, each revenue or expenditure stream. I use multilevel latent class analysis (MLCA) because it incorporates both of these pieces of information simultaneously through the estimation of clusters, or groups, of schools that rely on similar revenue and expenditure streams. By regressing different factors, such as competition and stakeholder influence, on those clusters I am able to estimate the likelihood of an organization being in one cluster relative to another, or in other words, the likelihood of a university pursuing a particular revenue or expenditure profile at a given point in time.

Answering the research questions listed above is important for higher education researchers, policy makers and other constituents for a several reasons. First, competition significantly impacts organizational behavior (Carroll & Swaminathan, 2000; Hannan & Freeman, 1977). However, research to date has not thoroughly examined the impact of competition on colleges and universities. Therefore my research will fill a notable gap in our understanding of the behaviors of these organizations. Filling this gap is increasingly important as higher education organizations continue to become more subject to market forces over time (Bok, 2003; Gumport, 2007; Gumport & Snydman, 2006; Weisbrod, 1998; Weisbrod, Ballou, & Asch, 2008).

Second, research shows that stakeholders influence organizational behavior including the goods and services offered, the organizational structure, and other policies (Frumkin, 2002; Frumkin & Galaskiewicz, 2004; Galaskiewicz, Inouye, Savage, & Molina, 2008). A university has numerous stakeholder groups which are often at odds with one another. My research will examine the relative power of the various stakeholder groups and how they utilize that power to influence university behavior, which is necessary for both researchers and policy makers.

Third, by examining the overall trends in the revenue and expenditure profiles as they increase or decrease in prominence over time in response to changes in competition and stakeholder influence I am able to determine how changes in these factors alter the industry overall. It is only through examining the industry level trends that essential questions about higher education in the U.S. can be answered. These questions include: (1) the extent and consequences of privatization in the industry, (2) the changes in the stratification of universities over time and (3) how competition and stakeholder groups have changed the field as a whole.

Review the literature and establish a theoretical grounding for the research:

The higher education industry has faced numerous challenges since the 1970s that have significantly impacted college and universities including: increased competition for resources, declining state support, increased vulnerability to economic cycles, changes in the composition and relative power of stakeholders, changes in federal financial aid, and shifts in research funding among others (Altbach, et al., 2005; Brint, 2002; Ehrenberg, 2002; Gumport, 2007; Gumport & Snydman, 2006; Peterson, 2007; Thelin, 2004). Empirical analyses have examined the structural, financial, and policy responses of colleges and universities to changes in their financial resources (Ehrenberg, 2006; Kraatz & Zajac, 2001; M. S. McPherson & Schapiro, 1998; Slaughter & Rhoades, 2004; Smith, 2000) and also how institutional characteristics such as the governance structures and wealth of universities affect their financial behaviors (Cheslock & Gianneschi, 2008; Kaplan, 2002; Kraatz & Zajac, 1996).

However, despite this research three things necessary to understanding the financial behaviors of higher education organizations have not been fully examined. First, researchers have examined the impact of many environmental factors however researchers have not fully examined how these relationships change over time and what this means for the industry as a whole. Second, the impact of competition between schools for resources and the influence of stakeholder groups on the financial behaviors of colleges and universities has also not been fully examined. Third, a thorough investigation of how these factors impact the revenue and expenditure profiles, rather than individual financial streams, and how the specific revenue and expenditure streams of higher education institutions are related has not yet been done.

Weisbrod, Ballou, and Asch (2008) have taken steps towards filling one of these holes in their work on the role of institutional mission in university finances by recognizing the interdependencies among these organizations. Specifically, they highlight two things. First competition exists between higher education organizations for multiple funding sources including tuition dollars, government funding, and donations. Second, the stakeholders of universities significantly influence their financial behavior. However, the authors fail to provide empirical evidence of the extent of the impact of stakeholder influence and competition on the financial behaviors of universities. Therefore they only partially address the gap in our current understanding. By examining the financial profiles of universities, the impact of competition and stakeholder influence on those profiles, and how these things change over time, I address key deficiencies in our understanding of higher education organizations.

Conceptual Frameworks

In order to fill these gaps and advance the state of knowledge I rely on the sociology of organizations research on competition to assess the impact of competition on the financial behaviors of universities. Relying on the organizations literature is necessary because, despite some recent work on competition within higher education (Allen & Shen, 1999; Jongbloed, 2004; Marginson, 2006; Winston & Zimmerman, 2000), the role of competition within this industry is not fully conceptualized or empirically assessed. The population ecology framework within the organizations literature argues that the density of organizations within a particular resource space significantly affects the behavior of the organizations within that resource space or niche (Baum & Singh, 1996; Carroll & Swaminathan, 2000; Dobrev, Kim, & Hannan, 2001; Hannan & Freeman, 1977, 1989; M. McPherson, 1983). Specifically competition within a niche influences whether or not an organization stays in that niche or changes its behavior and moves into a different niche. Therefore understanding the competition that colleges and universities face for resources is necessary for understanding how they market themselves to the various constituencies that control their resource streams. This is increasingly important for universities and policy makers as key resources continue to decline and fluctuate over time.

Higher education organizations compete for multiple resource pools, each of which can pit a different set of organizations against each other, requiring a multifaceted understanding of competition (Ehrenberg, 2002; Gumport & Snydman, 2006; M. S. McPherson & Schapiro, 1998; Weisbrod, et al., 2008). I examine four facets of competition: tuition dollars, state appropriations, federal funding, and donations. For each facet I evaluate the density of organizations and the concentration of the resources. I argue that considering both density and concentration is necessary for understanding competition. For example, if two states have the same number of universities competing for state appropriations, but in one state the flagship receives a disproportionate amount of state funding, the nature of competition in the two resource spaces differs because of the different resource concentrations. By conceptualizing, measuring, and evaluating the impact of multifaceted competition, my research extends the current understanding of competition between universities and establishes a foundation for understanding how this impacts these organizations.

