PUBLIC FINANCE AND OUTCOMES IN HIGHER EDUCATION: TESTING DIMENSIONAL PUBLICNESS

by

JENNIE CHRISTINE WELCH

(Under the Direction of Laurence O'Toole)

ABSTRACT

This dissertation is comprised of three, distinct essays, each of which explores the utility of dimensional conceptualizations of publicness for understanding and explaining university outcomes and impact. The first essay explores the extent to which a university's publicness affects university budgeting and finance outcomes. More specifically, the essay examines the extent to which varying degrees of state-authority over university tuition price-setting and tuition revenues affects a series of budget related outcomes including (1) the amount of public support a university receives; (2) university revenue diversification; and (3) the amount of resources a university spends on public-service related activities and programs. This essay employs fixed-effects and OLS regression analyses to explore these relationships. The OLS results provide limited support for the proposition that a university's reliance on public support is inversely related to university tuition authority. However, the significance of the findings is sensitive to index construction. In addition, the fixed-effects results suggest that these relationships are not meaningful over time. The second essay is concerned with the extent to which university publicness affects the negotiating power of department chairs in personnel and hiring decisions. The essay applies maximum likelihood estimation to a nested structure of equations to explain

both individual (department chair) and group level (university) variance. Findings suggest that a number of individual-level characteristics affect the amount of authority chairs have in faculty negotiations. However, the results do not suggest a strong association between public status or dimensional measures of publicness and department chair hiring authority. The final essay builds upon these findings, as well as findings from existing literature related to university performance measures to present a new conceptual model for comparative analyses of university performance—one that incorporates dimensional understandings of publicness and considers a university's fulfillment of public value outcomes as the dependent variable of interest.

INDEX WORDS: dimensional publicness; higher education; university finance; university personnel and hiring; university performance

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DEDICATION

This dissertation is dedicated to my husband, Kevin Welch, who has patiently loved me through this work, and inspires me to be the best version of myself I can be each and every day.

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Finally, I would like to acknowledge my family and friends who have been cheerleaders, motivators, encouragers, and shoulders-to-lean-on throughout my academic career. I would not have been able to complete this dissertation without their support.

TABLE OF CONTENTS

Page

APPENDICES

LIST OF TABLES

Page

LIST OF FIGURES

Page

INTRODUCTION

The landscape of higher education in the United States is changing. Over the past several decades, scholars have noted a "blurring of sectors" within the American higher education system (Feeney & Welch, 2012), as legally public universities have become increasingly responsive to market forces and as the for-profit college and university sector has become increasingly regulated. Although there is a long and well-documented history of comparative analyses of university inputs, outputs, outcomes, and impact that favor dichotomous, public v. private comparisons,[1] there are few examples of comparative analyses in the higher education sector that treat "publicness" as a dimensional concept—one that can be measured with consideration to an organization's responsiveness to the market (Bozeman, 1987), to political authority (Bozeman, 1987), or with consideration to an organization's fulfillment of public value outcomes (Feeney & Welch, 2012; Moulton, 2009; Moulton & Bozeman, 2011).

This dissertation is comprised of three distinct essays, each of which explores the utility of dimensional conceptualizations of publicness for understanding and explaining HEI outcomes and impact. The first essay explores the extent to which a university's publicness affects university budgeting and finance outcomes. More specifically, the essay examines the extent to which varying degrees of state authority over university tuition price-setting and tuition revenues affects a series of budget-related outcomes including (1) the amount of public support a university receives; (2) university revenue diversification; and (3) the amount of resources a university spends on public-service related activities and programs. The second essay is

[1] See Chapter 4 for a review of these sources.
[2] Welch, J.C. To be submitted to *Public Management Review.*
[3] See Appendix A for a comparison of these traditional funding structure characteristics to the new funding

concerned with the extent to which university publicness affects the negotiating power of department chairs in personnel and hiring decisions. It employs a hierarchical linear model to explore both organizational and individual level effects. Finally, the third essay considers the utility of comparative analyses of university performance that privilege a university's fulfillment of public value outcomes as the primary outcome of interest—and argues that this conceptualization of dimensional publicness may have the greatest utility in the higher education sector.

Although each of these essays draw from slightly different literature bases germane to the ideas explored in each paper (budgeting and finance outcomes, hiring and personnel outcomes, and comparative analyses of university performance), all three are bound together by a common variable of interest: organizational publicness. Taken together, these essays also represent the full cycle of scientific knowledge building (Singleton & Straits, 2010). Chapters 2 and 3 employ a deductive approach, utilizing Bozeman's theory of multidimensional publicness as a framework for hypothesizing about and modeling the effects of publicness on the outcomes of interest (Bozeman, 1987), while Chapter 4 builds upon these findings, as well as findings from existing literature, and employs an inductive approach to develop a new concept map for comparative analyses of university performance. The dissertation concludes with a discussion of the relationship between the findings from the first two essays and the concept map presented in the third essay, and explores the possibilities for future research concerned with dimensional publicness theory and comparative analyses of HEI outcomes and impact.

CHAPTER 2:

UNIVERSITY TUITION AUTHORITY: EXPLORING ITS RELATIONSHIP TO GOVERNMENT APPROPRIATIONS, REVENUE DIVERSITY, AND PUBLIC SERVICE SPENDING[2]

[2] Welch, J.C. To be submitted to *Public Management Review.*

ABSTRACT

In recent years, public universities around the United States have faced pressure to stymie tuition increases, despite the decline in state appropriations for higher education and demands from citizens for public institutions to maintain high levels of support for the communities and students they serve. However, the ability of public universities to respond to these pressures is mitigated by the authority granted to them by states to set tuition prices and to control tuition revenues. In this way, legally public universities may be more or less public depending on the political constraints they face and their ability to be responsive to economic market pressures. This paper draws from dimensional publicness theory (Bozeman, 1987) in order to develop an indexed measure of a university's tuition authority, and explores the relationship between this measure and other budgeting and finance variables including the amount of public funding support universities receive; the diversification of their revenues; and the amount universities spend on public-service related activities and programs. This paper utilizes a three-year panel (FY2002, 2005, and 2010), as well as cross-sectional data (FY2010) and employs fixed-effects and OLS regression analyses respectively to explore these relationships. The OLS results provide limited support for the proposition that a university's reliance on public support is inversely related to university tuition authority. However, the significance of the findings is sensitive to index construction. In addition, the fixed-effects results suggest that these relationships are not meaningful over time. The implications of these findings for dimensional publicness theory, as well as their implications for higher education policy are discussed.

INTRODUCTION

In some instances, publicness is an effective shelter; in others, it is an effective shackle.
– Barry Bozeman, 1987

Market failures and the suitability of public institutions for managing the production of goods and services that have a clear benefit to society are two frequently cited reasons for the public provision of goods and services (Pigou, 1938; Summers, 1989; Webster, 2003). The argument that government should play a role in the provision of higher education is aligned with this rationale. Scholars contend that education provides positive externalities to society such as more informed citizens who vote on government and social affairs, as well as positive economic benefits (AASA, 2004; Albert Shanker Institute, 2003; Friedman, 1955; Marcy, 2002). In an increasingly globalized economy where some form of postsecondary education is required to maintain even a moderate standard of living, it is also argued that government subsidies for education can help smooth inequities in a citizen's ability to pay due to variations in relative income (Broadway & Marchand, 1995; Fernandez & Rogerson, 1995; Lommerud, 1989). This rationale for government support is evident in federal legislation as well, such as the Morrill Acts of 1862 and 1890, which granted land to states for the purpose of broadening access to higher education for members of the working classes.

Although publicly owned universities in the United States have historically relied on *both* public appropriations and private donations to support their missions, public dollars have traditionally been the largest piece of the revenue pie. This traditional funding structure has characteristics identified by Fethke and Policano (2012) of heavily regulated tuition; low-tuition/high-subsidy; fixed entry requirements; unrestricted subsidy use; spending of revenues received; limited external accountability; "hourglass" governance structures; trying to be "all

things to all people"; opaque financial reporting; and innumerable internal cross-subsidies.[3] However many policy makers and scholars have argued that this model is financially unsustainable in the long run (Fethke & Policano, 2012; SHEEO, 2012). The fallout from the Great Recession suggests these criticisms may have merit, as cuts in state support have continued to batter university budgets since the recession began in 2008 (Mangan, 2012) and as appropriations for higher education have suffered disproportionately compared to other funding areas because of higher demands placed on Medicaid, prisons, public assistance programs, and local governments (Zumeta, 2010).

In order to adjust to the new funding climate, many public universities have responded by raising tuition and fees, instituting aggressive fundraising campaigns, or making drastic cuts in expenditures. David Blinder, UC Berkeley's associate vice chancellor for university relations, described this new financial reality by stating,

> *"Tuition is now a major source of revenue in a way that historically it wasn't for public colleges, as well as philanthropy. Philanthropy was always key in the private university world. That was their life-blood, whereas we had traditionally relied on public support. We did need to learn from the privates"* (Applegate, 2012).

If publicly owned universities are being called upon to become "increasingly entrepreneurial" (Mangan, 2012), this begs the question, "How much authority do publicly universities actually have to set tuition prices and to control the revenues that accrue from it?" A review of state higher education policies (SHEEO 2002; 2005; 2011; 2013) suggests that while some public universities have high levels of authority over tuition pricing and control over tuition revenues once they are collected, others are still heavily dependent on regional or state governing bodies, as the governance structure in many states places primary tuition-setting authority and control over tuition revenues in the hands of governors, the legislature, or

[3] See Appendix A for a comparison of these traditional funding structure characteristics to the new funding reality.

governing boards populated by elected officials (SHEEO 2002; 2005; 2011; 2013). At a time when individual institutions need to respond to a new funding reality, many remain constrained, unable to make the adjustments that will allow them to move away from the heavily regulated, high-subsidy model and towards a funding structure that grants them more flexibility to respond to external market forces.

This chapter applies dimensional publicness theory (Bozeman, 1987) in order to explore the variation that exists across public universities with respect to this tuition authority. This chapter develops an index, drawing from Bozeman's original conceptualizations of political and economic authority, and uses the measure to address this question: "If publicly owned universities can be more or less public with respect to the political and economic authorities that influence and control tuition pricing and revenues, is there a relationship between this conceptualization of dimensional publicness and (1) a university's *reliance* on public support; (2) the *amount* of financial support the university receives from the state; (3) the *diversity* of a university's revenue structure; and (4) the *amount* a university spends on public service related activities?" This question is explored using cross-sectional data from FY2010, as well as a three-year panel that also includes data from FY2002 and FY2005. The results suggest that although there may be an association between university tuition authority and a university's reliance on public funding support, this association is sensitive to variations in how authority is measured and sensitive to the time period of analysis.

LITERATURE REVIEW

This section explores (1) publicness theory and its application to university financing; (2) power and resource dependency theories and their relationship to public mission; and (3) the propositions informed by these theories and tested in this chapter.

Publicness Theory and its Application to University Financing

Barry Bozeman articulates dimensional publicness theory in his book, *All Organizations are Public* (1987), arguing that an organization can be more or less public based on the extent to which political authority affects the organization's behavior and processes (Bozeman, 1987, p. 83). Bozeman argues that simple categorization based on legal status or predominant funding sources limits our understanding of the effects of political authority on organizational structure, behavior, and outcomes. Instead of treating "public" as a dichotomous variable, the theory adopts a dimensional view in order to explore its effects (Bozeman, 2013). Recent trends in the public sector such as contracting out and sector-blurring have been argued to make the theory increasingly relevant (Feeney & Welch, 2012), as the legal identities of organizations have become less useful for explaining organizational behaviors and outcomes, and as authority and accountability have become increasingly spread across networks (Mitchell & Thurmaier, 2010).

These trends are certainly evident in higher education, where reductions in state appropriations and the call for more businesslike practices from within and outside academia have blurred traditional distinctions between "public" and "private" (Feeney & Welch, 2012). Public universities around the country are striving to reduce their dependence on public support and to move towards more self-reliant funding models. This movement is well documented in the literature (Cheslock & Hughes, 2011; Fethke & Policano, 2012; Kane et al., 2003). Some departments within universities have also been making these strides. For example, UVA's

Darden School of Business made the decision to forego public support and to generate *all* of its operating revenues from private sources beginning in the fall of 2003 (UVA Financial Report, 2004). On the other hand, government often heavily subsidizes the budgets of private research universities. For example, in 2010, the Johns Hopkins University, a legally private institution, received more than $260 million in federal stimulus money to fund 480 proposals from the institution's research faculty and the addition of 190 staff jobs—a direct result of the public support they received (De Nike, 2010).

Because a public university's ability to make substantive changes in revenue and expenditure structures and sources can be more or less constrained by political authorities, these institutions are more or less free to respond to market forces and pressures. In this way, Bozeman's dimensional publicness theory has a great deal of utility when applied to our understanding of a public university's tuition authority: universities that are unconstrained by political oversight would theoretically be entirely responsive to market forces in their decisions related to price-setting and tuition revenue spending. However those that are entirely constrained would be unable to wield any influence over pricing or revenue spending decisions. Research suggests (SHEEO 2002, 2005, 2008, 2011, 2013) that there is variation across states in the extent to which universities have authority in price-setting and revenue decision making—suggesting their responsiveness to market pressures is more or less constrained by political bodies.

The relevance of dimensional publicness theory to the analysis presented in this paper is perhaps best expressed by Bozeman (2013, p. 179) who writes, "Whether one is interested in describing or prescribing organizations or policies, dimensional publicness plays a role". This paper is concerned with both, as the analyses consider the extent to which universities make financial and budgetary decisions that are responsive to market pressures and to serving the

public, *and* with the state level policies that constrain or incentivize public research universities to do so.

Although dimensional publicness theory serves as a useful framework for understanding the relationship between university tuition authority and the outcomes of interest, previous measures that have sought to operationalize the theory actually use some of the outcomes of interest in this paper as proxies for dimensional publicness (e.g. percentage of funding from public sources). However, this approach has been criticized because the amount or percentage of money an organization receives from public sources does not necessarily measure the degree of influence political authorities have on organizational decision-making or outcomes. Scholars who have attempted to measure political influence, authority, or control more directly have done so by examining an organization's rationale for being a public entity (Antonsen & Jorgensen, 1997); the publicness of an organization's goals or agenda (Bozeman & Bretschneider, 1994; Goldstein & Naor, 2005); the amount of communication an organization has with political authorities (Bozeman & Bretschneider, 1994); as well as a handful of other measures that are specific to the policy area of interest (Boschken, 1992; Bozeman & Moulton, 2011; Crow & Bozeman 1998).

The indexed measure developed in this paper was developed to be relevant to the policy area of interest (higher education); to be closely aligned with Bozeman's original conceptualization of dimensional publicness theory and the axioms therein—a purpose achieved by including questions that *specifically* ask about political authority over an institution's decision-making (Bozeman, 1987, p.84); and to explore the relationship between this authority and budgeting and financing outcomes of interest—outcomes that have been treated as proxies for dimensional publicness in the past. Thus, the results of this paper should be of

methodological interest to those interested in measuring dimensional publicness, because the models explore the relationship between the direct measure of political authority applied here and several funding proxies that have been previously applied.[4]

Power and Resource Dependency and the Effects on Public Mission

In addition to dimensional publicness theory, research concerned with resource dependency and power dependency also have application to this analysis, as several university administrators and scholars have raised concerns about how the movement towards more privately supported funding structures would affect public universities' responsiveness to their missions. As Edward Ray, President of Oregon State noted in print in 2010,

> *"Being privately funded and having a public mission can create conflicts in priorities…I often worry about how we will sustain that public mission in the face of declining public financial support; if we fail, there is no Plan B for students who depend on us and the state we serve" (*Register-Guard, 2010).

And as Keller (1983) sees it, American universities are "dependent yet free; market-oriented yet outside cultural and intellectual fashions" and "perpetually in search of vital financial nourishment." This concern over the "proper balance" between public and private revenues—both for pursuit of mission and organizational survival—relates to scholarly literature on the nature of resource and power dependence. Resource dependency theory, originally posited by Pfeffer and Salancik (1978), suggests that an organization's survival "hinges on its ability to procure critical resources from the external environment" (Casciaro & Piskorski, 2005, p.1). Similarly, Emerson's power dependence theory (1962) suggests that dependence is a function of resource criticality and the availability of alternative providers of critical resources (Casciaro & Piskorski, 2005, p.5).

[4] The relationship between dimensional publicness and the index developed in this paper is discussed in more detail in the "Data" section (pg. 15).

Taken together, these theories suggest a somewhat obvious point: the survival of public universities is dependent upon their ability to procure resources, and the resource mix may affect an institution's dependence on resource providers. Thus, universities that are heavily reliant on a single source of revenue may be more threatened by economic downturns than public universities with more diverse revenue streams. Accounting and finance literature has long asserted the benefits of diverse revenue structures, arguing that no organization should be too reliant upon any one source for financial support because it exacerbates the threats imposed by external forces to an organization's budget (Finkler et al., 2013).

Yet the idea of resource dependence is less clear-cut for publicly owned organizations. For some, dependence may actually be a source of stability. Indeed, many critics of public organizations argue that performance suffers because managers do not have to worry about the bottom line, knowing that support is assured through the environment in which they operate. As Jung & Moon (2007) find in a study of Korean non-profit organizations, constraints from resource dependence on public funding affects goal setting, resource allocations, and program choices, while on the other hand public support earns organizations institutional legitimacy.

While this rationale for intentionally remaining resource dependent may be useful in explaining the revenue structures of public universities in the past, many already enjoy high levels of legitimacy from their land-grant or flagship status, and the "stability" that a heavy reliance on public funding has ensured in the past is waning given the post-recession funding climate. The attractiveness of moving towards a more balanced revenue model is that by increasing reliance on tuition and private gifts, public universities can reduce the power imbalance between themselves and the constraining entity (the state). For example, Wayne State recently forfeited $534,700 in state performance funding when it violated a tuition cap imposed

by the state—but the 8.9% tuition hike the university imposed more than offset the lost dollars from state support (Benes, 2013).

Propositions

The literature reviewed above informs the three propositions that are explored in this chapter. The first proposition is informed by dimensional publicness theory, resource and power dependency theory, and the myriad of studies that treat reliance on public funding as a proxy for dimensional publicness. This proposition suggests that universities with low levels of tuition authority (meaning those that face high constraints from political authorities) will rely *more* heavily on public forms of support than institutions that have high levels of tuition authority (meaning they face low levels of political constraints). That is,

P1. University tuition authority will be negatively associated with university dependence on public revenue sources.

This proposition makes intuitive sense as well. For example, state legislatures who have faced budget challenges post-recession may recognize that (1) universities require a minimum level of resources in order to survive and (2) that massive cuts in higher education appropriations will require changes in state policy that allow universities more pricing flexibility if universities are expected to continue to produce the same outputs and provide the same level of instructional quality to students. The state of Virginia provides a good example of this: In 2005, the state passed *The Restructured Higher Education Financial and Administrative Operations Act*, which granted public institutions more autonomy over enrollment, donor solicitation, and tuition levels, with the acknowledgement that this freedom would result in less state support (UVA President's Report FY2003; President's Report FY2004; UVA, 2012).

