A Dissertation

entitled

The Impact of Performance-Based Funding Models among Ohio’s Universities

by

David E. Chatfield

Submitted to the Graduate Faculty as partial fulfillment of the requirements for the

Doctor of Philosophy Degree in Higher Education

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An Abstract of

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This research utilized a two-part, mixed-methods approach to analyze the impact of the Performance Based Funding: PBF funding model at Ohio’s thirteen bachelor’s-degree-granting public universities. The State of Ohio added four student success measures to the university funding formula, referred to as State Share of Instruction (SSI), beginning in 2010. This research study examined changes in the student success outcomes measures at all bachelor’s-degree-granting universities during a six-year period, beginning in 2009, to assess performance changes statewide. Interviews were conducted with university provosts to assess their perception of the impact the PBF model has had at their respective universities. The findings indicated that university performance, as measured by student outcomes, has improved in response to the PBF model. Further, universities have implemented operational changes designed to improve student success outcomes, including monitoring student progress and increasing student advising. The findings also revealed a pattern of (a) universities increasing their admission standards as a way to improve student outcomes and (b) declines in SSI funding during the six-year period between 2009 and 2014.
This dissertation is dedicated to my wonderful wife, Debra. Deb is my life partner, mentor, advisor, coach, role model, and best-friend-forever. We share every adventure and challenge together. We share a deep appreciation that each day is a gift. Each day is a time to share and to savor and an opportunity to engage in and contribute to the well-being of others. Self-improvement and life-long education are exciting themes that have always been important to us. This dissertation and the educational adventure that it has embodied have been achieved because of Deb’s love, patience, advice, and inspiration.
To Deb, with all my love, Dave.
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# Table of Contents

Abstract iii

Acknowledgements v

Table of Contents vi

List of Tables xi

List of Figures xii

I. Introduction 1

   A. Background of the Study: The Importance of Higher Education 2

      a. Concerns about University Performance 3

      b. Ohio’s Funding for Universities 5

      c. Policy Change to Increase University Performance 7

      d. Performance-Based Funding 9

   B. Statement of the Problem 9

   C. Purpose of the Study 12

   D. Significance of the Study 12

   E. Conceptual Framework 15

      a. Qualitative Analysis: Policy Analysis 15

      b. Qualitative Analysis: Grounded Theory 16

   F. Quantitative Research Questions 16

   G. Qualitative Research Questions 17

   H. Methodology: Quantitative Analysis 17

   I. Methodology: Qualitative Interviews 18

   J. Assumptions 18
K. Delimitations
L. Limitations
M. Definitions of Terms and Abbreviations
N. Summary
O. Organization of the Remainder of the Study

II. Review of the Literature
A. The Importance of Higher Education
B. Pressure for Improved University Performance
C. The Cost of College
D. Performance-Based Funding
E. Success Challenge in Ohio
F. State Governance and the University System of Ohio
G. Strategic Plan of the University System of Ohio
H. Performance-Based Funding in Ohio
I. Ohio Lags in Investment in Higher Education
J. Ohio as a Role Model in Performance-Based Funding Requirement
K. University Performance and the Use of Performance-Based Funding
L. Conceptual Framework
   a. Policy Analysis
   b. The Process of Policy Development
   c. Grounded Theory
M. Summary: Review of Literature

III. Methodology
A. Research Questions 68
B. Data Collection and Data Analysis 68
   a. Variables 69
   b. Statistical Test 69
C. Qualitative Survey 70

IV. Results 71
A. Summary of the Results 73
   a. Summary of the Quantitative Results 73
   b. Summary of the Qualitative Results 73
B. Results: Quantitative 75
   a. Performance Goal I: Credit Hours Completed: All Public Four-Year Universities in Ohio Bachelor’s Degree Credit Hours Completed as a Ratio of Total Eligible Credit Hours 2009-2014 75
   b. Performance Goal II: At-Risk Credit Hours Completed: All Public, Four-Year Universities in Ohio: At-Risk Credit Hours Completed as a Ratio of Total Credit Hours Completed (Bachelor’s-Degree-Seeking Students) 2009-2014 77
   c. Performance Goal III: Graduation Rate: Graduation Rate: Rate of Bachelor’s Degree Completions within Six Years at All Four-Year, Public Universities in Ohio 2009-2014 78
   d. Performance Goal IV: At-Risk Graduation Rates at All Four-Year, Public Universities in Ohio as a Ratio of Total Degree Completions Within Six Years 2009-2014 80
C. Results Qualitative 81
   a. Provost Interviews: Perception of Impact of the Performance-Based Funding Model in Ohio 81

D. Interview Question 1 82
E. Interview Question 2 84
F. Interview Question 3 85
G. Interview Question 4 86
H. Word Cloud 1 87
I. Word Cloud 2 88
J. Word Cloud 3 89
K. Word Cloud 4 90

V. Discussion, Conclusions, and Recommendations 92
   A. Contribution of the Study 93
   B. Findings/Conclusions 94
      a. Quantitative Research: Student Outcomes 94
      b. Qualitative Research: Provost Interviews 95
   C. Concerns Raised by this Research 97
      a. Student Access 97
      b. Cost of Compliance 98
      c. Insufficient Funding 98
      d. Competition among Universities 98
   D. Significance of the Findings 98
   E. Recommendations for Future Research 100
List of Tables

