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PERFORMANCE FUNDING OF STATE PUBLIC HIGHER EDUCATION:
HAS IT DELIVERED THE DESIRED EXTERNAL ACCOUNTABILITY AND
INSTITUTIONAL IMPROVEMENT?

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DOCTOR OF PHILOSOPHY IN URBAN EDUCATION

at the

CLEVELAND STATE UNIVERSITY

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DEDICATION

This work is dedicated to my wife Teresa and my three children, Alexander, Melanie, and Emily. Their love, support, and encouragement over the past five years were immeasurable and knew no bounds.

It is also dedicated to my parents, Roman and Eugenia Polatajko, first-generation Ukrainian-Americans. Their courage, work ethic, values, and belief in the American Dream will always serve as a shining example for my sister Lidia and me to model. We are eternally grateful for this gift. *Мамо, прошу знай що ми вам вічно вдячні за цей дар...*

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At the successful conclusion of a long, arduous journey, one reflects upon the contributors and factors that helped transform the dream into a reality. My successful completion of this doctoral degree is no different and is the result of the support, encouragement, and dedication of so many individuals whom I would like to acknowledge and recognize.

First and foremost, I am grateful to Dr. Catherine Monaghan, who not only served as my Dissertation Chair, but also my scholarly mentor throughout the doctoral program. She took me under her wing during my first semester and has been there ever since, sharing her wealth of knowledge and wisdom, all the while guiding me, and motivating me through the doctoral process. We charted a course and plan of action, and never veered from the path. Her commitment to my success was so focused, that she even worked with me tirelessly during her one-year sabbatical to ensure that we meet our mutually agreed-upon timeline. I hope that she always knows how much she means to me both personally and academically.

This accomplishment could not have been possible without the subject-matter expertise and dedication of my Dissertation Committee: Dr. Catherine Monaghan (Chair); Dr. Graham Stead (Methodologist); Dr. Craig Foltin (Member); Dr. R.D. Nordgren (Member); Dr. Elice Rogers (Member); and, Dr. Joshua Bagaka's (non-voting Member). Their responsiveness, patience, and scholarly wisdom in guiding my work were critical to my success. In particular, Dr. Joshua Bagaka's, who was recommended to be brought on by Drs. Monaghan and Stead to serve as the subject-matter expert on the individual growth model that served as the method for analyzing the data we collected, was instrumental in delivering a successful outcome. I will forever be grateful to this group of scholars for their mentorship and helping me achieve this monumental goal.

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My family has and always will be the priority in my life, and although this work is dedicated to them, it is only proper to acknowledge their support along my transformational journey as well. Throughout these five years, my wife Teresa stepped-up beyond measure, caring for and nurturing our three young children, Alexander, Melanie, and Emily, while I became somewhat of a parent in absentia, working a demanding job by day, taking on two to three nights of classes per week, and studying and researching on non-class nights. This was a conscious choice we made in the spirit of true partnership, and together we have succeeded – our deep faith in God's divine path has been rewarded.

I have been truly blessed with wonderful parents – while my father Roman will always be my inspiration, my mother Eugenia is my hero. My father had the courage to flee the war-front

of his native Ukraine at the age of 16 in the midst of World War II, in hopes of finding freedom, liberty, and an opportunity to someday raise a family outside of the oppression he experienced. My mother overcame arguably even greater obstacles - immigration during the 1960's and the unexpected death of my father when I was 16 years old and my sister Lidia was six – and achieved the American Dream: successful entrepreneurship, all the while holding together our family and seeing to it that her children stayed on the right track and made something of themselves. These challenges served to forge a friendship and camaraderie between my sister Lidia and me that I will cherish forever.

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PERFORMANCE FUNDING OF STATE PUBLIC HIGHER EDUCATION:
HAS IT DELIVERED THE DESIRED EXTERNAL ACCOUNTABILITY AND
INSTITUTIONAL IMPROVEMENT?

MARK M. POLATAJKO, CPA

ABSTRACT

In today's economic climate, state public institutions of higher education face challenges on multiple fronts. This applies particularly to state funding as it relates to the financing of the mission of the institutions. The purpose of this quantitative study was to examine the effectiveness of allocating state resources to state public institutions of higher education by comparing results from performance funding states to non-performance funding states. The focus was to determine whether the change to the performance funding methodology delivered the desired external accountability and institutional improvement in state public higher education. The research question guiding this study was: To what extent does the method of funding state public higher education, either performance or non-performance funding, predict the improvement in key higher education performance funding indicators between the years 2002 through 2009? Data collection and analysis investigated the rate of change in key higher education performance funding indicators at state public institutions of higher education in five performance funding states (Tennessee, Florida, Ohio, Connecticut, and South Carolina) in comparison to five states that do not employ performance funding (Michigan, Georgia, Arizona, Massachusetts, and Maryland). The general hypothesis tested was: State public institutions of higher education in states that employ a performance funding methodology will experience a statistically significant increase in performance funding indicators that is greater than in states

that employ a non-performance funding methodology. Data were analyzed using the Hierarchical Linear Model (HLM) with a focus on individual change over time. The findings revealed that method of funding was not a statistically significant predictor of either the initial status or the rate of change of graduation rate or retention rate over the eight-year period, although institution type and enrollment were. The study recommends further research of performance funding outcomes, state funding levels, and other environmental factors.

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CHAPTER ONE
INTRODUCTION
Background

State public institutions of higher education are challenged on many fronts especially with regard to state public higher education funding as it directly relates to financing the mission of the institution. These institutions play a major role within the economic development of the region and state by providing an educated, skilled workforce for the 21st century economy. For instance, the State of Ohio is behind other states in terms of college graduates and is further challenged by the problem of “brain drain” versus “brain gain” resulting from the State’s lagged response to the evolution from a manufacturing based economy to a service based economy. In its report entitled *Measuring Up 2006: The State Report Card on Higher Education – Ohio*, The National Center for Public Policy and Higher Education reports the following:

Ohio performs fairly well in preparing students for college. Compared with leading states, however, relatively few high school students in Ohio go directly on to college after graduating. Ohio trails other states in providing college-level education and training opportunities for working-age adults. In addition, there are large disparities in opportunity based on income and ethnicity. Internationally, Ohio ranks low in the

proportion of certificates and degrees produced, and is outpaced by such low performing nations as Poland and the Slovak Republic. Since the early 1990's, higher education has become considerably less affordable in Ohio. If these trends are not addressed, they could limit the state's access to an educated, competitive workforce and weaken its economy over time. (p. 3)

Overcoming this trend is the new mission of the State's executive leadership and a primary focus of the State's Chancellor and Board of Regents, with state funding of public higher education a specific area of emphasis.

State Higher Education Funding Policies

Extensive research exists on the manner in which state public higher education is funded; specifically, state higher education funding policies and the funding models utilized by the states to allocate financial resources directly to higher education institutions in support of undergraduate studies (e.g., Layzell, 2007). In addition, given the recent trend of the application of efficient and effective business management practices to the operation of governments, substantial evidence in the form of key performance indicators, metrics and accountability measures have been developed to provide objective feedback on the performance of state higher education (Ewell, 1999; Layzell, 1999; University System of Ohio, 2008). By applying a Venn diagram approach and reviewing the literature in three areas, higher education performance measures, public higher education funding models, and state higher education funding policies, the following research gap was identified: the effectiveness of performance funding of public higher education (see Exhibit A).

Public Higher Education Funding Models

The methodologies used to fund state public higher education are organized by Layzell (2007) into five categories (incremental budgeting, funding formulas, performance funding, performance contracting, and vouchers) in his Continuum of State Higher Education Funding Approaches. Each of these categories is dynamic in relation to external economic and budgetary variables that exist at the time a state develops its appropriations. These variables come into play dramatically during times of economic strife and shrinking state revenue estimates as state legislators develop state budget appropriations policies and priorities, including the level at which to fund economic advancement initiatives, such as higher education, and economic entitlement programs, such as welfare (Hossler, Lund, Ramin, Westfall, & Irish, 1997). Many times during these tumultuous budgetary conditions, higher education experiences decremental funding, with originally planned funding methodologies thrown aside and replaced by rudimentary, straight-forward funding algorithms based on enrollment (e.g., credit hours, number of students) or a straight percentage of prior year's allocation (McKeown-Moak, 2006). Therefore, generally speaking, there does not appear to be a uniform commitment to funding public higher education across the states, with each reacting in a different manner to variables impacting the state budget and as a result, public higher education funding is treated inconsistently. One could speculate that this inconsistency would then also translate into the state's social and economic health.

Higher Education Performance Measures

In order to track and monitor performance, several states have developed performance indicators relative to public higher education. Layzell (1999) reports that 38 states use performance indicators for higher education, predominantly for the purposes of accountability

reporting or “consumer information” with state legislators and governors representing the largest constituency group for this reported information. Furthermore, Burke and Associates (2002) note the following:

By the early 1990’s, the convergence of problems and politics made the linkage of state resources to campus results an attractive policy alternative in state capitols... Funding for performance also fit well with the popular movements of reinventing government and reengineering business. (p. 17)

Burke and Associates (2002) proceed to explain that performance funding:

ties tightly specific resources to institutional results on each of the designated indicators.

The tie is automatic and formulaic. If a campus achieves a set target on a designated indicator, it receives a specific amount of performance money for that measure.

Performance funding focuses on the distribution phase of the budget process. (p. 21)

The proportion of the respective state’s overall public higher education budget allocated using performance varies from state to state, from as little as one to six percent to as much as 100 percent.

Problem Statement

Since 1979, many states have employed a performance funding methodology as a means to allocate resources for public higher education. While there has been some research of a qualitative and opinion survey nature (Burke & Associates, 2002) about the effectiveness of performance funding in general, no research exists that quantitatively links the implementation of performance funding methodology to results (e.g., improvement in key performance funding indicators). This study sought to remedy this gap by statistically analyzing the performance of states engaged in performance funding versus states that use other funding methodologies to

determine whether the change to the performance funding methodology has delivered the desired external accountability and institutional improvement in state public higher education. To do so, this study investigated the changes in key higher education performance funding indicators at state public institutions of higher education in five states that employ performance funding (Tennessee, Florida, Ohio, Connecticut, and South Carolina) in comparison to five states that do not employ performance funding (Michigan, Georgia, Arizona, Massachusetts, and Maryland).

Purpose of the Study

The purpose of this study was to examine the effectiveness of allocating state resources to state public institutions of higher education by comparing results from performance funding states to non-performance funding states.

Research Questions

In particular, the study addressed the following research questions:

1. To what extent does the method of funding state public higher education, either performance or non-performance funding, predict the initial status and the rate of change in graduation rate between the years 2002 through 2009?
2. To what extent does the method of funding state public higher education, either performance or non-performance funding, predict the initial status and the rate of change in retention rate between the years 2003 through 2009?

Significance of the Study

This research study attempts to elevate the usage and value of performance data by attempting to establish a statistical significance, correlation, and/or predictive strength in relation to the manner in which state funds are allocated to public higher education institutions. These results may be used by state legislators and higher education administrators in making effective,

data-driven decisions when evaluating the commitment of the state's valuable yet diminishing resources. It also establishes a basis upon which to evaluate and potentially determine the key attributes of proven higher education performance funding models, which may then provide state policymakers and legislators with quantifiable data upon which to base performance funding modifications in the hopes that these changes deliver continuous improvement in the attainment of the state's strategic public higher education goals and objectives; namely, external accountability, institutional improvement, and student success. This is important, in particular to adult education, since 27% of undergraduates are over 25. In addition, with the new changes in benefits to Service veterans and the recession there is the potential that even more adults will participate in the higher education system. Assessing what type of funding provides the best performance can help all students.

Limitations of the Study

This study did not take into consideration the influence of variables external to the performance funding process that may conceivably affect the performance funding indicator results. Examples of such variables include: college-readiness of the potential enrollment base; economic condition factors such as unemployment and recession; federal, state, local, and private financial aid resources that directly fund students' post-secondary education; individual student credit-worthiness and access to student loans; and, the financial viability and performance of individual state public institutions of higher education. Furthermore, although as of 2006 there were 19 states that had employed performance funding to allocate state budgetary resources to public higher education institutions (McKeown-Moak, 2006), the scope of this study focused solely on the performance funding states of Tennessee, Florida, Ohio, Connecticut, and

South Carolina. Finally, the total amount of state budget appropriations available for funding of state public higher education was not considered.

List of Terms

The following represents a list of terms defined within the context of this study:

Full-time Equivalent (FTE) – a unit of measure that represents the translation of total credit hours generated by courses offered in a particular academic year into full-time students.

Leverage – expanding or multiplying the benefits derived from the spending of public resources.

Return on Investment – the benefits realized as a result of state funding expended on state public higher education.

CHAPTER TWO

LITERATURE REVIEW

The purpose of this study was to examine the effectiveness of allocating state resources to state public institutions of higher education by comparing results from performance funding states to non-performance funding states. Layzell (1999) posits “The ultimate question regarding performance-based funding is, of course, whether it will actually serve to improve institutional performance in the long run” (p. 245). Developing a response to this question was the overarching aim of this research study, primarily in terms of the effect of performance funding on the key performance funding indicators of institutions and the educational outcomes of students attending public institutions of higher education.

The following review of literature begins with a brief overview of adult learners in higher education, the role and challenges of the states in funding public higher education, and a discussion of the five primary higher education funding models along with associated research. This serves as the basis for an in-depth discussion of the evolution of performance funding, the measurement of performance and accountability in state public higher education, the policy issues and challenges associated with the performance funding philosophy, and, finally, an analysis and critique of the research that has been conducted to date.

Adult Learners in Higher Education

From its inception in the early 1900s, the concept of adult education was regarded as a “voluntary activity characterized by the self-direction of adult learners who are attempting to improve their personalities: personal improvement was the fundamental motive of individuals for learning” (Stubblefield & Keane, 1994, p. 3). This broad definition still holds true today; however, the context within which it exists has evolved significantly nearly a century later. Today, the primary objective of formal adult education is job training or degree and credential attainment to support the pursuit of gainful employment. In fact, a study by the College Board concluded that 85% of adults cited employment as the reason they decided to attend college (Wolf, 2005).

In formal higher education, more and more students are entering undergraduate and graduate programs as adults, with adult responsibilities (Wolf, 2005). However, adults face unique challenges from traditional age students, such as balancing multiple roles and priorities (work, family, school), weighing the opportunity cost of paying for higher education as opposed to other non-discretionary and discretionary living expenses, and others (Martin & Rogers, 2004). As with most challenges, unique opportunities avail themselves to meet these obstacles; specifically, in terms of innovative approaches to educational delivery. For instance, distance learning now brings the classroom to the adult learner at any time of day and at any location so long as it is equipped with a computer (Conceição, 2007).

In broader terms, the circumstances described above speak to the sociology of adult education by looking at the social, political, and cultural influences of the adult learner and recognizing the symbiotic relationship between adult education and its social context (Butterwick & Egan, 2010). One of the prevalent paradigms within the sociology of adult

education is structural functionalism, which views society as structured to maintain its stability and schools as essential to promoting this stability. Although stability is the primary objective in theory, this does not necessarily materialize seamlessly in form and without barriers for some segments of society.

Barriers to adult learning are classified into two categories. The first category is dispositional, which are internal to the adult learner and represent individual issues such as abilities, attitudes, locus of control, and self-efficacy. While the second is situational, which are external to the adult learner and represent environmental stimuli the learner must respond to such as family, work life, financial circumstances, cost of higher education, and transportation needs (Merriam, Caffarella, & Baumgartner, 2007). Regardless of how effectively an adult learning program in higher education is developed, if the target audience of adult learners is unable to be reached because the dispositional and situational barriers that exist block the span of reach and delivery of the education, the achievement of the intended learning objectives and outcomes is not possible.

The funding of public higher education is critically important in each State and bears with it monumental benefits and risks, especially in relation to societal benefit and economic health and vitality. Therefore, it is imperative that the types of adult learning environments and the associated barriers that exist are well understood when developing state public higher education funding methodologies so that the core principles of access, quality, affordability, and student success are met.