Next, even if universities are granted a high level of authority over their main source of self-generated revenue (tuition), this authority still has to be exercised. In other words, a

university may be granted a great deal of flexibility in tuition price-setting and may have control over decisions related to the spending of tuition revenues once they are collected, but achieving revenue diversity requires the university to *use* that authority to pursue a more balanced revenue structure (Ebel & Petersen, 2012). Because of the competing theories with regards to the relationship between revenue diversity and power dependence, this paper posits a relationship between university tuition authority and revenue diversification, but does not posit a direction for this relationship:

P2. University tuition authority will be associated with revenue diversification.

The University of Virginia's revenue structure since the state policy change in FY2005 offers support for this proposition. Today, sources of private support are more important than ever before, with state support making up 6.7% of the University's total revenues--nearly equal to the percentage of revenue generated from private gifts (6.2%) and endowment spending (6.0%) (UVA Financial Report, FY2011).

However changes in revenue structures rarely occur overnight, nor do they occur in vacuums—and it is likely that any association between university tuition authority and more balanced revenue structures may be mitigated by the financial leadership's bias towards action, as well as a number of internal factors, external pressures, or any number of extraneous circumstances that may combat change.

It is also possible that more tuition authority could result in changes in revenue structure—but not necessarily changes that result in more balance. For example, at The University of Minnesota a change that granted institutions more flexibility actually resulted in *less* diverse revenue structures at the University's Carlson School of Management. Between 2006-2011, the school's budget went from $17 million from state support and $15 million from

cost pools to $2 million in state support and $22 million in cost pools (Fethke & Policano, 2012)—a change that was likely associated with changes in funding support from the Great Recession but also with a shift in state policy in FY1999 towards greater institutional autonomy over pricing (Minnesota State Colleges & Universities, 2008). It seems that more pricing authority resulted in a reduction in the school's dependence on public support—but the pendulum actually swung away from balanced and towards a heavy reliance on own-source revenues.

Finally, university administrators (Register-Guard, 2010; Rice, 2006); scholars (Georgianna & Jones, 2007; Rice, 2006; Travis, 2012); and the popular press (Thrift, 2010) have raised concerns about the movement away from heavily subsidized and regulated funding structures towards a greater private-public funding balance, suggesting that incentives to serve the public mission are heavily tied to the level of public funding sources and the political authority over university pricing and private-source revenues. Power dependency theory (Casciaro & Piskorski, 2005) also suggests that power-dependent organizations (e.g. heavily regulated public universities) grant a "seat at the board" (p. 168) to constraining entities (e.g. the state)—a seat that would theoretically influence priority setting.

The final proposition explores these ideas, suggesting that universities with more tuition authority and less state constraints will spend less on public service activities, a proxy for prioritization of "service" to the public mission:

P3. University tuition authority will be negatively associated with public spending priorities.

The idea that there is a negative association between private-source revenues like tuition and pursuit of public mission is supported by old adages such as, "money is power" and "don't bite the hand that feeds you", which remind us that (1) power and influence over organizational

priorities will be in the hands of those who provide the most resources to the organization; and (2) that if institutions know what is good for them, they will be responsive to the funding sources that provide them the most "financial nourishment." Those who worry about a heavy reliance on private-source revenues are largely concerned that private-source priorities are in conflict with universities' public missions. For example, critics of profit generating college athletic programs and the universities that support them through internal cross-subsidies argue that the massive amount of revenues that some athletic programs generate have shifted university priorities towards revenue-generating enterprises that have little to do with the public mission of the institution. However, proponents argue that these programs help to foster community support for the institution and generate local, state, and national "brand awareness". They argue that this support and awareness actually fosters rather than hinders the pursuit of the public mission of the institution.

DATA

In order to test the three propositions listed above, two secondary data sources were merged that provide (1) information on the level of state-authority over university price setting and tuition revenues and (2) information on university revenues, expenses, characteristics, and outcomes.

Data on tuition-setting authority comes from the State Higher Education Executive Officers (SHEEO) survey of state fiscal officers.[5] The survey was designed to gather information on the philosophies, policies, and procedures that influence decision-making with

[5] Job titles of these officers vary, but the vast majority are state budget officers, directors or assistant directors of finance policy, or vice presidents or presidents of finance/budgeting for state university systems, commissions, or governing boards. A full list of survey respondents for the FY2002, FY2005, and FY2010 studies can be found at the end of SHEEO's tuition and fees reports. These reports are cited in the references.

regard to public college and university tuition, student fees, and student financial aid programs (SHEEO, 2011, p. 3). Survey items that specifically target authority over tuition-setting and tuition revenue collection and spending were included in this analysis (see Appendix B).[6]

The first iteration of the survey was administered in 1988. However, it was revised in later iterations to increase its relevance, given the reforms in state higher education policy.[7] Survey questions have remained fairly consistent in the past five iterations of data collection (FY1999, FY2002, FY2005, FY2010, and FY2013). This chapter only includes survey responses from 2002, 2005, and 2010 because of critical changes in university finance and budgeting reporting that occurred after FY1999 (passage of GASB 34); because of a relatively low response rate from states in FY2013 (70%); and because FY2013 data were not apart of the panel data matched to SHEEO responses, which is described below. The response rates across the three time periods vary, but are generally high—in FY2002, 44 state officers responded (88%), in FY2005, 48 (96%), and in FY2010, 45 (90%).

The data on university finances comes from the IPEDS Delta Cost Project.[8] This project collected data on university revenues and expenditures over time, culminating in a panel data set that includes university fiscal, enrollment, staffing, and outcome data for academic years 1987-2010. The project relied entirely on data already in the public domain and translated the data into analytical formats to make them, "conducive to longitudinal analyses of trends in higher education revenues and spending" (Delta Cost Project, 2011, p.3). To date, this data represents

[6] Visit http://archive.sheeo.org/finance/tuit/2010-2011Tuition_and_fees.pdf to view SHEEO's summary of findings and the survey instrument employed in FY2010. Full survey instruments from FY2005 and FY2002 are available by viewing the respective reports for these years as well (see references).
[7] Eight iterations of the survey have been administered, including the first in 1988.
[8] Visit http://nces.ed.gov/ipeds/deltacostproject/ to download the IPEDS data utilized in this analysis and to view all related files.

the only public data set in the United States yielding reports of trends in finances for both public and private (for profit and not-for-profit) institutions (Delta Cost Project, 2011, p.3).

For this analysis, the 2000 Carnegie Classifications were used to narrow the sample to only public, 4-year, research institutions (n=152). The sample was limited to only public institutions because the responses of state fiscal officers regarding the tuition-setting authority of universities only applies to those universities that are publicly owned and to only research institutions, so the sample includes similar organization types with regard to mission and core functions. Research institutions are those that were classified as "research extensive" or "research intensive" by Carnegie in 2000—meaning that they offer a wide range of baccalaureate programs and graduate education through the doctorate (Shulman, 2000).

The 2002, 2005, and 2010 academic year data from the Delta Cost Project was pooled with the SHEEO survey data from the same fiscal years to create a 3-year panel for analysis. By merging these two sources of data together, I implicitly assume that the survey responses from fiscal officers in the summers of 2002, 2005, and 2010 are reflective of the tuition authority of universities for the 2002-2003, 2005-2006, and 2010-2011 academic years.

VARIABLES

Tables 1 and 2 (page 25) present the descriptive statistics for all variables included in the OLS regression models and the FE models respectively. For all financial data included in the fixed effects models, dollars were adjusted using a CPI index to FY2010 dollars.

Key Independent Variable

The explanatory variable of interest is an indexed measure of university tuition authority that was developed to be aligned with the axioms of dimensional publicness theory as originally posited by Barry Bozeman (1987).

Two specific questions from the SHEEO data were utilized to construct the index. The first question asked state fiscal officers to identify the primary body that retains tuition revenues and controls tuition spending once collected. Response choices included individual institutions or campuses, a handful of state-authority options, or "other" (see Appendix B). The second question asked state fiscal officers to indicate the entity with *primary* authority for setting tuition prices. Response choices included the university and a variety of political authorities including the Governor, the Legislature, state or local governing boards, or an institutional governing board (see Appendix B).

Two dummy variables were then created from these questions and combined into one index. Respondents who answered that the universities within their state had primary price setting authority were coded as "1",[9] and respondents who indicated that tuition funds were retained and controlled by universities within their state were coded as a "1." These questions were given equal weighting in the index so that high-state authority/low university authority over tuition was coded as a "0," moderate university/state authority coded as a "1," and low-state authority/high university authority coded as a "2." Thus, a low score suggests high

[9] In order to determine the sensitivity of the analysis to how the index was constructed, responses to this question were re-coded as dummy variables in two ways. First, responses were coded *strictly* so that only respondents who said the individual university had primary pricing authority were coded as a "1," with all other primary authority bodies coded as a "0." Next, responses were coded *loosely* so that respondents who indicated either the individual institution *or* the individual institution's board had primary pricing authority were coded as a "1," with all other primary authority bodies coded as a "0." The former coding method was used to create the variable "tuitionauthoritySTRICT," while the latter was used to create the variable "tuitionauthorityLOOSE."

responsiveness to political constraints/regulations, while a high score suggests low responsiveness to political constraints/regulations.

Dependent Variables

The propositions tested in this paper are concerned with the relationship between university tuition authority and (1) support coming from public sources; (2) university revenue diversity; and (3) the share of public service spending relative to overall university expenses. Measures for these outcomes are discussed below.

Public Funding Support

In order to test the first proposition that university tuition authority will be negatively associated with university dependence on public revenue sources, a measure for reliance on public support was calculated by dividing the amount of operating revenue coming from public sources by total operating revenues (PublicSupport). Public sources were identified as federal, state, and local support including appropriations, grants, and contracts. As Table 1 demonstrates, the average percentage of public support among universities in the sample is approximately 44.7% in FY2010, and the average for the three-year panel is approximately 49.4%. In addition, because most public authority over universities is located at the state-level, a second measure of public funding support was calculated focusing specifically on state funding (StateShare). This variable was generated by the author by dividing the amount of operating revenue coming from state appropriations, grants, and contracts by the university's total operating revenue. The average state share of revenues in the sample is 27.0% for FY2010 and 31.8% for the three-year panel. Next, a dollar-measure was generated to capture state support per student by dividing total state support by the total full-time equivalent student enrollment (StateDollarsPerStudent). The average amount of state spending per student after dropping one extreme outlier is

approximately $10,195 in FY2010 and $11,120 for the three-year panel.[10] Given the timing of the Great Recession and the reported trends in declining appropriations for higher education, the lower averages in FY2010 as compared to the overall averages including FY2002 and FY2005 are not surprising. Finally, because the composition of public sources may be more or less related to publicness depending on type, a fourth measure was included that isolates public grants and contracts money (typically more targeted towards research functions) from appropriations (typically more targeted towards instruction functions). This measure was constructed by dividing federal and state grant and contract dollars (net Pell) by total revenues. The average share of revenues coming from federal and state grants and contracts is 17.0% in FY2010 and 16.7% for the three-year panel.

Revenue Diversity

In order to test the second proposition that political authority is associated with revenue diversity, the IPEDS Data was used to create a Herfindahl Index (HI) (Ebel & Petersen, 2012; Schunk & Porca, 2005). The index provides a way to measure the diversity of local revenue composition, and is simply the sum of the square of the share of each source of revenue (RevenueDiversity).[11] The greater the number of revenue sources available and the more equal the share of revenue from each of the available revenue sources, the greater the diversity of the revenue structure (Ebel & Petersen, 2012). Thus, the more diverse the revenue structure, the lower the HHI will be: if a university relied solely on one source of revenue, the index would be equal to 1.

Five sources of revenue were included in the generation of the index: (1) tuition; (2) federal appropriations, grants, and contracts; (3) state and local appropriations, grants, and

[11] The share of each source of revenue was measured by percent, ranging from 0.0 to 1.0.

contracts; (4) private gifts, endowment, and investment revenues; and (5) auxiliaries, hospitals, other independent operations revenues.[12] As Table 1 demonstrates, the lowest index score for FY2010 in the sample is .178, and the highest is .463, indicating the sample is representative of moderately to well-diversified revenue structures. The low and high index for the three-year panel are the same, although the mean index score was slightly higher (0.261) in the three-year panel than in the cross-sectional data (0.256), suggesting slightly less diversified revenue structures on average.

Percentage of Public-Service Spending

In order to test the third proposition that the degree of public authority over university price setting may be associated with public spending priorities, a measure of public service spending was generated by the author by dividing the amount that universities spend on public-service related activities by the sum of university spending on instruction, student services, research, and public services (PublicServiceSpending).[13] This is a somewhat crude measure of a university's responsiveness to its public mission, but is the best available financial metric for determining the amount of spending on services that benefit individuals and groups external to the institution (e.g. non faculty, students, and staff). The mean in FY2010 was approximately 9.5%, which is slightly lower than the three-year average (10.0%).

[12] Note on actual variable names from the Delta Cost Project that were used here.
[13] "Public service" is a functional expense category that includes expenses for activities established primarily to provide non-instructional services beneficial to individuals and groups external to the institution. Examples are conferences, institutes, general advisory service, reference bureaus, and similar services provided to particular sectors of the community. This function includes expenses for community services, cooperative extension services, and public broadcasting services (IPEDS, 2010).

Institutional Control Variables

Institution-level controls that were included in the models include university enrollment, research extensiveness, flagship status, and land grant status. Each of these controls are discussed in more detail below.

University Enrollment

University enrollment is a common control in studies of university budgeting and resource allocation decisions (Pfeffer & Moore, 1980) and a common control for university size. Enrollment is a control in all models because the amount of total revenues and expenses varies widely based on the amount of students the university serves. Enrollment was specifically measured using the full-time equivalent count, which is used by the U.S. Department of Education to produce the full-time equivalent enrollment data published annually in the Digest of Education Statistics. An additional enrollment-related control, the percentage of full-time graduate students out of total full-time students was included (GradStudentPercentage) because public support varies substantially based on the type of student supported, with graduate education tending to cost more. As Table 1 demonstrates, the average percent of full-time graduate students among the research universities in this sample is 24.0% in FY2010 and 21.4% for the three-year panel.

Research Extensiveness

The public research universities included in this data have a Carnegie Classification of either "research extensive" or "research intensive." The difference is that research extensive institutions awarded 50 or more doctoral degrees per year across at least 15 disciplines during the period studied and research intensive institutions awarded at least 10 doctoral degrees per year across three or more disciplines, or at least 20 doctoral degrees per year overall (Shulman, 2000).

Thus, the Carnegie Classification control indicates the extent to which universities in the sample devote resources to doctoral education and research, and is a necessary control when considering the amount of public support these institutions receive (which are often in the form of grants and contracts for research), as well as revenue diversity and public-service spending, both of which could be related to the strategic priorities of universities and the relative importance they place on research, teaching, and service. Among the universities in this sample, sixty-three percent were research extensive in FY2010. This variable is not included in the fixed effects models because it is time invariant.

Flagship/Land-grant Institutions

Two dummy variables were also included to indicate whether or not the institution was a flagship or a land-grant institution. Flagship can indicate either the oldest campus in a public state higher education system, or it can mean any of the larger and better-known campuses. Each state has only one flagship institution. A land-grant college or university is an institution that has been designated by its state legislature or Congress to receive the benefits of the Morrill Acts of 1862 and 1890. The original mission of these institutions, as set forth in the first Morrill Act, was to teach agriculture, military tactics, and the mechanic arts as well as classical studies so that members of the working classes could obtain a liberal, practical education. Both of these variables may mitigate the relationship between university publicness and the variables of interest. Because being a flagship or a land grant institution may affect the amount of resources a university receives or how a university spends its resources, both of these controls were included in all models. Sixty-seven percent of the universities in the sample were land-grant institutions, and thirty percent were flagship institutions. These variables were not included in the fixed effects models because they are time invariant.

Table 1. Descriptive Statistics: FY2010 Data

Descriptive Statistics	Observations	Mean	Std. Deviation	Min	Max
PublicSupport[14]	150	0.447	0.133	0.134	0.827
StateShare	150	0.270	0.103	0.055	0.606
StateSupportPerStudent[15]	149	10194.830	8874.028	2508.26	38002.750
Grant_Contract_Share	151	0.170	0.084	0.001	0.470
RevenueDiversity	150	0.256	0.050	0.178	0.463
PublicServiceSpending	152	0.095	0.074	0.074	0.467
TuitionauthoritySTRICT	139	1.079	0.591	0	2
TuitionauthorityLOOSE	139	1.460	0.617	0	2
FTE_Count(thousands)	152	24.003	17.742	1.515	170.858
GradStudentPercentage	152	0.233	0.106	0.086	1.000
ResearchExtensive Dummy	152	0.632	0.484	0	1
Flagship	152	0.303	0.461	0	1
Landgrant	152	0.329	0.471	0	1

Table 2. Descriptive Statistics: Three-Year Panel (FY2002, FY2005, and FY2010)

Descriptive Statistics	Observations	Mean	Std. Deviation	Min	Max
PublicSupport[13]	454	0.494	0.131	0.134	0.827
StateShare	454	0.318	0.114	0.055	0.665
StateSupportPerStudent[14]	451	11119.720	8699.933	2508.260	49069.710
Grant_Contract_Share	453	0.168	0.081	0.001	0.500
RevenueDiversity	454	0.261	0.048	0.178	0.463
PublicServiceSpending	456	0.100	0.075	0.000	0.467
TuitionauthoritySTRICT	409	0.976	0.724	0	2
TuitionauthorityLOOSE	409	1.284	0.769	0	2
FTE_Count(thousands)	456	22.161	16.169	1.343	170.858
GradStudentPercentage	456	0.214	0.087	0.061	1.000
ResearchExtensive Dummy	456	0.632	0.483	0	1
Flagship	456	0.303	0.460	0	1
Landgrant	456	0.329	0.470	0	1

[14] Missing observations for this variable, as well as state share and revenue diversity, are from the University of Colorado at Boulder and the University of Northern Colorado, who did not report financial IPEDS data in FY2010.

[15] A missing value was created for the University of California San Francisco for this measure because the university is an extreme (over $97,0000 per student) compared to the next highest value of approximately $49,000.

METHODS

This paper employs both OLS regression modeling for a cross-sectional data set from FY2010 and fixed effects using a three-year panel that includes FY2002, FY2005, and FY2010 data. The three propositions are explored using *both* methodologies because each approach has benefits and limitations for exploring the relationships proposed in this paper.

OLS allows for the analysis of the independent effect of each of the regressors in the equation on the outcome variables, holding all else equal. The multivariate model is generally expressed as:

$$DV = \beta_0 + \beta_1 IV_1 + \beta_2 IV_2 + \ldots \beta_n IV_n + e$$

Where DV = dependent variable, IV = independent variable(s), e = error, and β= estimator. OLS regression has the benefit of producing solutions that are easily interpretable and, provided none of the underlying assumptions of the model are violated, generates the best linear unbiased estimator (BLUE) of the model coefficients. The BLUE estimator is represented by β in the above equation.