Table 1  25 Years of Declining State Support for Public Colleges in Ohio. ...............6
Table 2  SSI Funding for Four-Year Universities in Ohio 2009-2015. .....................38
Table 3  Ratio of Credit Hours Completed to Total Eligible Credit Hours ...............76
Table 4  At-Risk Credit Hours Completed as a Ratio of Total Credit Hours
        Completed.......................................................................................................78
Table 5  Graduation Rate, Bachelor’s Degree, within Six Years .............................79
Table 6  Degrees Completed within Six Years at All Public Universities in Ohio
        between 2009 and 2014 .................................................................................80
Table 7  At-Risk Degree Completions/Total Degree Completion within Six Years ....81
List of Figures

Figure 1  Percentage of Individuals 25-34 Years Old and 55-64 Years Old Who Have Been Through Tertiary Education. ........................................................32

Figure 2  Price Changes Since 1985. .................................................................34

Figure 3  State Funding Versus Tuition at U.S. Public Universities. .......................35

Figure 4  Trends in State/Local Funding and Tuition for Higher Education in Ohio from 1995 through 2009. ..........................................................36

Figure 5  University Funding in Ohio: State/Local Support and Tuition per Student FTE. .........................................................................................37

Figure 6  Snapshot of State Outcomes-Based Funding Policies (as of July 2014) States Having Performance-Based Funding Policies as of 2014.........................46

Figure 7  Linear Model of Policy Process...............................................................64

Figure 8  The Grounded Theory Process................................................................65

Figure 9  Ratio of Completed FTE/Eligible FTE ..................................................77

Figure 10 Ratio of At-Risk FTE/Completed FTE ...................................................78

Figure 11 Overall Average Graduation Rate.........................................................79

Figure 12 Ratio of At-Risk Degrees Completed to All Degrees Completed ..........81

Figure 13 Word Cloud 1—Provost Responses: “In What Ways Has Performance-Based Funding Impacted Your University?” ..................................................88

Figure 14 Word Cloud 2—Provost Responses: “Have You Seen Changes in the Rates of Success in the Four Performance Goals?” ........................................89
Figure 15  Word Cloud 3—Provost Responses: “Have Operational Changes Been Made Which Are Designed to Impact the Outcome of the Four Performance Goals?” .................................................................90

Figure 16  Word Cloud 4—Provost Responses: “If You Could Make One Change to the Ohio PBF Formula, What Would It Be?” .................................................................91
Chapter One

Introduction

Success in higher education is well understood to be more important today than at any time in history. Benefits of earning a college degree affect individuals, families, communities, and the nation (Baum & Payea, 2004, McMahon 2009, Baum, Kurose & Ma, 2013). Most students who earn university degrees in the U.S. do so at public universities (Dougherty & Reddy, 2011). Public universities have been established by and receive substantial financial support from state governments. State government funding in Ohio historically has provided the largest share of revenue to public universities, thus serving to support higher education as a public good. State funding, referred to as State Share of Instruction (SSI), enables students and their families to experience tuition and fees that are lower, thus making the goal of earning a college degree accessible to more people. Many states have experienced long-term declines in the share of state funding support provided to their public universities. Ohio has experienced a pattern of declining state support. On a per-student, full-time-equivalent (FTE) basis, Ohio has invested less in higher education than all but five other states (Below the Curve, 2006). The disinvestment by Ohio’s policymakers in higher education has precipitated significant increases in university tuition and fees. At the same time, university students in Ohio have a graduation rate of only 60%. On average, 60% of Ohio’s college students who enroll in a four-year bachelor’s degree program will successfully graduate within six years.

The State of Ohio has identified increased college productivity as a leading strategic goal for higher education. In 2007, then Governor Ted Strickland issued an
executive directive creating the University System of Ohio. With this action, the State’s existing institutions, which consisted of 13 public universities, 23 community colleges, and one free-standing medical college, were for the first time formally linked as members of this system. The University System of Ohio has enabled the Ohio Board of Regents to address higher education policy in Ohio within a fully integrated adult education system, ranging from G.E.D. to Ph.D. Accompanying the governor's announcement was the formal release of the State’s first 10-year strategic plan for higher education. The strategic plan included three overarching goals: (1) graduate more students, (2) keep more of our graduates in Ohio, and (3) attract more degree holders from out of state. The plan also was described as a way to accomplish the goal of the governor and the Ohio General Assembly to make higher education a principal driver of Ohio’s economic growth and prosperity in the 21st century. It explained that graduating people is the core business of higher education (The University System of Ohio, 2008). Governor Strickland, in his first State of the State address, called upon Ohio's universities to enroll 230,000 more students by 2017 and to increase the number of graduates by 20%.

In response to these pressures, state policymakers in Ohio adopted a new funding model for higher education. Referred to as “performance-based funding” (PBF), this model seeks to incentivize Ohio's public universities to produce more college graduates. This study examines the outcomes of this funding policy. In essence, the research question is as follows: “Have university outcomes in Ohio changed in response to the new PBF funding model that went into effect in 2010?”
Background of the Study: The Importance of Higher Education

McMahon (2009) examined the benefits of higher education for individuals as well as for communities. He assessed factors beyond the narrowly defined economics of job performance and individual earnings. His assessment encompassed the market rate of return to individuals as a result of their earnings and also identified benefits that occur at home and in the community during leisure time. McMahon pointed to improved individual health, spousal health, child health, child education, fertility rates, longevity, and personal happiness as outcomes that are improved by higher education. McKeown-Moak and Mullin (2014) further indicated that the social benefits of college education include increased civic participation, reductions in poverty, lower crime rates, and lower public assistance rates. McMahon, (2009) stated that “the importance of measuring and valuing the earnings, private non-market, and social benefits of higher education and relating their total to the costs of higher education cannot be overstated” (p. 327).