The other key unexamined aspect of higher education behavior is the influence of key stakeholder groups on university behaviors. The nonprofits literature argues that organizations in different sectors have different stakeholders to which they are accountable and it is the differences in these accountability structures that results in variations in the behaviors of organizations across sectors (Galaskiewicz, et al., 2008; Weisbrod, 1988; Weisbrod, et al., 2008). I extend this literature by arguing that not only do differences exist between sectors, but even within the sectors significant variation in the power of the stakeholder groups exists. Furthermore this variation results in differences in the financial profiles universities pursue. For example, take two universities, an elite liberal arts school and an elite research university. Both schools have the same stakeholders. However at the liberal arts university students have a higher level of influence than at the research university because of the reliance of that school on tuition income.

I extend the state of knowledge on the impact of organizational stakeholders on financial behavior by examining the impacts of the influence of three stakeholder groups (students, governments, and private donors). Specifically I examine the impact of the economic influence of these groups, measured by the proportion of total revenues that come from each stakeholder group, on the financial profiles of colleges and universities. This will provide for a better theoretical and empirical understanding of the role of stakeholders in higher education organizations.

Describe the research method that will be used:

The research questions of interest for this analysis are: (1) How have higher education organizations changed their revenue and expenditure streams over the past 30 years and what does this imply for this industry as a whole? (2) How do differences in competition affect the revenues and expenditures of higher education organizations? and (3) How does stakeholder influence affect the revenue and expenditure streams of universities and the field of higher education as a whole?

I utilize multilevel latent class analysis (MLCA) to answer these questions. Simply put, MLCA maps out the financial profiles utilized by universities at the organizational-level and how these financial profiles increase or decrease in prominence within the field of higher education over time (Macmillian & Eliason, 2003; Vermut, 2003). It utilizes the variation between organizations and within organizations over time to examine individual schools and the field of higher education as a whole simultaneously. MLCA effectively breaks up the field into clusters of schools allowing me to examine the changes in each piece over time to determine if they lead to the privatization, fragmentation, or homogenization of U.S. higher education.

MLCA is useful for examining complex situations such as the higher education industry for several reasons. First, MLCA inductively estimates clusters of schools that pursue similar financial profiles at a given point in time allowing me to map out the diversity within the field of higher education and how it changes over time (Eliason, Mortimer, Vuolo, & Tranby, 2007; Macmillian & Eliason, 2003; Vermut, 2003). Second, the ability to examine multiple revenue or expenditure streams simultaneously through the estimation of clusters of schools that rely on similar financial streams at a given point in time is a key advantage over standard regression analyses. Third, MLCA uses variation over time to estimate how the clusters increase or decrease in prominence over time which allows for the organizational-level analysis of financial profiles and the field-level analysis of the clusters to be conducted simultaneously. Fourth, by regressing factors, such as competition and stakeholder influence, on these clusters I can estimate the likelihood of a university being in one cluster relative to another, or in other words, the likelihood of a university pursuing a particular financial profile at a given point in time. This provides a more holistic understanding of the impacts of competition and stakeholder influence than can be gained by examining their impact on individual revenue or expenditure streams.

MLCA proceeds in two stages. The first is the estimation of latent clusters of organizations that are closely associated based on the sets of revenue or expenditure streams included in the model. The statistical model at this stage is a variation on a log linear model for counts where the parameters each capture different parts of the overall association between all of the observed financial streams. The difference is that the MLCA model as a multilevel model accounts for variation between and within organizations over time (Singer & Willett, 2003). For example, an analysis of the funding profiles of public four year universities using MLCA estimated four distinct funding profiles in 1980 that then consolidated to three profiles by 2000 (Barringer, 2011). The revenue profiles of the clusters and the changes in the prominence of the clusters over time indicate that privatization occurred, but not for all public schools.

In the second stage of the analysis the clusters from the first stage become the dependent variables in a regression analysis that evaluates the impact of competition and stakeholder influence on the likelihood of an institution being in a particular cluster at a particular point in time (Clogg, 1995; Macmillian & Eliason, 2003; Vermut, 2003). This stage of the MLCA is similar to a multinomial logistic regression model because both estimate the impact of independent variables on the likelihood of belonging to a particular cluster (Agresti, 2002; Hagenaars & McCutcheon, 2002). In effect this stage of the analysis determines if changes in competition and stakeholder influence significantly impact financial behaviors by looking how these factors increase or decrease the likelihood of being in a particular cluster and having the financial profile characterizing that cluster. For example, the analysis of the revenue profiles mentioned above also examines the role of services in determining the revenue profile of colleges and universities. The MLCA regression results indicate that the services that a school provides do significantly affect their revenue profiles (Barringer, 2011).

The full model, combining both stages of the analysis, is depicted in the "Statistical Equation" and "Figure 1" attachments. Both depict a model which estimates the impact of competition and stakeholder influence on the likelihood of a university belonging to a particular cluster. For simplicity and brevity this equation has been abbreviated in two ways. First it only deals with the revenue profiles; there is a parallel equation which is focused on expenditures. Second, this specification outlines the basic framework for the models, but doesn't include all the variables that will be analyzed. As with any research project of this size and complexity numerous model specifications with different variable combinations will be evaluated. A full list of variables that will be analyzed can be found in the attached variable list.