While analysis of the cross-sectional data allows for exploration of the relationship between university tuition authority and the outcomes of interest at one point in time, panel data has the added benefit of more accurate inference of model parameters; allows for an understanding of time effects on the outcomes of interest; and also controls for the impact of omitted variables (Hsiao, 2006). The fixed effects models employed here explore the relationship between the predictor and outcome variables within a university over the three time periods included in the panel. The fixed effects models can be generally expressed as:

$$Yit = \beta 1 Xit + \alpha i + uit$$

Where αi (i=1…n) is the unknown intercept for each university (n university-specific intercepts); Yit is the dependent variable (DV) where i = university and t = time; *Xit* represents one independent variable (IV); *β1* is the coefficient for that IV; and *uit* is the error term.

In order to test the three propositions put forth in this paper, six different regressions were run on the cross-sectional data and the panel data respectively. The first four regressions are related to the proposition that university tuition authority is negatively associated with the amount of public support an organization receives, with "public support" being measured in four distinct ways as described above. The fourth and fifth models are related to the second and third proposition respectively. The specific models applied are outlined below.

OLS Equations

OLS was deemed an appropriate methodology to apply to the FY2010 data based on tests of the underlying assumptions of the model for all five regressions.[16] Robust standard errors were used in several models due to evidence of heteroskedasticity (see Table 4). The following OLS regressions test the three propositions outlined above:

Models for Proposition 1

1a. Public_Support = β_1Tuition_Authority + β_2FTE_Count + β_3ResearchExtensive + β_4Grad_Stud_Percentage+ β_5Flagship + β_6 Landgrant + *e*

1b. State_Share = β_1Tuition_Authority + β_2FTE_Count + β_3ResearchExtensive + β_4Grad_Stud_Percentage+ β_5Flagship + β_6 Landgrant + *e*

1c. StateDollars_Per_Student = β_1Tuition_Authority + β_2FTE_Count + β_3ResearchExtensive + β_4Grad_Stud_Percentage+ β_5Flagship + β_6 Landgrant + *e*

1d. Grant_Contract_Share = β_1Tuition_Authority + β_2FTE_Count + β_3ResearchExtensive + β_4Grad_Stud_Percentage+ β_5Flagship + β_6 Landgrant + *e*

[16] See Greene, p. 51 for a discussion of the least squares estimator and the underlying assumptions of OLS regression.

Model for Proposition 2

2a. Revenue_Diversity = β_1Tuition_Authority + β_2FTE_Count + β_3ResearchExtensive + β_4Grad_Stud_Percentage+ β_5Flagship + β_6 Landgrant + *e*

Model for Proposition 3

3a. Public_Service_Spending = β_1Tuition_Authority + β_2FTE_Count + β_3ResearchExtensive + β_4Grad_Stud_Percentage+ β_5Flagship + β_6 Landgrant + *e*

Fixed Effects Equations

Fixed effects is an appropriate methodology to apply to the panel data because it focuses on the change over time within universities in the sample and controls for all stable characteristics of the universities such as flagship status or Carnegie Classification that do not change over the sampling time period. A series of Hausman tests were conducted that confirmed that fixed effects were preferable to random effects models for this data, suggesting that the random effects estimators could not be treated as unbiased. The following six models were run:

Models for Proposition 1

1e. Public_Support$_{it}$ = $\beta 1$Tuition_Authority$_{it}$ + $\beta 2$FTE_Count$_{it}$ + $\beta 3$Grad_Stud_Percentage$_{it}$ + αi + *uit*

1f. State_Share$_{it}$ = $\beta 1$Tuition_Authority$_{it}$ + $\beta 2$FTE_Count$_{it}$ + $\beta 3$Grad_Stud_Percentage$_{it}$ + αi + *uit*

1g. StateDollars_Per_Student$_{it}$ = $\beta 1$Tuition_Authority$_{it}$ + $\beta 2$FTE_Count$_{it}$ + $\beta 3$Grad_Stud_Percentage$_{it}$ + αi + *uit*

1h. Grant_Contract_Share = $\beta 1$Tuition_Authority$_{it}$ + $\beta 2$FTE_Count$_{it}$ + $\beta 3$Grad_Stud_Percentage$_{it}$ + αi + *uit*

Model for Proposition 2

2b. Revenue_Diversity$_{it}$= $\beta 1$Tuition_Authority$_{it}$ + $\beta 2$FTE_Count$_{it}$ + $\beta 3$Grad_Stud_Percentage$_{it}$ + αi + *uit*

Model for Proposition 3

3b. $\text{Public\_Service\_Spending}_{it} = \beta 1 \text{Tuition\_Authority}_{it} + \beta 2 \text{FTE\_Count}_{it} + \beta 3 \text{Grad\_Stud\_Percentage}_{it} + \alpha i + uit$

Sensitivity Analysis

Because the index employed as the explanatory variable of interest has never been utilized before, two variations of the index were tested to determine if the results were sensitive to coding. The strict index coded responses to the price-setting authority as a "1" *only* if the respondent indicated that individual institutions had primary authority to set tuition, and treated all other responses (individual institution governing board, state governing board, local governing board, legislature, and governor) as indicative of a political authority constraining price-setting behavior. The loose index coded responses to the price-setting authority as a "1" if the respondent indicated that individual institutions had primary authority to set tuition *or* if the respondent indicated that an individual institutions' governing board had primary authority. In this instance, primary authority is still at the institution level.

RESULTS

This section presents the results of the analyses outlined above, and is organized by the propositions outlined in the literature review. The results of the OLS analyses are presented first, followed by the results of the fixed effects analysis. As discussed below, while there is support for some of the propositions in the findings from the OLS analysis, the statistical significance of these results disappear or are practically insignificant in the fixed effects models.

Proposition 1: "University tuition authority will be negatively associated with university dependence on public revenue sources"

OLS

The OLS models support the proposition that university tuition authority is negatively associated with university dependence on public source revenues. While the statistical significance of these results was not particularly sensitive to index construction, the magnitude of the effects appears to be sensitive to how individual institution authority is operationalized in the index. When the strict index is applied, the results suggest that a one-unit increase in tuition-authority for universities results in a 6.3% decline in overall public support; a 4.3% decline in the state share of total revenues; a decrease of approximately $1,075 in state dollars per student; and a 2.6% decline in the share of total revenues from public grants and contracts. These results are all statistically significant (see Table 3). However using the loose index the magnitude of effects decreases substantially for the first two models while remaining relatively stable for the third and fourth: a one-unit increase in tuition-authority for universities results in a 3.8% decline in overall public support; a 2.0% decline in state share of total revenues; a decrease of $1,112 in state dollars per student; and a 2.3% decline in the share of total revenues from public grants and contracts.

Fixed Effects

The results of the fixed effects models do not offer the same support for the first proposition. Only two of the associations between university tuition authority and the outcomes of interest were statistically significant at the $p<.05$ level using the strict index (state share of revenues) and only one remained statistically significant when the looser index was applied. Furthermore, the magnitude of the statistically significant effects was less than two percent for

these models—suggesting the relationships are practically insignificant.

Proposition 2: "University tuition authority will be associated with revenue diversification"

OLS

The results of the fourth regression do not support the proposition that there is an association between university tuition authority and university revenue diversity. The tuition authority measure was not statistically significant at the $p<.05$ level using either the strict or loose index. The only statistically significant control in this model was land-grant status. Because low values on the revenue diversity index suggest more highly diversified structures, the negative association suggests that land grant institutions have *more* diversified revenue structures than their non-land grant counterparts.

Fixed Effects

The fixed effect model that uses the strict index does find a statistically significant relationship between university tuition authority and university revenue diversity, however the magnitude of the effect is essentially zero. The statistical significance of the results disappeared when the loose index was utilized.

Proposition 3: "University tuition authority will be negatively associated with public spending priorities"

OLS

The results of the final regression do not support the proposition that university tuition authority is negatively associated with public spending priorities. When the strict index is applied the results actually suggest the opposite, indicating that universities with higher levels of tuition authority spend a greater share of their revenues on public service expenses (2.0%). However when the loose index is applied the significance of these results disappears. The other significant control was the land-grant dummy and the effect size was stable regardless of the index applied,

suggesting that on average, the share of expenses devoted to public service activities is approximately five percent higher at land-grant universities than at the other institutions in the sample.

Fixed Effects

The results of the fixed effects regressions do provide support for this proposition. However, the magnitude of the effect size is quite small. For both the model applying the strict index and the loose index, the results suggest that university tuition authority is negatively associated with public service spending priorities. Both models suggest that a one unit increase in university tuition authority results in a decrease of approximately one percent in a university's share of expenses devoted to public service related activities.

Table 3. OLS Regression Results with Strict Index: FY2010 Data[17]

Variable	Public Support	State Share (robust)	State Dollars Per Student (robust)	Grant Contract Share	Revenue Diversity (robust)	Public Service Spending
Tuitionauthority STRICT	-0.063***	-0.043***	-1075.142**	-0.026***	0.006	0.020***
	(0.015)	(0.011)	(484.596)	(0.009)	(0.006)	(0.008)
FTE_Count (in thousands)	-0.001	-0.001**	-13.832	-0.000	-0.000*	0.000
	(0.001)	(0.000)	(19.602)	(0.000)	(0.000)	(0.000)
Research Extensive	-0.042*	-0.047**	653.512	0.003	-0.000	0.012
	(0.025)	(0.019)	(928.571)	(0.016)	(0.010)	(0.014)
GradStudent Percentage	0.168	-0.142*	32351.140***	0.207***	0.003	0.028
	(0.121)	(0.084)	(7279.651)	(0.079)	(0.055)	(0.068)
Flagship	-0.008	-0.004	879.593	0.005	-0.002	0.014
	(0.026)	(0.020)	(878.752)	(0.017)	0.011	(0.014)
Landgrant	0.071***	0.018	2350.181***	0.038**	-0.031***	0.054***
	(0.024)	(0.018)	(737.955)	(0.016)	(0.010)	(0.014)
Constant	0.503***	0.396***	2303.600	0.144***	0.267***	0.040*
	(0.038)	(0.027)	(1669.812)	(0.024)	(0.015)	(0.021)
Observations	136	136	136	138	136	138
R-squared	0.2090	0.1975	0.3613	0.1483	0.1237	0.2165
*Note: *p <.10, ** p<.05, ***p<.01. Standard error in parentheses.*						

[17] For both the OLS and the Fixed Effects regressions, the models were run with the University of California San Francisco treated as an extreme outlier and changed to missing.

Table 4. OLS Regression Results with Loose Index: FY2010 Data

Variable	Public Support	State Share (robust)	State Dollars Per Student (robust)	Grant Contract Share	Revenue Diversity (robust)	Public Service Spending
Tuitionauthority LOOSE	-0.038***	-0.020*	-1111.755**	-0.024***	0.002	0.013
	(0.015)	(0.012)	(521.442)	(0.009)	(0.006)	(0.008)
FTE_Count (in thousands)	-0.001	-0.001*	-11.179	-0.000	-0.000*	0.000
	(0.001)	(0.001)	(20.086)	(0.000)	(0.000)	(0.000)
Research Extensive	-0.035	-0.041**	763.458	0.006	-0.001	0.009
	(0.026)	(0.021)	(939.153)	(0.017)	(0.010)	(0.014)
GradStudent Percentage	0.218*	-0.108	33160.620***	0.227***	-0.002	0.013
	(0.126)	(0.088)	(7443.033)	(0.079)	(0.053)	(0.068)
Flagship	-0.014	-0.009	847.826	0.004	-0.001	0.016
	(0.027)	(0.021)	(866.778)	(0.017)	0.011	(0.014)
Landgrant	0.070***	0.017	2344.039***	0.038**	-0.031***	0.055***
	(0.026)	(0.019)	(740.385)	(0.016)	(0.010)	(0.014)
Constant	0.479***	0.372***	2463.458	0.143***	0.272***	0.047**
	(0.040)	(0.028)	(1695.725)	(0.025)	0.015	(0.021)
Observations	136	136	136	138	136	138
R-squared	0.1348	0.1263	0.3613	0.1382	0.1160	0.1940
*Note: *p <.10, ** p<.05, ***p<.01. Standard error in parentheses.*						

Table 5. Fixed Effects with Strict Index: Three-Year Panel

Variable	Public Support	State Share	StateDollars PerStudent	Grant Contract Share	Revenue Diversity	Public Service Spending
Tuitionauthority STRICT	0.011	0.018**	280.519	-0.013***	0.007**	-0.009*
	(0.009)	(0.008)	(270.308)	(0.005)	(0.004)	(0.005)
FTE_Count (in thousands)	-0.009***	-0.009***	-221.651***	-0.000	-0.002***	-0.002***
	(0.001)	(0.001)	(32.482)	(0.000)	(0.000)	(0.001)
GradStudent Percentage	-0.332***	-0.359***	-12596.730***	0.074*	0.039	-0.050
	(0.091)	(0.084)	(2739.723)	(0.046)	(0.037)	(0.053)
Constant	0.764***	0.588***	17799.070***	0.168***	0.280***	0.157***
	(0.030)	(0.028)	(903.874)	(0.014)	0.012	(0.018)
Observations	405	405	405	407	405	407
Groups	151	151	151	151	151	151
R-squared(within)	0.3015	0.3498	0.2565	0.0174	0.0649	0.0426
*Note: *p <.10, ** p<.05, ***p<.01. Standard error in parentheses.*						

Table 6. Fixed Effects with Loose Index: Three-Year Panel

Variable	Public Support	State Share	StateDollars PerStudent	Grant Contract Share	Revenue Diversity	Public Service Spending
Tuitionauthority LOOSE	-0.002	-0.002	-172.270	-0.007*	-0.000	-0.010**
	(0.008)	(0.007)	(231.895)	(0.004)	(0.003)	(0.004)
FTE_Count (in thousands)	-0.009***	-0.009***	-219.449***	-0.000	-0.002***	-0.001**
	(0.001)	(0.001)	(32.787)	(0.000)	(0.000)	(0.001)
GradStudent Percentage	-0.342***	-0.376***	-12844.590***	0.087*	0.031	-0.039
	(0.091)	(0.085)	(2730.281)	(0.046)	(0.037)	(0.053)
Constant	0.779***	0.612***	18301.330***	0.160***	0.290***	0.153***
	(0.029)	(0.027)	(860.147)	(0.014)	0.012	(0.017)
Observations	405	405	405	407	405	407
Groups	151	151	151	151	151	151
R-squared(within)	0.2978	0.3383	0.2550	0.0068	0.0495	0.0470
*Note: *p <.10, ** p<.05, ***p<.01. Standard error in parentheses.*						

DISCUSSION

The results presented above have implications for the higher education sector, as well as implications for dimensional publicness theory. These implication sets are discussed below.

Implications for Higher Education

The results of this analysis suggest that there are relationships between a university's authority over tuition and budget and financial outcomes that warrant further exploration and consideration. The negative association between university tuition authority and the public funding variables in the OLS models suggests a trade-off may exist between the amount of regulatory constraints a university faces and the amount of financial support they receive from public sources. Furthermore, the results from the model that isolates public grants and contracts—arguably the measure that is the most finely calibrated to support for the research

functions of the institution—suggests that universities with more flexibility in tuition pricing and control over tuition revenues actually receive a smaller share of their revenues from public grants and contracts—which heavily support and fund university research. This could be because institutions with more pricing flexibility are also more aggressive in their pursuit of private source research dollars, or it could be because state and federal grantors choose to fund institutions with more pricing flexibility at lower levels than institutions that are more constrained by political authority.

However, the fixed effects models do not offer the same level of support for the findings related to the first proposition (with the exception of the grants/contracts measure). Therefore, further analysis is warranted to determine if the results from FY2010 are simply an anomaly, the result of omitted variable bias, or perhaps a reflection of the post-recession funding climate and an indicator of associations that will continue over time in the future. The only association that was statistically significant across models was the relationship between university tuition authority and the variable that isolates public grant and contract revenues, which may indicate a trade-off between university tuition authority and the support that federal and state sources provide for university functions such as research, training programs, and public service activities.

The results related to revenue diversity suggest that university tuition authority is not a significant predictor of a university's revenue diversity. This suggests that although some universities have greater levels of authority over price setting and control over tuition revenue spending, this authority is not associated with more highly diversified revenue structures.

Finally, the analysis related to the third proposition suggests that more research is required to better understand the relationship, if any, between university tuition authority and public service spending priorities. While the fixed effects results did find support for the

proposition of a negative association, the magnitude of the effect was practically insignificant. Because the share of a university's expenses on public service related activities does not tell the whole story about the relationship between tuition authority and a university's responsiveness to its public mission, future research should consider other indicators of mission fulfillment to further explore this relationship.

Implications for Dimensional Publicness Theory

The results of this analysis have two important implications for dimensional publicness theory (Bozeman, 1987). First, if we accept that changes in an organization's publicness occur over time in response to changes in their mix of political and economic authority, then panel data and a longitudinal research design like the fixed effects models applied here probably offer the best approach for understanding the relationship between dimensional publicness and any outcomes of interest. However the indexed measure applied here, designed to be in alignment with Bozeman's original conceptualization of the theory, was not a statistically *and* practically significant predictor of any of the outcomes of interest in the fixed effects models. In short, the fixed effects results find limited support for dimensional publicness theory as originally conceived—at least when applied in a higher education context.

Future research might consider additional applications of the index developed in this paper to other university data sets or the development of similar indices for testing in other fields and sectors (e.g. health care) in an effort to corroborate or refute these findings and in an effort to develop more reliable and valid measures of the dimensional publicness concept. The sensitivity of the results to how "institutional authority" is defined suggests that deeper analysis around the political authority of individual institutions' governing boards may also be useful. Given the widespread recognition that the public-private distinction in higher education is becoming

increasingly blurred, it seems that there is still utility for dimensional understandings of publicness in higher education—however these results suggest that perhaps the initial conceptualization of the theory (Bozeman, 1987) can be refined to better explain or understand university outcomes.[18] Perhaps a more useful approach would be to explore the publicness of the outcomes that universities produce (as opposed to the publicness of the organization itself), such as a universities' regional economic impact or the upward mobility generated for traditionally marginalized demographics.[19]

Second, the results of this analysis raise questions about how dimensional publicness has been measured in the past. Correlation matrices between the individual survey items related to political authority over price-setting and revenue spending, as well as correlation matrices between the indexes created from these survey items and the funding measures that have been used to operationalize the dimensional publicness concept in the past, suggest relatively weak correlations.[20] If one accepts that these survey items are in fact more direct measures of the dimensional publicness concept in so far as they directly ask respondents about the political constraints over organization price-setting and revenue spending, then these results should serve as a warning to future researchers who use funding measures as proxies for an organization's responsiveness to political authority.

Limitations

There are several limitations associated with the analyses presented in this paper. First, a great deal more research is required in order to ascertain the reliability and the validity of the

[18] The third essay in this dissertation is a conceptual paper that explores expansions of dimensional publicness theory to better understand and compare university performance.
[19] The third essay of this dissertation addresses many of the other factors beyond sector distinctions that are worthy of analysis and may have explanatory power in the higher education sector.
[20] Correlations were <.25 between the strict and loose index measures and the funding outcomes included in this analysis (public support, state share, and state dollars per student).

index that is applied here. Though it is arguably more closely aligned to multidimensional publicness theory (Bozeman, 1987), the degree to which this index can be relied upon to achieve consistent results in repeated applications has yet to be determined. Indices that utilize similar types of questions in other fields may also shed light on whether this type of measure is useful for testing dimensional publicness theory in other sectors.