Local, regional, national, and international economies are driven by knowledge, skills, and information (Baum, Kurose, & Ma, 2013). The College Board (2013) concluded that college completion improves decision-making and increases personal awareness and understanding of important events of the day. Research has indicated that college graduates have better health, are more prepared as parents, achieve economic and social self-sufficiency, and experience less reliance on governmental support during their lifetimes. They are more likely to take an interest in civic and social improvement and to participate in the political process as informed voters. Earning a college degree has been shown to benefit graduates’ overall quality of life and the ongoing success of their communities.
Concerns About University Performance

Observers and policymakers have raised growing concerns about the ability of higher education institutions in the U.S. to respond adequately to societal needs for a highly trained labor force and to advance the goal of economic success (Schneider, 2008). In the American system of higher education, the largest numbers of students, approximately 80%, have received their education at public universities, which are governed by and funded in part by state governments (Dougherty & Reddy, 2011). The most recently available statistics have indicated that the average four-year public institution graduates fewer than 60% of its students within six years (Schneider, 2008). Many college students, including many of those who do not graduate, have been burdened with large sums of student loan debt. It has been noted that one of the most effective ways to reduce the total cost of a college education is for students to graduate in four years, instead of five or six, and one of the most effective ways to increase the number of college graduates in the U.S. would be to improve the success rate of those who enroll in college. According to Dougherty and Reddy (2011), the six-year successful graduation rates for students seeking four-year degrees in public universities are 57%.

In view of the recognized importance of higher education, and concerns about the productivity of universities, policymakers, governors, legislators, and taxpayers have shown growing interest in making universities more accountable for the funding and resources that are invested in their operation. State policymakers have increased their calls for universities to document and increase their productivity and to be more transparent about their performance. Burke and Minassians (2003) reported that all but four states in the U.S. currently require performance reporting from their public
universities. Some states have linked the allocation of state education funding directly to the measured results of public university performance. As a result, universities increasingly have been rewarded or penalized based on their performance, as determined by the state.

**Ohio’s Funding for Universities**

In the state of Ohio, the Ohio Legislature and Board of Regents historically have allocated the state share of instruction (SSI) based primarily on the headcount of student enrollment at each university. This allocation model was instituted in the mid-1960s. It was intended to help make the goal of achieving a college degree available to all Ohioans. Ohio historically has placed high value on providing access to higher education for its citizens. Governor James Rhoads led the effort to develop community colleges in Ohio with the pledge that the locations of universities and community colleges would assure that the opportunity to access higher education would be available no further than 30 miles from anyone in the state of Ohio. Accordingly, the SSI then focused on student headcount, thus rewarding universities for providing student access (The Strategic Plan for Higher Education, 2008-2017). In other words, increased enrollment resulted in increased funding. The intention was that the total pool of available funds for SSI would increase proportionately as the state population and student enrollment increased. This would have enabled Ohio’s public universities to maintain tuition rates that were within reach of middle-income and even lower-income families in Ohio. Over the years, however, Ohio experienced increases in a number of other areas that required state funding support. These included obligations that provided healthcare services funded by Medicaid; the state’s prisons; and the state’s infrastructure, including roads and bridges.
These and other funding mandates have been financed in part by state decisions to reduce the per-capita funding for higher education. Funds available to support higher education have not increased at a rate necessary to keep pace with enrollment growth. Universities have responded to declines in state funding by increasing student tuition. Compared to the national average, college students in Ohio pay higher tuition and amass larger amounts of student debt. This is because Ohio has invested less money in higher education than all but five other states. The rate of investment in higher education in Ohio as a percentage of the state’s budget was 25% less in 2005 than it was in 1985. All of Ohio’s universities have experienced declines in the share of operating expense covered by SSI funding. Table 1 provides an illustration of the declines in state support at each of Ohio’s universities during the 25-year period ending in 2012 (Chronicle of Higher Education, 2014). Universities have relied on tuition increases to fund the resulting gap in revenue. Tuition rates in Ohio range from 28% to 67% above the national averages at four-year and two-year universities, respectively (Patton, 2006).

Table 1

<table>
<thead>
<tr>
<th>Institution</th>
<th>Share of revenue coming from state support</th>
<th>Change in state support</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1987</td>
<td>2012</td>
</tr>
<tr>
<td>University of Akron</td>
<td>52.8%</td>
<td>26.2%</td>
</tr>
<tr>
<td>Bowling Green State University</td>
<td>48.4%</td>
<td>31.6%</td>
</tr>
<tr>
<td>Central State University</td>
<td>46.1%</td>
<td>44.3%</td>
</tr>
<tr>
<td>Cleveland State University</td>
<td>54.2%</td>
<td>29.9%</td>
</tr>
<tr>
<td>Institution</td>
<td>Share of revenue coming from state support</td>
<td>Change in state support</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-------------------------------------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>University of Cincinnati</td>
<td>41.9%  23.5%</td>
<td>-18.4 pts</td>
</tr>
<tr>
<td>Kent State University</td>
<td>48.6%  25.9%</td>
<td>-22.7 pts</td>
</tr>
<tr>
<td>Miami University</td>
<td>40.4%  16.5%</td>
<td>-23.9 pts</td>
</tr>
<tr>
<td>Ohio University</td>
<td>49.1%  28.0%</td>
<td>-21.1 pts</td>
</tr>
<tr>
<td>Ohio State University</td>
<td>44.9%  24.3%</td>
<td>-20.6 pts</td>
</tr>
<tr>
<td>Shawnee State University</td>
<td>47.5%  32.7%</td>
<td>-14.8 pts</td>
</tr>
<tr>
<td>University of Toledo</td>
<td>52.7%  30.2%</td>
<td>-22.5 pts</td>
</tr>
<tr>
<td>Wright State University</td>
<td>53.1%  28.6%</td>
<td>-24.5 pts</td>
</tr>
<tr>
<td>Youngstown State University</td>
<td>56.5%  27.4%</td>
<td>-29.2 pts</td>
</tr>
</tbody>
</table>