The left side of the statistical model represents the likelihood of an organization being in a particular cluster and having the revenue profile that characterizes that cluster. The right side includes the parameters that determine that likelihood. The parameters in the first set of brackets specify the clusters of schools in the first stage of the analysis. The first parameter included in the second set of brackets, and the final parameter specify the latent trajectories of the clusters by incorporating variation in the observed funding streams over time. The parameters in the second set of brackets are those that I argue affect the likelihood of a university pursing a particular revenue profile and correspond to the second stage of the analysis. The definition of each parameter in the equation is provided with the equation in the attached "Statistical Model" file.

Uploaded Appendix Document(s):

- Statistical Model
- Figure 1
- List of Variables

Project Description II

Will you use NCES target dataset? Yes

Please check all NCES datasets that apply

- IPEDS 12-Month Enrollment (E12)
- IPEDS Fall Enrollment (EF)
- IPEDS Finance (F)
- IPEDS Institutional Characteristics (IC)

Explain why each dataset best serves this research. Include a variable list for each dataset used.
In addition to the NCES datasets listed above I will also be using the Voluntary Support for Education Survey (VSE) from the Council for Aid to Education. The VSE includes data on donations from different stakeholder groups and will be used to evaluate the impact of the economic influence of a number of stakeholder groups on the financial behaviors of colleges and universities. I will also incorporate the National Endowment Study (NES) from the National Association of College and University Business Officers which includes data on endowment values, spending rates, and rates of return. I currently have access to both of these datasets and am in the process of mapping them to the IPEDS data. A list of the variables from each dataset that will be utilized for can be found in the attached appendix.

These datasets are well suited for use in my dissertation research for multiple reasons. First, the datasets listed cover the time period of interest. Second, the variables listed are all measured at the appropriate unit of analysis (school-year). Third, and most important, these datasets have variables that operationalize the key concepts of interest for my dissertation research. Specifically I generate measures of competition using the IPEDS data, measures of the economic influence of stakeholder groups using the IPEDS and VSE datasets, and measures of the revenue and expenditure profiles of colleges and universities using the IPEDS data. The IPEDS and NES data will also provide a number of key control variables to the analysis.

Will you use NSF target dataset? No

Explain why each dataset best serves this research. Include a variable list for each dataset used.

Will you address the NPEC focus topic? No

If yes, please briefly describe:

Project Description III

Provide a timeline of key project activities:

Current Progress
I will first describe the current state of my dissertation research and what I intend to accomplish between now and June of 2012. Following this I will outline the timeline of the key project activities during the period for which I hope to be funded by the AIR Dissertation Grant.

I successfully defended my dissertation proposal in May of 2010. Since that time I have been gaining access to and compiling my dissertation data, reading in the higher education, nonprofits, and organizations literatures, learning more about the primary statistical method I will be using in my dissertation, teaching undergraduate sociology courses, and working with the IPEDS data on a number of working papers, book chapters, and presentations.

Between January and May of 2012 I will continue to work on my three collaborative projects and my own working papers. My collaborative projects focus on the impact of endowments and endowment spending on student diversity and success, conflicts of interest between university boards of trustees and corporate boards of directors, and on the impact of higher education funding on state-level economic development. My own working papers center on the preliminary analyses for my dissertation research. The first examines the relationship between revenues and expenditures of higher education organizations and the impact of organizational size, organizational mission, and organizational slack on those relationships. The second paper I am currently working on focuses on explaining the differences between private nonprofit and public colleges and universities. Within it I argue that it is not the sector per say but rather the resource dependencies and the availability of restricted versus unrestricted funds that result in the differences in the behaviors of these two groups of organizations. The third paper I am working on focuses on the impact of competition for tuition income, donations and federal research funding on the financial behaviors of nonprofit colleges and universities in 2009.

In addition to my work on these papers and projects I will be working closely with my dissertation advisors to generate additional measures of my key concepts of interest and writing initial drafts of my literature review and data chapters.

Beginning of Funded Work Plan

<u>Summer 2012: June-August</u>
I am requesting funding from June 2012 through May of 2013. During the summer months of 2012 I will be revising my literature review and data chapters based on progress and feedback from my dissertation committee and beginning the draft of

the methods chapter of my dissertation. I will also be conducting the analyses of the first research question concerning how the financial behaviors of colleges and universities have changed from 1980 to 2010. I will also begin the draft of my first analysis chapter once these analyses are completed. I will also continue my work on the collaborative projects and working papers listed above. I hope to have all three of my working papers submitted by the end of the summer months.

Fall 2012: September-December 2013
During the Fall semester of 2012 I will finish the methods chapter and the first analysis chapter of my dissertation and submit them to my dissertation committee for review. I will also begin the analyses of the impacts of competition and stakeholder influence on the financial behaviors of colleges and universities to answer the second and third research questions of my dissertation. Once these analyses are complete I will begin drafting the remaining analysis chapters of my dissertation. During this time I will also being to draft separate working papers based on the first analysis chapter of my dissertation for publication in higher education, organizations and nonprofits journals.

Spring 2013: January-May 2013
The spring semester will be devoted to finalizing the analyses for my dissertation and finishing the initial drafts of all of the analysis chapters of my dissertation. These will then be submitted to my committee members for comments. I will then integrate the comments received on the methods and analysis chapters from my committee and draft the introduction and conclusion chapters. I will be submitting a complete draft of my dissertation to my committee by the end of the Spring semester of 2013. Over the summer I will integrate their feedback and schedule my defense in accordance with their feedback and a target graduation date of August 2013. I will also be continuing to work on the working papers that are developed out of the first analysis chapter of my dissertation and will being to develop a plan for turning my other analysis chapters into working papers for publication in higher education, organizations, and sociology journals.