The Role and Challenges of the States in Funding Public Higher Education

“Government subsidization of public higher education primarily is a function of the states. Even today, with budgets emerging from crisis, the states provide over four dollars of

support for higher education expenses for every dollar of federal subsidy” (Archibald & Feldman, 2006, p. 618). For instance, Ohio’s total budgeted unrestricted revenues for its state institutions of higher education in fiscal year 2008 were composed of 40% from tuition, 33% from sales and services, 21% from state appropriations, 1% from federal grants, and the remaining 5% from the combination of state, local, and private grants and contracts, and endowments (Ohio Board of Regents, 2008). The first notion of state funding and support of higher education dates back prior to 1800, with North Carolina, Georgia, Tennessee, and Vermont funding state-chartered, state-supported institutions (Rudolph, 1962). The mission of state support was made clear in a message from the President of Indiana University in response to concerns that 385 Indiana citizens were enrolled in institutions outside of Indiana in 1894, as noted by Rudolph (1962):

give us the money to make a great institution of learning and Indiana will not only save the greater part of the one-half million [dollars spent by Indianans elsewhere] but she will bring the sons and daughters of other states to spend a half million more. (p. 52)

The preceding passages set the tone for state funding of public higher education and the evolving responsibility of the state’s leadership to provide the necessary resources to deliver successfully on the public higher education mission. The message is quite clear, according to Weerts and Ronca (2006):

State governments and public colleges and universities have a symbiotic relationship. Public higher education institutions play an important role in creating an educated citizenry and improving state and local economies, while states bear the primary responsibility of funding postsecondary education. (p. 935)

Furthermore, according to Zumeta (2001):

Higher education contributes to economic advancement and to individual and societal welfare. The perspectives and skills associated with postsecondary education are crucial for the labor force in a 'new economy' characterized by rapid growth and organizational change, global economic relationships, and the primacy of information. The share of economic growth attributable to labor force skills, say economists, is large and growing. States with more educated populations show greater growth rates. And the labor market rewards higher education and punishes the lack of it as never before. (p. 75)

Therefore, given these high stakes and consequences, it appears incumbent on the states to fund public higher education effectively, efficiently, and at the highest level possible, with equity and access for all, in order to reap the economic market returns associated with turning out an educated citizenry and workforce.

Although the decision to fund public higher education at the maximum level seems obvious, this approach works only in a laboratory environment considering the real world variables that exist, as economic conditions, unemployment, social welfare, and healthcare present themselves within the legislative budgetary decision-making process. Zumeta (2002) states the following:

Historically, higher education is the 'balance wheel' in state budgets: experiencing disproportionate suffering when state fiscal fortunes decline and better than average fortune in good times. Economic dips and stagnancy hurt higher education and its clients and employees; they can also harm states' economic growth prospects, absent policies that run against the historical grain. (p. 73)

The challenge of managing the state budgetary equation is a monumental task and forces legislators to weigh social responsibility and altruism from the perspective of what is best for the

state's constituency and many times choosing between social welfare and economic growth to reap future societal benefits. According to Okunade (2004):

The share of state budgets for public education nationally fell from 14% in 1990 to 12.5% in 1995, but there are interstate variations in this decline as the states increasingly appropriate to the other sectors, including prisons, primary and secondary education, Medicaid, and welfare. Since fiscal year 1989-90, higher education has been the only major category of state spending whose share of total public budgets declined continuously. (p. 124)

In addition, Weerts and Ronca (2006) note that state appropriations have declined 40% since 1978, adjusted for inflation, and current state investment efforts per personal income has decreased \$32.1 billion below that of 1980. This decline in public funding has resulted in public institutions of higher education relying more heavily on tuition and endowment fundraising to support their respective educational missions. Furthermore, as noted by Hossler et al, (1997):

Many states find themselves struggling in a heated environment where -- with great effort, sweat, and political dust swirling about their heads -- they attempt to make difficult funding decisions, which leave unaltered the basic role and mission of higher education as well as the important values of student access, choice, and educational opportunity. (p. 160)

This dynamic has presented a serious consequence to the key outcome measures for public institutions of higher education: enrollment and awarding of degrees. In response to reduced public funding, public institutions of higher education were forced to reduce operations, maintenance, institutional support, and general administrative budgets; impose hiring freezes, reduce non-tenured faculty positions; lay off employees, and increase class sizes and faculty

teaching loads (Zumeta, 2001). As a result, enrollment growth began to stagnate and “reductions in courses and sections made it more difficult for students to complete their programs on time. Tuition increased faster at public colleges than at independent institutions and far beyond rates of inflation and of gain in family incomes” (Zumeta, 2001, p. 78). Weerts and Ronca (2006) note further that “the current trend in funding and the costs of higher education will mean a quadruple deficit in operating expenses for the nation’s colleges and universities by 2015” (p. 937), translating into a \$38 billion shortfall in the annual budget needed to educate the expected student population that year assuming tuition increases at the rate of inflation. Given the steady decline in available state resources, it is unrealistic “to sustain our longstanding commitment to educational equity and access without developing an integrated set of policies that provide a modicum of consensus and shared responsibility among all partners for keeping college affordable” (Hossler et al., 1997, p. 188).

These issues of equity, access, and responsibility have played out quite dramatically in the urban higher education setting where, unfortunately, the statistics show that the key success measure – graduation rate – has suffered and that although a greater number of students are entering urban universities, many never complete a degree (Carey, 2008). Carey (2008) further reports that urban universities nationwide are challenged with academically unprepared students, insufficient funding, and a variety of local and regional political pressures, not to mention the views of some legislators that higher education is a discretionary expense, which should be borne predominantly by the student upon whom the risk of failure should fall. If according to Zumeta (2002), the long term trend is that “America is becoming increasingly less willing to support higher education” (p. 79), the challenge should be to transform the funding process to support and drive successful student outcomes, especially “in a time when more students want and need

college than ever before” (Carey, 2008, p. 5). This applies particularly to those students that are academically at-risk or low-income attempting to access urban universities built on a traditional funding model (Carey, 2008). The dynamics discussed above - the interplay between access, affordability, and quality higher education, and the unstable fluctuation of state support to higher education with economic shifts in state fiscal health - set the stage for the evolution of performance funding as a means of funding higher education.

Public Higher Education Funding Models

Within the context established above relative to the state’s role in funding public higher education and the associated challenges, the methods by which states allocate resources to institutions of higher education may be discussed and evaluated. A variety of state public higher education funding approaches have been utilized by state legislatures over time. Layzell (2007) notes that the approaches adopted by states tend to be in a state of continuous flux and dynamic in relation to the external (e.g., state financial health, political shifts) and internal (e.g., enrollment growth, changing academic programs) higher education policy environments. Furthermore, Layzell (2007) identifies five funding models that states employ in allocating resources to public institutions of higher education: funding formulas, incremental (baseline) budgeting, performance contracting, vouchers, and performance funding. These are presented in Table 1.

Table 1. *Typology of Public Higher Education Funding Models*

Funding Model	Characteristics	Strengths	Weaknesses
Funding Formula	<ul style="list-style-type: none"> • Mathematical algorithm used to allocate some or all funding • In use since the 1950's • Range from very simple to very complex • Used by over 38 states 	<ul style="list-style-type: none"> • Equitable and adequacy-driven design • Responsive to environmental changes (e.g., enrollment shift; economic flux) 	<ul style="list-style-type: none"> • Does not encourage institutional performance, efficiency, and effectiveness
Incremental Budgeting	<ul style="list-style-type: none"> • Current year budget is starting point for the next year • Very basic form practiced in one form or another in most state governments • Relies on line-item allocation 	<ul style="list-style-type: none"> • Provides relative stability in funding • Simple to implement and use 	<ul style="list-style-type: none"> • Fails to recognize individual institutional needs and differences in allocating funds • Potential to perpetuate historic funding inequities • Lacks goal-orientation
Performance Contracting	<ul style="list-style-type: none"> • State agrees to provide a certain level of funding in return for a specified service or level of performance • Very focused format to fund specific academic programs (e.g., medical school, veterinary school); not for general institutional funding allocation • Only two states have employed this model: Kansas and Texas (McKeown-Moak, 2006) 	<ul style="list-style-type: none"> • Equitable, stable, and adequacy-driven by contractual terms in a very narrow scope 	<ul style="list-style-type: none"> • Non-responsive to short-term environmental changes due to long-term, binding nature of contracts • Limited to very specialized situations • Not applicable to globally funding all institutions within the respective state system
Vouchers	<ul style="list-style-type: none"> • No direct institutional subsidy; each resident admitted to a public institution receives a voucher to apply toward cost of attendance • Public institutions may set student tuition without state involvement or approval • Philosophy is to drive efficiency through institutional competition allowing for differentiation on quality, cost, and programming • Colorado is the only state to employ this model 	<ul style="list-style-type: none"> • Encourages institutional performance, efficiency, and effectiveness • Conceptually straightforward and understandable • Reinforces state's goals for higher education 	<ul style="list-style-type: none"> • Lacks ability to focus on institutional funding needs • Results in a high degree of uncertainty in annual institutional budget planning
Performance Funding	<ul style="list-style-type: none"> • Ties allocation of some or all state funding to performance on prescribed indicators in a direct, formulaic manner • Between 1979 and 2007, 26 states had implemented this model; however, 12 of those states ceased performance funding (Dougherty & Natow, 2009) 	<ul style="list-style-type: none"> • Encourages institutional performance, efficiency and effectiveness • Reinforces state and institutional goals • Objective and transparent based on performance data • Adaptable to changes in economic conditions 	<ul style="list-style-type: none"> • Possible instability in funding due to focus on outcomes (performance) rather than inputs (enrollments) • By design, not adequacy driven

Note: Based on Layzell (2007)

Traditional Funding Formulas

One of the most popular public higher education funding approaches is through the traditional funding formula, in which states first determine the amount of funding that will be dedicated to the higher education line item within the state's budget, and then this general amount is distributed to the receiving institutions through a funding formula. In its discussion of public higher education funding, the Southern Regional Education Board presented the evolution of funding formula objectives by decade and noted that the objectives have evolved as follows: adequacy in the 1950's, growth in the 1960's, equity in the 1970's, stability and growth in the 1980's, and stability, performance, and reform in the 1990's (Marks & Caruthers, 1999). These funding objectives translated into three primary funding formula drivers: enrollment, space utilization, and comparison to peer institutions (Education Commission of the States – Center for Community College Policy, 2000).

According to Layzell (2007), funding formulas:

are mathematical algorithms used to allocate some or all of the funding for public colleges, universities, and other higher education programs. State governments have used funding formulas for higher education since the 1950's (McKeown & Layzell, 1994).

Funding formulas can range from the very simple (e.g., institutions receive \$X per full-time equivalent student) to the very complex (e.g., funds are allocated to institutions through several subformulas for instruction, research, public service, and support activities and differentiate by type of institution, level of instruction, and programmatic costs). At last count, this funding approach was used to allocate at least a portion of funding for public colleges and universities by 38 states (MGT of America, 2006). (p. 6)

The use of funding formulas for allocating state funding resources has been the subject of several quantitative and qualitative research studies and the results have been quite telling. In its 2003 report focused on surveying issue priorities and trends in state higher education, the State Higher Education Executive Officers (SHEEO) found that on a scale of one (low) to five (high): adequacy of state financial support ranked second of the priorities surveyed with a mean score of 4.46 (median 5.0; mode 5.0; standard deviation 0.91); accountability and effectiveness ranked sixth with a mean score of 4.09 (median 4.0; mode 4.0; standard deviation 0.85); and, state funding models ranked twelfth of the priorities surveyed, with a mean score of 3.67 (median 4.0; mode 5.0; standard deviation 1.10) (State Higher Education Executive Officers, 2003), showing that the respondents viewed these issues as important priorities. Furthermore, teacher quality, preparation and professional development ranked first with a mean score of 4.48 (median 5.0; mode 5.0; standard deviation 0.81) and workforce preparation ranked third with a mean score of 4.35 (median 4.75; mode 5.0; standard deviation 0.84) (State Higher Education Executive Officers, 2003), demonstrating that the concerns of serving the larger societal needs and meeting the mission and values of higher education are key priorities within the realm of state funding and accountability. These results represent the views of a narrow respondent base, considering that the survey is of the SHEEO membership and limited to 50 individuals representing 48 agencies in 46 states (State Higher Education Executive Officers, 2003), bringing into question the generalizeability of the results and adequacy of the statistical sample size. By expanding the scope of the survey to other target populations, such as public college or university administrators, and expanding the sample size, the results of the SHEEO survey could be corroborated and a stronger case could be presented in relation to the validity, reliability, and generalizeability of the initial survey's findings.

Yet another study, this one compiled in 2006 and presented at the SHEEO Professional Development Conference, surveyed states to determine funding formula use. The data gathered, along with previous survey data collected by McKeown-Moak (2006), yielded the following conclusions relative to the shortcomings of funding formulas, including but not limited to: sacrificing academic quality for purposes of perceived equitable funding to institutions; reduction of incentives to seek outside funding; perpetuation of funding inequities that existed prior to implementation of a formula-based approach; inadequacy relative to funding client needs when the allocation method is enrollment based; inflexibility in times of sudden economic shift; and others. Similar to the previous study discussed above, the conclusions noted here represent survey data collected using the state as the unit of analysis, yielding a sample size that is less than 50 considering that not all recipients responded. By narrowing the unit of analysis to geographic area, institution type, or institution, and applying a more quantitative statistical design, the benefits, shortfalls, and implications of funding formula use could be further examined and understood, thereby providing even further value to stakeholders.

Incremental Budgeting

“In incremental budgeting, current year budget is the starting point for next year’s budget. Adjustments are made to the budget to allow for differences in activities planned for the next year and expected change in revenue and expenditures” (Layzell, 2007, p. 6). These budgetary adjustments have traditionally consisted of money to fund inflationary increases, enrollment growth, and special incentives. According to Layzell (2007), incremental budgeting is the most basic of the funding approaches listed in his Continuum of State Higher Education Funding Approaches and is practiced in one form or another by most state governments in compiling budgets. This approach utilizes line-item allocation, which in turn prescribes

internally the use of the funding, such as wages, capital, and others. Layzell's (2007) assessment of this funding approach is as follows: it has the potential to perpetuate long-standing funding inequities between institutions; it is historic rather than future goal-oriented; and, it is not sensitive to individual institutional missions. However, further research to substantiate his assessment is needed in terms of the effectiveness and weaknesses of this particular model.

Performance Contracting

Layzell (2007) describes performance contracting as follows:

In performance contracting, the state agrees to provide a certain level of funding to the institution in exchange for a specified service or level of performance (e.g., \$ X is provided if the institution enrolls X new students and achieves certain minimum retention rate threshold for these students from freshman to sophomore year). (p. 7)

This approach has been used in a focused manner for reserving enrollment slots in professional programs such as medical, veterinary medicine, or law at in-state private institutions or state public institutions in other states through regional higher education compacts or cooperative agreements as an alternative to offering such programs within their own state systems (Layzell, 2007). In other words, states engage in performance contracting for institutions outside of the state system. Given the relative newness of this methodology, the limited scope of resource allocation by way of this method, and that only two states, Kansas and Texas (McKeown-Moak, 2006), have applied this funding methodology, little or no research is currently available as to the effectiveness of performance contracting.

Vouchers

In the voucher model, "public colleges and universities would no longer receive a direct institutional subsidy from the state. Rather, each eligible state resident admitted to a public

college or university would receive a voucher or stipend to apply toward the cost of attendance” (Layzell, 2007, p. 7). This allows the institutions the authority and flexibility to set tuition at desired rates without state approval. As a result, the underlying philosophy supporting the voucher model “is that it can improve educational quality and efficiency through institutional competition for students. In short, taking a competitive focus on student choice and preferences will push institutions to differentiate themselves according to quality, cost, and program offerings” (Layzell, 2007, p. 7-8). The voucher model, which was first introduced by Colorado in May 2004, was employed to facilitate state subsidization of undergraduate education. Under this program, “vouchers will completely replace general fund appropriations to public institutions for undergraduate education. Second, students will be able to use their voucher, albeit at a reduced level, at selected in-state private institutions” (Harbour, Davies, & Lewis, 2006, p. 1). The voucher system also required fee-for-service contracts “between governing boards and the Colorado Department of Higher Education (DHE) to fund (a) specialized undergraduate education (e.g., engineering, forestry); (b) graduate education; and (c) professional education programs (e.g., law, medicine, and veterinary medicine)” (Harbour et al., 2006, p. 1). The strategy of the voucher system is simple: “state-promoted marketization to attain greater efficiencies in government services” (Harbour et al., 2006, p. 6). The voucher system operates under the assumption that this model offers students a measure of choice in selecting the institution they want to attend, and as a result, this creates competition among postsecondary institutions forcing them to become more efficient and expand their unique competitive advantages and value propositions.