**Policy Change to Increase University Performance**

Research has suggested clearly that the importance of achieving a college degree is highly beneficial to individuals as well as the communities in which they live (Baum & McMahon, 2009; Kurose & Ma, 2013). At the same time, concerns have emerged among parents, students, and policymakers about the cost of tuition and about the relatively low success rate of students completing their college degrees. It is understood that it is unlikely that state funding for higher education in Ohio will be restored to the relative levels seen in the 1960s (Below the Curve, 2010). This development has challenged
Ohio’s universities to produce “more with less.” State policymakers have turned their attention to how best to improve the accountability and performance of the state’s public universities. State funding has declined as a share of the total cost of higher education, while the importance of education to the success of the state has grown. Policymakers in Ohio have responded by developing a funding model that utilizes the allocation of SSI as a mechanism for increasing the performance of Ohio’s public universities (Conner & Rabovsky, 2011). Referred to as performance-based funding (PBF), the new method of allocating state funds was implemented in Ohio in 2010. The performance-based funding formula adopted by Ohio in 2010 has emphasized student completion rates. As a result, course completion and degree completion have become the aspects of higher education that are rewarded. Studies of the accountability and performance systems in use across the U.S. by Burke have identified that the most commonly used indicators of university performance include graduation rates, degrees awarded, student credit hours completed, retention, and time required to complete a degree (Burke, 2005).

Consistent with Ohio’s history of providing access to all Ohioans, the Ohio funding formula has been designed to attempt to compensate fairly those universities that enroll students who are considered to be at risk. Recognizing that course completion and graduation rates are lower for at-risk students, the funding formula includes performance goals specific to at-risk students. For the purpose of this funding formula, “at risk” was initially defined as those students who qualify for Ohio Instructional Grant (OIG) funds. Eligibility for an OIG requires that the applicant’s household income is less than $30,000 per year. A significant change was made in the definition of “at risk” in FY 2012. The definition was modified and expanded to include a total of five indicators: (a) Age: Over
25 at the time of graduation; (b) Effective Family Contribution (EFC): Less than $2,190 during the last three years prior to degree attainment; (c) ACT Score: Score less than 17 on ACT exam in either math or English; (d) Developmental: No ACT data available and completion of any developmental course; (e) Race: African American, American Indian, or Hispanic (from the Student Entrance table Ohio Board of Regents, SSI Handbooks, 2010-2011, and 2012-2013).

**Performance-Based Funding**

Beginning with the 2010 Fiscal Year (July 1, 2010 through June 30, 2011), the SSI formula incorporated four new performance measures to determine the allocation of SSI funding to Ohio’s universities. The performance measures are slightly different at university main campuses, university regional campuses, community colleges, and technical colleges. This research study is focused on the impact of the SSI performance-based funding on university main campuses. The performance indicators implemented in FY 2010 for students enrolled in bachelor’s degree programs at university main campuses include the following: (a) number of credit hours completed, (b) number of at-risk credit hours completed, (c) number of degrees awarded, and (d) number of at-risk degrees awarded.

**Statement of the Problem**

Much attention has been placed on the development of state policies designed to increase the accountability and performance of public universities. State legislators, governors, and policy leaders across the nation have adopted systems designed to increase the accountability and improve the outcomes of university performance. In fact, a total of 26 states adopted performance-based funding models from 1979 to 2007.
Fourteen states abandoned the programs after finding them unsatisfactory. Two of these states subsequently returned to a performance-based model. Effective beginning in the 2010 fiscal year, the State of Ohio has adopted a performance-based funding (PBF) model to guide SSI funding. The PBF model is designed to reward or penalize universities based on their achievement of the following four performance goals: (a) number of credit hours completed, (b) number of at-risk credit hours completed, (c) number of degrees awarded, and (d) number of at-risk degrees awarded. However, minimal research has been conducted on the question of whether university performance outcomes change in response to state-mandated performance goals. Existing research, while limited, has identified mixed results from state use of performance goals for universities. In fact, a study of four-year institutions in Tennessee indicated that universities there did not improve their student retention rates after implementing a state goal to do so (Sanford & Hunter. 2011).