List deliverables such as research reports, books, and presentations that will be developed from this research initiative:

Papers, Books, and Reports

- "The Struggles of Higher Education: The Impact of Competition and Stakeholder Influence on College and University Finances 1980-2010" –My dissertation which will be available electronically through "Dissertation Abstracts" once it is complete. It would also like to publish is as a book once I have published articles based on the analysis chapters.
- I also plan on publishing the analyses in higher education, organizations, nonprofits, sociology, and methodology journals. Current working papers include:
  - "The Privatization of Public Higher Education? Diversity, Change Over Time and The Role of Services"-This is a paper under review at a higher education journal and is based on preliminary dissertation analysis of the revenues of public colleges and universities from 1980 to 2000.
  - "The Black Box of Organizational Finance: Patterns of Cross-Subsidization in Colleges and Universities"—This is a working paper based on preliminary dissertation analyses that examines the relationships between the revenues and expenditures of higher education organizations and the impact of organizational slack, mission, and size on those relationships.
  - "The Role of Stakeholders: Explaining Sector Differences in Higher Education"—This is a working paper based on a preliminary analyses of my dissertation. This paper is a cross-sectional examination of the impact of stakeholder influence on the behaviors of colleges and universities. My dissertation will expand on this by looking at these relationships from 1980-2010. A separate paper will be published using the longitudinal analysis from my dissertation.
  - "Multifaceted Competition in Colleges and Universities"—This is a working paper that examines competition for tuition dollars, donations, and federal grants and contracts in private nonprofit colleges and universities in 2009. A separate paper looking at how these relationships change over time will be published based on the analysis of competition from my dissertation.
  - "Diversity, Change, Fragmentation and Mission Drift: An Examination of College and University Spending Profiles"—This working paper is an examination of the spending profiles of colleges and universities. It demonstrates the diverse and changing nature of the spending profiles of colleges and universities. It also examines the mission drift within these universities, as measured by expenditures of universities, as a result of changes in stakeholder influence and resource dependencies.
- There will also be a number of additional papers that will be published from my dissertation research. The current planned papers that will be derived from my dissertation research include: (1) an examination of the impact of restricted versus unrestricted revenues on the spending patterns of colleges and universities, (2) an examination of how resource dependencies and competition influence the birth and death of colleges and universities within the US, (3) a methodological paper arguing for the utility of using multilevel latent class analysis as a tool for higher education and organizational research using my dissertation data as the example, (4) a longitudinal analysis of the impact of stakeholder influence on the financial behaviors of colleges and universities, and (5) a longitudinal analysis of the impact of competition on the financial behaviors of colleges and universities.

Presentations

- I have two currently scheduled presentations that are based on the preliminary results of my dissertation research:
  - Barringer, Sondra N. "The Black Box of Organizational Finance: Patterns of Cross-Subsidization in Colleges and Universities." Pacific Sociological Association Annual Meeting. San Diego, CA. Scheduled: March 22nd-25th, 2012.
  - Barringer, Sondra N. "The Privatization of Public Higher Education? Diversity, Change Over Time and The Role of Services." Pacific Sociological Association Annual Meeting. San Diego, CA. Scheduled: March 22nd-25th, 2012.
  - I also have made plans to attend a number of conferences in 2012 and 2013 where I will be presenting my

dissertation research. With the exception of the 2012 American Sociological Association Annual Meeting the specific papers to be presented at these conferences will be a function of my progress on my working papers and dissertation analysis. The conferences that I have made plans to attend include:

- The American Sociological Association Annual Meeting--August 17th-20th, 2012, Denver, Colorado
    - I am currently in the process of submitting two papers for presentation at this conference: "The Privatization of Public Higher Education? Diversity, Change Over Time and The Role of Services" and "Diversity, Change, Fragmentation and Mission Drift: An Examination of College and University Spending Profiles"
- The Association for the Study of Higher Education Annual Meeting--November 14th-17th, 2012, Las Vegas, Nevada
- The Pacific Sociological Association Annual Meeting—March, 2013
- The American Education Research Association Annual Meeting--April, 2013
- The Association for Institutional Research Forum—May/June, 2013, Long Beach, California
- The American Sociological Association Annual Meeting August 10th-13th, 2013, New York City, New York
- The Association for the Study of Higher Education Annual Meeting November 13th-16th, 2013, St. Louis, Missouri
- I also have had the privilege of being invited to lecture in a Higher Education Finance course at the University of Arizona during the Spring semester of 2012 where I will present my dissertation research and lead a discussion on diversification of resources and consumer bases in higher education.

Other Deliverables

- I will also compile a panel dataset that combines the IPEDS Finance and Institutional Characteristics data with the identified and publicly available portions of the National Endowment Study data from the National Association of College and University Business Officers which I will make available to other higher education researchers.
- I also will develop suggestions for potential improvements in the IPEDS finance data that will make it more compatible with the other two datasets I am utilizing in my dissertation research: the Voluntary Support for Education Survey and the National Endowment Study.