A second limitation is that the analyses presented here only allow for us to understand the *associations* between the explanatory variable and the outcomes of interest, but prevent us from truly understanding the underlying, causal mechanisms. For example, it is possible that a state policy change related to increases or decreases in higher education appropriations is caused by a state policy change that grants more or less flexibility to universities to self-govern tuition price-setting and the spending of tuition revenues. However it is also possible that a change in policy related to more or less autonomy in these areas causes an increase or a decrease in state appropriations. Future analyses of data sets that offer reasonable instrumental variables could employ the use of estimators that help to address this endogeneity concern (e.g. the Arellano-Bond estimator, 1991).

A third limitation is the irregular spacing of the SHEEO data, with a three-year gap between the first and second wave, and a five-year gap between the second and third wave. Irregular spacing introduces a missing data problem to the panel data set, where the pattern of missing data is dictated by the survey design (Millimet & McDonough, 2013). Though a regularly-spaced panel would be preferred, a larger panel that incorporates more waves of data, even if unevenly spaced, would allow for approaches to dealing with this spacing issue, such as imputing based on previous waves to create a regularly-spaced panel (Millimet & McDonough,

2013). Until recently, this spacing issue has been largely ignored in dynamic panel models, but if possible this potential threat to ensuring unbiased estimators should be addressed.

Finally, although public-private distinctions and dimensional conceptualizations of publicness may offer a great deal of explanatory power when considering differences in outcomes between organizations with substantial differences in structure and legal status (e.g. comparing outcomes of a traditionally financed government organization to similar outcomes of owner-managed firms), higher education institutions in the United States, particularly the research universities included in this sample, are typically responsive to the needs of government, industry, and private consumers. Because research universities sit at this nexus, as opposed to being at one end of the spectrum or another (Bozeman, 1987, p. 95), dimensional publicness as originally conceptualized may not offer enough explanatory power for understanding differences in the budget and finance outcomes explored here. Indeed, these results suggest that other factors such as university size, location, or status may have more explanatory power. This is not to say that the theory is not still useful—but in a university setting more interesting comparative analyses may be related to the publicness of university outputs as opposed to exploring differences in the publicness of the institutions themselves.

CONCLUSION

Fethke and Policano (2012) argue that a new trend is emerging in university financing, one that is characterized by more differentiated pricing structures, with states providing less public support and universities charging varying rates of tuition to different types of students (typically based on merit and socioeconomic status), with a net effect of a heavier reliance on tuition to fund university missions (Fethke & Policano, 2012). However the speed with which

these models are actually adopted by public universities may be linked to state higher education policies that require more or less government involvement in tuition pricing. To better understand these relationships and their effects on university outcomes, these trends should continue to be studied over time to determine the appropriate mix of economic and political authority for public universities to be affordable, accessible, and to meet the needs of the students and communities they serve.

CHAPTER 3:

DIMENSIONAL PUBLICNESS AND MANAGERIAL AUTHORITY: A MULTI-LEVEL ANALYSIS[21]

[21] Welch, J.C. To be submitted to *Research in Higher Education.*

ABSTRACT

This paper examines the extent to which various conceptualizations of dimensional publicness affect the negotiating power of university department chairs in hiring new faculty. In this way, this paper builds upon our previous understanding of the effects of dimensional publicness on universities, as well as our understanding of comparative differences in managerial discretion and authority in both public and private organizations. This paper applies maximum likelihood estimation to a nested structure of equations to explain both individual (department chair) and group level (university) variance. Findings suggest that a number of individual-level characteristics affect the amount of authority chairs have in faculty negotiations. However, the results do not suggest a strong association between public status or other measures of publicness and department chair hiring authority.

INTRODUCTION

A key area of study in the field of public administration and public policy is the study of public and private organizational differences and, in particular, how these differences affect organizational outcomes. Examples include debates about the best type of organization or institutional framework for providing healthcare (Barros & Martinez-Girait, 2002; Basu, 2012; Hanson & Berman, Hsu, 2010), education (Barrera-Osorio, 2007; Wilkinson, 2005), and protection and regulation of environmental resources and other common pool resources (Ostrom, 1990). However as sector-blurring, the emergence of hybrid organizations, and increasingly complex inter-and intra-organizational networks have emerged to provide public goods and services, understanding how the structural characteristics of organizations affect outcomes has become increasingly difficult.

This paper focuses on the relationship between an organization's public status, measured as a dichotomous and as a dimensional characteristic, on one outcome of interest: managerial power in personnel negotiations. A core distinction between public organizations and private organizations is freedom of action under the law (Kettl, 2011), a distinction that may affect the freedom or discretion of managers operating within different organizational types to make decisions. Although the "right amount" of bureaucratic discretion and power has been debated intensely (Finer, 1941; Freidrich, 1940; Long, 1949; Wilson, 1887), there is general consensus that public actors are constrained by constitutions, laws, administrative regulations, judicial decisions, executive orders, and other forms of legislation and policy (LaPalombara, 2001)—and that their ability to act or wield power is confined by the laws that govern their organizational environment. On the other hand, private organizations and those operating within them are typically free to act, so long as their actions are not in direct violation of the law (Kettl, 2011).

This paper explores the hypothesis that managers operating within highly private contexts may have more freedom or discretion than those operating in more political or public contexts.

The landscape of higher education in the United States serves as a useful sector for testing this idea because there over 4,500 degree granting higher education institutions which are spread across sectors (USDOE, 2013). Among four-year institutions (n=3,171), approximately 22% are public, 52% are private, not-for-profit, and 25% are private, for-profit (IPEDS, 2010-2011). Furthermore, department chairs serve as a useful position for exploring this relationship because they are liasons between subordinate faculty and institutional administration and because they are leaders within their departments and key decision-makers within the institution (Bozeman, Fay, & Gaughan, 2013, p. 307). This paper explores one decision area in particular, hiring and personnel negotiations, because department chairs may be required to be more or less responsive in hiring procedures to institutional administration and the regulatory bodies that govern them in more political or public institutional contexts.

LITERATURE REVIEW

As Rainey and Bozeman (2000) acknowledge, comparing public and private sector differences and the publicness of organizations represents a substantial and growing body of literature in the field of public administration. Prior to the 1960s, much of the literature compared public and private organizations by sector or legal status alone (Parker & Subramaniam, 1964; Roessner, 1977). However as institutional frameworks became more complex and the intersections between sectors began to blur, scholars recognized the need for a dimensional understanding in their efforts to distinguish "public" from "private" (Perry & Rainey, 1988). Rather than focusing strictly on legal ownership, scholarship expanded to

consider other aspects of an organization's publicness including definitions based on the fulfillment of the public interest and definitions based on public goods and market failures (Perry & Rainey, 1988).

In 1987, Barry Bozeman posited that *all* organizations are public, and can be more or less so based on the amount of political authority over the organization in question. This idea has evolved over time as a number of scholars have sought to operationalize, test, and advance Bozeman's theoretical framework (Bozeman & Bretschneider, 1994; Feeney & Welch, 2012; Miller & Moulton, 2011; Moulton, 2009). One common measure of political authority employed in the studies referenced above is the extent of public funding support provided to an organization. Recent literature has explored other measures of publicness, including the amount of dollars the organization expends on public services (Feeney & Welch, 2012), transparency of the organization (Stirton & Lodge, 2001), and the organization's ability to "realize" public values (Feeney & Welch, 2012). However the extent to which these measures are aligned with Bozeman's original conceptualization of the term "publicness" is debatable, as there is little consensus in the literature regarding the best measure of dimensional publicness, or even a clear understanding of the concept and how it may or may not affect organizational outcomes (see Table 7).

Table 7. Conceptualizations of Dimensional Publicness

Author	Definition	Reference
Barry Bozeman	An organization is public to the extent that it exercises or is constrained by political authority—[and] is private to the extent that it exercises or is constrained by economic authority.	Bozeman, B. (1987). *All organizations are public: Bridging public and private organization theories.* San Francisco, CA: Jossey-Bass.
Stephanie Moulton	An organization is public to the extent that it contributes to the achievement of public outcomes.	Moulton, S. (2009). Putting together the publicness puzzle: A framework for realized publicness. *Public Administration Review, 69*(5), 889-900.
Cullen Merritt	An organization's publicness is associated with four dimensions: political authority; social equity; external engagement; and transparency.	Merritt, C. (2013). Specifying a multi-dimensional model of publicness: Towards a comprehensive perspective. Paper presented at PMRC Annual Meeting.

A general motivation for this work is to consider how public status, as well as conceptualizations of dimensional publicness, may or may not affect institutions of higher education and the decision-making authority of department chairs operating within them. Recent literature (Enders & Jongbloed, 2007; Feeney & Welch, 2012; Fethke & Policano, 2012) finds that the quickly changing environment within higher education in the United States, including declining public support and changes in accountability policies, regulations, and standards, has cultivated a climate in which many institutions are struggling to sustain themselves; maintain access and affordability; increase their impact on their communities; and fulfill their public missions.

Some scholars have referred to this changing landscape as a "trend towards privatization" (Geiger, 2007), leaving many to wonder how changes in a university's publicness will affect

institutions' ability to "serve the public good." As Edward Ray, President of Oregon State noted in print in 2010,

> *"Being privately funded and having a public mission can create conflicts in priorities…I often worry about how we will sustain that public mission in the face of declining public financial support; if we fail, there is no Plan B for students who depend on us and the state we serve" (*Register-Guard, 2010).

This work is also designed to deepen our understanding of how public status and dimensional publicness (conceptualized in several ways) affects managerial authority over personnel decisions within organizations. This research specifically focuses on institutions of higher education because of the changing landscape of the American higher education system, which makes it fertile ground for exploring how, if at all, public ownership and various measures of dimensional publicness may affect the decision-making authority of department chairs.

The relationship between publicness and department chair power is particularly interesting to examine in the post-recession funding climate, especially within universities that are highly dependent upon public forms of support and state appropriations. Within these contexts, department chairs may be even more constrained in personnel negotiations given the budgetary pressures; a climate resistant to growth and spending; and a trend towards fewer faculty hires than before—a trend that may translate into more control and oversight from superiors. Research that has explored this relationship in other sectors and organizational types suggests that public organizations are often more highly regulated by central agencies and are mandated to adhere to system-wide policies and procedures. Examples of studies that have sought to identify the effects of public status in this respect include Pugh et al. (1969) and Tolbert & Zucker (1983), both of whom found that government ownership led to a higher concentration of authority at the top, constraining and influencing managerial decision-making at the bottom.

Related literature studying bureaucratic red tape suggests that in certain instances, too much regulation or dysfunctional rules can negatively affect the efficiency of managers and the organizations in which they work (Bozeman, 2000). For example, a study of more than 14,000 federal employees found that many managers felt constrained by "unnecessary rules and regulations" (US Office of Personnel Management, 1979). Although there are few studies to date which attempt to understand the relationship between dimensional publicness and managerial authority in personnel decision making, this literature does suggest a relationship to Bozeman's conceptualization of the term, because those operating within highly constrained environments may be experiencing a trade-off between rules and regulations and managerial control (Bozeman, 1987).

Taken together, research suggests that public status, as well as the extent to which political authority constrains an organization, may affect the power of managers to make personnel decisions, because organizations that are highly responsive to political authority are often responsive to more routinized, standardized, and centralized rules and processes, designed to constrain managerial decision-making. As a result, managers operating in an environment that is highly responsive to political authority and oversight may have less power in personnel negotiations than managers in market-oriented environments—rather than being able to offer a prospective employee a package that is simply reflective of what the market bears for that person's skills, knowledge, and expertise, managers operating in highly political environments may be required to involve political authorities in the negotiating process, to get approval to offer additional salary or benefits, or may be responsive to additional rules and regulations that affect their negotiating power. Therefore this paper hypothesizes that department chairs operating within universities that are more constrained by political authority will have less power to

negotiate with new faculty members than department chairs operating in environments that are less constrained. The next section discusses the data and methods used to empirically test this hypothesis.

DATA

This paper makes use of several sources of data in order to empirically test the hypothesis that dimensional publicness is inversely related to managerial authority over personnel decisions. The data set includes responses of 770 department chairs from 154 research universities in the United States. Individual-level data comes from a study supported by the National Science Foundation that targets the population of STEM department chairs at Carnegie classified research extensive universities.[22] The survey instrument asked department chairs a number of questions about topics such as trends in science, the department chair job, doctoral education, faculty recruitment, development of junior faculty, departmental priorities, and several demographic questions of interest. Of the 1,832 department chairs identified, 770 department chairs from six disciplinary groupings (public health, social science, life science, physical science, engineering, and miscellaneous) responded to the survey (overall response rate of 42%). Five of the 770 responses were not linked to a unique university identifier and were therefore dropped, bringing the total sample size to 765.

The university-level data included in the model comes from two sources: IPEDS and SHEEO. IPEDS, or the Integrated Postsecondary Education Data System, is a system of interrelated surveys conducted annually by the U.S. Department's National Center for Education Statistics (NCES). IPEDS provides data on a number of variables including student enrollment,

[22] For a full description of the Carnegie Classifications see http://classifications.carnegiefoundation.org/downloads/2000_edition_data_printable.pdf.

staff employment, dollars collected and expended, and several measures of organizational performance including degrees earned. More than 7,500 institutions complete IPEDS surveys each year, including all of the universities represented by the sample of department-chairs included in the data set.[23] The second source for university-level data is SHEEO, or the State Higher Education Executive Officers. SHEEO conducts a survey to gather information on a number of variables including the policies that guide tuition-setting behaviors and the impact of federal funding on tuition and financial aid for public universities. The measure of tuition-setting authority, which is described in more detail below, was derived from the responses of state fiscal officers surveyed by SHEEO in the summer of 2010. Responses are representative of 90% of states, with no data available for Michigan, New Jersey, Nevada, Rhode Island, or Washington,[24] which explains the missing observations on the tuition-setting authority variable.

VARIABLES

Table 8 (page 55) provides descriptive statistics for all model measures, and a detailed description of the variables is provided below.[25]

Dependent Variable

The dependent variable of interest is the power or authority of department chairs to negotiate with prospective candidates for faculty positions within their department. NSF survey respondents were asked a series of questions about whether or not they could offer certain resources when negotiating with prospective new faculty or if the specified resource required additional involvement from other offices (dean, provost/VP, or president). If a respondent

[23] Visit http://nces.ed.gov/ipeds/deltacostproject/ to download the IPEDS data for FY2010 and to view all related files.
[24] Visit http://archive.sheeo.org/finance/tuit/2010-2011Tuition_and_fees.pdf to view SHEEO's summary of findings and the survey instrument employed.
[25] See Appendix C for a list of variables and a brief description.

indicated that "no outside involvement was needed," the response received a "1" on the power index (authority for each negotiating tactic was weighted equally). Because there were thirteen of these types of questions, the highest score on the index a respondent could receive is a "13," and the lowest is a "0." Because respondents had the option to answer that a particular negotiating tool was "not available" or to leave the question missing, the sum of all responses was then divided by the valid sum of questions answered. This variable, named "Chair Authority," is thus scaled from 0 to 1, and has a mean of .41 (see Table 2). A list of all of the questionnaire items included in the index is shown in Appendix B. A similar power index has been employed in a study of department chair power and its relationship to the strategic priorities of universities (Bozeman et al., 2013).

Independent Variables

The independent variables of interest are the variables that measure dimensional publicness and the public status of the institution. As mentioned in the review of literature, operationalizing the publicness concept has been done in a variety of ways. In an attempt to generate some comparative results across conceptualizations, this paper includes several different measures derived from the dimensional publicness literature and also includes a traditional, dichotomous measure of public status. The traditional measure, "Sector," is a dummy variable that indicates if the university is a public institution (coded as a "1") or if it is a private, not-for-profit institution (coded as a "0").

The publicness measures included in the model mirror measures that have been used in previous studies of dimensional publicness, as well as a new measure designed to be more closely aligned with Bozeman's original conceptualization of the term (1987). First, the model includes two publicness variables that measure the amount of money the university receives from

public sources, including state and local appropriations ("StateandLocalApp") and federal appropriations and government grants and contracts ("GovtGrantsandContracts"). While these measures move us to a dimensional scale and beyond a strictly legal status comparison, they are at best proxies for the amount of political authority governments are able to exert over higher education institutions. Put another way, these public funding measures implicitly assume that the amount of funding an organization receives from a political authority can be equated to the amount of control or constraints the organization faces—an assumption that may not be accurate in a higher education context.

Given that the primary political authority a university is responsive to in the United States is the state, this paper also includes a measure of dimensional publicness that relates to the amount of authority the state has over a university's ability to set and control their tuition prices ("Tuitionsettingauthority"). This measure is arguably more closely aligned with Bozeman's original conceptualization of multi-dimensional publicness because it captures the amount of economic authority the university has as it relates to the institution's primary revenue source (tuition), and it also captures the extent to which the state has control over that revenue source once it has been collected (political authority). This variable was constructed using state fiscal officer responses about university price-setting authority. Universities operating in states that had control over tuition revenues once they were collected and in states where they were unable to act as the primary authority in setting tuition (i.e. the governor, legislature, or some other public board had primary authority) were coded as a "0." Universities that faced one of these two constraints were coded as "1." Universities that had both control over the revenue generated from tuition *and* primary price-setting authority were coded as a "2." All private, not-for-profit

institutions in the sample were coded as a "2" because their revenue is not controlled by state actors, nor do state actors have primary authority in their tuition setting activities.

Finally, the model includes a measure of publicness in relation to university expenses on public services, which was retrieved from IPEDS.[26] This measure is more closely aligned with Moulton's (2009) conceptualization of dimensional publicness as an organization's achievement of public outcomes (see Table 1) and is included to simply allow for a comparative analysis of publicness measures and their relationship to the outcome of interest.

Controls

A number of university-level and department chair level controls were included in the model. Because the amount of authority a department chair has in new hire negotiations may vary based on organizational characteristics, the model controls for whether or not the university is a land-grant institution ("Landgrant"), and the size of the institution ("LogFTEenrollment"). In addition, the model controls for a number of individual-level characteristics including the department where the person works,[27] gender ("Female"), race ("White"),[28] previous experience as a department chair at a different university ("Has Chair Experience"), years working at the university ("YearsatUniv"), and years as the department chair ("YearsasChair").

[26] Public service" is a functional expense category that includes expenses for activities established primarily to provide non-instructional services beneficial to individuals and groups external to the institution. Examples are conferences, institutes, general advisory service, reference bureaus, and similar services provided to particular sectors of the community.

[27] Dummies for department type are "engineer", "pubhlth", "socsci", "lifesci", "physical", and "misfield". Engineer was chosen as the reference category (n=255).

[28] Race was accounted for as "white" or "other" due to low variance in the other racial categories (approximately 88% of the sample was white).