From a state-funding perspective, the voucher system is funded through a state trust, which is supported by transfers from the General Fund, which are appropriated annually by the

General Assembly. Given this funding mechanism, one could argue that this is merely realignment and re-allocation of existing resources that does not truly achieve its intent to deliver efficiency and the making of tough decisions with respect to prioritizing legislative funding decisions to specific state economic growth opportunities. Furthermore, given the program's reliance on General Fund transfers to the state trust, an inherent risk of this approach continues to be the sufficiency of resources to meet the demand and the potential for solvency issues as General Fund balances are subjected to stress during times of economic downturn. Other concerns with this model include the failure to achieve the desired levels of competition, efficiency and institutional performance, and finally, the notion that the program may disproportionately favor affluent and non-minority students who would have attended college in any case while failing to improve resource flows to under-represented populations (Harbour et al., 2006).

Similarly, as with performance contracting, given the relative newness of this funding methodology and that only one state, Colorado, has implemented it, little or no research is currently available as to its effectiveness. Harbour et al. (2006), however, offer several research questions that should give rise to meaningful quantitative and qualitative studies to ascertain how and if the voucher model has driven a shift in meeting institutional missions, enhanced budget stability and student participation, and transformed organizational culture.

Performance Funding

Finally, performance funding “ties the allocation of some or all of the state funding for public colleges and universities to institutional performance on specific indicators (e.g., freshman-to-sophomore retention rates, minority student enrollment rates) in direct and formulaic manner” (Layzell, 2007, p. 6). This tie of funding is formulaic; i.e., if an institution

achieves the prescribed target on a designated indicator, it receives a designated amount of performance funding for that measure (Burke & Associates, 2002; Layzell, 2007). Although this methodology may appear to mirror the traditional formula funding methodology described earlier, the key difference with performance funding is that it serves to reward institutions for achievement in metrics that are more strategic in nature, with a focus on accountability and institutional improvement as opposed to the bases upon which formula funding allocates funds. The underlying philosophy is to create a competitive environment among the recipient institutions in order to motivate them to become more efficient and effective. Nearly 15 states have employed this funding model since 2003, although the amounts of resources allocated in this manner have represented a very small proportion of the overall budget, for example 5% or less. A more detailed discussion of performance funding is presented further along in this literature review.

In an effort to assess and evaluate the five funding approaches discussed above, Layzell (2007) utilizes the following 14 desired characteristics of state higher education funding approaches - equitable, adequacy driven, goal based, mission sensitive, size sensitive, responsive, adaptable to economic conditions, concerned with stability, simple to understand, adaptable to special situations, uses valid and reliable data, flexible, incentive based, and balanced - to assess the relative strength and weaknesses of each funding approach. Layzell (2007) then groups each of these characteristics into three broad categories: design-related, application-related, and funding outcome-related, and assigns a high, moderate, or low score for each, in an effort to “focus more clearly on the potential implications and outcomes of a given funding approach for higher education across some basic policy considerations” (p. 12). In general, Layzell’s (2007) findings were that incremental budgeting tends not to recognize

individual institutional needs; traditional formula funding appears to incorporate most of the characteristics simply because this methodology has addressed each of the issues over its historical development; performance funding may apply most of the characteristics except for adequate, stable funding in cases where performance is driven by outcomes as opposed to inputs; performance contracting meets several characteristics except for responsiveness to short term needs in cases of longer term contracts; and vouchers also meet most characteristics except for the ones associated with institutional funding needs and certainty of funding.

Based on these conclusions, it is apparent that there are many commonalities in relation to key criteria that are achieved by all of the five funding approaches. Furthermore, it is also evident that each of the funding approaches meets some criteria in a more effective manner than the others, meaning that each of the funding approaches brings some of its own unique strengths and weaknesses. Upon presenting a conclusion of his findings, Layzell (2007) emphasizes, “that no funding approach is necessarily better than another. That determination must be made by each state in the context of its own funding policy goals, higher education governance structure, and fiscal capacity” (p. 17). This conclusion is challenged in the following discussion of higher education performance measures and the evolution of performance funding.

The Introduction of Performance Measures and Accountability

Regardless of funding models, “State-level policymakers (e.g., legislators, governors) have been monitoring the performance of publicly funded institutions of higher education since the late 1970s via a variety of accountability and other assessment mechanisms” (Layzell, 1999, p. 233). Although these state-level accountability and assessment methods came into existence during this time period, institutional participation was generally voluntary in nature, which would change as performance-based programs evolved into mandatory programs in respective

states (Layzell, 1999). The main uses for performance measures are ongoing monitoring of programs, institutions, or systems; evaluating the attainment of goals and objectives; providing concrete basis for dialogue about policy concepts; promoting rational policymaking process; and, providing a rational basis for resource allocation (Layzell, 1999). Layzell (1999) notes four common approaches toward accountability goals and associated performance measures: 1. inputs, processes, outcomes (e.g., average ACT, first year retention rates, six-year graduation rates, time to degree award, GRE scores, pass rates on licensure exams); 2. resource efficiency and effectiveness (e.g., student-faculty ratio, average faculty contact hours, cost per credit hour, instructional space utilization); 3. state need and return on investment (e.g., economic impact studies, degrees granted per 100,000 working age population level, percent of state high school graduates enrolled in higher education, employer satisfaction with graduates); and, 4. customer need and return on investment (e.g., percent of graduates placed in degree related job, average starting salary, pass rates on licensure exams).

Ewell (1999) offers four separate policy purposes that higher education performance measures serve. The first purpose is pure accountability, the intent of which is “to discharge established accountability obligations to the public and elected officials by generating a relatively straight-forward set of publicly available statistics about ‘performance’” (Ewell, 1999, p. 193). The second purpose is informing policy and decision-making, which intends “to provide policy makers with an overall contextual picture of what is happening in a particular institution, sector or system in order to broadly inform policy discussion” (Ewell, 1999, p. 193). The third purpose is leveraging improvement to stimulate some sort of intended behavior, most often along the lines of financial and operational efficiency as well as academic performance and results. Interestingly, Weerts and Ronca (2006) posit, “campus accountability, quality, and access might

affect how states respond to particular institutions. In other words, the success of campus stewardship for public education goals might have an impact on how well they are supported” (p. 943). The fourth and final purpose is informing consumer choice, the object of which is “to disseminate information that will enable large numbers of consumers to make informed choices about individual purchasing or investment decisions” (Ewell, 1999, p. 194).

This growing focus by legislators and key stakeholders of state public higher education on institutional performance and accountability, as noted by Layzell (1999) and Ewell (1999) above, supports the assertion made by Weerts and Ronca (2006) relative to the symbiotic relationship between state government and public colleges and universities. By measuring the performance of the state’s institutions of higher education based upon specifically identified performance indicators, policymakers are able to determine the return on the state’s investment of resources and provide a value-judgment as to whether there is alignment between the goals of the state and the mission and values of higher education, which Hossler, et al. (1997) identified as student access, choice and educational opportunity. An inherent flaw of performance measures and reporting, however, is the potential lack of financial rewards for exceeding performance expectations or financial consequences for underperformance. This would change with the evolution of performance funding.

The Evolution of Performance Funding in Response to State Fiscal Pressures

Although the evolution of performance funding began in the late 1970s, the explosion of this funding mechanism truly caught momentum in the early 1990s as states began to feel the pressures of balancing state budgets in the wake of an economic recession. According to Burke, Modarresi, and Serban (1999), these conditions set the tone for states to follow existing business models of re-engineering in an effort to re-invent government with a focus on managing,

measuring, and rewarding results while shifting from a compliance to a performance culture. As state budgets began to constrict, and the accountability and continuous process improvement philosophies in business practices began to grow in popularity and migrate into the governmental sector, state legislators began to question the return on their investment in public higher education. At that time, state resources were committed to this worthy mission; however, the results of these investments were not required to be reported in a quantifiable, system-wide manner to justify these expenditures to the various stakeholders and present the value proposition, or the unique benefit, that the state's investment in public higher education provided. As a result, there was no formal infrastructure or mechanism for anyone to lobby for increased or even flat funding for public higher education over other competing legislative interests such as primary and secondary education, Medicaid, corrections, and welfare programs. None of these other competing legislative interests were subject to quantifiable measurement or performance justification; however, for public higher education, states began requiring performance reports on common indicators to provide tangible data on performance. Furthermore, as economic conditions continued to deteriorate, the momentum began to favor utilization of performance indicators as a means to fund public higher education. This represented a logical step for legislators but a major shift for leaders of public higher education institutions. (Burke & Modarresi, 2000)

The manner in which these various policy interests (i.e., public higher education, primary and secondary education, Medicaid, etc.) interact within the development of public policy is conceptualized in Kingdon's multiple streams (MS) framework (Sabatier, 2007). The MS framework proposes that three definitive streams – problems, policies, and politics – interact at critical times in the policy development process, referred to as the policy window. This window

thus provides the arena within which policy entrepreneurs, defined as “individuals or corporate actors who attempt to couple the three streams” (Sabatier, 2007, p. 74), seize the opportunity to initiate policy development. Examples of policy entrepreneurs include elected officials, interest groups, research organizations, and other like entities willing to invest their time, energy, money, and reputation to support a particular policy proposal (Kingdon, 2003). By applying the MS framework to explain the evolution of performance funding in the 1990s, Burke and Associates (2002) propose that:

The now connected streams of problems and politics sent state leaders searching in the policy stream for a program that could satisfy their needs. They sought a policy that stressed improved performance, increased productivity, and contained costs. The policy had to conform to the new management mantra of centralized direction on the priority goals, objective measurement of performance results, and decentralized methods of goal achievement. (p. 18)

Performance funding fit these needs and between the time-period of 1979 and 2007, 26 states adopted performance-based funding with 14 of those subsequently dropping it (Dougherty & Natow, 2009).

As previously noted, performance funding is employed to allocate resources to institutions based upon the results of designated performance indicators (Burke & Associates, 2002). “It adds institutional performance to the input factors traditionally used in state budgeting for public higher education: current costs, student enrollments, and inflationary increases” (Burke & Modarresi, 2000, p. 434). However, according to surveys conducted by the Rockefeller Institute in 1999 and 2000, “both state and campus leaders consider selecting the indicators as one of the most difficult decisions in building performance funding programs” (Burke &

Associates, 2002, p. 40). The difficulty rests with the diversity and complexity of the higher education environment, along with the perceived lack of objectivity of measuring educational results, both quantitatively and qualitatively. In order to be effective, the number of performance indicators used in performance funding should be minimal (< 20), should be developed by a wide range of stakeholders, possess an emphasis on quantitative measurements, carry financial incentives for institutional achievement, and be communicated in a timely and understandable manner to all stakeholder groups (Layzell, 1999). Although the characteristics of effective performance indicators is not surprising, the lack of commonality among performance indicators between states that employ performance funding is, as is the disparity among two-year and four-year institutions. According to a survey of nine performance funding states conducted by Burke and Associates (2002), only four indicators appeared in more than half of the states surveyed, with retention/graduation rates representing the most common indicator used. The lack of commonality of performance funding indicators among states is surprising considering that, notwithstanding geographic or regional uniqueness, there should be some level of comparability among public institutions of higher education in relation to their missions to educate students and the quantitative measures that may be used to assess their performance relative to outcomes. For example, "One would expect that all community colleges would include a transfer indicator, since it constitutes one of their major missions" (Burke & Associates, 2002, p. 47). Furthermore, a similar measure would apply to four-year institutions that are responsible for admitting transfers from community colleges, "especially at a time when more and more students start their baccalaureate programs on two-year campuses" (Burke & Associates, 2002, p. 47). Burke (1998b) summarizes the core principles of effective performance funding indicators:

The selected indicators should represent a more inclusive model of excellence for public colleges and universities, which reflects the diversity of institutional types and clients and the demands of multiple stakeholders. Though some indicators should stress the particular priorities of each state, a common core should recognize that what is most valued in higher education knows no boundaries. (p. 60)

The alignment of performance funding indicators between the goals and objectives of the state and the mission and values of the state's colleges and universities (e.g., student access, choice, and educational opportunity) is critical to maintain the symbiosis posited by Weerts and Ronca (2006). The challenge of gaining consensus between state and campus leaders on a common set of objective, quantitative measures that are indicative of institutional performance may be evidence of self-preservation strategies being played-out within the policy development process. Each side has the potential to lose something if performance measures and accountabilities are established to their detriment - the state legislators lose the confidence of the public and electorate, while the state institutions of public higher education lose funding resources. The manner in which these varying interests interact and develop into performance funding policy is diverse and unique to each state, as presented in the following discussion.

Performance Funding in Tennessee, Missouri, Florida, South Carolina, and Ohio

According to Burke and Modarresi (2001), "state programs of performance funding for public colleges and universities are both popular and volatile" (p. 51) as evidenced by the fact that by mid-2000, 17 states used performance funding, seven more were deemed likely to adopt performance funding, and four states had already abandoned their performance funding programs. In order to delve into this assertion further, Burke and Modarresi (2001) conducted research in order to assess the stability of continuing performance funding programs in Florida,

Ohio, and South Carolina as compared to performance funding programs in Tennessee and Missouri, which were deemed to be stable from a previous research study Burke and Modarresi (2001) conducted in 1999. The research methodology utilized surveys consisting of 22 questions related to the characteristics of performance funding in order to collect data from a respondent base consisting of state and campus policymakers and yielded a response rate of 59 percent from South Carolina, 52 percent from Tennessee, 50 percent from Ohio, 49 percent from Missouri, and 48 percent from Florida, with in excess of 100 replies received from each state. Some of the key findings were as follows: 1. the responses from Missouri and Tennessee rated the possibility of achieving the goals of performance funding considerably higher than in Florida, Ohio and South Carolina; 2. Florida, Ohio, and South Carolina respondents felt that their existing performance funding programs slighted quality even though quality was deemed the top policy value; 3. Florida, Ohio, and South Carolina funding programs reflected less than optimal number of performance indicators, with South Carolina having too many and Florida and Ohio having too few; 4. Tennessee and Missouri funding levels are restricted and substantial as compared to the other three states; and, 5. Tennessee and Missouri respondents foresaw a long-term future for performance funding, while less certainty was evidenced in the other three states.

Based on the results of the study, Burke and Modarresi (2001) conclude that each state is different, with different needs and diverse resources. “Given these differences, no state can build a stable and successful program in performance funding by copying the plan and approach of another state. The precise programs in Missouri and Tennessee are neither perfect nor applicable in every state” (Burke & Modarresi, 2001, p. 65). In addition, “the model characteristics of stable programs are too tentative and imprecise to predict with certainty whether a particular program will persist. They do point to potential problems and pose possible solutions that could improve a

program's prospects" (Burke & Modarresi, 2001, p. 65). These conclusions set the stage for the need for further quantitative research beyond surveys of stakeholders; specifically, methodologies consisting of statistical analysis on actual performance indicators and the rate of change in these over time.

The theme of diversity among states in relation to needs and resources plays-out quite dramatically upon reviewing the development of performance funding in the states of Tennessee, Missouri, Florida, South Carolina, and Ohio. In 1979, Tennessee was the first state to implement performance funding formally. The method employed "involves allocation of a modest portion of state appropriations to public campuses based on a small number of performance indicators" (Burke & Associate, 2002, p. 85). The funding purpose is two-fold: 1. to demonstrate the initiative of Tennessee higher education in engaging performance issues, and 2. to pre-empt the imposition of performance measures by political action (Burke & Associates, 2002). As a result, since the program was initiated "voluntarily without legislation and with considerable collaboration between coordinating and campus officials" (Burke & Modarresi, 2001), this initiative would be viewed favorably by legislators, hopefully prompting more funding. Furthermore, the unlegislated "Tennessee performance funding policy modifies the appropriations recommendation based on enrollment by institutional performance on prescribed indicators" (Burke & Associates, 2002, p. 87). Upon reviewing the funding trend for the period 1979 through 1999, Burke and Associates (2002) conclude that "the record suggests that, at least in the later years, performance funding has not fulfilled the hope for increased state funding for higher education in Tennessee" (p. 101).

Gradually other states began to follow suit. Starting in 1989, legislators and public higher education administrators in Missouri began to explore various concepts of performance funding.