Describe how you will disseminate the results of this research:

The results of my dissertation research will be disseminated in a number of ways. First, I will publish the empirical, methodological and theoretical contributions from my dissertation in journal articles, book chapters, and possibly as a book. Second, I will present my research at regional and national conferences for higher education, sociology, education, and nonprofits. The specific meetings that I am planning to attend during 2012 and 2013 are listed in the list of deliverables. Third, I will be presenting my research at the 2013 AIR Forum in Long Beach, California. Fourth, I will also present my research and using it as the basis for discussions in my undergraduate and graduate courses in a variety of subjects including: research methods, statistics, sociology of organizations, sociology of education, sociology of higher education, higher education finance, the organization and administration of higher education, and any other courses that I have the privilege to teach. In the undergraduate courses that I currently teach I integrate my research into course lectures and discussions to illustrate how research is conducted to test theoretical and empirical questions in a way that has relevance for policy makers, society, and my students.

Provide a reference list of sources cited:

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IRB Statement

Statement of Institutional Review Board approval or exemption:

Due to the fact that my dissertation research is based on secondary data analysis, the majority of which is publicly available, it is exempt from Institutional Review Board review. This exemption was determined by myself and the faculty members of my dissertation committee and was also approved by the head of my department. The necessary exemption paperwork was filed by my department with the Graduate College at the time of my dissertation proposal defense. A copy of the signed paperwork is available upon request.

Statement of Use of Restricted Datasets

This proposal will not require the use of any restricted NCES or NSF datasets. I will be relying on the IPEDS data which is unrestricted and publicly available.

The additional datasets that I will be utilizing for my dissertation research are the Council for Aid to Education's Voluntary Support for Education Survey (VSE) and the National Endowment Study (NES) from the National Association of College and University Business Officers. The VSE is a restricted use dataset but I have already obtained the necessary license agreements for the data components that I will be using in my dissertation research. I have also already obtained the raw data and necessary mapping files to tie the VSE data to the IPEDS data. I have also obtained all of the restricted and publicly available sections of the NES that are relevant for my dissertation research. I am in the process of compiling this data and generating a mapping file to tie this to the IPEDS and VSE datasets.

Biographical Sketch

I am currently a Ph.D. candidate in Sociology at the University of Arizona specializing in higher education finance, the sociology of organizations, nonprofit organizations, and quantitative research methods. Prior to beginning my doctoral studies in Sociology at the University of Arizona I received a Bachelor of Arts Degree Magna Cum Laude in Sociology and Economics from Baylor University in Waco, TX in 2006. In 2008 I received my Master of Arts Degree in Sociology from the University of Arizona.

While attending the University of Arizona I have been involved in a number of research projects that involve large-N datasets, the majority of which focus on U.S. higher education and utilize components of the National Center of Education Statistics IPEDS data. My familiarity with the IPEDS data focuses on the Finances, Institutional Characteristics, and Enrollments portions. I have just completed compiling the necessary IPEDS data for my dissertation research and am working on integrating this with the National Endowment Study from the National Association of College and University Business Officers and the Voluntary Support for Education Survey from the Council for Aid to Education.

I also have a number of working papers and conference presentations that utilize the IPEDS data and the primary method of analysis for my dissertation, Multilevel Latent Class Analysis. I have already completed and presented preliminary results for my dissertation at national and regional conferences in sociology and I am currently in the process of revising these papers for publication. One of these papers examines the relationships between the revenue and expenditure streams of nonprofit colleges and universities from 2007 to 2009 and the impact of organizational slack on those relationships. Another paper looks at the differences in the patterns of expenditures between public and private nonprofit colleges and universities from 1980 to 2009 and how differences in stakeholder influence impact the spending behaviors of these institutions. I have also recently submitted a paper that examines the revenue streams of public colleges and universities from 1980-2000, focusing on the diversity of the revenue profiles of these universities, the impact of the specific services offered by these organizations on their revenue profiles, and how this relationship changes over time .

In addition to my own research I have been involved in a number of other collaborative research projects that have helped to provide me with the skills necessary for my dissertation research. First, I am currently working on a project with a nonprofits researcher at Georgia State University on the endowments of colleges and universities which examines the impact of endowments and endowment spending on student diversity and student success. This project utilizes the Finance, Enrollment, Student Financial Aid, Institutional Characteristics, Completions, and Graduation Rate components of the IPEDS data along with components of the National Endowment Study from the National Association of College and University Business Officers. A second project, in collaboration with a faculty member at the University of Arizona, uses IPEDS data along with state level economic data to examine the state-level economic impact of state government funding for higher education relative to other types of university funding.

My coursework and comprehensive examinations have also bolstered my research skills. I completed comprehensive examinations in the sociology of organizations and in statistics and research methods. I have also completed extensive coursework in quantitative and qualitative research methods, statistics including multilevel modeling and latent variable modeling, and the sociology of organizations. In addition to this I have taken and audited courses in the higher education department at the University of Arizona, which I have supplemented with extensive reading in the higher education literature. All of these activities have furnished me with the theoretical and methodological tools necessary to embark on this research.

Upon the completion of my dissertation research I will continue my research in higher education in two ways. First, I am interested in how increased competition for scarce resources influences the working conditions and stratification of faculty, staff and administrators of these institutions. I am also interested in the impact on the students, in particular the way in which these factors influence access, program offerings, affordability and student debt loads. Second, I am interested in how the resources utilized by colleges and universities move through these organizations to generate "outputs" such as teaching, research and service. In other words, I want to determine how resources are allocated to the different units and departments of these organizations and how those units and departments use the resources to provide services to their various constituencies.