In a dissertation entitled *Performance Funding in Ohio’s Four-Year Institutions of Higher Education*, O’Neal (2007) examined the impact of the Ohio Success Challenge funding on the performance of universities in Ohio. The Ohio Success Challenge, implemented in 1996, established a goal of increasing the level of baccalaureate degree attainment within the state. Financial rewards were established for universities that demonstrated more timely degree completion overall and more timely degree completion for at-risk students. “At risk” students were identified as those who were eligible to receive OIG funds. The study indicated that respondents at Miami University and Cleveland State University could not directly link the Ohio Success Challenge funds to decisions made to improve at-risk graduation rates or time-to-degree rates. Polatajko
(2011) examined and compared the performance of universities located in performance-funding states to the performance of universities in non-performance-funding states. The research question guiding this quantitative 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?” (p. 5). The findings revealed that the 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 during the eight-year period. Polatajko recommended further research of performance funding outcomes, state funding levels, and other environmental factors.

An in-depth analysis was conducted of Pennsylvania’s long-running performance-funding program. The analysis utilized a difference-in-differences research design with multiple comparison groups to analyze the impact of Pennsylvania’s performance-funding program on degree completions per full-time equivalent (FTE) student. The results indicated that there were only modest impacts, and when compared with other similar universities in other states, these impacts disappeared. They concluded that the performance-based funding policy had not systematically increased degree completions within the state of Pennsylvania (Hillman et al., 2014). The performance of community colleges in the state of Washington was analyzed for the years 2002 through 2012. This time period paralleled the implementation of performance-based funding for these community colleges. The authors concluded that the productivity of community colleges in the state of Washington did not vary greatly from the productivity of community colleges in other comparable states. In addition, the authors noted that the effects of
performance-based funding were delayed, occurring only after several years after implementing the policy (Hillman et al., 2015). An analysis of college performance change in a number of states that have implemented performance-based funding concluded that performance-based funding had no systematic impact on graduation rates (Shin & Milton, 2004). It is important to examine the question of whether or not performance-based funding is effective in achieving improved university performance.

**Purpose of the Study**

The purpose of this mixed-method study was to analyze the impact of performance-based funding on student outcomes in the state of Ohio. Ohio policymakers, including the state legislature and Ohio Board of Regents, adopted a performance-based funding model, which was implemented in 2010. The amount of SSI funding awarded to public universities is increased or decreased in response to the universities’ achievement of the state’s identified performance goals. Little evidence exists to indicate that university outcomes and student success are in fact changed as a result of state imposed performance goals. This research study analyzed the performance of the 13 four-year, public universities in Ohio during a period of five years to identify the changes in performance as measured by the four key performance indicators established by the Ohio Board of Regents in 2010.

**Significance of the Study**

This study makes a contribution to the available research on the effectiveness of performance-based funding systems in improving institutional performance in higher education. A national movement has begun requiring universities to improve their performance. The use of financial incentives, referred to as “performance-based
funding,” has provided the impetus for these new policies, and they have been used to align the goals of universities with the goals of state policymakers.

In 2013, the American Association of State Colleges and Universities identified performance improvement as the number-one issue for universities to address. As of January 2013, a total of 33 states were working on (or indicated that they were interested in) performance-based funding systems. This number has grown from 10 states as recently as two years earlier. State policymakers have spent considerable energy seeking funding models and accountability models to improve the performance and cost-effectiveness of public institutions. One of their primary purposes has been to motivate universities to pursue the goals of the state through the promise of rewards and the threat of punishment. However, performance-based funding has experienced periods of resurgence as well as periods of decline. First appearing in 1979 in Tennessee, performance-based funding has been implemented in an increasing number of states through the 1990s, but it then receded as many states ended their programs in the early 2000s. Some have observed that goals mandated by the state can have unintended consequences. Relatively little research has been conducted that identifies exactly which outcomes these goals have produced. Research results have repeatedly and consistently failed to find any statistically significant improvement in outcomes resulting from state-mandated performance-based funding. A survey of 224 university administrators in Ohio in 2004 yielded 11 responses citing higher retention rates as a positive outcome of the Ohio Success Challenge performance-based funding program (Schaller, 2004). However, these self-reports have not been corroborated by additional studies. The Ohio Board of Regents noted that the advent in 1995 of the Success Initiative in Ohio
was followed by an increase in the number of baccalaureate degrees awarded at Ohio public universities. In fact, the number of baccalaureate degrees increased by 18% between 1998 through 2007. The authors cautioned against claiming that such increases in the number of graduates can be attributed in whole or in part to performance-based funding, given that a myriad of other factors may have influenced these increases. According to Dougherty and Hong (2006), one of the most important contributing factors to the increased number of graduates could simply be rising enrollment.

O’Neal (2007) examined the impact of the Ohio Success Challenge funding on the performance of universities in Ohio. The Ohio Success Challenge, implemented in 1996, established a goal of increasing the level of baccalaureate degree attainment within the state. Financial rewards were established for universities that demonstrated more timely degree completion overall and more timely degree completion for at-risk students. “At risk” students were identified as those who were eligible to receive OIG funds. The results of the study indicated that respondents at Miami University and Cleveland State University could not directly link Ohio Success Challenge funds to decisions made to improve at-risk graduation rates or time-to-degree rates. According to Dougherty and Hong (2006), the results could be attributed to an increase in enrollment. In a follow-up assessment of the growing use of performance-based funding, Dougherty and Reddy (2013) identified a substantial need for studies that examined more recent models of performance-based funding. They specifically pointed out that the states of Indiana, Ohio, Pennsylvania, and Tennessee recently had implemented programs referred to as Performance-Based Funding 2.0, which embedded performance indicators in each state’s funding formula. Whereas many previous funding formulas treated performance as an
achievement that would result in an added bonus of funding, Performance-Based Funding 2.0 significantly increased the financial stakes and therefore may have served as a stronger motivating influence on university outcomes. Dougherty and Reddy suggested that this new form of performance-based funding should be studied carefully. They further pointed out that Tennessee and Ohio have subsequently dispensed with enrollment-based funding for four-year public universities, thus marking a sharp departure in the development of performance-based funding for higher education (Dougherty & Reddy, 2013).