By 1995, the first state budgetary provisions totaling \$2.8 million were identified for distribution via performance funding. As a result of the actions of Tennessee and Missouri, two specific precedents were set: 1. this funding policy of public higher education institutions developed without a legislative mandate, and 2. performance funding represented discretionary base increases as opposed to “one-time” funding, thereby ensuring that institutional budgets would not change drastically in any given year (Burke & Associates, 2002). In addition, several advantages of Missouri’s performance funding model were identified; specifically, a simple funding model with easy-to-quantify performance measures that facilitated effective application in practice, and the potential for additional funding, which motivated public institutions to compete and improve (Burke & Associates, 2002). Over the period 1994 through 2001, nearly \$66 million in core budget funding was designated and distributed through performance funding in Missouri (Burke & Associates, 2002). As a result, Burke & Associates (2002) note that Missouri has been commended for:

shifting the dialogue around performance funding to teaching and learning and for building money into each institution’s base budget. In addition, Missouri’s commitment to use consensus through dialogue in evolving its program is often cited as one of its strengths. (p. 124-125)

Florida’s evolution into performance funding took a much different path than in Tennessee and Missouri; there was a legislative mandate to tie state funding to campus performance (Burke & Associates, 2002). In 1991, statutes were enacted that mandated higher education systems reporting of performance. Shortly thereafter in 1994, the legislature passed the Government Performance and Accountability Act, which required the submittal of annual budget requests based on results achieved relative to a list of approved performance measures, in

essence performance based budgeting, however, very little incentive funding was tied to the performance aspects of this model (Burke & Associates, 2002). Then, in 2001 new legislation implementing performance funding was passed that directed that “at least 10 percent of the state funds appropriated for the K-20 education system are conditional upon meeting or exceeding established performance standards” (Burke & Associates, 2002, p. 158).

As noted in other states, South Carolina’s evolution toward performance funding followed a unique path as well, evolving in the mid 1990s due to the growing conflict between leadership of the South Carolina Commission on Higher Education (SCCHE) and respective public institution leaders, much to the dissatisfaction of the State’s legislature (Burke & Associates, 2002). This conflict grew over time within a state that had the most decentralized system of higher education governance in the United States as a key dynamic (Burke & Associates, 2002). This very dynamic, coupled with constrained resources, competing demands, and growing complaints about performance, led to legislative action in an effort to reduce campus autonomy and increase statewide coordination by the SCCHE (Burke & Associates, 2002). Furthermore, the progression toward performance funding followed a common trend: outcome assessment moved to performance reporting, which then moved to performance funding (Burke & Associates, 2002). As a result, in a short period of time, South Carolina moved from “the fringe to the mainstream of performance funding” (Burke & Associates, 2002, p. 214) to a pioneering role, as South Carolina became the first state to dedicate 100 percent of its public higher education general operating fund budget, over \$700 million annually, to distribution via performance funding in fiscal years 2001 and 2002. (South Carolina Commission on Higher Education, 2005). In fact, 100 percent performance funding is still the norm in South Carolina in 2010.

According to Burke and Associates (2002), “Pressure from state economic needs and dissatisfaction with a complex budget formula produced performance funding for public higher education in Ohio” (p. 169). By the 1990s, Ohio’s higher education performance and productivity was lagging behind other states. The transformation occurring in other states from the low-skilled worker based manufacturing economy to a new age economy driven by a highly educated workforce was not materializing in Ohio. Ohio’s elected officials were taking notice and understood that improved access to higher education and improved performance of its public higher education institutions were key drivers to the state’s economic success (Burke & Associates, 2002). As noted by Burke and Associates (2002), the Ohio Board of Regents:

estimated that the ‘education gap’ in Ohio fell 18 percent below the national average in undergraduate, and 22 percent in graduate and professional, degrees (OBR, *Budget Review, 1996*). With so many public colleges, universities, and branches, the lack of degree attainment appeared to arise not from campus and program availability but from institutional performance and budget practices. (p. 171-172)

However, the lack of degree attainment was also caused by other severe challenges including high rates of tuition, low levels of state funding, and low taxpayer support for higher education (Burke & Associates, 2002). It was evident that action was necessary and as a result, the Board of Regents initiated a Higher Education Funding Commission to explore these issues and develop recommendations for system improvement (Burke & Associates, 2002). As the Commission’s work was concluded, several recommendations were approved and accepted by the Governor, General Assembly, and the Board of Regents, including a plan to tie funding to institutional performance that stressed accountability and institutional improvement. The plan included five goals that focused on affordable access, higher quality learning experiences,

research that contributes to general knowledge and state needs, services to help meet all of state stakeholders' goals, and efficient and effective use of state resources (Burke & Associates, 2002). This change represented a huge shift from the enrollment-driven funding formula methodology that had been in effect for the previous 30 years.

The development of performance funding programs in Tennessee, Missouri, Florida, South Carolina, and Ohio was diverse and materialized in some common and some unique policy forms. For the most part, each state's legislative leadership recognized that budget resources were constricting, with few if any new revenue streams available to create additional state financial resources to further fund public higher education. Furthermore, with the proliferation of business practices into governmental processes in relation to accountability and performance, the constituents of state legislatures began to expect that this same philosophy be applied to state public higher education in order to reap the expected return on investment. The manner in which performance funding materialized, either by legislative mandate or by a consensus reached between state legislators and higher education commissions, is a key differentiator between performance funding programs. Other notable differentiating factors among these five programs include the level of funding subject to awarding through performance funding and the number of performance indicators. Given the similarity in purpose and the variability in actual program form among these states, a further assessment of research conducted on the topic of performance funding is appropriate to identify and support the research gap established by this study.

Research of Performance Funding

Within the context presented above relative to the state's role in funding public higher education, the five primary public higher education funding models, and the evolution, objectives and strategies of performance funding, an assessment and analysis of research

conducted on the subject area of performance funding is necessary in order to understand the nature and extent of work performed to date and to further develop and support the research gap that exists in relation to the literature review and research question presented in Chapter 1.

Performance funding has been the subject of many dissertations. In fact, per a search of the ProQuest database, 23 dissertations were located between the periods of 1989 and 2008 dealing with three nested phrases: performance funding, higher education, and state. Upon reviewing the abstracts, problem statement, and methodology of each, it appears that very few statistically analyzed the actual performance indicators; surveys and interviews served as the primary data collection tool for most; two compared performance to non-performance funding states; and, none delve into the quantitative analysis of performance funding indicators rate of change over time among states that utilize a performance funding methodology.

Several other studies have been conducted to determine the effectiveness of performance funding, predominantly through surveys as well. In 1997, the Higher Education Program at the Rockefeller Institute began conducting annual telephone surveys of state higher education finance officers in all 50 states in order to understand the trends in state policies related to performance funding (Burke & Minassians, 2001). In its second annual survey, the number of states utilizing performance funding grew from 10 states in 1997 to 13 states in 1998, with eight states considering its continuation highly likely and four deeming it likely (Burke, 1998a). Furthermore, a key conclusion drawn was that performance funding is more stable in states that employ it but less desirable to states that do not utilize it (Burke, 1998a). The reluctance of some respondents to pursue performance funding was primarily based on perceptions related to South Carolina's model that is was too complex and 100 percent of the funds are tied to performance. South Carolina's model consists of 37 performance funding indicators. However, the overall

survey results show that there continues to be growing interest in funding public higher education for results (Burke, 1998a). A year later, the third annual survey showed yet further growth of states employing performance funding, with 16 states now responding that they utilize this methodology; however, this result was somewhat deceiving considering that since 1997, eleven states had implemented performance funding while five states terminated their performance funding program (Burke & Modarresi, 1999).

Other key survey results included a projection that 24 states were likely to have performance funding programs in place within five years of the survey, a net increase of 50%, and that most of the new programs recently implemented were initiated by university systems rather than legislative mandates, predominantly seeking specific improvements in campus performance rather than systemic reform of state higher education, as was the case in earlier performance funding program adoptions (Burke & Modarresi, 1999).

In its fourth annual survey focusing on the effects of performance funding, the results showed that 40 percent of the respondents felt it was too early to assess the impact, while 25 percent of the respondents noted that performance funding has improved their institution's performance to a great or considerable extent (Burke, Rosen, Minassians, & Lessard, 2000). The fifth annual survey reported that the number of states responding that they use performance funding grew by two from the previous year, reaching a total number of 19, or 38% of the respondent base (Burke & Minassians, 2001). Another key conclusion derived from this survey was that the new or planned performance funding programs were less comprehensive than earlier programs launched in that they called for less funding, fewer indicators, limited goals, and incremental implementation (Burke & Minassians, 2001). The sixth annual survey showed that the net number of states reporting that they employ performance funding had decreased to 18 in

2002, and concerns that state budget problems may erode support for performance funding, including predictions that deep budget problems may diminish prospects for performance funding (Burke & Minassians, 2002). Finally, in its seventh annual survey, this one focusing on performance reporting, the results showed that 46.5 percent of the respondents noted that performance funding has improved their institution's performance to a great or considerable extent; however, the number of states employing performance funding had dropped to 15, the lowest number since the second survey in 1998, a realization that was foreseen by the respondents in the prior year's survey and bringing into question the respondent projections from the third annual survey in 1999 that within five years, 24 states would have performance funding programs in place (Burke & Minassians, 2003).

The collective results of these seven annual surveys show some distinct trends. First, the development and sustainability of performance funding programs appears to be extremely volatile in relation to the economic climate of the state. Second, programs appear to have evolved from an early initiation by legislative mandates to a more collaborative involvement from campus leadership, lending to a greater focus on institutional improvement rather than wholesale, systemic reform, as was the primary policy driver early on. Third, a transformation to a more focused performance funding format with fewer, more meaningful performance indicators, and funding base that secure the buy-in from both state government and campus leaders. These distinct trends show an integration of the missions of the state, the benefactor of a strong system of public higher education in terms of an educated citizenry and economic development, and that of higher education in terms of student access, choice, and educational opportunity. Although the results of these surveys present a compelling message, the limitations of these studies are that they surveyed respondent opinions and did not statistically analyze

actual performance indicator data from the surveyed states in order to assess whether in fact performance has improved over time at institutions in performance funding states.

The evident instability of performance funding programs identified in the Rockefeller Institute surveys of state higher education finance officers presented above led to further, more narrowly scoped research related to the question of why some states kept and others quit performance funding (Burke & Modarresi, 2000). The purpose of the study was to identify characteristics that seemed to separate stable from unstable programs and employed a methodology utilizing surveys sent to state and campus policymakers in nine of ten states with performance funding in an original survey conducted in December 1996 (Burke & Modarresi, 2000). The surveyed states were separated into two groups: the unstable group (Arkansas, Colorado, Kentucky, and Minnesota) were states that had dropped performance funding, and the stable group (Tennessee and Missouri) based upon their design, considerable continuity, gradual implementation, limited but sufficient number of indicators, collaboration between coordinating officials and campus officers, and general acceptance by stakeholder groups (Burke & Modarresi, 2000). The programs in the remaining three states (Ohio, Florida, and South Carolina) were deemed too uncertain or controversial to be included within the successful and stable examples of performance funding (Burke & Modarresi, 2000).

The results of this study showed that both the unstable and stable groups agreed that choice of indicators, recognition of the difficulty of measuring results, and the preservation of institutional diversity were desirable characteristics of performance funding programs (Burke & Modarresi, 2000). Furthermore, the results suggest that stable programs exhibit the following characteristics more so than unstable programs: important input from state coordinating boards; sense of achieving goals of improving higher education; accountability and increasing state

funding; policy values stressing quality over efficiency; sufficient time for planning and implementation; limited number of performance indicators; restricted yet substantial funding; prediction of long-term future; stable state priorities; protection from budget instability; and finally, curbed cost of implementation (Burke & Modarresi, 2000). Burke and Modarresi (2000) concluded that the replies from stakeholders were consistent with the stability of the performance funding within the respective state – the stable group responses centered around the desirable objectives of the program while those of the unstable group concentrated on the difficulties, hinting of the debate between optimism and pessimism and that translated into a self-fulfilling prophesy in relation to the probability of success for a performance funding program. The results, although compelling in their own right, show a continued reliance on survey data of state government and campus leaders as opposed to a statistical analysis of performance indicator activity over time, as previously discussed.

The concept of accountability, the fundamental core upon which performance funding is based, has evolved over time, especially within the context of the public higher education in the United States. McLendon, Hearn, and Deaton (2006) recognized that accountability in that regard transformed from a design based upon “governance systems capable of effectively and efficiently regulating the flow of resources and the decisions of campus officials” (p. 1) twenty years prior to a philosophy whose primary focus is no longer resource inputs but rather one that demands performance from public colleges and universities, thereby influencing institutional behavior in an effort to improve institutional performance.

Furthermore, McLendon et al. (2006) acknowledged that there was a tremendous lack of empirical, systematic research on the performance policies in higher education and that “with few exceptions the literature remains largely descriptive in nature, prescriptive in tone, and

anecdotal in content” (p. 2), as observed in the discussion above. In response to this concern, McLendon et al. (2006) conducted a quantitative study to examine “the factors that influenced states to establish new higher-education performance policies” (p. 8) using a 47 state data set (Alaska, Hawaii, and Nebraska excluded) with state adoption of a new higher-education performance policy serving as the dependent variable, and independent variables such as educational attainment, change in gross state product, percentage of Republicans in the legislature, Republican gubernatorial control, change in public higher-education enrollment, and several others.

The key finding from this research study specifically in regard to performance funding was that the primary drivers of state adoption of a performance funding methodology was legislative party strength and higher education governance arrangements (McLendon et al., 2006). More specifically, “higher percentages of Republican legislators in a state and the absence of a consolidated governing board increased the probability of a state adopting such a policy in a given year” (McLendon et al., 2006, p. 11). One could argue that these results may be considered in direct contrast to those of Burke and Modarresi (2000), who concluded that “unstable programs show significantly more input from those outside of higher education, such as legislators, governors, business leaders, and community representatives” (p. 444) in their study of the desired characteristics separating stable from unstable performance funding programs. Nonetheless, the more relevant argument is that of the need for more extensive, empirically-based statistical analyses on the actual results of performance funding programs in relation to performance indicators and their changes over time between states in order to assess the success in relation to the concept of accountability and institutional improvement.

The stability of performance funding programs was the subject of yet another research study, this one conducted by Dougherty and Natow (2009), which focused on the demise of three state higher education performance funding systems. “Between 1979 and 2007, 26 states enacted performance funding, but 14 of those state dropped it over the years (with two reestablishing it recently)” (Dougherty & Natow, 2009, p. 1). Therefore, despite its popularity, there appears to be a level of instability, which Dougherty and Natow (2009) analyzed by investigating the experiences of Illinois, Washington, and Florida, each of whom had experienced different forms of program cessation. This study gathered data through interviews of state and local governmental and higher education leaders and documentary analyses, including legislation, policy declarations, and reports, and newspaper articles in the three identified states.

The performance funding programs in each of these three states had relatively short lives. In Illinois, performance funding was implemented in 1997 through a legislative budget provision, only to lapse after two biennial budget cycles in 2002 (Dougherty & Natow, 2009). Performance funding in Washington also launched in 1997 as a provision of the state’s higher education appropriation, but only lasted one biennial budget cycle and was then transformed to performance reporting for the subsequent biennial budget in 1999 (Dougherty & Natow, 2009). Interestingly, Washington re-launched performance funding for community colleges in 2007 (Dougherty & Natow, 2009). In Florida, performance funding was enacted in 1994 with two distinct programs – one focusing on higher education and the other focusing on workforce development education – with performance funding of workforce development education ceasing operation after 2002 and the higher education performance funding program persisting (Dougherty & Natow, 2009).

Based upon the research, Dougherty and Natow (2009) concluded that although there were several factors specific to each state that contributed to the demise of performance funding, there were five important commonalities. First, in Florida and Illinois, a sharp drop in higher education funding was experienced due to a sharp decline in state revenues, resulting in higher education institutions in both Florida and Illinois to opt to cut out performance funding in an effort to protect their respective enrollment-based funding levels (Dougherty & Natow, 2009). Second, all three states experienced a lack of support for the continuation of performance funding by higher education institutions, driven primarily by the inefficient design of the program. For example, the Florida and Washington programs were based upon a holdback provision, where the institutions could earn allocated money only in subsequent periods through improved performance, creating funding uncertainty (Dougherty & Natow, 2009). Third, all three states also experienced the loss of key supporters of performance funding in the form of either key champions such as legislators that left office or lost power as political party control shifted (Dougherty & Natow, 2009). Fourth, Florida and Illinois experienced weak support from the business community, which resulted in a lack of momentum and key stakeholder support (Dougherty & Natow, 2009). Fifth, the Illinois and Washington performance funding programs were established through a budget provision as opposed to legislation, making it easier to unwind as a budget policy considering that it would not require the more difficult task of repealing legislation (Dougherty & Natow, 2009). In general, these conclusions offer mixed views from the various stakeholder groups in relation to the state public higher education mission priorities; primarily, student access, choice and educational opportunity to drive an educated citizenry and economic development.