Budget Requirements

Salary/Stipend: $19433.00
Tuition and fees: $0.00
Travel: $567.00
Other travel related expenses: $0.00
Other research expenses: $0.00
Total Request: $20000.00

Funding History

To date I have received support for conducting my dissertation research from the University of Arizona Graduate College. Specifically I have been awarded the University of Arizona Excellence Graduate Fellowship in the Social Sciences by the Graduate College at the University of Arizona for the 2011-2012 academic year. This fellowship amounted to $18,750 plus a full tuition scholarship for the academic year. The University of Arizona Excellence Graduate Fellowship is designed to support graduate students as they conduct their dissertation research. It is a competitive fellowship awarded based on the academic and research record of the applicants and the merits of the proposed research with specific emphasis on innovation and advancing the knowledge within their field of research.

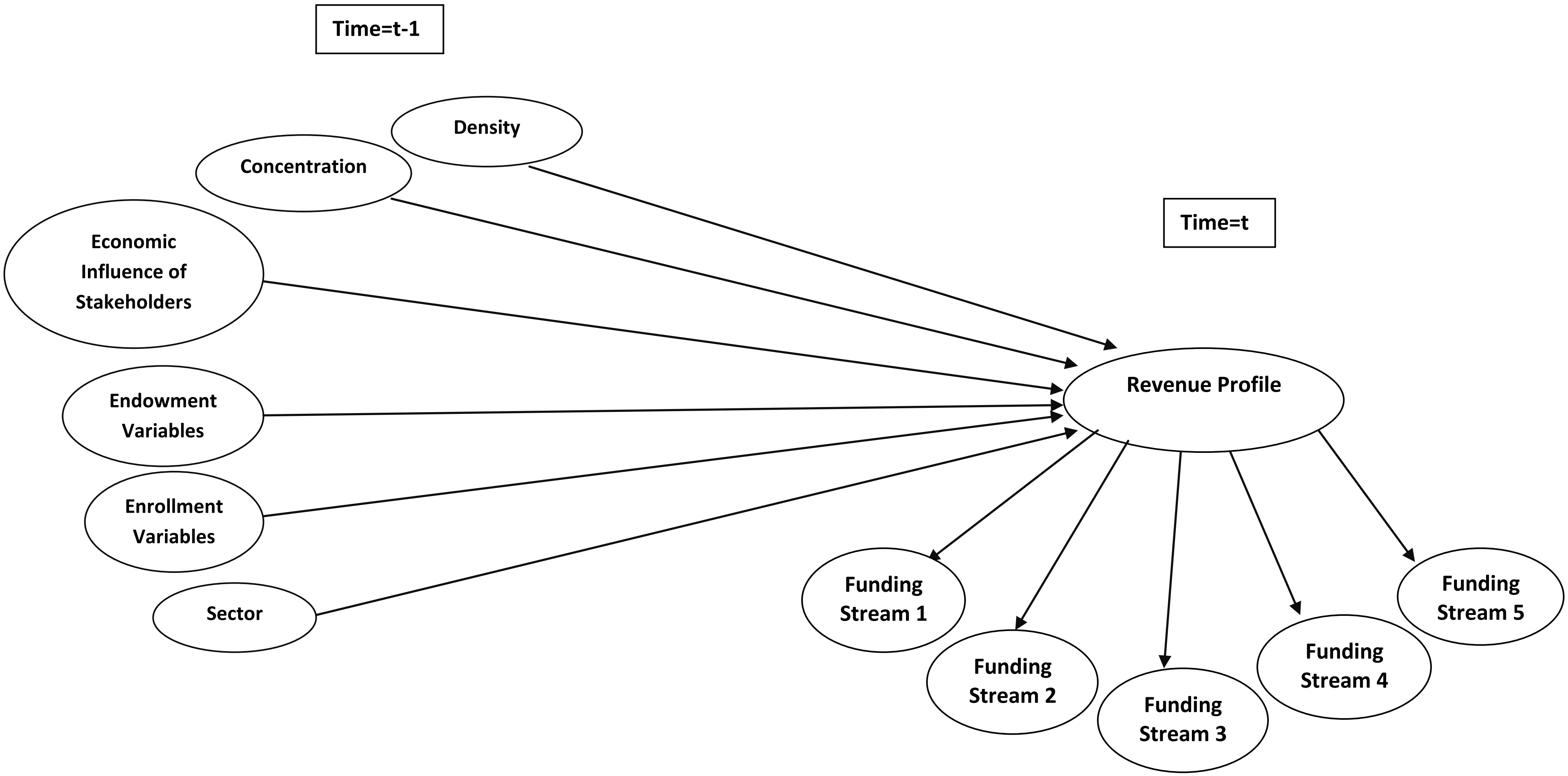
In addition to applying for the AIR Dissertation Grant I have also applied for the National Academy of Education/Spencer Dissertation Fellowship for the 2012-2013 academic year. Awards for the National Academy of Education/Spencer Dissertation Fellowship will be announced in May of 2012.

I, as the only PI for this research, have never before received funding from the Association for Institutional Research.