**Conceptual Framework**

This research study employed a mixed-method approach and featured the analysis of 5 years of performance data from each of Ohio’s 13 bachelor’s-degree-granting public universities as well as interviews of the provost (or the provost’s designee) at each university to assess their perceptions of the impact of Ohio’s performance-based funding model.

**Qualitative Analysis: Policy Analysis**

The conceptual framework that guided the quantitative portion of this research study was policy analysis. Social policies have been defined by Thissen and Valker (2013) as the set of forces within the control of policymakers that affect the structure and performance of the system. A policy is a set of actions taken by a problem owner to control the system, to help solve problems within it, or to obtain benefits from it. For each policy goal, criteria are used to measure the degree to which policy actions serve to help to reach the goal. These criteria are directly related to the outcomes produced by the system and determine which outcomes are relevant. Those system outcomes that are
related to the policy goals and objectives are called outcomes of interest (Thissen & Valker, 2013). The exploration of the effects of policies on the outcomes of interest under a variety of scenarios requires a structured analytical process, the traditional policy analysis process that supports the policy-making process (Walker 2000). The eight steps of the policy analysis process have been described by Walker as follows: (1) identify problem, (2) specify objectives, (3) decide on criteria, (4) select alternatives, (5) analyze alternatives, (6) compare alternatives, (7) implement chosen alternatives, and (8) monitor and evaluate results.

**Qualitative Analysis: Grounded Theory**

The conceptual framework that guided the qualitative portion of this research was grounded theory. Grounded theory suggests a systematic process that enables researchers to identify and summarize the most important information gained from interviews or surveys of individuals directly involved in the implementation of policy (Gomm, 2009). The eight steps of the model of analysis that have been suggested by Gomm are as follows: (1) read and re-read; (2) code or index; (3) look for patterns, key ideas, themes; (4) decide what is important; (5) highlight, categorize what is important; (6) label categories; (7) describe connections between categories; and (8) write results.

**Quantitative Research Questions**

The following research question guided the quantitative portions of this study:

RQ1: Does university performance at Ohio’s public universities, as measured by the four performance indicators established in 2010 by the Ohio Board of Regents, change significantly from time N (2009) to N+1(2010), N +2(2011), N+3(2012), N+4(2013)? The performance indicators include the following: (a) number of credit
hours completed, (b) number of at-risk credit hours completed, (c) number of degrees awarded, and (d) number of at-risk degrees awarded.

**Qualitative Research Questions**

The following research questions guided the qualitative portions of this study:

RQ1: In what ways has the Performance Based Funding model impacted your university? Please share examples…

RQ2: Have you seen changes in the rates of success in the 4 performance goals? Please clarify with examples…

RQ3: Have operational changes been made which are designed to impact the outcomes of the 4 performance goals? Please share examples…

RQ4: If you could make one change to the Ohio PBF model going forward, what would it be?

**Methodology: Quantitative Analysis**

The Ohio Board of Regents database was used to access the performance measures for each of the 14 universities in Ohio during 2009 through 2013, the most recent years available. The Ohio Higher Education database is located at [http://www.ohiohighered.org/node/685#fy12-13](http://www.ohiohighered.org/node/685#fy12-13). Statistical analyses were conducted to determine whether the four performance indicators experienced a statistically significant change in response to the State’s four performance indicators. The time period for the analysis consisted of six fiscal years: 2009 through 2014.

- \( N = 2009 \): Year immediately prior to implementation of performance goals.
- \( N + 1 = 2010 \): First year of performance goals requirement.
- \( N + 2 = 2011 \): Second year of performance goal requirement.
● N + 3 = 2012: Third year of performance goal requirement.
● N + 4 = 2013: Fourth year of performance goal requirement.
● N + 5 = 2014: Fifth and final year of data available at the time of this research.

Statistical analysis using Hotelling’s T-squared test was used to determine whether there were significant changes across time (Shier, R., 2004).

**Methodology: Qualitative Interviews**

A personal interview with the provost or with an administrative officer who has responsibilities regarding the SSI funding at each of the 13 universities in Ohio was conducted. An assessment of the common trends in the responses to these interviews is provided.

**Assumptions**

This research study was based on two assumptions. The first assumption was that the data provided in the Ohio Higher Education database provided a complete and accurate measure of the four performance outcome measures that were the focus of this study. The second assumption was that changes that are identified in the performance outcomes are a direct result of the funding incentives provided in the performance-based funding system.

**Delimitations**

This research was delimited to four-year universities and did not include community colleges.
Limitations

This research study was subject to two limitations. First, this research study was limited only to the State of Ohio and therefore may not be generalizable to all states. Secondly, this research compared changes in the four performance indicators in response to the implementation of the performance-based funding model that began in 2010. It is possible that other factors may have influenced changes in one or more of the four performance indicators.

Definitions of Terms and Abbreviations

The following terms and definitions are important for this study:

*Academic*--ACT score <17 in English or <17 in math for students who took the ACT and students who completed any developmental courses for students with no ACT. The data for at-risk FTE for 2009 and 2010 are estimated because of data validity questions for some of these data. These estimates are what were used in the SSI formula in FY 2012.