Table 8. Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max	Missing
ChairAuthority	740	0.422	0.221	0	1	25
State and Local Appropriations*	726	7394.361	5240.158	0	21310.89	39
Public Expenses*	733	2767.155	2839.293	0	19417.34	32
Govt Grants and Contracts*	732	14320.9	13922.06	387.052	155507	33
Tuition Setting Authority	688	1.193	0.737	0	2	77
Sector	765	0.773	0.419	0	1	0
Engineer	765	0.333	0.472	0	1	0
SocSci	765	0.131	0.337	0	1	0
LifeSci	765	0.142	0.35	0	1	0
Physical	765	0.238	0.426	0	1	0
PubHlth	765	0.141	0.348	0	1	0
Misfield	765	0.014	0.119	0	1	0
Female	763	0.143	0.35	0	1	2
White	759	0.877	0.328	0	1	6
Had Chair Experience	747	1.89	0.301	1	2	18
Years as Department Chair	743	6.629	6.607	0	75	22
Years at University	738	19.015	10.455	0	85	27
Log Enrollment(FTE)	765	10.036	0.588	0	1	0
Landgrant	765	0.407	0.492	0	1	0
TuitionandFees*	732	12303.51	6758.12	4045.127	41996.75	33

** Reported on FTE basis*

METHODS

This paper uses a two-level hierarchical linear model (HLM) in order to test the hypothesis that dimensional publicness is inversely related to managerial authority over faculty negotiations. HLM allows for the layering of coefficients and is a popular tool in public administration and public policy studies because of the nested structure of much of the data scholars collect (e.g. employees work within firms, students are educated within certain schools, and voters and tax-payers are located within districts) (Albright & Marinova, 2010; Greene, 2012; MethodsConsultants, 2013). For example, Raudenbush and Bryk (2002) employ an HLM

approach to study student performance on standardized tests that includes both student-level and school-level measures. A similar approach was chosen for this analysis because relying on the department chair data alone under the assumption of a simple random sampling scheme would likely produce misleading results. Because department chairs were surveyed with consideration to the type of university in which they work (research extensive); because the data set includes multiple respondents from the same institution; and because many individual level variables may vary systematically based on the institution where they are employed (e.g. tenure policies may affect years at the university, human resource policies at the university may affect gender and race of the respondent, etc.), standard OLS assumptions of linear independence and homoscedasticity are violated (Albright & Marinova, 2010; Greene, 2012).

Using matrix notation, the multilevel model specified can be represented as:

$$y = X\beta + Zu + \varepsilon^{29}.$$

Where y is an $nx1$ vector of responses to the NSF survey, X is an nxp matrix containing the fixed-effects regressors, β is a $px1$ vector of fixed-effects parameters, Z is an nxq matrix of random effects regressors, u is a $qx1$ vector of random effects, and ε is an $nx1$ vector of errors. In other words, the HLM approach assumes that the power over faculty negotiations of any given department chair in any given university depends on university-specific variables which are included in the two-level model. All level-1 variables (individual level regressors) were centered around the mean of cases within the same level-2 group (i.e. the same university).

The two simultaneously-estimated equations, described in matrix notation above, can be expressed in algebraic notation as:

[29] See Raudenbush & Bryk (2002) notation for multilevel model specification in non-matrix form.

Equation 1: Department Chair Model

$$Y_{jk} = B_{0k} + B_{1k}(Female) + B_{2k}(White) + B_{3k}(SocSci) + B_{4k}(LifeSci) + B_{5k}(Physical) + B_{6k}(PubHlth) + B_{7k}(Misfield) + B_{8k}(YearsatUniv) + B_{9k}(YearsasDeptChair) + B_{10k}(AlreadyChair) + R_{jk}$$

Equation 2: University Model

$$B_{0k} = \gamma_{00} + \gamma_{01}(Landgrant) + \gamma_{02}(TutionFeeRevFTE) + \gamma_{03}(StateLocalAppropFTE) + \gamma_{04}(GovtContractsandFedAppropFTE) + \gamma_{05}(PubServiceExpFTE) + \gamma_{06}(LogFTE) + \gamma_{07}(TuitionSettingAuthority) + \gamma_{08}(Sector) + U_{0k}$$

The first equation assesses within-university determinants of department chair authority and the second equation assesses between-university effects.

The results presented below reflect three iterations of the HLM approach. First, an empty model was run in order to determine the percentage of the variance attributable to the university-level (level 2). Second, in order to explain some of the university-level variance in department chair authority, university-level predictors and individual-level predictors were incorporated into the model. Finally, because the "tuition-setting authority" variable has a number of missing cases, a third model was estimated dropping this variable from the equation.

In the second and third models, individual level variables were centered around their group mean to ensure that the model captures within-group variation only.[30] Several of the financial variables were also transformed in the models so that coefficients could be more easily assessed.[31] Because HLM modeling requires a distinction to be made between fixed and random effects, the level-2 group intercept is designated to vary around its overall mean, while all other variables are treated as fixed. This methodological approach is similar to methods employed in a

[30] "Mean-centered" means that all level-1 variables (department chairs) have been centered around the mean of all cases within the same level-2 group (university). Financial variables interpreted in terms of the tens of thousands of dollars are state and local appropriations, public service expenses, government grants and contracts, and tuition and fees revenues.

[31] Financial variables were transformed so coefficients could be interpreted in the tens of thousands of dollars (e.g. "an increase of $10,000 is associated with X change in the managerial power index").

similar study examining the effects of dimensional publicness on realized public values at universities (Feeney & Welch, 2012).

RESULTS

The results of the empty model are presented in Table 9 (see Model 1). The results suggest that the average authority index score for department chairs, reflected in the intercept term, is 0.41. Using the variance estimates for the intercept and the error to calculate the intraclass correlation coefficient,[32] I determine that approximately 18% of the variance is attributable to the university-level (level 2).

The results of the second estimation indicate several statistically significant regressors at the $p<0.05$ level including: the social science dummy; the average years serving as a department chair; gender; government grants and contract revenues per student; and land-grant status (see Model 2 in Table 9). The results indicate that relative to the average engineering department chair within a university, the average social science department chair scores about -.102 less on the power index. They also suggest that additional years of experience increases the power score for the average department chair, while being female decreases it. These results are discussed more fully in the following section.

[32] Coefficient = 0.0088057/(0.0404822+ 0.0088057) = 0.178658454

Table 9. HLM Results (DV is "Chair Authority")

	Fixed Effects	Model 1	Model 2	Model 3
	Intercept	0.415 (0.011)	0.294 (0.225)	0.293 (0.211)
I-level	MisField		-0.296 (0.242)	-0.262 (0.240)
	PubHlth		-0.014 (0.032)	-0.001 (0.031)
	SocSci		-0.102*** (0.030)	-0.093*** (0.029)
	LifeSci		-0.013 (0.029)	-0.003 (0.028)
	Physical		-0.037 (0.024)	-0.030 (0.023)
	YearsatUniversity		0 (0.001)	0 0.000
	YearasDepartmentChair		0.004** (0.002)	0.003* (0.002)
	Female		-0.070*** (0.026)	-0.067*** (0.026)
	White		0.055* (0.030)	0.073*** (0.029)
	AlreadyChair		0.012 (0.032)	0.011 (0.031)
U-level	StateandLocalAppFTE		-0.050 (0.035)	-0.054 (0.035)
	PubServiceExpFTE		0.001 (0.044)	0.010 (0.043)
	GrantsandContFTE		0.024*** (0.008)	0.024*** (0.008)
	TuitionSettingAuthority		0.030 (0.021)	
	Sector		0.067 (0.057)	0.045 (0.052)
	TuitionandFeesFTE		-0.036 (0.029)	-0.030 (0.028)
	LandGrant		0.061** (0.028)	0.057** (0.027)
	LogFTE		0.001 (0.022)	0.011 (0.021)
	Random Effects	**Model 1**	**Model 2**	**Model 3**
	Intercept	0.009 (0.002)	0.007 (0.002)	0.007 (0.002)
	Residual	0.040 (0.002)	0.038 (0.002)	0.038 (0.002)
Universities in Sample		**154**	**134**	**142**
Department Chairs in Sample		**740**	**638**	**679**
Note: *p<.10, **p<.05, ***p<.01				

The second estimation finds no evidence to support the hypothesis that department chairs working within universities more heavily constrained by political authority will have less negotiating power than those working in less constrained institutions. The variable measuring the receipt of federal appropriations and government grants and contracts was *positively* associated with department chair power and statistically significant, while all of the other dimensional measures of publicness aligned with Bozeman's conceptualization were not statistically significant. The sector measure was also not statistically significant at the $p<0.05$ level, nor was the measure related to the amount of public service expenses. Compared to the base model, the variance component corresponding to the random intercept decreased, which suggests that the inclusion of the level-2 variables has accounted for some of the variance in the dependent variable.

The results of third estimation that dropped "tuitionsettingauthority" are consistent with the findings from Model 2, with only slight changes in the statistical significance of the regressors (see Model 3 in Table 9). Just as in the second model, the only publicness measure that was significant was the amount of government grants and contracts and federal support that a university received.

DISCUSSION

The results of this analysis suggest that there is not a strong association between the publicness of a university and the personnel negotiating authority of department chairs, and that individual characteristics of department chairs within universities explain more of the variance observed. All of the measures of dimensional publicness included in the model, as well as the dummy variable for public status, were statistically insignificant with the exception of the

measure of federal appropriations and government grants and contracts. However concerns have been raised about using resource variables as measures of publicness[33], and it is perhaps the case that this measure is actually a proxy for resource-competitiveness productivity, or a measure of a multitude of additional concepts such as university productivity or university prestige. In addition, because the amount of grants and contracts that a department brings in are taken into account when institutional administrators make decisions about faculty line allocations, the positive relationship between this measure and department chair personnel authority could be related to the fact that departments bringing in more grants and contracts may be better positioned to bring in new faculty and may be granted more leniency in negotiations.

These results, particularly the insignificance of the "tuitionsettingauthority" variable, are not aligned with the findings from studies of other organizational types, which suggest that highly public institutions, or those that are heavily constrained by political authority, will face more constraints on personnel decision-making. However longitudinal data, which by its very nature would allow for observed changes in department chair power over time, may reveal a stronger correlation than can be observed with static, cross-sectional data.

Given that the relationship between federal dollars and personnel negotiating authority is *positive,* it may be the case that institutions executing a larger number of federally supported research grants and contracts offer more negotiating authority to chairs responsible for recruiting faculty to support and maintain these endeavors. In this way, the amount of federal support an institution receives could be a proxy for institutions that are heavily involved in research, development, and innovation rather than a proxy for the amount of political authority--in this case, federal authority--to which an institution is responsive. And although this relationship is statistically significant, it may not be practically important: The model suggests that as the

[33] See Chapter 2 of this dissertation

amount of federal grants and contracts increases by $10,000, a manager's score on the power index increases by approximately 0.02 on a 0-1 scale. Although these results warrant further analysis, this small change in negotiating authority suggests that the amount of federal grants and contracts the university receives likely has little practical significance on the amount of negotiating power of department chairs.

The insignificance of the other publicness measures makes comparisons of their explanatory power challenging, given that interpreting the magnitude of effects is only appropriate for those variables that are statistically significant predictors of the dependent variable. However the significance of some of the control variables warrants future analysis and raises some interesting questions about the nature of department chair authority within higher education institutions. The results suggest that within the same university, the negotiating authority of department chairs may vary based on the school or department where the chair works. Specifically, the findings indicate that the average social science department chair has less authority relative to their engineering chair counterparts. The results also raise concerns about the equity of negotiating power for non-white and female department chairs. Within universities in the sample, the average white department chair has more perceived negotiating power than the average non-white department chair. Because the variance in this variable was so low (over 85% of the sample were white), determining if there was variation across all racial categories was not possible. However this result could be further examined in future research using a stratified sample to balance respondents across race. Furthermore, the results suggest that within universities the average female has less perceived authority in personnel negotiations than the average male (-0.07). Further inquiry into this finding was conducted to determine if perhaps women were statistically different from men in terms of experience, and findings

suggest that on average men had been in the department chair position for approximately two years longer than women and that this difference was statistically significant at the $p<0.01$ level (see Appendix C). Of course a causal relationship cannot be determined from this additional analysis, and future research should consider this finding more fully, as there may be institutional biases at work, differences in how men and women interpreted the questionnaire items, or differences in perceived power but not differences in *actual* power—explanations that can not be accounted for given the nature of the survey items and the HLM model applied here.

Limitations

There are several limitations to this analysis that may affect the results reported. First, the data comes from three separate, secondary sources. While all survey responses (SHEEO and NSF) were collected in 2010, the responses were collected at different points in time throughout the year, which could introduce systematic bias into the analysis. Furthermore, privately owned universities in the sample use the Financial Accounting Standards Board (FASB) standards for financial reporting while publicly owned universities use the Governmental Accounting Standards Board (GASB) standards, which may introduce bias in how the expense variable ("public service expenses") was reported.

Second, the scope of this analysis is narrow, focusing specifically on how dimensional publicness affects one characteristic of organizational management within institutions of higher education. In an era of performance and high-stakes accountability, this focus may seem misplaced—and one may rightly criticize this chapter for not also examining the effects of dimensional publicness on university outcomes that are seemingly more important to the education sector, such as university access, affordability, quality, and performance. This would be a fair criticism, as this chapter represents only the first step towards understanding the impact,

if any, of dimensional publicness on American higher education institutions. While empirical research has already found that dimensional publicness may be related to an organization's ability to "realize public values" (Feeney & Welch, 2012), this paper represents the first attempt at understanding the underlying decision-making constraints that may be contributing to those results. Given the complexity of university systems, more work should be conducted in this vein in the future—as many of these individual-level effects may moderate the relationship between institutional characteristics and the outcomes universities ultimately produce.

Finally, some may question the measures of dimensional publicness included in this analysis. I would contend that *all* of the measures included here deserve further exploration, as some may be more or less reliable and valid measures of dimensional publicness than others.

CONCLUSION

In closing, this paper raises more questions than answers about the extent to which publicness affects managerial authority in personnel negotiations within the university context. While there appears to be a positive relationship between the amount of federal appropriations, grants, and contracts a university receives and the negotiating power of department chairs, this result cannot be readily explained by existing theory about the relationship between political authority and the decision-making power of individual agents within an organization. These results raise questions about the generalizability of previous findings, as well as questions about the importance of publicness to organizational outcomes across different sectors and time periods. Further analysis is warranted to understand its relationship with internal organizational processes and organizational outcomes in a variety of settings and contexts.

The results of this paper also suggest that further conceptual development may be warranted around the notion of dimensional publicness. What aspects, if any, are relevant to personnel negotiations within institutions? The results of this inquiry and future studies can perhaps bring us closer to building a deeper understanding of private, public, and hybrid organization differences, but they suggest a need to work towards consistency of concept, as well as greater validity and reliability of publicness measures. Work in this vein will help policy makers make critical decisions about the best institutional arrangements for the provision of goods and services that have clear social values and provide a deeper understanding of the effects of institutional structures and arrangements on organizational outcomes and performance.

CHAPTER 4:

EXPLORING PUBLIC VALUES MULTIDIMENSIONAL PUBLICNESS IN HIGHER EDUCATION[34]

[34] Welch, J.C. To be submitted for presentation at *PMRA,* 2015.

ABSTRACT

This chapter asks the question, "How might conceptualizations of dimensional publicness be expanded and practically applied for the purpose of evaluating university performance?" It argues that "publicness" can be thought of as the outcome of interest upon which universities can and should be assessed, where "publicness" is defined as a university's responsiveness to a core set of public values or a university's fulfillment of a core set of public value outcomes. This argument is outlined in four sections. First, this chapter examines the current state of comparative evaluations of university performance and the reliance on sector-based comparisons of performance in the debate over public funding and support for higher education. Second, it addresses the gaps and problems with these frameworks. Next, it explores the promise of dimensional publicness theory (Bozeman, 1987) and public value failure theory (Bozeman, 2007) for developing a new framework to comparatively assess university performance. Finally, it presents a concept map informed by these theories and concludes with a discussion of the strengths and limitations of the concept map for theory and practice.

INTRODUCTION

The question of "what is public?" crosses many disciplinary boundaries and pertains to many intellectual problems. Dimensional publicness provides only one of many answers to the "what is public?" question, a question whose answers are socially constructed and dependent on national history, cultural identity, and, of course, disciplinary focus.
—Barry Bozeman, 2013

We are living in an era of accountability—one in which public funding and support is increasingly tied to organizational performance. This shift towards performance-based funding and higher standards is part of a broader new public management (NPM) agenda that emerged in the latter part of the twentieth century which privileges smaller, cheaper, and more effective government (Kettl, 2005). Over the past several decades, performance-based funding initiatives have had an impact on local, state, and federal agencies and touched nearly every public service sector.

Higher education is no exception (Alexander, 2000; Jongbloed & Vossensteyn, 2001; Lynton, 1989). Historically, colleges and universities have received state funding based on some type of enrollment funding formula (NCSL, 2014). However, many states are retiring this "input" based model in favor of an "output" or performance-based approach, where funding is linked to institutions' fulfillment of public goals and priorities (NCSL, 2014). Federal policies related to the funding of higher education institutions (HEIs) are also shifting to performance-based and output-focused models: The Obama Administration's FY2015 Budget Proposal incentivizes colleges and universities to (1) enroll and graduate a significant number of low and moderate-income students; (2) graduate students on time; and (3) support efforts to increase college access and success. The proposal also mentions new grant funding programs that will attach funding to "university performance" (USDOE, 2014).

Despite recent (and overwhelming) criticism of these performance-based reform proposals from both public and private HEIs (Lederman, Stratford, & Jaschik, 2014), public funding streams are, nevertheless, becoming increasingly tied to the performance outcomes of higher education institutions (Jongbloed & Vossensteyn, 2001). Therefore, questions of how to assess and compare HEI performance are becoming increasingly relevant. To date, these assessments and comparisons are largely informed by frameworks and models that focus on the marginal utility of a collegiate education; cost-benefit analyses related to the appropriate amount of public funding support for HEIs; and value-added approaches for assessing university programs and services (Pascarella & Terenzini, 2005). Critics of the most recent Obama Administration's proposals argue that proposals for a new, federally funded and operated college ranking system may actually *hurt* the students it is designed to help (e.g. by tying federal funding for HEIs to the future earnings of graduates) (Lederman et al., 2014). Furthermore, current ranking systems and assessments tend to focus heavily on university inputs and are ill-equipped to address the "publicness" of university outputs and the outcomes universities produce (e.g. the upward mobility generated by HEIs for traditionally marginalized populations).

This chapter asks the question, "How might conceptualizations of dimensional publicness be expanded and practically applied for the purpose of evaluating university performance?" This chapter argues that "publicness" can be thought of as the outcome of interest upon which universities can and should be assessed, where "publicness" is defined as a university's responsiveness to a core set of public values or a university's fulfillment of a core set of public value outcomes. This approach is different from the approach taken in the previous two chapters, which treated "publicness" as a *descriptive or explanatory* variable (aligned to organizational characteristics). Here, "publicness" is treated as a *normative* concept related to

public value fulfillment. This chapter argues for the development of a framework that is more explicitly grounded in theory than current evaluation methods (specifically, dimensional publicness theory and public value failure theory) and, by extension, calls for the development of university measures that address HEIs' fulfillment of public value outcomes. It suggests that these measures may be the most important comparative measures of university performance for state and federal funding bodies to consider. Building upon the public value and dimensional publicness literature, this paper presents a concept map that re-frames the assessment of university performance to allow for more explicit consideration of a university's responsiveness to particular value sets and an institution's fulfillment of public value outcomes. This reconceptualization is argued to be relevant and timely given the current funding climate, and to have utility for university evaluators interested in accounting for the wide variety of university functions and purposes that are insufficiently considered in current frameworks and indices designed to assess university performance.