Letter of Support from Dissertation Faculty Advisor

- Letter of Support

Figure 1: Diagram for Estimating the Impact of Competition and Stakeholder Influence on the Revenue Profiles of Colleges and Universities



Statistical Model

$$\pi_{fjklmst}^{F_1F_2F_3F_4\ F_5\ X_{it}Y_i} = [\pi_{fs}^{F_1|X}\pi_{js}^{F_2|X}\pi_{ks}^{F_3|X}\pi_{ls}^{F_4|X}\pi_{ms}^{F_5|X}\ ][\pi_{st}^{X|Y}\pi_{ds}^{D|X}\pi_{cs}^{C|X}\pi_{is}^{I|X}\pi_{ws}^{W|X}\pi_{es}^{E|X}\pi_{qs}^{Q|X}]\pi_{t}^{Y}$$

- Note that this equation is using the classic latent class model notation in which the equation is expressed in terms of probabilities (Clogg, 1995; Macmillian & Eliason, 2003).
- F_i represented the observed revenue streams where i corresponds to the particular revenue stream.
- X refers to the clusters of organizations as determined by the observed revenue streams (F's) included in the model.
- Note that all of parameters for the independent variables in the second set of brackets are conditioned on X, this is because a separate regression coefficient is specified for each cluster specified in the measurement model.
- Y refers to the latent trajectories over time which are how time is incorporated into a multilevel latent class analysis (Eliason, Mortimer, Vuolo, & Tranby, 2007; Macmillian & Eliason, 2003).
- It should be noted that all of the variables in this model vary over time.
- The s subscript indicates that there will be a separate parameter for every cluster estimated in the measurement model.
- The subscript t denotes that parameter as part of the time specification.
- The other subscripts refer to the different levels of the variable denoted by the corresponding superscript.
- D refers to the set of density variables that will be specified for the four facets of competition.
- C refers to the set of concentration variables that will be specified for each of the four facets of competition.
- I refers to the set of economic influence variables for each of the key stakeholder groups.
- W refers to the set of variables use to operationalize wealth, most notably the endowment of the college or university.
- E refers to the set of enrollment variables.
- Q refers to sector as measured by a dummy variable to determine if the relationships are different for public and private nonprofit colleges and universities.

Clogg, C. C. (1995). Latent class models. In G. Arminger, C. C. Clogg & M. E. Sobel (Eds.), *Handbook of statistical modeling for the social and behavioral sciences* (pp. 311-360). New York: Plenum Press.

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APPENDIX: Variable Lists for Relevant Datasets

National Center for Education Statistics Datasets[1]

- IPEDS Enrollment—These variables will be used to generate measures of total enrollment, gender breakdowns of enrollments, level of study breakdowns of enrollments, and racial/ethnicity breakdowns of enrollments that will be included in the model as control variables that affect the likelihood of a school having a particular revenue or expenditure profile.
    - Unit id (unitid)
    - Attendance status(section)
    - Type of student counted (line)
    - Level of study (lstudy)
    - These will be combined to generate total enrollment, they will also be used to generate measures of student diversity.
        - Grand total men (efrace15)
        - Grand total women (efrace16)
    - State residence of student when 1st admitted (line)—This will be used to evaluate the states in which colleges and universities compete for students for the years for which this data is available.
    - The race/ethnicity variables will be used to generate measures of student diversity which will be used to understand the results and as independent variables to predict the expenditure profiles.
        - Nonresident alien men (efrace01)
        - Nonresident alien women (efrace02)
        - Black, non-Hispanic men (efrace03)
        - Black, non-Hispanic women (efrace04)
        - American Indian or Alaskan Native men (efrace05)
        - American Indian or Alaskan Native women (efrace06)
        - Asian or Pacific Islander men (efrace07)
        - Asian or Pacific Islander women (efrace08)
        - Hispanic men (efrace09)
        - Hispanic women (efrace10)
        - White, non-Hispanic men (efrace11)
        - White, non-Hispanic women (efrace12)
        - Race/ethnicity unknown men (efrace13)
        - Race/ethnicity unknown women (efrace14)
- IPEDS Finance[2]
    - Variables used to define the revenue profiles of colleges and universities. The revenue profiles are the dependent variables in the second stage of the analysis which evaluates that the impact of

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[1] It should be noted that I am actually employing IPEDS data and HEGIS data given that the time period I am examining. I am interested in the period from 1980-2010 which includes HEGIS data from the early to mid 1980s and the IPEDS data from the mid 1980s to 2010.

[2] My dissertation examines public and private nonprofit colleges and universities from 1980 to 2010. There are key changes in federal accounting standards for public and private nonprofit organizations during this period that have created comparability issues for the financial data between sectors and across sectors over time. In order to resolve this issue I am using the IPEDS Delta Cost Project (DCP) Database Mapping file obtained from the Delta Cost Project to generate measures of key revenue and expenditure streams that are comparable across sectors and over time. Because the names of the variables used also change over time I am listing the variables as they are listed in the IPEDS-DCP Database Mapping file. The mapping file which includes the variable names listed here along with their original names for public, private nonprofit, and private for-profit institutions over time within the HEGIS/IPEDS finance data can be obtained from the Delta Cost Project's website: http://www.deltacostproject.org/data/download/download.php.

competition and stakeholder influence on the likelihood of a college or university having a particular revenue profile at a particular point in time.[3]