*Accountability*--Systems of required reporting by universities to enable policymakers and the public at large to have access to quantitative and or qualitative performance outcomes and to allow comparison of such outcomes among universities.

*At-Risk FTE*--A subset of completed FTE, those completed by at-risk students. Students are considered at risk if they are academically underprepared or financially at risk.

*At-Risk Students 2010*--Students who have been considered financially at risk of not completing their college or university education and who are eligible to receive OIG funds.
*At-Risk Students 2012*--Meeting any one of the following five indicator criteria: (a) Age: Over 25 at the time of graduation; (b) Effective Family Contribution (EFC): Less than $2,190 during the last three years prior to degree attainment; (c) ACT Score: Score less than 17 on ACT exam in either math or English; (d) Developmental: No ACT data available and completion of any developmental course; (e) Race: African American, American Indian, or Hispanic (from the Student Entrance table Ohio Board of Regents, SSI Handbooks, 2010-2011, and 2012-2013).

*Completed FTE*--A subset of eligible FTE. They are eligible FTE reported as having earned credit for the class in the course enrollment file.

*Effective Family Contribution (EFC)*--< $2,190 in any of these years or

*Eligible FTE*--FTE attempted in eligible courses by eligible students. Course eligibility comes from the course inventory file and student eligibility from the student enrollment files.

*FTE*--Annualized full-time equivalent students (credit hours/45 if on quarters, credit hours/30 if on semesters). *Grounded Theory*--A qualitative research approach originally developed by Glaser and Strauss.

*Ohio Instructional Grant (OIG)*--A state-based scholarship awarded to Ohio residents who attend a college or university.

*Performance-Based Funding (PBF)*--A financial model which ties the allocation of state financial support for universities to the measured performance outcomes of the university. Performance outcome goals are prescribed by the state governing board or state legislature.
**State Policy**—“An authoritative action by state government” (Dougherty & Reid, 2007)

*State Share of Instruction (SSI)*—The State of Ohio’s annual funding support for universities.

*Success Challenge*—A performance-based funding challenge for four-year universities in Ohio that was created in 1996 and ended in 2010. Funds in the Ohio Success Challenge were awarded based on the graduation rates of at-risk students and for the timely degree completion of at-risk students.

**Summary**

Chapter 1 discusses a national trend among state policymakers related to increased accountability and performance improvement of universities. Burke and Minassians (2003) reported that all but four states require performance reporting from their universities. A number of states, including Ohio, have established specific performance goals and have directly linked the payment of state funding support, referred to as State Share of Instruction (SSI), to university performance. Known as performance-based funding (PBF), this funding model is intended to serve as a mechanism for increasing the performance of universities (Conner & Rabovsky, 2011).

Research on the effectiveness of the performance-based funding model has been limited and is inconclusive regarding the effectiveness of this model in bringing about improved university performance. According to the National Conference of State Legislators (2015), 14 states have adopted and then abandoned such models. A number of researchers, including Sanford and Hunter (2011), O’Neal (2007), Polatajko (2011), and Hillman et al. (2004) have concluded that little evidence exists to support the idea that
university performance outcomes have improved in response to the implementation of state-imposed performance goals.

The purpose of this study was to analyze the outcomes at Ohio’s universities in response to the four performance outcomes that are included in the State of Ohio’s performance-based funding model. The analysis identified the change in each performance outcome at each of Ohio’s public universities during a six-year period (i.e., 2009 to 2014). The analysis evaluated the changes in performance outcomes during the year immediately prior to the implementation of the performance-based funding model and each of the first five years (i.e., 2010 to 2014) of the funding model’s implementation. The four performance outcomes include the following: (a) number of credit hours completed, (b) number of at-risk credit hours completed, (c) number of degrees awarded, and (d) number of at-risk degrees awarded. Two conceptual frameworks guided this study: Walker’s (2000) eight-step model of policy analysis and Charmaz (2006) and Gomm’s (2009) process of grounded theory. Aggregate data from each of Ohio’s four-year universities were accessed via the Ohio Board of Regents database. The specific items of data analyzed were credit hour completions, at-risk credit hour completions, degrees awarded, and at-risk degrees awarded for all bachelor’s-degree-seeking students at each public university for each academic year of the study period, which was 2009 through 2014. The Ohio Higher Education database is located at http://www.ohiohighered.org/node/685#fy12-13. Data for this analysis were provided to the author by the office of Data Management and Analysis of the Ohio Board of Regents in April, 2015.
Statistical analyses utilizing Hotelling’s T-squared test were performed to determine whether the four performance indicators experienced a statistically significant change during the time period of the analysis in response to the state’s four performance goals (Shier, R., 2001). The time period included six fiscal years: \( N = 2009 \), the year prior to the beginning of performance measurement period; \( N + 1 = 2010 \), the first year of the performance-based funding period; \( N + 2 = 2011 \), the second year of the performance-based funding period; \( N + 3 = 2012 \), the third year of the performance-based funding period; \( N + 4 = 2013 \), the fourth year of the performance-based funding period; and \( N + 5 = 2014 \), the fifth year of the performance-based funding period.

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N + 3 = 2012, the third year of the performance-based funding period; N + 4 = 2013, the fourth year of the performance-based funding period; and N + 5 = 2014, the fifth year of the performance-based funding period.