The chapter is organized in four sections. First, it examines the current state of comparative evaluations of university performance and the reliance on sector-based comparisons of performance in the debate over public funding and support for higher education. Second, it addresses the gaps and problems with these frameworks. Next, it explores the promise of dimensional publicness theory (Bozeman, 1987) and public value failure theory (Bozeman, 2007) for developing a new framework to comparatively assess university performance. Finally, it presents a concept map informed by these theories and concludes with a discussion of the strengths and limitations of the concept map for theory and practice.

PART I. CURRENT METHODS FOR COMPARARTIVE ANALYSES OF UNIVERSITY PERFORMANCE

This section discusses two types of comparative evaluations of university performance (comprehensive and focused) and reviews the link between assessments of university performance and dimensional publicness theory.

Comparative Evaluations of University Performance

Evaluations of university performance are conducted by a variety of actors, both internal and external to the university, and for a variety of purposes. This paper focuses specifically on evaluations that are comparative in nature—that is, evaluations that are conducted for the purposes of assessing an HEI's performance relative to other institutions. A comparative focus is most relevant to this dissertation because the "public v. private" debate in higher education, as well as normative arguments about the "right" amount of public funding dollars for supporting HEIs, are generally made in the context of some sort of comparative review of a legally public university's performance relative to private, not-for-profit institutions or relative to private, for-profit institutions (Fain, 2014; S.Rpt 112-37; Sheehy, 2013).

In the broadest sense, there are two ways that HEI performance is typically compared. The first is comprehensive, where HEIs are compared on the basis of their performance across a variety of college/university functions. The second type is focused comparisons that target one core function of the institution—typically research, teaching, or service engagement, or one core "value"—such as quality, effectiveness, efficiency, equity, or monetary value. Both of these broad "types" are reviewed briefly below.

Comprehensive Assessments

Perhaps the most well known comprehensive assessment of university performance in the United States is the *US News and World Report*. The metrics applied in this ranking system are atheoretical—that is, there is no theoretical framework that explicitly informs the design or choice of measures, nor is there a grounded literature that informs the weighting of particular measures. However, one could argue that this rating system is *implicitly* informed by neoclassical economics—specifically, neoclassical understandings of quality and utility—because many variables included in the ranking system privilege economic efficiency as proxies for institutional quality and performance (e.g. expenditures per student).

There are a number of problems with the *US News and World Report* rankings--both methodological and substantive--that have been well documented in the literature and in the popular press (Diver, 2005; Gater, 2002; Gladwell, 2011; Myers & Robe, 2009; Pascarella & Terenzini, 2005; Thompson, 2000; Tierney, 2013). However the weaknesses that are most relevant to this paper relate to (1) the reliance on economic valuations of "quality" and "performance"; (2) the use of perceptual measures of prestige and reputation, which are nothing more than inferences about university quality and performance (Gladwell, 2011); and (3) ad hoc changes to the ranking system overtime which distort understandings of university performance over time.

The current system is based on seven weighted variables: (1) undergraduate academic reputation (22.5%); (2) graduation and freshman retention rates (20%); (3) faculty resources (20%); (4) student selectivity (15%); (5) financial resources (10%); (6) graduation rate performance (7.5%); and (7) alumni giving (5%) (Gladwell, 2011). Critics argue that the "reputation" measure, which receives the highest weighting, is based on inferences about a

university's identity and prejudices about an institution's history, prominence, beauty, and other factors that have little to do with the ability of the institution to achieve its stated goals and mission (Gladwell, 2011). Furthermore, many of the other "proxies" for quality that are employed in the ranking are aligned with economic understandings of organizational efficiency (e.g. student/faculty ratio), but are only trivially related to what they are designed to measure (e.g. student engagement). As Pascarella and Terenzini (2005) explain,

> *"After taking into account the characteristics, abilities, and backgrounds students bring with them to college, we found that how much students grow or change has only inconsistent and, perhaps in a practical sense, trivial relationships with such traditional measures of institutional "quality" as educational expenditures per student, student/faculty ratios, faculty salaries, percentage of faculty with the highest degree in their field, faculty research productivity, size of the library, [or] admissions selectivity."* (As quoted in Gladwell, 2011).

In addition, other indicators that are included in the ranking system, such as student selectivity, might actually conflict with public value outcomes that HEIs are asked to be responsive to—outcomes such as broadening student access. Finally, changes to the ranking system over time can distort understandings of university performance over time. As Bob Morse (2013) reports, there were a number of changes made to the ranking system that affected the most recent publication of *U.S. News Best Colleges*. For example, a university might appear to be lessening in quality because of a dropping in rankings—however the change may be entirely related to the choice to more heavily weight one measure over another or the decision to add or delete a particular measure.

A second example of a tool for comprehensive comparisons of university performance is the benchmarking framework developed by McKinnon and colleagues, designed to allow universities to (1) ascertain performance trends and initiate self-improvement; (2) compare performance to groups of similar universities; and (3) ascertain competitive positions

(McKinnon, Walker, & Davis, 2000, p. 1). Unlike the *US News and World Report* system, which is designed for public consumption and to benefit "consumers" of university products, this benchmarking framework was originally designed as a self-evaluation tool, in order to assess the competitiveness of one institution to peer institutions that produce similar products (Scott, 2011).

The university benchmarking framework is comprehensive because it covers the range of university operations, grouped in nine areas: (1) governance, planning, and management; (2) external impact; (3) financial and physical infrastructure; (4) learning and teaching; (5) student support; (6) research; (7) library and information services; (8) internationalization; and (9) staff (McKinnon et al., 2000). All of these areas must be operationalized and quantified, and, just as with the *US World and News Report* ranking system, they are typically operationalized with a heavy focus on organizational efficiency and productivity, and tend to ignore more difficult-to-measure university outcomes and impact measures. Critics also argue that benchmarking tools sometimes convolute inputs and output performance indicators, and, like the *US News and World Report* ranking system, seem to arbitrarily weight included measures (Turner, 2005). Unfortunately, outcomes and impact that are more difficult to capture in benchmarking frameworks are also those that are strongly aligned with public value successes and failures, discussed more fully in the next section. Furthermore, this framework is not explicitly grounded in any particular theory, but borrows heavily from private sector management practices and the ideals that inform competitive market environments.

Focused Comparisons of University Performance

More focused comparisons of university performance are too numerous to discuss here. However, it is important to note that unlike the *US News and World Report* ranking system and the comprehensive benchmarking tool, focused comparisons are narrower in scope and tend to

compare HEIs on the basis of a single function of the institution. For example, Hart, Northmore, and Gerheardt (2009) identified sixteen different benchmarking tools that are narrowly focused on a university's public engagement. Other popular areas of focus in comparative assessments of university performance are teaching and instructional quality (Bedggood & Donovan, 2012), research productivity (García, Rodriguez-Sánchez, Fdez-Valdivia, Robinson-García, & Torres-Salinas , 2013), business management and internal operations (Rabovsky, 2014), governance structures (Brown, 2001), organizational effectiveness (Cameron, 1978), and student productivity (Johnes & Taylor, 1990).

Focused comparisons are akin to comprehensive assessments in so far as their grounding is typically atheoretical but implicitly informed by neoclassical economic theory and market-based ideologies. For example, comparison tools that have been employed to assess performance management come directly from the private sector business literature (e.g. Total Quality Management processes, Balanced Score Card). Similarly, comparative assessments focused on instructional quality typically rely on data from surveys given to students that resemble "customer satisfaction" surveys. Although this data mirrors similar surveys used to assess consumer demand for a product in the private sector, critics argue that these surveys are poor proxies for what instruction is designed to achieve: student learning and growth (Bedggood & Donovan, 2012). There are also a number of comparative evaluations of performance that rely on human production functions or economic measures such as earning power of graduates to compare the "value-added" of different types of higher education for various student populations (Betts, Ferrall, & Finnie, 2013). These analyses are also grounded in economic understandings of marginal utility, productivity, and performance (Alexander, 2000; Ewell & Jones, 1994). Finally, the vast majority of assessments designed to value knowledge creation—a key facet of

most major research universities in the United States—rely on economic valuations of knowledge[35].

University Performance and the Publicness Link

In the United States, university sector has been a key explanatory variable in comparative studies of university performance and outcomes (Eide, Brewer, & Ehrenberg, 1998; Lechuga, 2006; Lott, Hernandez, King, Brown, & Fajardo, 2013; Monks, 2000). Public colleges and universities have been compared to private, not-for-profit institutions and private, for-profit institutions across a variety of performance indicators and outcomes including the marketplace for federal research funding (Lombardi, Phillips, Abbey, & Craig, 2011); research performance and productivity (Casani, De Filippo, Garcia-Zorita, & Sanz-Casado, 2013; Dundar & Lewis, 1998); size of endowment (Lombardi, Craig, Capaldi, & Gater, 2002); instructional quality (Ruch, 2001); academic value (Yeoman, 2011) and a number of student success indicators (Cellini & Chaudhary, 2012). Furthermore, popular comparative reports such as the *US News and World Report* "College Rankings & Lists" rank institutions and publish comparisons disaggregated by sector annually (USNews, 2014). The recent growth in the private, for-profit sector (Casani et al., 2013) has fueled sector-based comparisons, and perpetuated debates over institutional quality based on organizational "type" (Ruch, 2001; Yeoman, 2011; S.Rpt 112-37; Sheehy, 2013).

However, sector-based comparisons of value, instruction, innovation, access, or any other variable of interest are convoluted by the reality of the funding climate in the higher education sector. During the 2009-2010 school year, for-profit institutions received $32 billion in federal grants and loans, including $7.5 billion specifically in Pell Grants (NCSL, 2013). In 2012, a United States Senate report (S. Rpt 112-37) indicated that this translates to $8 out of every $10 in

[35] See Welch, Rimes, and Bozeman (forthcoming) for a discussion of alternative valuation methods.

revenues received coming from public sources. Yet, on the other hand, many legally public institutions rely more heavily on private-source revenues (e.g. tuition, enterprise, and endowment dollars) than public sources, a trend that has caused some to argue that the higher education sector is moving towards the "privatization" of what has traditionally been perceived as "public goods" (Greiger, 2007; Priest & St.John, 2006; Morphew & Eckel, 2009). Furthermore, many for-profits have established non-profit organizations to receive gifts and grants, while non-profits are continuing to launch a number of for-profit ventures (Ruch, 2001).

This "blurring of sectors" within the American higher education system suggests that sector-based comparisons of university performance and outcomes may be increasingly less meaningful (Feeney & Welch, 2012). As Ruch (2001, p.65) writes,

> *"Traditional universities and corporations are expected to continue to develop new and complex affiliations, suggesting to some observers that the difference between for-profit and not-for-profit higher education will eventually become so indistinct as to be largely meaningless to all but tax accountants"*

Given that the missions of most colleges and universities are multifaceted and complex, and that nearly all HEIs receive public support regardless of sector, sector-based comparisons of performance are shortsighted if they are unable to account for the various (and sometimes competing) goals and values that public; private, not-for-profit; and private, for-profit HEIs are responsive to. In short, sector comparisons of performance are reductive because, by design, they ignore the complexity of HEIs' funding structures and organizational goals and strategies.

What, then, if not sector-based comparisons and explanations, should university stakeholders, researchers, and funders rely on to assess HEI performance; explain differences in performance outcomes and impact; and to hold HEIs accountable to the public dollars they receive? Because public HEIs engage in a variety of functions, behaviors, and relationships that mirror private business functions, behaviors, and relationships, and because legally private HEIs

do the same, evaluating university performance on the basis of "realized publicness"—defined by a university's fulfillment of public value outcomes—may be a more useful way for those responsible for appropriating public funds to determine the public "value-added" of HEIs across sectors. When operationalized in evaluations of performance, this means shifting from a descriptive assessment of public status towards a normative understanding based on an institution's fulfillment of a particular set of PVOs (this idea is explored more fully in Part III)—one that can include consideration of public, private, for profit, and private, not-for-profit HEIs.

PART II. EXPOUNDING ON THE WEAKNESSES OF CURRENT FRAMEWORKS AND PUBLIC/PRIVATE COMPARISONS OF UNIVERSITY PERFORMANCE

The core issues with the frameworks and sector-based comparisons of university performance have already been highlighted above, but several points are worth expounding upon here. First, the Pareto efficiency criterion championed by neoclassical economic thought is not useful for addressing distributional issues that are often at the heart of public value questions—questions that are at the core of many HEIs' missions (e.g. equitable access to of university resources for population served) (Howarth & Norgaard, 1990). Second, the theoretical assumptions that implicitly inform many of the evaluation methods currently employed are based in utilitarianism, a theory which many contend is insufficient for valuing equity concerns (Brown, 1992; Sen, 1970; Sen & Williams, 1982). Furthermore, the philosophical foundation of many university performance metrics (e.g. earning potential of graduates) is firmly rooted in economic individualism, which privileges the interests of the individual over the interests of society; treats HEIs as a means of satisfying individual needs; and gives the individual supreme value over society or the polity. Critics have also argued that evaluation tools derived from

neoclassical theory (e.g. cost-benefit analyses related to university investment opportunities) fail to account for long-term, social consequences (Mishan, 1980)[36]. In sum, the current tools for assessing and comparing university performance are insufficient in scope, because they rely on proxies for university outputs that are grounded in a neoclassical economists' understandings of quality and performance. This results in a failure to capture some of the most important data about university performance—such as long-term student outcomes, the impact of investments in university R&D on future innovations, and other public value outcomes of interest (additional outcomes of interest and methods for identifying public values are explored in the next section).

In addition, the changes that have occurred in the higher education sector over the past several decades further illustrate the need for a new framework that can compare HEI performance on the basis of their fulfillment of PVOs. For the past several decades, the NPM agenda has informed the creation of programs and policies that have encouraged the creation of systems and metrics that track, measure, and evaluate university performance. According to the NPM approach, the economic market becomes the dominant policy model (Morphew & Eckel, 2009, p. vii). Supporters of a shift towards NPM argue that agencies operating in an environment that incentivizes more responsiveness to market forces and one that places less emphasis on traditional, bureaucratic control mechanisms will produce better results.

Despite the market-orientation of the NPM policy agenda, current funding debates at the federal and state level are concerned with university performance outcomes and impact that go beyond individualistic measures of university value (e.g. earning potential of graduates) and assessments of organizational effectiveness (e.g. input/output ratios), but are focused instead on the fulfillment of particular public value outcomes (e.g. access for traditionally marginalized

[36] See Welch, et al.(forthcoming) for a more thorough discussion of the shortcomings of market-based analytical tools for assessing an organization's fulfillment of public value outcomes.

populations, community engagement, regional impact of university programs and services). However, we do not have a framework grounded in theory that can guide assessment of university performance around the values that public funding and regulatory bodies are interested in supporting.

The next section explores the promise of two related literatures for developing a framework that compares university performance on the basis of public value fulfillment.

PART III. A NEW APPROACH TO HEI PERFORMANCE EVALUATION: THE PROMISE OF DIMENSIONAL PUBLICNESS AND A PUBLIC VALUES FRAMEWORK

This section reviews the promise of dimensional publicness theory and public value failure theory for the development of new assessments of HEI performance. It begins with a review of the relevance of dimensional publicness theory, followed by an explanation of the relevance of a public values approach.

The Promise of Dimensional Publicness Theory

Dimensional publicness theory was first posited by Barry Bozeman in 1987 in the book, *All Organizations are Public.* This seminal work argues that all organizations can be more or less public, depending on the constraints they face and endowments they receive from economic and political authorities. This idea is visually depicted in the book as a "publicness grid" (Bozeman, 1987, p. 95), which charts owner-managed firms as the most highly responsive to economic authority; traditional, indirectly financed government organizations as the most highly responsive to political authority; and a variety of other organizational types as falling somewhere in the middle. Bozeman places "research university" near the center of the diagram—suggesting that research institutions are moderately responsive to economic authority in a variety of ways

(e.g. R&D partnerships with private firms; responsiveness to market pressures related to pricing of tuition and fees; etc.), but also moderately responsive to political authority—both in terms of funding support and the regulations that govern their behavior[37].

Figure 1 borrows from the diagram originally depicted in *All Organizations are Public* to demonstrate where a variety of different HEIs may fall on the "publicness grid."

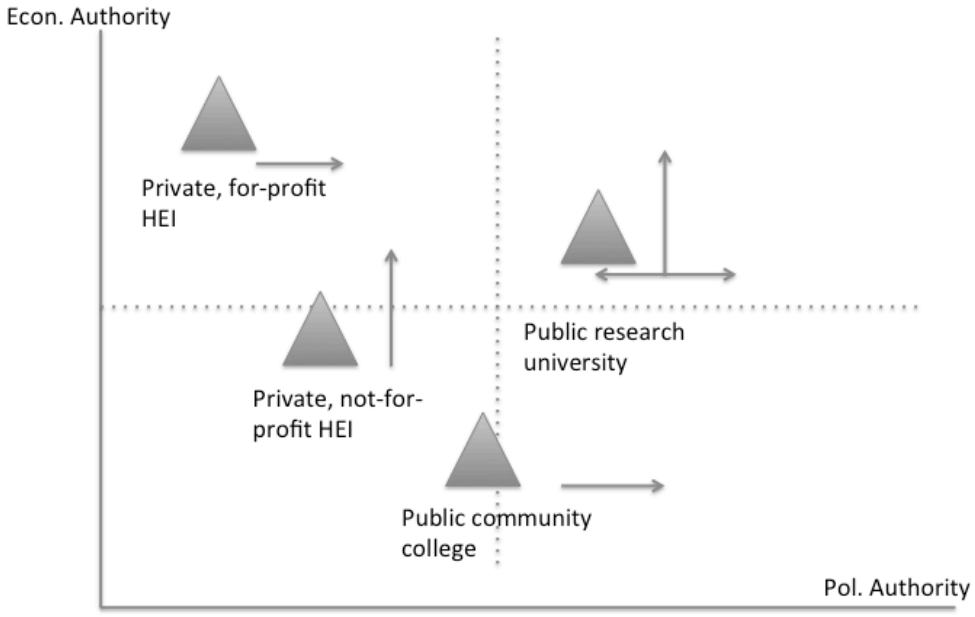

Figure 1. The Publicness Grid for HEIs (Adapted from Bozeman, 1987)

This charting moves us beyond the dichotomous, public/private comparisons of university performance that have dominated our understanding of HEI outcomes in the past. Of course, there is considerable variation within each of these HEI types at the individual level in terms of an HEI's authority mix[38], however these charts serve as a crude summary of where different institutional types may fall. The arrows indicate current policy and funding changes that may affect placement. For example, the Senate hearings on abuses in the private, for-profit sector

[37] See the first two essays of this dissertation for a more thorough exploration of the variation in responsiveness to political authority among this group of institutions.

[38] Essays 1 and 2 explore the variation in responsiveness to political authority for among American research universities.