- A number of these variables will also be used to operationalize the density and concentration measures that are used to evaluate the impact of competition as outlined in the literature review. Some will also be used in combination with the VSE data to generate measures of the economic influence of key stakeholder groups as discussed in the literature review.
    - Tuition and Fees
    - Federal Appropriations
    - State Appropriations
    - Local Appropriations
    - Federal Grants and Contracts
    - State Grants and Contracts
    - Local Grants and Contracts
    - Private Gifts, Grants and Contracts
    - Investment Return (2002-2010 for public, 1997-2010 for private nonprofit)
    - Endowment Income (1980-2002 for public, 1980-1996 for private nonprofit)
    - Sales and Services of Educational Activities (1980-2002 and 2009 for public and 1980-2010 for private nonprofit)
    - Revenues generated by auxiliary enterprises
    - Hospital Revenues
    - Other Sources
    - Independent operations
    - Total Current Funds Revenues
    - Pell Grants
    - Other Federal Grants
    - State Grants
    - Local Grants
    - Institutional Grants (funded)
    - Institutional Grants (unfunded)
    - Total Student Aid
- Variables used to define the expenditure profiles of colleges and universities. The expenditure profiles are the dependent variables in the second stage of the analysis which evaluates that the impact of competition and stakeholder influence on the likelihood of a college or university having a particular expenditure profile at a particular point in time
    - Instruction - Current year total excluding operations and maintenance and interest
    - Research - Current year total excluding operations and maintenance and interest
    - Public Service - Current year total excluding operations and maintenance and interest
    - Academic Support - Current year total excluding operations and maintenance and interest
    - Student Services - Current year total excluding operations and maintenance and interest
    - Institutional Support - Current year total excluding operations and maintenance and interest
    - Operation Maintenance of Plant - Current year total

[3] I will also be using the restricted and unrestricted revenue breakdowns for all revenue streams for which they are available for an additional analysis of the revenue profiles of colleges and universities for a subset of the data. Specifically for the years of 1987-1999 to investigate how the availability of restricted and unrestricted revenues is related to stakeholder influence and the spending profiles of colleges and universities.

- Scholarships and Fellowships - Current year total excluding operations and maintenance and interest
- Auxiliary Enterprises - Current year total excluding operations and maintenance and interest
- Hospital Services - Current year total excluding operations and maintenance and interest
- Independent Operations - Current year total excluding operations and maintenance and interest
- Other Operating - Current year total (2002-2010 for public institutions)
- Total Operating - Current year total operating
- Other Nonoperating - Current year total
- Other Expenses - Current year total
- Total Nonoperating - Current year total nonoperating
- Grand Total - Current year grand total

▪ Balance Sheet Components[4]--These will be used as control variables.
- Total assets
- Total liabilities
- Total net assets
- Ending value of endowment assets-market

▪ Other variables—These are the identifying variables for the cases.
- Unit id (unitid)
- Entities included (entities)
- Primary nature of unit(s) (pnature)
- Parent child indicators

o IPEDS Institutional Characteristics

▪ Identifying variables
- Unit id (unitid)
- Institutional Name (instnm)

▪ Variables used to restrict the data to the population of interest
- Sector of institution (sector)
- Control of institution (control)
- Undergraduate offering (ugoffer)
- 2000 Carnegie Classification (Carnegie)

▪ Variables dealing with geographic location that will be used to operationalize the density and concentration measures.
- Fips state code (fips)
- Geographic region (obereg)

▪ Additional variables used for controls, measures of sector, and to generate descriptives[5]
- Basic Carnegie Classification 2005 (ccbasic)
- 1995 Carnegie Classification (carnegie)
- Basic Carnegie Classification 2010 (ccbasic)
- Institutional control or affiliation (cntlaffi)
- Religious affiliation (relaffil)

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[4] The data on these variables is not available in some years and is missing for a higher proportion of colleges and universities. Therefore it will be used for understanding the cases and possibly as control variables. I will also utilize the National Endowment Study from the National Association of College and University Business Officers to supplement the endowment data.

[5] Not all of these variables are available in all years, they will only be used for those years that they are available.

    - Measures of selectivity –Combined to generate measures of selectivity (Admissions divided by Applicants)
        - Applicants total (applcn)
        - Admissions total (admssn)
    - Institution has hospital (hospital)
    - Historically Black College or University (hbcu)
    - Institution grants a medical degree (medical)
    - Tribal college (tribal)
    - Degree of urbanization (locale)
    - Land Grant Institution (landgrnt)
    - Does the institution have a tenure system (tenursys)
- Variables dealing with opening/closing/combining schools
    - Unitid for merged schools (newid)
    - Year institution was deleated from IPEDS (deathyr)
    - Date institution closed (closedat)
    - Institution is active in the current year (cyactive)

Voluntary Support for Education Survey (The Council for Aid to Education)[6]

- I have the following list of variables for each of the following groups and the totals for all groups from 1980-2010: Alumni, Parents, Other Individuals, Foundations, Corporations, Religious Organizations, Fundraising Consortia, and Other Organizations.
    - Total Outright Gifts for Current Operations
    - Unrestricted Donations
    - Total Restricted Contributions
    - Restricted Donations for Academic Division
    - Restricted Donations for Faculty and Staff Compensation
    - Restricted Donations for Research
    - Restricted Donations for Public Service and Extension
    - Restricted Donations for Library
    - Restricted Donations for Operation and Maintenance of Plant
    - Restricted Donations for Student Financial Aid
    - Restricted Donations for Athletics
    - Other Restricted Donations

National Endowment Study (National Association of College and University Business Officers)[7]

- These variables will be used in combinations with the balance sheet variables from the IPEDS finance data to control for the wealth of these organizations.
    - Endowment Market Value (1980-2010)
    - Annual Spending Rate (1992-2010)
    - One Year Rate of Return (1980-1989, 1991-2010)

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[6] I also obtained a mapping file from the Council for Aid to Education that ties the colleges and universities from the VSE to the corresponding colleges and universities in the IPEDS data based on the year and unitid variables from the IPEDS data.

[7] I am currently working on mapping the NES data to the IPEDS data for my dissertation and a separate research project with a colleague at Georgia State University that focuses on the impact of endowments and endowment spending rates on student diversity and success. If the mapping is completed in the necessary time frame these are the variables that will be included.