In addition to these conclusions, Dougherty and Natow (2009) recommend that advocates of performance funding undertake three key strategies to create a sustainable basis upon which to build an effective performance funding program: 1. insulate the financing of performance funding from the economic volatility of the state revenue cycle; 2. find ways of securing support from the higher education institutions themselves; and 3. expand the range of the support base of performance funding by bringing in social groups interested in the outcomes and educational effectiveness of underserved students (Dougherty & Natow, 2009). Upon comparing these three strategies to the five common features that played a role in the demise in performance funding in Florida, Illinois, and Washington noted by Dougherty and Natow (2009), it would seem that engaging the support of the business community would qualify as a fourth strategy, considering that business and industry is a key stakeholder and benefactor of the outcomes of higher education in terms of a well-educated and trained workforce and vibrant, innovative research. As previously discussed, the methods employed in this research study relied upon a qualitative method of inquiry, this time through interviews (e.g., state and local higher education officials; governors, legislators, and their respective staff members; business leaders) and analysis of documents (e.g., state government legislation; newspaper accounts; policy declarations and reports; analyses by other investigators) (Dougherty & Natow, 2009). Nonetheless, the conclusions and recommendations developed by Dougherty and Natow (2009) present a compelling case in support of the quantitative statistical analysis of performance indicators conducted in this study, potentially yielding the empirical data and results upon which to lobby for support from leaders of public institutions of higher education, social groups, business and industry leaders, and legislators on the merits of performance funding programs that have been successful in specific outcome measures.

The research studies discussed above delved into the critical issue of the “extent to which performance funding has achieved its avowed goals of increasing accountability and improving performance of public higher education” (Burke & Associates, 2002, p. 33) and the stability of state performance funding programs. These are important issues and responses that need to be pursued both quantitatively and qualitatively. To date, the current research has failed to provide actual data on the effect of funding on performance measures that is comparative and valuable in helping legislators grapple with the issues facing higher education and business in today’s economic climate. As Burke et al. (1999) note:

Public higher education is too important to states and their citizens to fund only inputs and ignore results. Taxpayers are unlikely to accept forever the proposition that performance should count in all endeavors except higher education. Results will continue to count more and more in the funding of public colleges and universities. (p. 23)

Summary

The literature review above serves to establish the basis upon which to examine performance funding of public higher education and the related strategies and objectives. This basis follows a logical progression: overview of adult learners in higher education; the state’s role and challenges in funding public higher education; the five primary higher education funding models and associated research; the evolution of performance funding, measurement of performance, and accountability in state public higher education; the policy issues and challenges associated with the performance funding philosophy; and finally, analysis and critique of the research conducted to date.

Based upon the information provided, it is apparent that there has been no consistent manner in which performance funding initiatives have been designed, implemented, or

administered. In fact, it appears that the only consistency is in fact inconsistency, lending further support for the need of comparing and contrasting states with performance funding programs to states who use a more traditional funding model in a quantitative and empirical manner; specifically, in relation to assessments as to whether certain programs have seen improvements in performance indicators over time, and if so, the respective program design attributes upon which state policymakers can base future policy decisions. As noted above, a vast majority of research work on this subject matter has been either qualitative in nature or quantitative based upon survey results; however, nothing in terms of assessing the rate of change of performance indicators over time to understand whether meaningful improvement in outcome measures was taking place to support the philosophy and assertion of policy leaders and their mantra of external accountability and institutional improvement.

The challenges noted above are further exacerbated by the volatility of performance funding programs and the dynamics with which these program initiatives are implemented and abruptly ceased. In the absence of a consistent performance funding environment over a defined period of time, a statistical analysis of performance indicators in performance funding states would be impossible to conduct. By comparing the listing of states identified as having performance funding programs in place in 1997 (Burke & Associates, 2002) and 2007 (Dougherty & Natow, 2009), the following states appear to have retained performance funding without interruption during the defined time period: Connecticut, Florida, Ohio, South Carolina, and Tennessee. Noteworthy is the fact that Missouri's program ceased in 2003, which was quite surprising since national observers lauded that program, which began in 1992, as one of the best and most stable in the country (Burke & Minassians, 2003).

As a result, the purpose of this study was to examine the effectiveness of allocating state resources to state public institutions of higher education by comparing results from performance funding to non-performance funding states. Furthermore, the focus was to determine whether the change to the performance funding methodology has delivered the desired external accountability and institutional improvement in state public higher education as compared to other states by statistically analyzing the actual results of performance indicators in the states of Tennessee, Florida, Ohio, Connecticut, and South Carolina after the implementation of performance funding to selected states discussed in Chapter 3 that have not employed a performance funding methodology.

CHAPTER THREE

METHODOLOGY

Introduction

The effects of funding methodology (either performance or non-performance) on higher education outcome measures were determined by analyzing the rate of change in key higher education performance funding indicators at state public institutions of higher education in five states that employ performance funding (Tennessee, Florida, Ohio, Connecticut, and South Carolina) in comparison to five states that do not employ performance funding (Michigan, Georgia, Arizona, Massachusetts, and Maryland).

Participant Selection

As noted in Chapter 2, the five performance funding states are identified as states that retained performance funding without interruption for the duration of time from 1997 through 2007 (Burke & Associates, 2002; Dougherty & Natow, 2009).

In order to identify a comparable sample of five non-performance funding states for purposes of this study, an analysis was conducted based upon data provided in the U.S. Census Bureau 2010 Statistical Abstract – The National Data Book (U.S. Census Bureau, 2010). First, any states that are listed by the Burke and Minassians (2003) survey as having used performance

funding during the period 1997 to 2003 or the Dougherty and Natow (2009) listing of states that enacted performance funding between 1979 and 2007 were eliminated from the full population of eligible states for the sample, leaving 24 states to select from as non-performance funding states during the identified time-period. Next, the following data were gathered and assembled by state for the remaining 24 states: population, enrollment in public degree-granting institutions, Gross Domestic Product (GDP), and personal income per capita (U.S. Census Bureau, 2010). These data were then sorted in descending order by population and analyzed. The results of this analysis showed that the five largest states (Michigan, Georgia, Arizona, Massachusetts, and Maryland) have an aggregate population of 38,321,000, enrollment in public degree-granting institutions of 1,642,000, and GDP of \$1,667.5 billion, with the following average across these five non-performance funding states: 7,664,200 in population; 328,400 enrollment in public degree-granting institutions; \$333.5 billion in GDP; and, \$40,211 in personal income per capita. Comparable data were gathered and analyzed for the five performance funding states selected for this study (Tennessee, Florida, Ohio, Connecticut, and South Carolina). The results of this analysis showed that the sample reflects an aggregate population of 44,010,000, enrollment in public degree-granting institutions of 1,598,000, and GDP of \$1,840.3 billion, with the following average across these five performance funding states: 8,802,000 in population; 319,600 enrollment in public degree-granting institutions; \$368.1 billion in GDP; and, \$39,409 in personal income per capita. Upon comparing the aggregate and average state data for both samples (performance funding states versus non-performance funding states); it appears that a meaningful, representative, and comparative sample was developed for purposes of this study. These data are summarized in Table 2.

Table 2

State Sample Data; U.S. Census Bureau – National Data Book

Sample States for Study - Performance Funding

State	Population (2008)	Enrollment in Public Degree- Granting Institutions (2006)	Gross Domestic Product - in billions of \$ (2008)	Personal Income Per Capita (estimated 2008)
CT	3,501,000	112,000	\$216.2	\$56,248
FL	18,328,000	652,000	\$744.1	\$39,070
OH	11,486,000	453,000	\$471.5	\$35,511
SC	4,480,000	176,000	\$156.4	\$31,884
TN	6,215,000	205,000	\$252.1	\$34,330
Total	44,010,000	1,598,000	\$1,840.3	N/A
Average	8,802,000	319,600	\$368.1	\$39,409

Sample States For Study - Non-Performance Funding

State	Population (2008)	Enrollment in Public Degree- Granting Institutions (2006)	Gross Domestic Product - in billions of \$ (2008)	Personal Income Per Capita (estimated 2008)
MI	10,003,000	512,000	\$382.5	\$35,299
GA	9,686,000	346,000	\$397.8	\$33,975
AZ	6,500,000	331,000	\$248.9	\$32,953
MA	6,498,000	192,000	\$365.0	\$50,735
MD	5,634,000	261,000	\$273.3	\$48,091
Total	38,321,000	1,642,000	\$1,667.5	N/A
Average	7,664,200	328,400	\$333.5	\$40,211

Data Sources

The primary data source was the Integrated Postsecondary Education Data System (IPEDS), a system of interrelated surveys conducted annually by the U.S. Department's National Center for Education Statistics. By using IPEDS, the assurance in the consistency of data definitions was elevated, thereby reducing the risk that comparisons between state institutions were not equitable. The annual data for the two performance indicators – retention rate and graduation rate - were selected for all state public institutions of higher education in five performance funding states (Tennessee, Florida, Ohio, Connecticut, or South Carolina) and five non-performance funding states (Michigan, Georgia, Arizona, Massachusetts, and Maryland) for the years 2002 through 2009. The resulting data set of the state public higher education institutions as the unit of analysis for the 10 states produced a sample size of 329, and provides a rich and relevant sample size upon which to apply the complex statistical data analysis to be discussed further in this Chapter, due to the number of institutions, the number of performance indicators, and the longitudinal time-period covered. Furthermore, given the vastness and complexity of this data set, opportunities exist for further research beyond the scope of the research question identified earlier.

Data Collection Procedures

Permission to conduct this research study was secured through the Cleveland State University Institutional Review Board. Furthermore, all data collection procedures were conducted electronically by downloading data from the IPEDS databases, with the permission of the U.S. Department's National Center for Education Statistics. Performance indicator data were collected for the years 2002 through 2009 for all of state public institutions of higher education located within the ten states selected as the sample for this study.

Variables

Given the longitudinal nature of the data, the flux in indicators and state priorities over time, and the varying lifespan of performance funding in each of the five performance funding states selected, a commonly defined set of performance indicators data were collected for all 329 state public institutions of higher education within the sample. The resulting data set provides a baseline measurement and assessment methodology, which then provides the basis upon which to evaluate the degree of statistically significant rate of change over time at the performance indicator, institutional, and state levels.

Given the information presented above, the following variables were used for purposes of this research study, as defined by IPEDS (National Center for Education Statistics, 2010):

Time – the year for which the respective data will be selected, ranging from the years 2002 through 2009.

State – name of the state where the respective state public institution of higher education is located.

Institution Name – name of the state public institution of higher education for which the data were collected; represents the base unit of analysis.

Funding Methodology – the primary independent variable representing the funding methodology employed by the respective state institution for the given year, either performance funding or non-performance funding.

Institution Type – an independent variable that identifies the institutional type, either four-year or two-year.

Institutional Full-time Enrollment Equivalent – an independent variable that identifies the

size of the respective institution based on an annualized full-time equivalent (FTE) enrollment basis.

Degree of Urbanization- – an independent variable that identifies the geographic status of the respective institution on an urban continuum ranging from “large city” to “rural.”

Graduation Rate – a dependent variable representing the graduation rate of first-time, full-time degree or certificate-seeking students within 150% of the required time period; either six years for undergraduate degree-seeking students or three years for associate degree-seeking students.

Retention Rate – a dependant variable representing first-time, full-time degree-seeking freshman persisting in the next fall term.

Dependent Variables

Burke (1998b) and Burke and Associates (2002) concluded that retention rates and graduation rates represented the most frequently used performance indicators. Both retention rates and graduation rates fall within the category of outputs (Burke & Associates, 2002), each of which is representative of performance in terms of external accountability and institutional performance.

Hypothesis

As noted in the introductory paragraph of Chapter 2, the general hypothetical framework for this research study is posed by Layzell (1999): “The ultimate question regarding performance-based funding is, of course, whether it will actually serve to improve institutional performance in the long run” (p. 245). Developing a response to this question was the overarching aim of this study, primarily in terms of the effect of performance funding on the key

performance funding indicators of institutions and the educational outcomes of students attending state public institutions of higher education, as defined by the research question presented in Chapter 1. As a result, the following hypothesis was offered based upon the literature review in Chapter 2:

State public institutions of higher education in states that employ a performance funding methodology will experience a statistically significant increase in performance funding indicators that is greater than in states that employ a non-performance funding methodology.

Data Analysis

Data were analyzed in order to first determine whether there was a statistically significant improvement in the selected performance indicators (graduation rate, retention rate), and then further, to assess the degree to which the funding methodology (performance vs. non-performance) impacted the rate of change over time in the selected performance indicators. Data were analyzed further to determine the role played by institutional characteristics such as degree of urbanization, institution size, and institution type (two-year versus four-year), on the rate of change in performance indicators. The results of these statistical analyses were used to assess the effectiveness of performance funding versus non-performance funding methodologies for funding state public higher education in terms of statistically significant improvement in key performance funding indicators over time.

For the purposes of this study, the data obtained from IPEDS for the years 2002 through 2009 were organized by year and by institution within the SPSS version 16.0 and HLM for Windows version 6.08 statistical software packages. This served as the base dataset upon which

the various statistical analyses were performed by applying hierarchical linear modeling (HLM) with a focus on individual change over time.

According to Raudenbush and Bryk (2002), individual change modeling allows for modeling growth over time, allows for the accommodation of missing data in a series of repeated measures, and provides the capability to nest data within a hierarchical structure. These individual change models are traditionally represented at a two-level hierarchical model, with the first level representing the individual growth trajectory that depends on a unique set of parameters, which then become the outcome variables in the two level model. Therefore, in this study using individual change modeling, the rate of change over time of the dependent variables (retention rate and graduation rate) at the institutional level were the first level of analysis, and were further explained as a function of the independent variables at the second level of analysis.

The model for the first level of this hierarchy is represented as follows:

$$Y_{it} = \pi_{0i} + \pi_{1i}t + e_{it}$$

where, Y_{it} is the observed status of the dependent variable, either retention rate or graduation rate, at time t for the institution i ; the intercept π_{0i} is the initial retention rate or graduation rate of institution i at the beginning of the study (year 2002); π_{1i} is the slope, or change, in either retention rate or graduation rate during the period of time defined in the study; and, e_{it} is the error, which is independently and normally distributed with a mean 0 and constant variance σ^2 (Raudenbush & Bryk, 2002; Scott & Bagaka's, 2004).

The model for the second level is represented as follows:

$$\begin{aligned} \pi_{0i} &= \beta_{00} + \beta_{01}(\text{FUNDING_METHOD}) + \beta_{02}(\text{INST_TYPE}) + \beta_{03}(\text{ENROLLMENT}) + \\ &\quad \beta_{04}(\text{URBAN}) + r_{0i} \\ \pi_{1i} &= \beta_{10} + \beta_{11}(\text{FUNDING_METHOD}) + \beta_{12}(\text{INST_TYPE}) + \beta_{13}(\text{ENROLLMENT}) + \end{aligned}$$

$$\beta_{14}(\text{URBAN}) + r_{1i}$$

where,

π_{0i} is the initial retention rate or graduation rate of institution i at the beginning of the study (year 2002);

β_{00} is the constant common to all observations;

β_{01} is the effect of funding methodology (either performance funding or non-performance funding) on the initial status of either retention rate or graduation rate at the institution;

β_{02} is the effect of institution type (either four-year or two-year) on the initial status of either retention rate or graduation rate at the institution;

β_{03} is the effect of the institution's annualized full-time equivalent enrollment on the initial status of either retention rate or graduation rate at the institution;

β_{04} is the effect of the degree of urbanization on the initial status of either retention rate or graduation rate at the institution;

r_{0i} is a level-2 random effect with variance π_{00} ;

π_{1i} is the rate of change (slope) in either retention rate or graduation rate at institution i across all observations;

β_{10} is the constant common to all observations;

β_{11} is the effect of funding methodology (either performance funding or non-performance funding) on the rate of change of either retention rate and/or graduation rate;

β_{12} is the effect of institution type (either four-year or two-year) on the rate of change of either retention rate and/or graduation rate;

β_{13} is the effect of the institution's annualized full-time equivalent enrollment on the rate of change in either retention rate and/or graduation rate;

β_{14} is the effect of the degree of urbanization on the rate of change of either retention rate and/or graduation rate; and,

r_{1i} is the level-2 random effect with variance π_{01} (Raudenbush & Bryk, 2002; Scott & Bagaka's, 2004).