(S.Rpt 112-37) and recent policy proposals from the Obama administration suggest that the previously deregulated policy environment for private, for-profit HEIs may be shifting towards an environment characterized by more oversight and regulation. On the other hand, not-for-profit and public research institutions are becoming increasingly responsive to market forces as they continue to pursue pricing strategies that make them competitive with the for-profit sector and as their partnerships with private firms for various research and development endeavors expand. The two-directional arrow for public, research universities is related to the movement in some states towards more centralized regulation of university functions, and the movement in other states towards more deregulation (SHEEO, 2013). The arrow for public, community colleges towards more political authority relates to the Obama administration's recent policy proposals related to rewarding and incentivizing college access and the need to provide more public support to community colleges nationwide (whitehouse.gov, 2014).

Considering the dimensional nature of publicness is highly relevant in the higher education sector (Feeney & Welch, 2012). However, recent research that has explored the utility of Bozeman's original conceptualization of the theory for predicting and explaining university outcomes has produced mixed results (see Essays 1 and 2). Perhaps this is because the theory as originally conceived is focused on dimensional aspects of publicness related to organizational *inputs* (i.e. authority mixes) as opposed to organizational *outcomes or impact.* This begs the question, "What other dimensions of publicness may be useful for understanding and explaining university performance outcomes and impact?"

A promising expansion of the dimensional publicness concept is the idea of "realized publicness" (Moulton, 2009; Moulton & Bozeman, 2011). As mentioned previously, this expansion of the theory is simply a shift in how dimensional publicness is operationalized.

Rather than treating publicness as a descriptive variable that can be measured based on an organization's responsiveness to certain authority sets, publicness is treated as an organization's fulfillment of particular public values—which requires (1) value identification and (2) an implicit, normative valuation of "what is public value?" on the part of the researcher.

Applied in the higher education sector, scholars have posited that an HEI can be more or less public based on its fulfillment of public value outcomes (Feeney & Welch, 2012). Using a sample of Carnegie classified Research I (RI) institutions, Feeney and Welch find that organizational (university) and individual (scientist) public value components are associated predictably with different realized individual public outcomes. The next section expands upon the promise of applying a public values approach to move us beyond simplistic institutional approaches to publicness and the utility of the public values literature for developing a framework to assess university performance outcomes and impact.

The Promise of a Public Values Approach

Reconceptualizing "dimensional publicness theory" from a public values perspective does not diminish the dimensional nature of the concept. The idea that organizations can be more or less public based on their fulfillment of public value outcomes simply shifts the orientation of the theory as originally conceived (Bozeman, 1987) from a focus on organizational characteristics or inputs towards a focus on organizational outcomes and impact. Barry Bozeman (2007) articulates how a public values approach can advance dimensional publicness theory for understanding university performance in the book, *Public Values and Public Interest: Counterbalancing Economic Individualism*. Bozeman argues that there is no one fixed blend of economic and political authority that will guarantee the provision of public value outcomes, but that there *is* a legitimate expectation that political authority will be exercised to advance the

public interest. In the context of university performance, one could argue that there is a legitimate expectation that taxpayer dollars—which support the work of HEIs across sectors—will be appropriated in ways that advance the public interest, and that HEIs will be held accountable to the political authorities that fund them for demonstrating fulfillment of public value outcomes through the products and services they produce. Table 10 demonstrates how this framing differs from traditional assessments of university performance.

Table 10. Key Characteristics of University Performance Assessment: Traditional v. Proposed Approach

Characteristics of Traditional Comparative Assessments of University Performance	Characteristics of a Public Values Approach to Assessing University Performance
Focus on university outputs	Focus on university outcomes and impact
Heavy emphasis on measurement and quantification, especially in the form of performance indicators	Shift towards capacity-based and outcomes-based performance indicators
Focus on market-based metrics for the assessment of university services	Judge university services on the basis of their public value achievements
Heavy emphasis on efficiency and economic individualism in assessment of university performance	Focus on equity, community, and pragmatically determined public interest
Source: Adapted from Bozeman, 2007, p. 185	

Of course this begs the question, "How can we identify the public value outcomes worthy of assessment in the context of university performance?" The public values literature offers some guidance here as well. A number of scholars have given explicit consideration to how to define "public value" (Alford & Hughes, 2008; Bozeman, 2002, 2003, 2007; Jørgensen & Bozeman, 2007; Moore, 1995; Stoker, 2006; Talbot, 2009; Welch, Rimes, & Bozeman, forthcoming), as well as specific aspects of public value (Jørgensen, 1996; Kirlin, 1996; Van Deth and Scarbrough, 1995; Van Wart, 1998). Public value failure theory offers perhaps the most useful approach for identifying public value outcomes (Bozeman, 2002). A key

assumption of the theory is that all instrumental values (public, economic, and private) can be viewed as casual hypotheses that are, in principle, subject to empirical tests (Bozeman & Sarewitz, 2011). This means that values—including public values and desired public value outcomes—can be identified by reviewing a variety of sources including formal scholarly literature; cultural artifacts and traditions; government documents; agency and program mission statements; strategic plans; and opinion polls (Bozeman, 2007; Bozeman & Sarewitz, 2011; Welch et al., forthcoming). Table 11 lists these sources, offers some examples in the context of HEIs, and presents some public values that were identified by a cursory review of these sources.

Table 11. Identifying PVOs Worthy of Consideration in Evaluations of University Performance

General Source Type	Examples in a Higher Education Context	Sampling of Public Values Identified through Pragmatic Source Review
Formal Scholarly Literature	Review of literature related to (1) the history of higher education in the United States; (2) higher education policy; (3) management of HEIs	Advancement of knowledge and learning; Promotion of literacy and citizenship; Creation of knowledge through the development of experimental evidence; Ensuring curriculum is reflective of the demands of nation and state; Promoting access for the purpose of protecting our form of government; Cultivation of "mental powers" for the benefit of society
Cultural Artifacts/Traditions	Review of (1) HEI traditions, ceremonies, honorees, awards; (2) popular press and media reflective of cultural beliefs/values about higher education in the United States	Ensuring affordability of higher education; Commitment to service learning; Concern over international exchange effects; Promotion of technological development and innovation
Government Documents	Review of (1) HEI documents (e.g. meeting minutes); (2) key legislation related to the governance and performance of HEIs (e.g. Morrill Acts; Higher Education Act); (3) university budgets and annual reports; (4) state budgets and annual reports; (5) legislative reports, minutes from public forums/higher education governing board meetings, etc. related to higher education funding and higher education policy setting	Ensuring upward mobility of traditionally marginalized student populations; Improving gainful employment opportunities for students post-graduation
Agency/Program Mission Statements	Review of HEI mission, vision, and value statements; Review of speeches given by HEI leadership pertaining to the mission, vision, and values of the institution	Promoting access to university goods and services; fostering civic engagement; ensuring diversity of populations served; developing greater global awareness; managing through shared governance
Strategic Plans	Review of HEI strategic plans	Human capital development (specifically student development and long-term growth/success); Development of university-industry collaborations; Ensuring a regional economic impact
Opinion Polls/Survey Data	Review of opinion polling data from university stakeholders; review of other data (quantitative/qualitative) that provides information on the values that inform university governance and decision making	Ensuring affordability of higher education

This table is not representative of a comprehensive review of all sources listed, but rather serves as an illustration of the types of values that society ascribes to the work of HEIs in the United States. It is important to note that values are moldable, fluid, and changing, and therefore choices of values in any assessment of university performance should consider (1) the level of consensus around the value of interest; (2) other values that may compete and collide with the value of interest; and (3) the evolution that led to the prominence of the value of interest over others.

PART IV. TOWARDS A PUBLIC VALUES FRAMEWORK FOR UNIVERSITY PERFORMANCE ASSESSMENT

Taken together, the two literatures reviewed above can help us identify the key factors, constructs, variables, and presumed relationships related to the assessment of HEI public value fulfillment (Miles & Huberman, 1994). First, the dimensional publicness literature offers a theoretical base for developing measures of HEI performance outcomes that move us beyond strict, dichotomous measures of sector. It also serves as a spring board for thinking beyond input dimensions and about how HEIs are responsive to public value sets. Second, the public values literature provides a road map for identifying public values of interest in the higher education sector, and provides some guidance around the relationship between organizational inputs, outputs, and public value fulfillment.

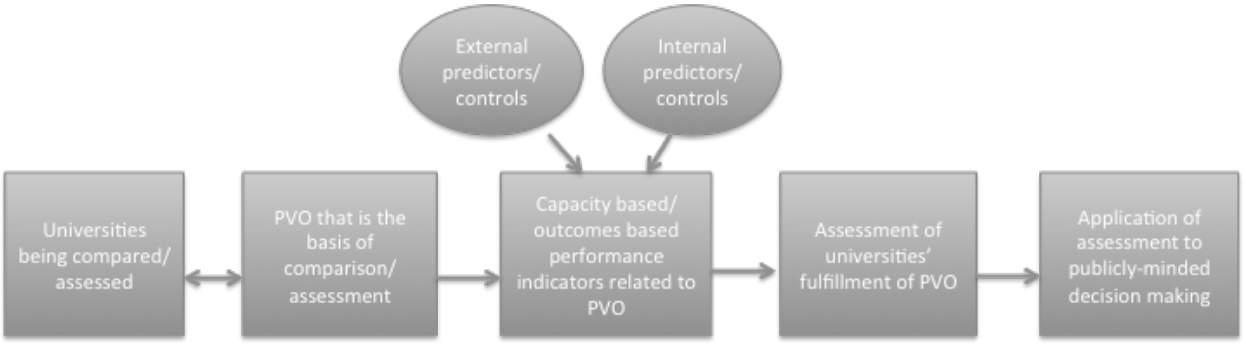

Figure 2. Concept Map

Figure 2 presents a concept map informed by these literatures, which privileges a university's fulfillment of public value outcomes as the basis for comparative analyses of university performance. The map is designed to illustrate the important stages of analyses and key components that should be included in order to compare universities in this way. A more thorough description of each stage is provided below.

Choice of Universities and Choice of PVO

On the far left of the map are two boxes that represent the institutions for comparison, as well as one or more public value outcomes to serve as the basis for comparison. The two-directional arrow suggests that the choice of institutions to include in the analysis and the choice of public value outcome(s) should not be made independently. Certain PVOs may be well suited for evaluation across institutional types (e.g. instructional impact), while others may be better suited to institutions of a particular size or type (e.g. ensuring a regional economic impact).

Choice of PVO Indicators

Determining appropriate measures for the public value outcome(s) of interest is an extremely important step to ensure the results of the analysis have meaning and value. Public value failure theory (Bozeman, 2007), as well as applications of the theory in public value mapping applications (Welch et al., forthcoming) provide some insight into the types of

indicators that could be useful when applied in a higher education context. In addition, movement from the choice of concept/value towards a reliable and valid measurement or metric of concept/value should be done carefully—and should include multiple stages of measurement testing and refinement.

Consideration of External/Internal Predictors/Controls

What are the factors that may influence a university's fulfillment of the PVO of interest? Careful consideration to both the internal and the external factors are important here if one is interested in understanding, explaining, or predicting a university's fulfillment of PVOs. This is because most public value outcomes of interest involve generating, promoting, or contributing to a *societal* level impact—which requires consideration to the numerous other factors—both inside and outside the university—that may be affecting public value fulfillment. For example, those interested in the societal impact of university research and design innovations need to not only focus on the scientific inputs, outputs and resources developed and expended by scientists but also on the actors and factors that support or impede an innovation's impact. As Bozeman (2003, p.4) explains, failure to do so "will result in an incomplete or misleading inferences about social outcomes and their causality."

Future research to inform and refine the concept map presented here should focus explicitly on the development of these explanatory variables and controls. However, a list of possible controls for the public value outcomes identified previously include,

- Institutional characteristics (structural, managerial, political, financial);
- Student characteristics (scholastic ability, demographic variables of interest, etc.);
- Environmental factors (e.g. economic and social indicators); and

- Faculty characteristics (productivity, size, demographic variables of interest, etc.).

Scholars interested in dimensional publicness concepts but concerned with different organizational types have already conducted research that explores how these types of variables may or may not affect the fulfillment of PVOs. For example, Crow and Bozeman (1998) explore how the environmental context of R&D laboratories can affect public value fulfillment. They find that federal laboratories are in a unique position to fulfill missions of "high publicness" —missions that are highly aligned to the public interest—such as hazardous waste mitigation (Crow & Bozeman, 1998, p. 178). The approach that these authors take to developing a typology of R&D laboratories and determining predictors of public value fulfillment could also be applied to the study of HEIs.

Assessment of University Fulfillment of PVO

Once appropriate models and measures have been developed, comparative assessments can be made. What types of universities are most responsive to the public value of interest? Are there particular university characteristics that can be casually linked to the success/failure of achieving public value outcomes? What are the other performance indicators and values that hinder/support the fulfillment of the public value of interest? These questions, and many others, may be of great interest to taxpayers, as well as local, state, and federal funders of higher education. Responses to these questions can help to make the case for or against public investment in particular types of HEIs, as well as certain university functions and services, but are, until now, largely being ignored. Ultimately, results from these types of assessments can inform funding allocation decisions of HEI investors—both public and private—because they provide information on an HEI's commitment to economic, private, and public value sets.

CONCLUSION

Dimensional conceptualizations of publicness and public values theory may offer the brightest path forward for comparing HEI's achievement and fulfillment of public value outcomes. Comparisons focused on PVO fulfillment should not be thought of as replacements for assessments and comparison tools grounded in economic individualism and neoclassical economic thought such as cost benefit analyses, value added approaches, or benchmarking frameworks. Indeed, there is a great deal of utility in understanding the economic "value-added" of HEI initiatives, such as a new community engagement program or a research and development partnership. These utilitarian frames for understanding value have been applied in the higher education for centuries (Lynton, 1989) and continue to necessitate the concern and involvement of federal and state level regulation and funding bodies. However, a strict reliance on resource-based evaluations of university quality and performance deny the evidence that suggests more useful taxononomies and frameworks for measuring HEI effectiveness and quality are warranted (Pascarella & Terenzini, 2005). The concept map presented here offers university stakeholders and researchers an opportunity to also focus our attention on the *publicness* of university outcomes and impact—a focus that has a great deal of utility given growing concerns over the "privatization" of public university funding, functions, and services on the one hand and concerns over the under-regulated environment in which for-profit institutions operate on the other.

Of course this concept map is only a beginning. In its current form, it represents the key stages of a comparative assessment of university performance focused on public values fulfillment, but the concept map has yet to be empirically tested, refined, and applied. A great deal more work needs to be done to determine (1) the most appropriate ways of grouping

colleges and universities for comparing their fulfillment of PVOs; (2) expanding the list of PVOs offered here through systematic inquiry and analysis of legislation that governs HEIs, HEI mission statements, citizen preferences related to HEIs voiced through surveys and polling initiatives; etc.; (3) the development and testing of PVO indicators; (4) the development and testing of explanatory and control variables that should be included in assessments of HEI fulfillment of PVOs; and (5) the ultimate utility of the concept map for university stakeholders.

Through repeated application and refinement, this concept map can inform the work of university stakeholders, university funding decisions of public and private contributers, and may also serve as a useful tool for guiding empirical research that targets the performance of HEIs. Key questions that this concept map may help to assess include:

- Are certain types of HEIs better equipped for the fulfillment of certain types of public value outcomes?
- Should public funding allocations for HEIs be designed to support the strengths of certain types of institutions?
- What does the RI University of the future look like? How can other types of HEIs begin to fill in the gaps around fulfillment of PVOs where RIs have been traditionally weak?
- Can we rely on for-profit institutions to achieve some of the PVOs that are paramount for our nation's success?
- Are there trade-offs (or complementarities) between or among certain types of PVOs? For certain types of HEIs? Can some of these be mitigated?
- How do various university stakeholders communicate about an HEI's publicness, for what purpose(s), and what effect, if any, do different communication strategies have on PVO fulfillment?

In his first address to Congress in 1787, President George Washington stated, "…there is nothing more deserving of your patronage than the promotion of science and literature. Knowledge in every country is the surest basis of public happiness." However, we are just beginning to develop theory, models, and measurement tools that allow us to fully capture and

assess the relationship between knowledge creation and dissemination and a host of public value outcomes. This concept map will hopefully provoke future scholarship, inquiry, and theoretical development devoted to more robust assessments of HEIs' ability to serve the "needs and problems of the community and society of which they are a part" (Ladner, 1993, p. 22).

CONCLUSION

The three essays presented in this dissertation are united by dimensional publicness theory and attempts to ascertain its utility for the assessment and comparison of higher education outcomes in the United States. Chapters 2 and 3 applied the theory as originally conceived (Bozeman, 1987) through the use of the "tuition authority" measure, which was designed to be a better operationalization of Bozeman's initial conceptualization of the theory than the resource publicness measures that have been employed in the past. The measure was developed in consultation with a review of numerous applications of dimensional publicness theory (see Appendix F), and was designed to be appropriate for application in the higher education sector.

The findings from the two analyses presented in these chapters suggest that university tuition authority is not a strong predictor of budgeting and finance outcomes, nor a strong predictor of department chair negotiating power. Although the original conceptualization of dimensional publicness theory (Bozeman, 1987) may offer a great deal of explanatory power in other sectors (see Appendix F), the lack of explanatory power offered by the measure employed here suggests that other institution characteristics, such as university size, may explain more of the variance ion university outcomes that were observed.

Of course the results presented here are limited in scope, and do not provide conclusive evidence that dimensional publicness theory as originally conceived has little utility or application in the higher education sector. Indeed, further testing and refinement of the measure developed and applied in these essays, as well as applications of the measure to different sampling frames (e.g. expansion beyond the research university), tof other university outcomes

of interest, and to different units of analysis (e.g. presidents/deans v. department chairs) may produce statistically significant and substantively important results.

Nevertheless, the results of Chapters 2 and 3 do suggest that other conceptualizations of publicness that have been recently developed (Moulton, 2009) may have greater promise for measuring and understanding university outcomes and impact. Chapter 4 explores the utility of reframing our understanding of dimensional publicness in the higher education sector around "realized publicness," and explores the possibility of comparing HEI performance around the fulfillment of public value outcomes. Although limited applications of this framing have already been applied in the higher education sector (Feeney & Welch, 2012), the concept map presented at the end of Chapter 4 offers a road map for further theoretical development and future empirical analyses related to this reconceptualization.

In closing, the literature reviewed in each of these essays suggests that there are numerous ways of conceptualizing publicness (see Appendix F) and measuring publicness concepts once developed. For the purpose of building knowledge, this is both a blessing and a curse. As Pesch (2008) explains, there is great divergence around the "publicness" concept—divergence that has perhaps stymied our attempts to build a large body of research that confirms or refutes the utility of the conceptualizations reviewed here. On the other hand, this divergence has also produced a vast array of conceptual frameworks, understandings of publicness, and empirical analyses which provide avenues for future research and application. Perhaps it is time to abandon the term "publicness" in favor of new language that makes the conceptual delineations more clear as scholars continue to produce research aligned to various meanings or dimensions. The concept map presented in Chapter 4 is one example of how new understandings of dimensional publicness can be useful in the higher education field for the purpose of HEI

performance assessment—and hopefully will be a stepping stone for politicians and university stakeholders to embark on more meaningful assessments of university performance—ones that are grounded in the actual outcomes and impact that HEIs hope to achieve.