Reliability and Validity

Both reliability and validity are highly important considerations in designing statistical analyses for purposes of research. Reliability refers to the consistency of a set of measurements or to the extent that to which research findings can be replicated (Merriam, 1998). Validity refers to the degree to which the statistical design measures what it intends to measure. There are two types of validity: external, in which study findings can be generalized to a larger population, and internal, or the extent that changes in a dependent variable are due to the effect of the independent variable and not some other unintended variable (Howell, 2007). High internal and external validity leads to high statistical power, thereby increasing the probability of correctly rejecting a false null hypothesis (Howell, 2007).

In terms of reliability for this study, HLM reports estimates of reliability on a scale of 1.0 as the highest and 0.0 as the lowest. Furthermore, reliability in HLM is impacted by changes in the duration of a study and the number of observations made during the duration; therefore, the longer the duration and the more numerous the observations, the higher the reliability (Raudenbush & Bryk, 2002). In terms of validity, the completeness and accuracy of the dataset upon which the statistical analyses will be applied plays a crucial role. Since 1. the dataset was obtained from an authoritative source such as IPEDS for the years 2002 through 2009; 2. IPEDS obtain the annual data directly from each of the state public institutions of higher education; and 3. the state public institutions of higher education verify the data once it has been compiled

through a member-checking process; this lends support to the validity of the dataset and the statistical design.

Finally, this study's potential for generalizability, or the ability to argue that the results of this study may be applied broadly to states beyond the scope of those statistically analyzed within this study, must be addressed. Although, as previously discussed in Chapter 2, there is no consistency among state performance funding models, the core values and principles of performance funding are to invest in and reward performance in terms of accountability and institutional improvement (i.e., growth in performance indicators). Based upon the research design of this study, which includes five performance funding states and five non-performance funding states, as well as the sheer magnitude of number of state public institutions of higher education with a sample size of 329, the generalizability and power of the results will be supported by the representative nature, relevance, and sufficiency of the sample size (Howell, 2007). Therefore, statistically significant improvements in performance funding indicators over the defined time period in a particular state, state public institution of higher education characteristic type, or funding methodology, lends credence to the generalizability of the results (Howell, 2007).

Limitations of the Research Design

Upon assessing the research design identified above, a few limitations should be noted. First, with the focus of the study solely on two specific performance indicators (retention rate and graduation rate), there was a risk that some performance indicators that were not within the scope of this study may have experienced a statistically significant improvement over the time period sampled. Second, although this study focused on four specific independent variables (funding methodology, institution type, institutional full-time enrollment equivalent, and degree of

urbanization), there may be others, such as economic conditions or political factors, at play that have had an influence on the rate of change over time of the performance funding indicators.

Third, considering that the selected performance funding states implemented their programs prior to the date range of 2002 through 2009, there is a risk that a statistically significant improvement may have occurred in the time period from when the respective performance funding state implemented its program and the first year tested within this study, and may have gone undetected. This risk may be mitigated by the argument that it would take some time for the change to performance funding model to be implemented before a statistically significant change would be evidenced. These three limitations serve as opportunities for future research and will be discussed further in Chapter 5.

CHAPTER FOUR

RESEARCH FINDINGS

Results from the statistical analysis discussed in Chapter 3 are presented in this chapter, addressing the general research question: To what extent does the method of funding state public higher education, either performance or non-performance funding, predict the improvement in key higher education performance funding indicators between the years 2002 through 2009? As noted in Chapter 3, the two key higher education performance funding indicators selected for the purposes of this study were graduation rate and retention rate. Therefore, for the purposes of this study, the graduation rate and retention rate served as the dependent variables, while funding methodology, institution type, institutional full-time enrollment equivalent, and degree of urbanization, served as the independent variables. Furthermore, in this study using individual change modeling, the rate of change over time of the dependent variables at the institutional level were the first level of analysis (Level 1), and were further explained as a function of the independent variables at the second level of analysis (Level 2).

The individual change for each of the dependent variables – graduation rate and retention rate - was examined for each year between 2002 and 2009 for graduation rate and between 2003 and 2009 for retention rate in two aspects – the initial status (2002 for graduation rate and 2003

for retention rate) and the rate of change during the respective time period (eight years for graduation rate and seven years for retention rate) (Bagaka's, 2010). For each of these aspects, an individual change model (Raudenbush & Bryk, 2002) in the Level 2 analysis was used to determine the extent to which the funding methodology (either performance funding or non-performance funding), the institution type (either four-year or 2-year), the institution's enrollment (median full-time equivalent enrollment during the defined time period), and the degree of urbanization (either non-metropolitan or metropolitan) can predict either the initial status and/or the rate of change (Bagaka's, 2010).

Graduation Rate

The research findings in this section address the following research question:

1. To what extent does the method of funding state public higher education, either performance or non-performance funding, predict the initial status and the rate of change in graduation rate between the years 2002 through 2009?

The results of the individual change model for graduation rate (Level 2 analysis) are presented in Table 3. Descriptive statistics for graduation rate in the Level 1 analysis were as follows: mean = 28.85; standard deviation = 18.25; range = 0 through 89; and, a sample size of 329 institutions.

Table 3

Individual Change Model Results for the Prediction of Initial Graduation Rates in 2002 (initial status) and the Annual Rates of Change of Graduation Rates (growth rate)

Variable	Initial status (π_0)		Rate of Change (π_1)	
	Coefficient	<i>p</i> -value	Coefficient	<i>p</i> -value
Funding method (1 = performance, 0 = non-performance)	1.099	.510	-0.088	.474
Institution type (1 = 4-year, 0 = 2-year)	18.869	.000	0.841	.000
Enrollment (median full-time equivalent)	0.959	.000	0.030	.000
Urbanization (1 = metropolitan, 0 = non-metropolitan)	-3.807	.034	0.028	.839

The individual change model revealed that institution type was a statistically significant predictor of the initial status ($\beta = 18.869, p < .001$) and the rate of change during the eight-year period ($\beta = 0.841, p < .001$). These results show that graduation rate at 4-year institutions was initially 18.9 percentage points above 2-year institutions and the rate of change for the 4-year institutions improved by over 0.8 percentage points annually. Enrollment was also revealed to be a statistically significant predictor of the initial status ($\beta = 0.959, p < .001$) and the rate of change during the eight-year period ($\beta = 0.030, p < .001$); therefore, the higher the enrollment, the greater the initial status and the rate of change in graduation rates. Furthermore, level of urbanization was found to be a statistically significant predictor of the initial status ($\beta = -3.807, p = .034$) but was not statistically significant for the rate of change during the eight-year period ($\beta = 0.028, p = .839$). Finally, funding method was found not to be a statistically significant predictor of the initial status ($\beta = 1.099, p = .510$) or the rate of change during the eight-year period ($\beta = -0.088, p = .474$).

The results of the individual change model for funding method, institution type, enrollment, and urbanization are depicted in Figures 1 through 4 below. These Figures show the

graphing of graduation rate in terms of the respective independent variable over time, which is represented on the horizontal axis starting with the initial year 0 (2002) through year 7 (2009). Upon comparing the results in Table 3 to the graphical depictions in Figures 1 through 4, it is apparent that although there is a distinct trend of positive change in graduation rate for both funding method and level of urbanization, these are not deemed statistically significant rates of change based upon the results of the individual change model at Level 2 reported in Table 3: funding method ($\beta = -0.088, p = .474$) and urbanization ($\beta = 0.028, p = .839$).

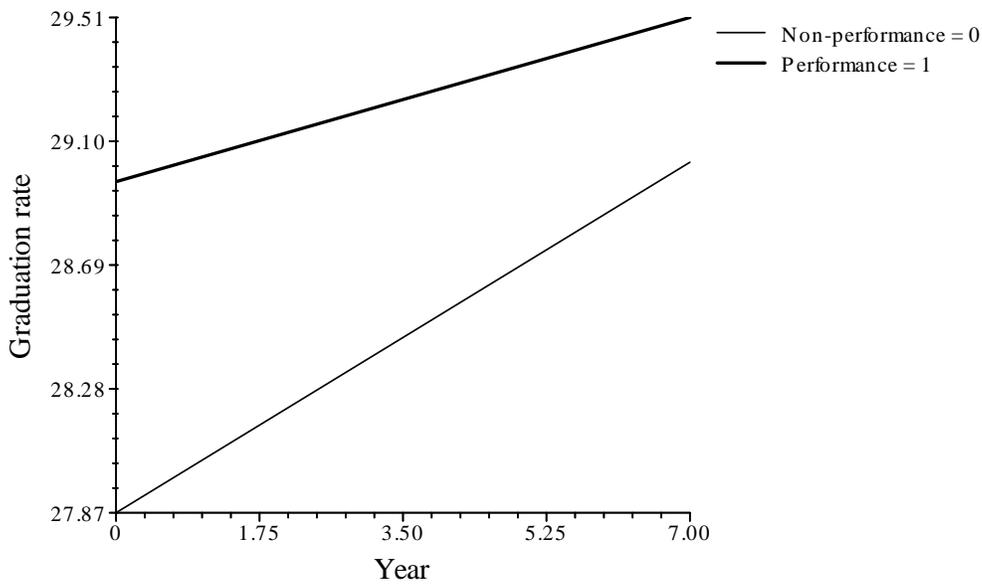


Figure 1. Initial Funding Method as a Predictor of Graduation Rate over Time

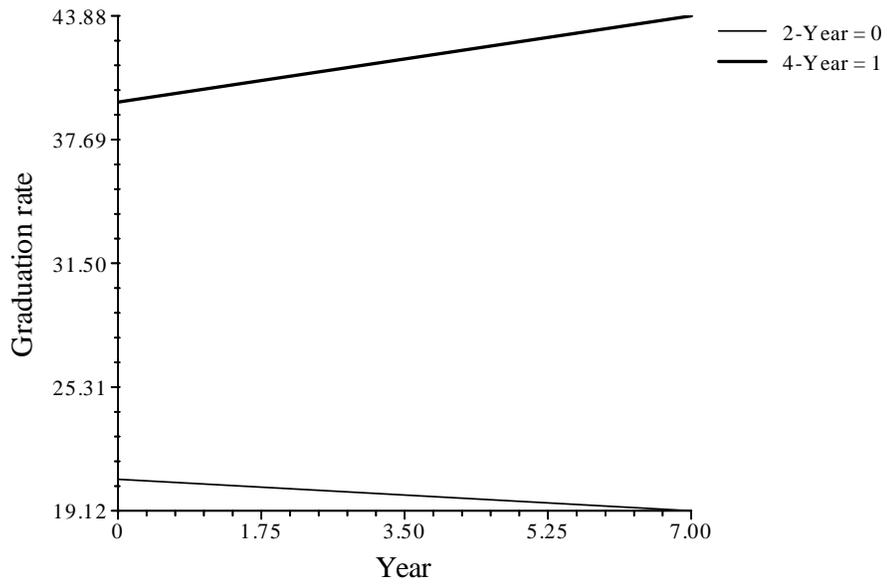


Figure 2. Initial Institution Type as a Predictor of Graduation Rate over Time

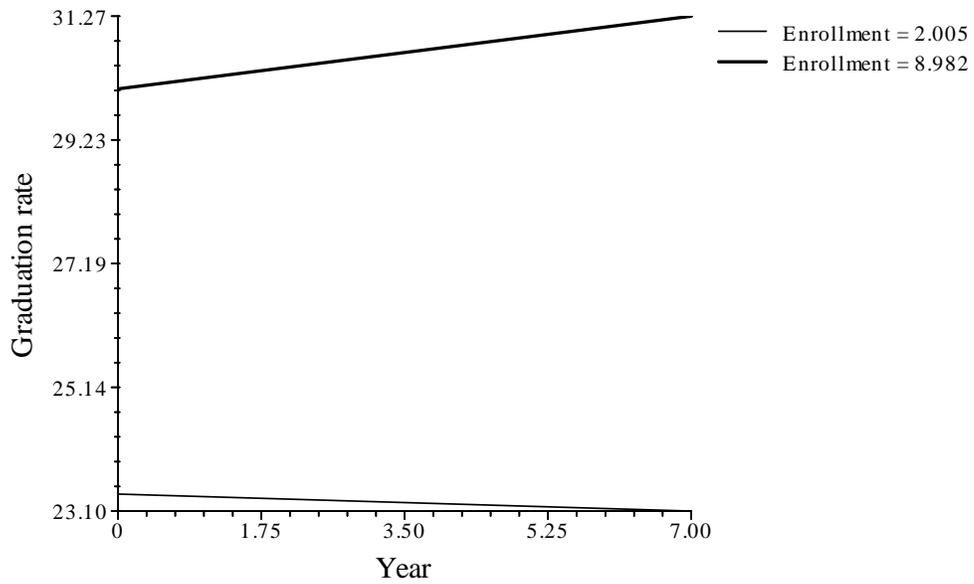


Figure 3. Initial Enrollment as a Predictor of Graduation Rate over Time

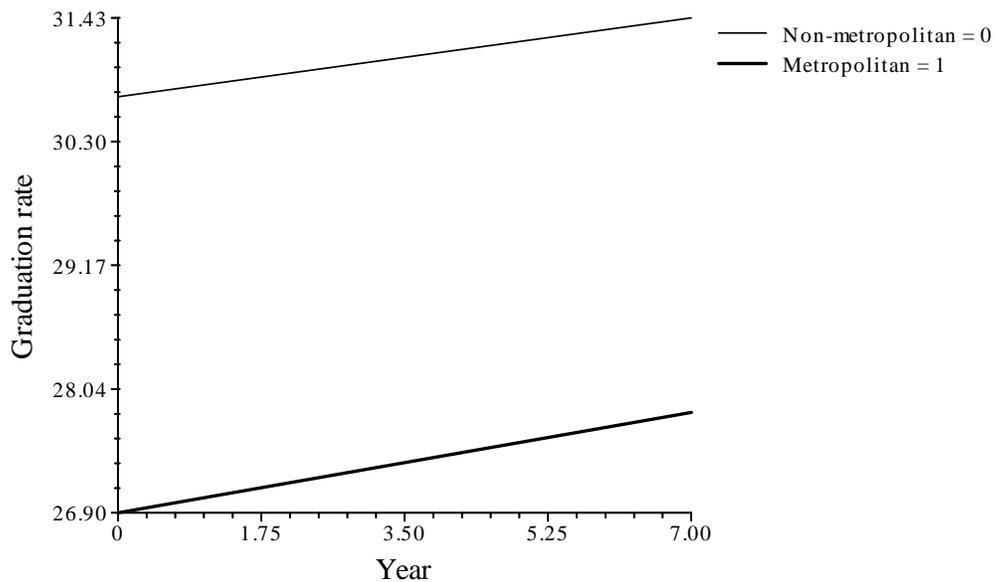


Figure 4. Initial Level of Urbanization as a Predictor of Graduation Rate over Time

Retention Rate

The research findings in this section address the following research question:

2. To what extent does the method of funding state public higher education, either performance or non-performance funding, predict the initial status and the rate of change in retention rate between the years 2003 through 2009?

The results of the individual change model for retention rate (Level 2 analysis) are presented in Table 4. Descriptive statistics for retention rate in the Level 1 analysis were as follows: mean = 64.07; standard deviation = 12.28; range = 8 through 100; and, a sample size of 329 institutions.

Table 4

Individual Change Model Results for the Prediction of Initial Retention Rates in 2003 (initial status) and the Annual Rates of Change of Retention Rates (growth rate)

Variable	Initial status (π_0)		Rate of Change (π_1)	
	Coefficient	<i>p</i> -value	Coefficient	<i>p</i> -value
Funding method (1 = performance, 0 = non-performance)	-1.951	.073	0.047	.722
Institution type (1 = 4-year, 0 = 2-year)	12.948	.000	-0.071	.584
Enrollment (median full-time equivalent)	0.720	.000	0.007	.153
Urbanization (1 = metropolitan, 0 = non-metropolitan)	0.620	.597	0.072	.610

The individual change model revealed that institution type was a statistically significant predictor of the initial status ($\beta = 12.948, p < .001$) but was not statistically significant for the rate of change during the seven-year period ($\beta = -0.071, p = .584$). These results show that retention rate at 4-year institutions was initially 12.9 percentage points above 2-year institutions; however, the rate of change did not improve annually. Enrollment was also revealed to be a statistically significant predictor of the initial status ($\beta = 0.720, p < .001$) but the rate of change during the seven-year period was not statistically significant ($\beta = 0.007, p = .153$). These results show that retention rate increases at the initial status as enrollment increases; however, this is not the case with the rate of change over time. Furthermore, level of urbanization was found not to be a statistically significant predictor of the initial status ($\beta = 0.620, p = .597$) or the rate of change during the seven-year period ($\beta = 0.072, p = .610$). Finally, funding method was not a statistically significant predictor of the initial status ($\beta = -1.951, p = .073$) or the rate of change during the seven-year period ($\beta = 0.047, p = .722$).

The results of the individual change model for funding method, institution type, enrollment, and urbanization are depicted in Figures 5 through 8 below. These Figures show the

graphing of retention rate in terms of the respective independent variable over time, which is represented on the horizontal axis starting with the initial year 0 (2003) through year 6 (2009). Upon comparing the results in Table 4 to the graphical depictions in Figures 5 through 8, it is apparent that although there is a distinct trend of positive change in retention rate for funding method, institution type, enrollment, and level of urbanization, these are not deemed statistically significant rates of change based upon the results of the individual change model at Level 2 reported in Table 4 and discussed above.

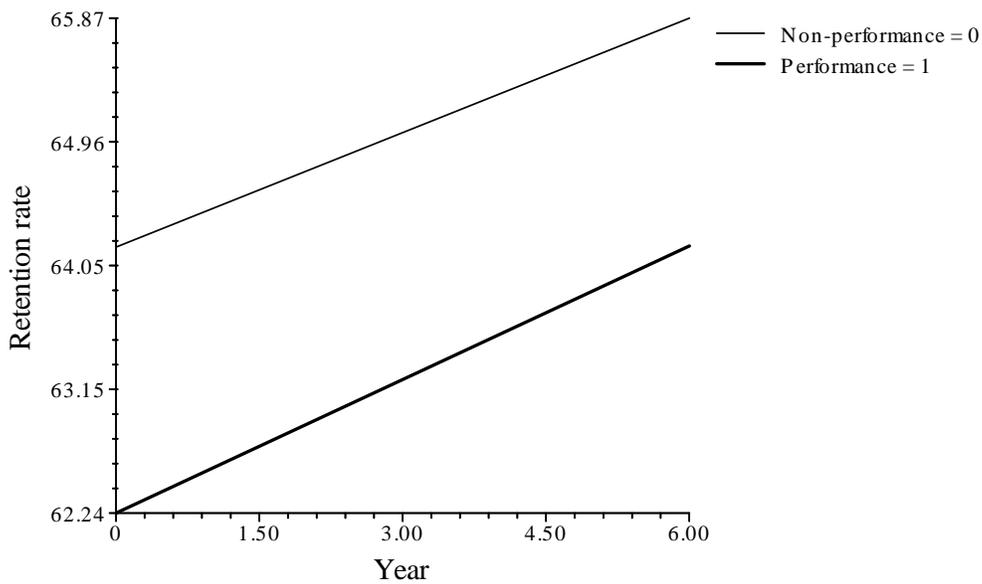


Figure 5. Initial Funding Method as a Predictor of Retention Rate over Time

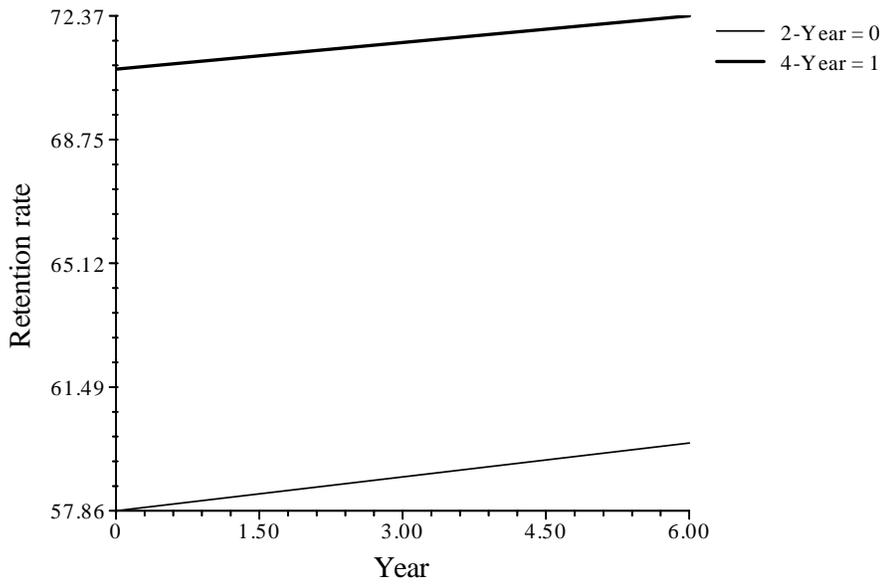


Figure 6. Initial Institution Type as Predictor of Retention Rate over Time

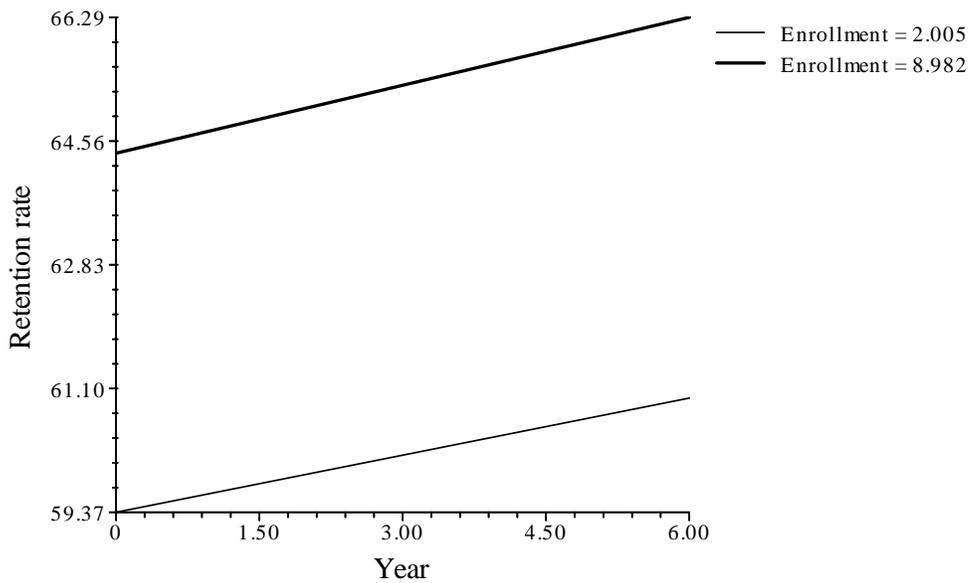


Figure 7. Initial Enrollment as a Predictor of Retention Rate over Time

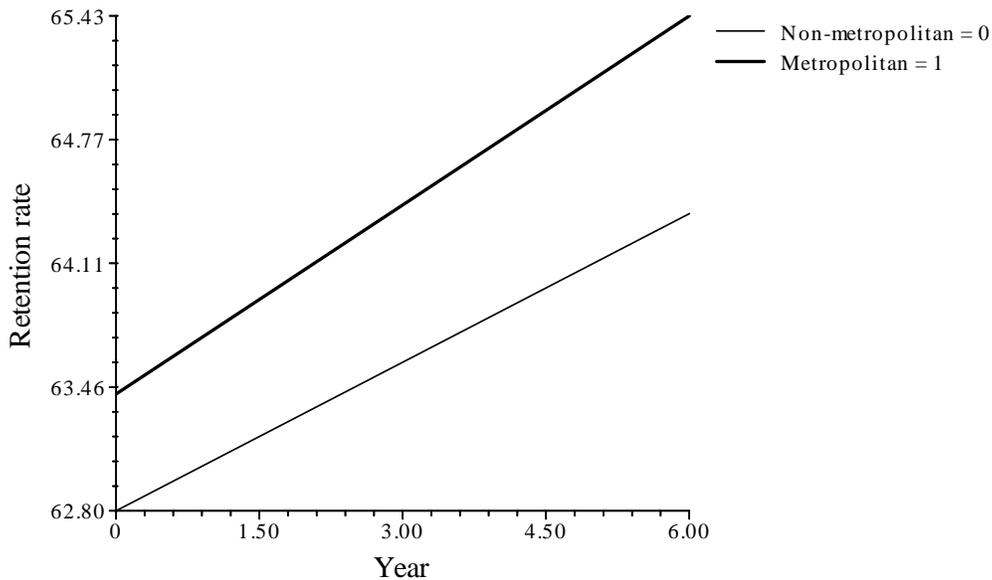


Figure 8. Initial Level of Urbanization as a Predictor of Retention Rate over Time

Based upon the individual change model results presented in Table 3 for graduation rate, the institution type ($\beta = 0.841, p < .001$) and enrollment ($\beta = 0.030, p < .001$) were found to be statistically significant predictors of the rate of change in graduation rate over the time period 2002 through 2009. Furthermore, based upon the individual change model results presented in Table 4 for retention rate, none of the independent variables tested were found to be statistically significant predictors of the rate of change in retention rates over the time period 2003 through 2009.

The manner in which the dataset was constructed provided an immediate opportunity to further analyze these results; specifically, in relation to institution type. Given that institution type comprises a few diverse categories of state public institutions of higher education, further analysis was merited to determine whether any of the dependent variables may be statistically significant predictors of either the initial status or the rate of change over time within a particular institution type. Based upon the IPEDS categories, institutions were classified as either 1. four-

year and above, or 2. two-year, with a variety of different institution types in the two-year category, including community colleges, agricultural colleges, and technical colleges to name a few. For purposes of this study, two specific institution types were selected for further analysis based upon the uniqueness of their respective missions: universities and community colleges. As a result, the total sample size declined from the previous sample of 329 due to the elimination of 48 institutions within the two-year category that were not community colleges.

From their inception, universities in the United States, particularly land-grant universities, have had a “tripartite mission of teaching, research, and public service” (Spanier, 1999, p. 199) to meet their stakeholders needs of education, invention, and discovery. Over time, universities have proliferated as enrollments have grown and research programs have expanded (Spanier, 1999). Although the university mission seems noble and altruistic, some have criticized that these institutions have grown distant from the society they are charged with serving (Spanier, 1999). To the contrary, the community college “has been viewed and conceived as a social and educational institution that responds to its local community, offering open-access to postsecondary education and providing comprehensive education and training programs to meet the needs of individual students” (Levin, 2001, p. 238). According to Levin (2001), the community college mission is to serve the under-served and broaden access to postsecondary education and training, all in service to the individual student and the respective local community. Therefore, it appears that the mission differentiation between these two institution types rests in three distinct areas: 1. student constituencies, 2. research aims and building of knowledge, and 3. focus on the local service area.

Analysis of University Compared to Community College Institution Type

The individual change for each of the dependent variables - graduation rate and retention rate - at universities and community colleges were examined separately for each year between 2002 and 2009 for graduation rate and between 2003 and 2009 for retention rate in two aspects – the initial status (2002 for graduation rate and 2003 for retention rate) and the rate of change during the respective time period (eight years for graduation rate and seven years for retention rate) (Bagaka's, 2010). For each of these aspects, an individual change model (Raudenbush & Bryk, 2002) in the Level 2 analysis was used to determine the extent to which the funding methodology (either performance funding or non-performance funding), the institution's enrollment (median full-time equivalent enrollment during the time period 2002 through 2009), and the degree of urbanization (either non-metropolitan or metropolitan) can predict either the initial status and/or the rate of change (Bagaka's, 2010).

Graduation Rate

The results of the individual change model for graduation rate for universities and community colleges are presented in Table 5. Descriptive statistics for graduation rate in the Level 1 analysis for universities were as follows: mean = 44.54; standard deviation = 16.53; range = 4 through 89; and, a sample size of 125 institutions. Descriptive statistics for graduation rate in the Level 1 analysis for community colleges were as follows: mean = 19.93; standard deviation = 10.73; range = 0 through 75; and, a sample size of 156 institutions.

Table 5

Individual Change Model Results for the Prediction of Initial Graduation Rates in 2002 (initial status) and the Annual Rates of Change of Graduation Rates (growth rate) in Universities versus Community Colleges

Variable	Initial status (π_0)		Rate of Change (π_1)	
	Coefficient	<i>p</i> -value	Coefficient	<i>p</i> -value
University				
Funding method (1 = performance, 0 = non-performance)	-3.473	.177	-0.008	.965
Enrollment (median full-time equivalent)	0.747	.000	0.007	.346
Urbanization (1 = metropolitan, 0 = non-metropolitan)	-3.682	.192	0.058	.747
Community College				
Funding method (1 = performance, 0 = non-performance)	6.273	.000	-0.205	.262
Enrollment (median full-time equivalent)	-0.137	.295	0.034	.032
Urbanization (1 = metropolitan, 0 = non-metropolitan)	-3.535	.042	-0.002	.993

For universities, the individual change model revealed that enrollment was a statistically significant predictor of the initial status ($\beta = 0.747$, $p < .001$) but the rate of change during the eight-year period was not statistically significant ($\beta = 0.007$, $p = .346$). These results show that graduation rate increases at the initial status as enrollment increases; however, this is not the case with the rate of change over time. Furthermore, level of urbanization was found not to be a statistically significant predictor of the initial status ($\beta = -3.682$, $p = .192$) or the rate of change during the eight-year period ($\beta = 0.058$, $p = .747$). Finally, funding method was found not to be a statistically significant predictor of the initial status ($\beta = -3.473$, $p = .177$) or the rate of change during the eight-year period ($\beta = -0.008$, $p = .965$).

For community colleges, the individual change model revealed that funding method was a statistically significant predictor of the initial status ($\beta = 6.273$, $p < .001$) but the rate of change during the eight-year period was not statistically significant ($\beta = -0.205$, $p = .262$). These results

show that graduation rate at performance funding institutions was 6.3 percentage points above non-performance funding institutions in the initial status, with no statistically significant rate of change over time. Furthermore, enrollment was found to be a statistically significant predictor of the rate of change during the eight-year period ($\beta = 0.034, p = .032$) but was not statistically significant for the initial status ($\beta = -0.137, p = .295$). Finally, level of urbanization was found to be a statistically significant predictor of the initial status ($\beta = -3.535, p = .042$) but the rate of change during the eight-year period was not statistically significant ($\beta = -0.002, p = .993$).

Retention Rate

The results of the individual change model for retention rate for universities and community colleges are presented in Table 6. Descriptive statistics for retention rate in the Level 1 analysis for universities were as follows: mean = 73.66; standard deviation = 10.56; range = 25 through 97; and, a sample size of 125 institutions. Descriptive statistics for retention rate in the Level 1 analysis for community colleges were as follows: mean = 58.05; standard deviation = 8.65; range = 8 through 100; and, a sample size of 156 institutions.

Table 6

Individual Change Model Results for the Prediction of Initial Retention Rates in 2003 (initial status) and the Annual Rates of Change of Retention Rates (growth rate) in Universities versus Community Colleges

Variable	Initial status (π_0)		Rate of Change (π_1)	
	Coefficient	<i>p</i> -value	Coefficient	<i>p</i> -value
University				
Funding method (1 = performance, 0 = non-performance)	-4.020	.010	0.136	.304
Enrollment (median full-time equivalent)	0.497	.000	0.003	.482
Urbanization (1 = metropolitan, 0 = non-metropolitan)	0.861	.612	-0.141	.350
Community College				
Funding method (1 = performance, 0 = non-performance)	0.466	.686	-0.050	.821
Enrollment (median full-time equivalent)	0.280	.002	0.020	.325
Urbanization (1 = metropolitan, 0 = non-metropolitan)	1.484	.276	-0.133	.622

For universities, the individual change model revealed that funding method was a statistically significant predictor of the initial status ($\beta = -4.020$, $p = .010$) while the rate of change during the seven-year period was not statistically significant ($\beta = 0.136$, $p = .304$). These results show that retention rate at performance funding institutions was 4.0 percentage points below non-performance funding institutions, with no statistically significant rate of change over time. Furthermore, enrollment was found to be a statistically significant predictor of the initial status ($\beta = 0.497$, $p < .001$) but was not statistically significant for the rate of change during the seven-year period ($\beta = 0.003$, $p = .482$). These results show that retention rate increases at the initial status as enrollment increases; however, this is not the case with the rate of change over time. Finally, level of urbanization was found not to be a statistically significant predictor for either the initial status ($\beta = 0.861$, $p = .612$) or the rate of change during the seven-year period ($\beta = -0.141$, $p = .350$).

For community colleges, the individual change model revealed that enrollment was a statistically significant predictor of the initial status ($\beta = 0.280, p = .002$) while the rate of change during the seven-year period was not statistically significant ($\beta = 0.020, p = .325$). These results show that retention rate increases at the initial status as enrollment increases; however, this is not the case with the rate of change over time. Furthermore, funding method was found not to be a statistically significant predictor either of the initial status ($\beta = 0.466, p = .686$) or the rate of change during the seven-year period ($\beta = -0.050, p = .821$). Finally, level of urbanization was found not to be a statistically significant predictor of the initial status ($\beta = 1.484, p = .276$) or the rate of change during the seven-year period ($\beta = -0.133, p = .622$).