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APPENDICES

A. CHARACTERISTICS OF THE TRADITIONAL AND NEW FUNDING MODELS FOR PUBLIC UNIVERSITIES (ADAPTED FROM FETHKE & POLICANO, 2012)

Traditional Characteristic	Explanation	New Reality
Heavily Regulated Tuition	Traditional funding models set a base tuition for resident undergraduates that applies generally to all programs and majors. This can be problematic because it leads to various distortions because it ignores substantial differences in program costs, quality, and differences in a student's willingness to pay (Fethke & Policano, 2012, p. 6)	Increased Tuition Discretion
Low-tuition/High-subsidy	Traditional funding models heavily rely on state and federal subsidies and have a relatively lower reliance on tuition. However scholars (Fethke & Policano, 2012; Hossler, 2006) note a shift away from this model towards an increasing reliance on student tuition dollars to cover operating costs.	High tuition-low-subsidy-high financial aid
Fixed Entry Requirements	Traditional models are characterized by strict entry requirements related to cost and academic requirements for entry. However a movement towards a heavier reliance on tuition suggests that more flexible entry requirements are preferable, as they would allow universities to be responsive to the market demand for particular programs and services offered.	Flexible entry requirements
Unrestricted Subsidy Use	Traditional funding models tend to place little to no stipulations on the use of subsidies or guidance over which university activities should be subsidized verses which activities should not be. Fethke and Policano (2012, p. 221) argue that activities that have returns which extend beyond those captured by the individual (e.g. R&D) are where subsidies should be concentrated.	Restricted subsidy use
Spending of Revenues Received	A complaint against the traditional funding model is that there is a great deal of inefficiency in how revenues received are allocated and spent--with high-cost programs being heavily subsidized through internal cross-subsidies. Fethke and Policano (2012) argue that greater operational efficiences can be achieved by moving to a model that is concerned with the effective performance of sub-units.	Increased operational efficiencies
Limited External Accountability	The traditional, high-subsidy model did not have the same "strings attached" to subsidies as new state and federal funding policies, which seek to more directly link funding to measures of university performance.	Increased external accountability
"Hourglass" Governance Structure	The traditional model places most decisions in the hands of regents and legislatures at one end and in faculty at the other (hourglass). Fethke & Policano (2012, p.217) argue that this model should change to grant central administrators more discretion in setting differential tuitions to cover costs and to be more responsive to differences in students' willingness to pay.	Top-down governance emphasis
Trying to be "All Things"	The traditional high-subsidy and cross-subsidy model meant that a variety of programs, units, and enterprises could be supported within one institution. However the new funding reality suggests that institutions need to make "scope-related choices" and the need for distinct, positioning strategies (Fethke & Policano, 2012, p. 217)	More focused strategic vision
Opaque Financial Reporting	Fethke and Policano (2012, p. 80) refer to the traditional approach as "central-administrator management", where money flows from the state to the central office and is then distributed to sub-units based on strategic initatives. This approach makes it difficult to observe the effects of others' influencing efforts. New approaches, such as "responsibility-centered management"develops formulas that govern the flow of funds and that can better reward cost control and revenue generation. These formulas also introduce greater transparency into resource allocation and financial reporting.	Financial transparency
Innumerable Internal Cross-Subsidies	The traditional approach has allowed for high-cost, limited-access programs to be sustained due to the heavy reliance on direct state subsidization. However declining state support and the movement towards funding models that rely more heavily on tuition and, by extension, a student's willingness-to-pay, mean that high-cost cross subsidies to programs that do not bring in significant revenues may be financially unviable in the long run. Fethke and Policano (2012, p. 8) suggest that public universities need to make choices that limit program scope.	Fewer internal cross-subsidies

B. SHEEO SURVEY: ITEMS AND MISSING DATA

B1. Survey items used in the construction of tuition-authority index:

1. Which of the following tuition revenue appropriation policies are in place in your state? (Check all that apply)
    a. Tuition revenues are controlled and retained by individual institutions or campuses.
    b. Tuition revenues are deposited into separate, institutionally designated state tuition accounts from which all funds must be appropriated prior to expenditure (in FY2002 this option was phrased as, "Tuition revenues are deposited into separate state tuition accounts from which all funds must be appropriated prior to expenditure for higher education purposes")
    c. Tuition is appropriated and is a direct offset of the state general revenue appropriation (not a survey option on the FY2002 survey)
    d. Tuition revenues are retained at the state level but under the direct control of a state governing or coordinating board.
    e. Tuition revenues are deposited into state general funds, with their return to higher education only inferred.
    f. Other

If other, respondents were asked to specify.

2. Which of the following entities has primary authority for establishing tuition? (Please check one)
    a. Governor
    b. Legislature
    c. Statewide coordinating/governing agency for multiple systems
    d. Coordinating/governing board(s) for individual systems
    e. Local district governing board(s)
    f. Individual institutions

B2. Missing Data

Responses to one or both of these questions were missing for the following states:

	FY2002	FY2005	FY2010
States Missing	AK, CA, CO, MI, MT, OR	MD, NC	MI, NV, NJ, RI, WA
Count Missing States	6	2	5
Response Rate	88%	96%	90%
Count Universities from Sample in these States	27	7	14
Percent Missing from Sample (n=152)	17.7%	4.6%	9.2%

C. VARIABLE DESCRIPTION

	Variable Name	Level*	Description	Source
Outcome of Interest	ChairAuthority	I	Author-constructed variable scaled 0-1 indicating the level of authority the department chair has in new-faculty negotiations	NSF
Measures of Publicness	StateandLocal Appropriations	U	State and local appropriations, full-time equivalent	IPEDS
	PublicExpenses	U	Public service expenditures by university, full-time equivalent	IPEDS
	GovtGrantsandContracts	U	Federal Appropriations and Government Grants and Contracts, full-time equivalent	IPEDS
	Sector	U	Dummy variable for university sector	IPEDS
	TuitionSettingAuthority	U	Author-constructed variable scaled 0-2 indicating the extent of tuition-setting authority and control at the university	SHEEO
Controls	DepartmentType (Engineer, SociSci, Physical, LifeSci, PubHlth, and Misfield)	I	Dummy variables indicating the type of department where the chair works	NSF
	Female	I	Dummy variable for department chair gender	NSF
	White	I	Dummy variable for department chair race	NSF
	HadChairExp	I	Dummy variable indicating whether or not the chair had been a department chair at another university	NSF
	YrsDeptChair	I	Variable accounting for the number of years the department chair has served in current chair position	NSF
	YrsUniversity	I	Variable accounting for the number of years the department chair has worked at his/her current university	NSF
	LogEnrollment	U	Log of the number of undergraduate students enrolled	IPEDS
	Landgrant	U	Dummy variable indicating whether the university is designated as a land-grant institution	IPEDS
	TuitionandFees	U	Revenue from tuition and fees, full-time equivalent	IPEDS

**U = university; I = individual*

D. MANAGER POWER INDEX QUESTIONS

12. In negotiations with prospective new faculty, some department heads are able to add incentives to the contracts.

    Of the following resources, which ones can be offered with the resources you have in the department and which require additional involvement *(resources or approval)* from other offices?

	No Outside Involvement Needed ▼	Requires Dean's Involvement ▼	Requires Provost/ VP Involvement ▼	Requires President's Involvement ▼	Not Available ▼
Additional salary	⬭	⬭	⬭	⬭	⬭
Course reduction(s)	⬭	⬭	⬭	⬭	⬭
Teaching assistants	⬭	⬭	⬭	⬭	⬭
Summer money	⬭	⬭	⬭	⬭	⬭
Research money	⬭	⬭	⬭	⬭	⬭
Research assistants	⬭	⬭	⬭	⬭	⬭
Start-up money	⬭	⬭	⬭	⬭	⬭
Spousal hiring assistance	⬭	⬭	⬭	⬭	⬭
Computing/ software	⬭	⬭	⬭	⬭	⬭
Laboratory space	⬭	⬭	⬭	⬭	⬭
Laboratory supplies	⬭	⬭	⬭	⬭	⬭
Moving expenses	⬭	⬭	⬭	⬭	⬭
Travel funds	⬭	⬭	⬭	⬭	⬭

E. TWO-SAMPLE T-TEST: YEARS AS DEPARTMENT CHAIR BY GENDER

Group	Observations	Mean	Std. Error	Std. Dev.	95% CI
Male	633	6.916	0.276	6.953	6.374-7.459
Female	108	4.963	0.356	3.704	4.256-5.670
Combined	741	6.632	0.243	6.614	6.155-7.109
Degrees of freedom	739				
t	2.8502				
Ha: diff ! =0					
Pr(|T| > |t|) = 0.0045					

F. APPLICATIONS OF DIMENSIONAL PUBLICNESS THEORY

Reference	Area of Application	Measures of Publicness Applied	Findings/Contributions
Anderson, S. (2012). Public, private, neither, or both? Publicness theory and the analysis of healthcare organisations. *Social Science & Medicine, 74*(3), 313-322.	UK Health Care Services	Core (legal), Dimensional (political/economic authority), and Normative (public sector values). No measures applied--but framework developed that takes all 3 of these dimensions into account.	A framework is described that can be used to map the relationships between public service outcomes and publicness. Argues that publicness theory can help health administrators and researchers understand and better manage public service outcomes.
Andrews, R., Boyne,G.A., & Walker, R.M. (2011). Dimensions of publicness and organizational performance: A review of the evidence. JPART 21 301-319.	Organizational Theory	Review of studies of publicness and organizational performance	Publicness makes a difference to efficiency and equity, but the magnitude and direction of this effect varies with the characteristics of the empirical studies.
Antonsen, M., & Jorgensen, T.B. (1997). The 'publicness' of public organizations. *Public Administration*, *75*(2), 337-357.	Danish public organizations	Publicness is defined as "organizational attachment to public sector values". Survey measures where "high publicness" is when an organization indicates "high importance" for 4 or more "reasons for being public" items not including economies of scale and tradition (see page 340)	Show that organizations with a high degree of publicness differ from organizations with a low degree of publicness. The former are characterized by complex tasks, professional orientation, many external stakeholders, conflicting environmental demands, and low managerial autonomy. The latter are the opposite. Also find that organizations with a high degree of publicness are subject to a tight ministerial control and have formal and distant relations with the ministry. They also have strong vertical links, externally and internally. All organizations ranked high on publicness are reluctant to adopt organizational changes stemming from the 'New Public Management'. Organizations with a low degree of publicness are the opposite.

Boschken, H.L. (1992). Analyzing performance skewness in public agencies: The case of urban mass transit. *Journal of Public Administration Research & Theory, 2*, 265-288.	U.S. Urban Mass Transit Agencies	Applies Bozeman conceptualization of dimensional publicness to develop a grid that identifies different ways of conceptualizing organization performance. See Appendix A for the transit-specific measures applied	A framework is developed for considering multiple avenues of organizational performance and tests the framework using mass transit data. Findings confirm the model's robustness in structuring a dependent variable for empirical research on why agencies perform towards different public ends.
Bozeman, B. (1987). *All organizations are public: Bridging public and private organizational theories.* San Francisco, CA: Jossey-Bass.	Organizational Theory	Applies conceptualization of dimensional publicness aligned with theory presented in the book. R&D application is provided--examples of measures include "resource publicness" and …	This book articulates dimensional publicness theory and is the seminal work from which other applications of dimensional publicness have emerged.
Bozeman, B. (2013). What organization theorists and public policy researchers can learn from one another: Publicness theory as a case-in-point. *Organization Studies, 34*(2), 169-188.	Organization Theory-- Uses R&D Organizations as Example from Crow & Bozeman paper	Publicness is defined as economic/political authority mix. See Table 178 (Adapted from Crow & Bozeman) for the ways these concepts could be operationalized in an R&D context	Argues for the "cross-fertilization" of public management and public policy fields and uses dimensional publicness theory as a vehicle for illustration
Bozeman, B., & Bretschneider, S. (1994). The 'publicness puzzle' in organization theory: A test of alternative explanations of differences between public and private organizations. *Journal of Public Administration Research & Theory, 4*, 197-224.	R&D Laboratories	Compares core and dimensional approaches. Core is measured by legal status, dimensional is measured by "resource publicness" which was defined in 3 ways: % of R&D's unit's total budget is from government contracts and grants; % of R&D unit's budget from government appropriations; and total value of equipment and facilitates financed directly by government. Also measured by publicness of organization's goals and agendas using questions about the extent to which government financing (continued next pg.)	Finds that both core and dimensional publicness make unique and significant contributions as an explanation of fundamental organizational activities and characteristics related to composition of output, bureaucratization, redtape, and external focus.

		influences the unit's ability to continue to work and the course of its agenda. Communications publicness was also considered by measuring % of time spent on the phone and correspondence received from government personnel	
Brewer, G.A., & Brewer, G.A., Jr. (2011). Parsing public/private differences in work motivation and performance: An experimental study. *Journal of Public Administration Theory & Practice, 21*, 347-362.	Public/Private Comparison of worker performance	Core--compares worker performance based on the legal status of the agency they perceive themselves to be working for (private v. government agency)	Individuals are significantly faster, more accurate, and more vigilant when their work is funded by a government agency rather than a private business firm. Two major implications are (1) government provision of goods and services that require faster, more accurate, and more vigilant workers (e.g., airport security or emergency responders) may be superior to private provision, ceteris paribus; and (2) our participants in this study, who are college students, seem to perform better when working for government rather than for the private sector.
Bretschneider, S. (1990). Management information systems in public and private organizations: An empirical test. *Public Administration Review, 50*(5), 536-545.	Information system management/Data processing organizations	Concerned with comparing differences in IM between private and public organizations. Only uses a core measure	The findings suggest that the environment of public organizations has led to adaptation of standard management practices. In other words, the environment of the organization affects or tailors the nature of management action.
Demortain, D. (2004). Public organizations, stakeholders, and the construction of publicness. Claims and defence of authority in public action. *Public Administration, 82*(4), 975-992.	Case study of a single, national association in France	"Publicness" of actions carried out by the association is stated to be ambiguous--focuses on the confusion around what societal actions should be regulated (in this sense, treats publicness as the regulation of action by political authorities)	Responses by public organizations show that publicness does not only relate to the plurality of organizational forms but also to the existence of a form of hierarchy within systems of governance themselves.

Goldstein, S.M., & Naor, M. (2005). Linking publicness to operations management practices: A study of quality management practices in hospitals. *Journal of Operations Management, 23*, 209-228.	Operations management/U.S. Hospitals	Investigates the linkage between four publicness dimensions (ownership, goal setting, funding, and control) and operations-related quality practices (information and analysis, staff focus, and process management) in U.S. hospitals. Dimensions are measured as follows: ownership (just public, private, or non-profit status); goal setting (relates to the teaching mission of the hospital); funding (% of funding coming from Medicare and Medicaid); and control (2 factor measures--one for public responsibility and the other for compliance).	Publicness dimensions of ownership and control are related to some quality management practices, with control (i.e. public responsibility and compliance) having a significant effect throughout the studied models. Hospital goal setting and funding, two additional publicness dimensions, are not significantly related to quality management practices.
Haque, M.S. (2001). The diminishing publicness of public service under the current mode of governance. *Public Administration Review, 61*(1), 65-82	General public services	Publicness is defined as a distinction from the private sector, the scope and composition of its service recipients, the magnitude and intensity of its socioeconomic role, the degree of its public accountability, and the level of its public trust. This is a conceptual paper--no measures of these concepts are applied.	Argues that the challenge to publicness posed by the erosion of public-private distinction—especially in terms of replacing public norms (citizenship, representation, impartiality, equality, and justice) with market values (consumerism, competition, productivity, and profitability)— is likely to worsen the existing "identity crisis" of public service as a public domain.
Heinrich, C.J., & Fournier, E. (2004). Dimensions of publicness and performance in substance abuse treatment organizations. *Journal of Policy Analysis & Management,* 23(1), 49-70.	Substance Abuse Treatment Facilities	Measure core publicness (public, private, not-for-profit) and call this 'organizational form'. Also measure 'resource publicness' by % of revenue coming from gov't sources. Measure 'goal publicness' by patient insurance--those with higher % of uninsured may feel a greater obligation to serve high- (con't next pg.)	A few effects of organizational form and structure on substance abuse treatment outcomes are statistically significant (primarily improved social functioning), although the specific contributions of measures of ownership and publicness to explaining program-level variation are generally small.

		need populations. Measure external influence by the unit type (stand alone, full-service, or "one of many stages" types of facility). Also measure external influence by whether the facility is accredited.	
Isett, K.R., & Provan, K.G. (2005). The evolution of dyadic interorganizational relationships in a network of publicly funded nonprofit agencies. JPART, 15, 149-165.	Organization Networks in Health Human Services Sector	The findings in this article present a new look at networks in a public sector setting. The public sector creates a unique operating environment for organizations involved in inter-organizational relationships and networks. This operating environment encourages contracting as a way to safeguard organizational stability. In general, this paper treats "publicness" in the "core sense"--comparing networks in the private sector to networks in the public sector.	The analysis suggests that public and nonprofit sector relationships evolve differently than private sector partnerships, providing an alternative perspective to the prevailing view in organization theory.
Jennings, P.H. (1996). The effects of publicness on the energy technology decision process. *Journal of Technology Transfer, 21*(1/2), 27-33.	Decision Making	**	The study suggests that a greater understanding of the multiple forms of publicness can help technology service providers minimize disruptions and administrative costs for service recipients.
Moulton, S. (2009). Putting together the publicness puzzle: A framework for realized publicness. *Public Administration Review, 69*(5), 889-900.	Mortgage lending	"Realized publicness", or the extent to which outcomes or objectives achieve public values	This conceptual paper suggests that dimensional publicness theory can be broadened to consider the extent to which an organization achieves public value sets, and uses the mortgage lending industry as an illustrative example.

Moulton, S., & Bozeman, B. (2011). The publicness of policy environments: An evaluation of subprime mortgage lending. *Journal of Public Administration Research & Theory, 21*(1), 87-115.	Mortgage lending	Measures lending environment publicness. Indicators of direct lending publicness are measured by (con't next pg.) the proportion of MRB loan activity in the county as of 2004, change in MRB loan activity from 2004 to 2006, the number of housing counseling agencies in the county, and the size of the registered housing and community nonprofit organizations in the county. In addition to direct lending publicness indicators, institutional publicness indicators include the proportion of mortgages originated by regulated lending institutions in the county as of 2004 and the change in regulated originations from 2004 to 2006, as well as the average localness of lending institutions in the county as of 2004 and the change in average localness from 2004 to 2006. Finally, indicators of secondary market publicness include the proportion of mortgages in a county sold to the GSEs or Ginnie Mae (FHA loans), or private companies/securities (less publicness) as of 2004 and as the change in the proportion of mortgages sold to the respective entities from 2004 to 2006. The proportion as of 2004 represents the ''base'' publicness of the county, whereas the change from 2004 to 2006 represents the	An increase in the publicness of a lending environment reduces the probability of a borrower receiving a high-cost (subprime) mortgage.

	effect of an increase or decrease in publicness on the probability of receiving a high-cost mortgage in 2006.