Summary of Research Findings

The results presented in this chapter addressed the general research question: To what extent does the method of funding state public higher education, either performance or non-performance funding, predict the improvement in key higher education performance funding indicators between the years 2002 through 2009? An individual change model (Raudenbush & Bryk, 2002) was applied to determine the extent to which the funding methodology (either performance funding or non-performance funding), the institution type (either four-year or 2-year), the institution's enrollment (median full-time equivalent enrollment during the time period 2002 through 2009), and the degree of urbanization (either non-metropolitan or metropolitan) can predict either the initial status and/or the rate of change (Bagaka's, 2010) in two key higher education performance funding indicators that served as the dependant variables for this study: graduation rate and retention rate.

Overall, the results of the analysis showed that the method of funding was not a statistically significant predictor of either the initial status or the annual rate of change of

graduation rate or retention rate. Also noteworthy were the results that showed that institution type and enrollment were statistically significant predictors of the initial status and the rate of change for graduation rate and the initial status of retention rate, primarily with the larger institutions and larger enrollments. In addition, upon reviewing Figures 1 through 8, it is apparent that there is a distinct trend of positive change in graduation rate for both funding method and level of urbanization and in retention rate for funding method, institution type, enrollment, and level of urbanization; however, these are not deemed statistically significant rates of change based upon the results of the individual change models at Level 2 reported in Tables 3 and 4.

Upon further analysis between the university and community college institution types, method of funding was shown to be a statistically significant predictor of graduation rate at the initial status for community colleges and of retention rate at the initial status for universities. Furthermore, enrollment was found to be a statistically significant predictor of graduation rate at the initial status for universities and the rate of change for community colleges, as well as a statistically significant predictor of retention rate at the initial status for both universities and community colleges. Finally, level of urbanization was found to be a statistically significant predictor of the initial status of graduation rate for community colleges.

CHAPTER FIVE

SUMMARY, DISCUSSION, AND RECOMMENDATIONS

This chapter will present a general overview of the findings from this study in relation to the purpose of the study as presented in Chapter 1, which was to examine the effectiveness of allocating state resources to state public institutions of higher education by comparing results from performance funding states to non-performance funding states. These findings will be discussed in relation to the literature review presented in Chapter 2, which served as the basis for developing the hypothesis for this study, in order to develop conclusions as well as recommendations for future research.

Summary

The results presented in Chapter 4, based upon a representative sample size of 329 state public institutions of higher education from ten states, provide quantitative research results that reject the hypothesis presented above. These results are summarized as follows:

- Method of funding was not a statistically significant predictor of either the initial status or the rate of change of graduation rate or retention rate;
- Institution type was a statistically significant predictor of the initial status and the rate of change for graduation rate and the initial status of retention rate, with the graduation rate at 4-

year institutions initially 18.9 percentage points above 2-year institutions and the rate of change for the 4-year institutions improving by 0.8 percentage points annually.

- Enrollment was a statistically significant predictor of the initial status and the rate of change for graduation rate and the initial status of retention rate; therefore, the higher the enrollment, the greater the initial status for both graduation rate and retention rate and rate of change for graduation rate;
- Method of funding was a statistically significant predictor of graduation rate at the initial status for community colleges and of retention rate at the initial status for universities;
- Enrollment was a statistically significant predictor of graduation rate at the initial status for universities and the rate of change for community colleges, as well as a statistically significant predictor of retention rate at the initial status for both universities and community colleges;
- Level of urbanization was found to be a statistically significant predictor of the initial status of graduation rate for community colleges.

Based upon the literature review presented in Chapter 2, the following hypothesis was developed to guide this study: State public institutions of higher education in states that employ a performance funding methodology will experience a statistically significant increase in performance funding indicators that is greater than in states that employ a non-performance funding methodology. In direct response to the hypothesis posed, the results of the study showed that the method of funding was not a statistically significant predictor of the annual rate of change of graduation rate or retention rate over the time-period 2002 through 2009. As noted in Chapter 3, these two measures are the most frequently used performance indicators by states that employ performance funding (Burke, 1998b; Burke & Associates, 2002). Furthermore, both graduation rates and retention rates fall within the category of outputs (Burke & Associates,

2002), each of which is representative of performance in terms of external accountability and institutional performance.

These results present a particularly interesting response to many of the positions and assertions presented within the literature review in Chapter 2; specifically, the state's role in funding public higher education, the objectives of performance funding, research of performance funding, and implications to adult learners in higher education.

Discussion

The general hypothetical framework for this research study was posed by Layzell (1999): “The ultimate question regarding performance-based funding is, of course, whether it will actually serve to improve institutional performance in the long run” (p. 245). Developing a response to this question was the over-arching aim of this study, primarily in terms of the effect of performance funding on the graduation rates and retention rates of students attending state public institutions of higher education in ten states that served as the sample for this study, as identified in Chapter 3.

The Roles and Challenges of the States in Funding Public Higher Education

As noted by Weerts & Ronca (2006), the symbiotic relationship between the state government and state public institutions of higher education is irrefutable – the institutions educate the citizenry and drive economic growth while the state bears the primary responsibility for funding postsecondary education. As state populations grow and the economy becomes more complex and demanding in terms of work-related skills and required education or credentials for entry, outcomes such as graduation rates and retention rates will continue to be important as a basis for measurement of return on investment for the state's strained and diminishing resources in terms of direct funding to public institutions of higher education. Although it may seem

simple, the discussion becomes very complex when taken in terms of the multitude of variables at play. The results of this study show that the method of funding, either performance or non-performance, was not a statistically significant predictor of the annual rate of change in either graduation rate or retention rate over an eight year period. Therefore, if the manner in which funds are allocated to state public institutions is not a driver of outcomes, then there may possibly be other drivers that need to be considered.

This study also found that institution type and enrollment were statistically significant predictors of the rate of change in graduation rates, meriting further analysis between the universities and community colleges. As a result, it is probable that the complexities at play encompass variables beyond those identified within the scope of this study, possibly including economic conditions, other funding sources, unemployment levels, and many others. Weerts and Ronca (2006) and Hossler, et al. (1997) address the concerns of diminishing public resources available for funding public higher education, as well as the difficulty and struggle states experience while developing policies that will not negatively impact the basic public higher education mission. In addition, unemployment has reached unthinkable levels since late 2008, with no immediate relief on the horizon. With joblessness at the highest levels in decades, enrollments have surged beyond the steady incremental growth evidenced within the defined time period of this study (2002 through 2009). Within the context of these dynamic and volatile environmental conditions, the challenge going forward will be to identify those key variables through further research, understand their inter-relationships with and impact on public higher education outcomes, and ideally, to develop an optimal funding methodology meeting all stakeholder objectives.

Performance Funding

Conceptually, performance funding is designed to encourage institutional performance, efficiency, and effectiveness, thereby reinforcing state and institutional goals in a transparent manner based upon performance data (Layzell, 2007). This sentiment is further supported by Burke and Modarresi (1999), who noted that most of the new performance funding programs implemented at that time were initiated by university systems rather than legislative mandates, predominantly seeking specific improvements in campus performance rather than systemic reform of state higher education. As a result, the overall objective is external accountability and institutional improvement.

Within this spirit, the results of this study speak directly to Ewell's (1999) policy purposes that higher education performance measures serve; specifically, accountability, informing policy, and leveraging improvement. In terms of accountability and informing policy, the results of this study provide a basis for discourse relative to what these data and results mean, as well as what further research can be performed, so to deliver in leveraging improvement and the intended results. In alignment with Layzell's (1999) four common approaches toward accountability goals and associated performance measures, opportunities exist for further research to study performance measures other than the dependent variables used within this study – graduation rate and retention rate. As noted above, although these are highly complex relationships and dynamics, the key is that the information and opportunity exists and it is actionable.

Overall, in terms of the state and its respective stakeholders measuring the return on investment of the state funds dedicated to state public higher education, the results of this study do not necessarily provide a definitive response in terms of the value driven by performance

funding. The results of this study do show a positive rate of change over time of both graduation rate and retention rate; however, method of funding was not a statistically significant predictor of either graduation rate or retention rate, although institution type and enrollment were statistically significant predictors of the rate of change of graduation rate. As noted earlier, these results merit further research in terms of other potential independent and dependent variables to ascertain whether there are specific systemic characteristics that drive measurable public higher education outcomes.

Research of Performance Funding

The multitude of studies discussed and critiqued within Chapter 2 concluded that in many ways, performance funding was meeting these key objectives of increasing accountability and improving the performance of state public higher education. For example, the results of the survey conducted by Burke, Rosen, Minassians, and Lessard (2000) showed that 25 percent of the respondents noted that performance funding has improved their institution's performance to a great or considerable extent. Yet another survey, this one conducted by Burke and Minassians (2003) and the last of the Rockefeller Institute Higher Education Program's seven annual telephone surveys of state higher education finance officers, reported that 46.5 percent of the respondents noted that performance funding has improved their institution's performance to a great or considerable extent. Although meaningful in their own right, the inherent limitations of these studies were that they surveyed respondent opinions and did not statistically analyze actual performance indicator data from the surveyed states in order to assess whether in fact performance has improved over time at institutions in performance funding states.

In response to this identified research gap, the methodology of this study was based upon the statistical analysis of the rate of change in graduation rates and retention rates at state public

institutions of higher education in five states that employ performance funding (Tennessee, Florida, Ohio, Connecticut, and South Carolina) and five states that do not employ performance funding (Michigan, Georgia, Arizona, Massachusetts, and Maryland) during the time period 2002 through 2009. The results show that the method of funding was not a statistically significant predictor of the annual rate of change in graduation rates or retention rates within the sample, in direct contrast to the conclusions and results presented within the literature and research studies on this topic. In accordance with this study's intent, these results provide a basis for dialogue and reflection in terms of developing further quantitative research methodologies to further analyze the conditions and variables of the public higher education funding system that may positively influence the expected outcomes, facilitating the development of meaningful public policy. As previously noted, these are highly complex matters and inter-relationships requiring extensive research and analysis. Also, it must be emphasized that while this study attempted to match similar states across funding models, other variables including the degree of performance funding from state to state may have affected the results. As was noted in Chapter 2, states engaged in various levels of performance funding from less than 10 percent to 100 percent of the total allocation for higher education funds.

Adult Learners in Higher Education

In addition to the conclusions discussed above specific to method of funding, the results of the study also showed that institution type and enrollment are statistically significant predictors of the rate of change in graduation rate over the time-period 2002 through 2009, with 4-year institutions showing a rate of change improving by 0.8 percentage points annually as compared to 2-year institutions. These results provided an opportunity for further analysis among the institution types. By segmenting the data between universities and community colleges and

applying the individual change model, it was determined that community college enrollment was also a statistically significant predictor of graduation rate over time. These results are quite telling within the context of adult education. As noted in Chapter 2, the adult learner's objective for seeking formal adult education is job training and employment (Wolf, 2005) and many adult learners are faced with balancing multiple priorities along with weighing the opportunity cost of paying for higher education (Martin & Rogers, 2004). Furthermore, as noted in Chapter 4, the community college mission is to serve the under-served and broaden access to postsecondary education and training (Levin, 2001). This would reasonably lead one to believe that the community colleges are well versed in assisting and supporting adult learners in overcoming the situational barriers presented by Merriam, et al. (2007). In addition, these results provide a hopeful alternative to the findings of Carey (2008), who determined that graduation rates at urban universities were declining as enrollments were surging. This does not appear to be the case with either the universities or the community colleges analyzed within this study.

Based upon the information above, one could reasonably explain that community college enrollment as a statistically significant predictor of graduation rate over the time-period 2002 through 2009 is attributed to the value proposition of the mission of the community college offers – high quality, affordable, and accessible postsecondary education and job training. From a U.S. economic perspective, this time-period was marred by two recessions: post 9/11 and the Great Recession, which started in December 2007. Unemployment rates exceeded 5.5% from November 2001 through July 2005, and again from June 2008 through the present, peaking at a level in excess of 10% (United States Dept of Labor, 2011). As a result, the needs for job training and post-secondary education of the increasingly unemployed workforce for whom quality, accessibility, and most importantly, affordability, were paramount, apparently drove

them toward the community college to meet their individual educational goals and objectives. These findings point to an important question: What can four-year institutions learn from community colleges concerning the implementation of their mission that might act as a catalyst to help adult students be more successful at four-year institutions?

Recommendations

Based upon the findings and results of this study, several recommendations for future research opportunities are offered to support the continued development of the foundation of research on the topic of performance funding of state public higher education. The recommendations are grouped into three thematic areas: performance funding outcomes, state funding levels, and environmental factors.

In terms of performance funding outcomes, the results of the study showed that two specific institutional characteristics, institution type and enrollment, are statistically significant predictors for graduation rate. These results merit further research and quantitative analysis to fully explore whether these key characteristics are in fact drivers of institutional performance outcomes and whether these results can be replicated on a broader scale. Another opportunity would be to statistically analyze performance outcome measures other than graduation rates and retention rates (the ones that comprised this study) to determine whether there was a statistically significant rate of change over time. Finally, statistically analyze a broader proportion of performance and non-performance funding states and expand the time-period studied to determine whether statistically significant results occur after a longer time-period once performance funding has been implemented.

State funding levels dedicated to state public higher education were not within the scope of this study; however, these may have a material effect on several institutional performance

outcomes. A study should be performed consisting of a quantitative analysis that measures the strength of the relationship between state funding resources allocated to public higher education institutions with the key output performance measures of higher education such as graduation, transfer, job readiness, employment, underemployment, and state economic development and strength. Furthermore, an analysis of the levels and proportion of all public higher education funding levels to state public institutions of higher education as compared to outcomes (graduation rates, retention rates, employment rates after graduation) and the related impact on college affordability would be meaningful.

Environmental factors also may have significant influence on institutional performance outcomes. For example, an assessment of the level of college-readiness of incoming freshman classes over a longitudinal time-period may arguably impact graduation and retention rates positively, yielding the desired rate of change over time. In addition, research of the prevalent state public higher education organizational structures (e.g., university systems, boards of regents, councils of higher education, legislatively mandated versus non-mandated) consisting of a statistical analysis of the individual growth of outcome measures between the various structures to determine if one particular type promotes a statistically significant rate of growth over time would be helpful in developing public policy.

Conclusions

The trend since the early 1990s has been a growing focus by legislators and key stakeholders of state public higher education on institutional performance and accountability, as noted by Layzell (1999) and Ewell (1999). This trend evolved into states funding public institutions of higher education for performance based upon the results of designated performance indicators (Burke & Associates, 2002). Until now, a vast majority of research work

on this subject matter has been either qualitative in nature or quantitative based upon survey results. This study has brought further quantitative research to the body of knowledge on the topic of performance funding, for the first time introducing statistical analysis in the form of an individual change model. The individual change model revealed that method of funding was not a statistically significant predictor of either the initial status or the rate of change of graduation rate or retention rate over the eight-year period.

As discussed in Chapter 1, the significance of this study was to elevate the usage and value of performance data to stakeholders of state public higher education by attempting to establish a statistical significance, correlation, and/or predictive strength in relation to the manner in which state funds are allocated to public higher education institutions. This has been accomplished in two distinct aspects. First, this study has established an initial baseline for statistical analysis of performance measures and outcomes of public higher education; hopefully, spurring further innovation and research to continue to seek answers to the question of optimal funding methods of public higher education in order to drive results in support of the states goals of an educated citizenry and vibrant economic condition. Second, the results of the study show that independent variables other than method of funding, such as enrollment and institution type, were determined to be statistically significant predictors of the rate of change of graduation rate. This merits further discourse as to the other variables that should be analyzed to understand the complex inter-relationships among environmental factors, state policy, institutional variables, and outcomes. All of these will be of great interest to the stakeholders of public higher education – students, legislators, administrators, taxpayers, and business leaders. In these two distinct ways, this study has accomplished its objective in terms of significance.

Finally, these results may in fact support the representation by Layzell (2007), who emphasizes, “that no funding approach is necessarily better than another. That determination must be made by each state in the context of its own funding policy goals, higher education governance structure, and fiscal capacity” (p. 17). As a result, this study serves to supplement and build upon the foundation of research on the topic of performance funding by adding statistical research results to the already established knowledge-base supported by the many studies that have been performed, which have relied predominantly upon 1. survey data of an opinion-based nature, and 2. qualitative research methods.

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EXHIBITS

EXHIBIT A

The Effectiveness of Performance Funding of Public Higher Education