Each of the four selected performance goals was a dependent variable: (a) number of credit hours completed per year, (b) number of at-risk credit hours completed per year, (c) number of degrees awarded per year, and (d) number of at-risk degrees awarded per year. The independent variable was the incentive for change created by the State’s implementation of the four performance goals. Hotelling’s T-squared test was used to determine whether significant changes occurred over time. The null hypothesis was that there would be no change in the performance outcomes from one time period to the next. The null hypothesis is 

\[ H_0: \mu_1 - \mu_2 = 0 \]

This null hypothesis was tested against one of the following alternative hypotheses, depending on the question posed: \( H_1: \mu = 0 \), \( H_1: \mu > 0 \), \( H_1: \mu < 0 \) (Shier, 2004).

Following the quantitative analysis of the performance data, the researcher conducted interviews with administrative officials at each university to identify their perceptions of the impact of the PBF model on their respective universities. The administrators interviewed were the university provost, or the designee of the provost, who was directly responsible for implementing the PBF model. Interview results were analyzed using grounded theory, and summary findings are reported to identify the perceived impact of Ohio’s PBF funding model on Ohio’s universities.

**Organization of the Remainder of the Study**

This research study is organized in five chapters. Chapter 1 provides the background of the study, statement of the problem, purpose of the study, significance of
the study, definitions of terms, theoretical framework, research questions, limitations, and the assumptions of the study. Chapter 2 presents a review of the literature, including the importance of a college education; pressures for improved university performance; the cost of college education; performance-based funding systems; success challenge in Ohio; state governance and the University System of Ohio; the strategic plan of the University System of Ohio; performance-based funding in Ohio; Ohio’s lagging investment in higher education; Ohio as a role model in performance-based funding, university performance, the use of performance-based funding, university organization, decision-making, and change management; and theoretical framework. Chapter 3 describes the methods used to conduct this research study. It includes the source of the data, the research questions, the dependent and independent variables, and the data analysis procedures. In Chapter 4, the results are provided for the rate of change in each performance outcome measure at each university for each year. Chapter 5 provides a summary of the findings for theory and practice, recommendations for further research, and conclusions.
Chapter 2

Review of the Literature

This chapter presents the rationale for conducting research on the effectiveness of state-imposed performance-based funding formulas on public universities. Higher education has experienced a remarkable transformation. Once viewed as a luxury experience reserved for the intellectual and economically elite, a college education has come to be regarded as essential for the success of the individual, the community, and the nation. Economic and social responsibilities of each state with the U.S. have created demands for tax-generated funds and have reduced the ability of the states to maintain historic levels of funding support for higher education. At the same time, states have regarded the success of universities as engines of economic growth and prosperity that drive the future generation of tax revenues. States have increasingly responded by establishing requirements for improved performance of universities. Dissatisfaction has been expressed by students, parents, business leaders, policy makers, legislators, and governors regarding university graduation rates. For example, less than 60% of college students have graduated within six years. Frustration has risen among these same stakeholders as the cost of college tuition has risen at rates in excess of inflation, resulting in increased student debt. Student debt in total has grown to exceed the total amount of consumer credit card debt in the U.S. Students commonly graduate or, even worse, do not graduate, and leave college with levels of student debt that create a significant burden for them and their families for decades to come. Student debt has been recognized as a general burden on the overall health of our economy. Student debt causes young adults, in many cases, to postpone major economic decisions, such as purchasing a home or a
car. Student debt has been seen in some cases as a cause of delaying the ability of young adults to establish their own household, get married, or start a family.

Borrowing from classic business management theories, such as management by objectives, and zero-based budgeting, state policy makers have developed accountability and funding models to “align the incentives” and to motivate universities to “do more with less.” Nearly every state has experienced a consistent movement toward mandating increased university accountability. However, there has been a notable lack of evidence indicating that mandated performance improvement goals, in fact, produce predictable improvements in university performance. A number of states have been so frustrated by the lack of expected results that they have removed the enacted requirements. Some of these states have then modified and reenacted university performance requirements.

There has been no consensus about the reasons why expected results have been so elusive. Relatively few studies have been conducted to measure the results of the state-mandated performance goals. Studies that have been conducted indicate, at-best, mixed results. Actually, they have revealed a consistent pattern of failure of state-imposed performance standards in producing significant improvement in university performance. Speculation about the reasons why state-imposed performance standards have not worked includes the view that an insufficient amount of time has passed in which to experience the full implementation of the improvement goals. Some have opined that the ability to significantly increase college student success is a complex issue that is impacted by a number of significant factors that are beyond the control of universities. These factors may include the socio-economic status of students and families as well as the personal support networks of students.
This study sought to examine the effect of the mandated performance-based funding model in the state of Ohio. Data from the 13 four-year public universities in Ohio was analyzed to identify whether statistically significant improvement occurred in the four performance goals that were adopted by Ohio and implemented in 2010. Data within the time period of 2009 through 2013 were included in the analysis. This allowed for a quantitative, longitudinal comparison of university performance outcomes for the most recent year prior to the adoption of the required goals and for each of the four years subsequent to their adoption. The theoretical model that informed this research is policy analysis theory, as described by Walker (2000).

Chapter two is organized into seven sections: (a) the importance of higher education, (b) pressures for improved university performance, (c) the cost of college, (d) state governance of public universities, (e) the Ohio strategic plan for higher education, (f) Ohio as a role model in use of performance-based funding, and (g) conceptual framework (i.e., policy analysis theory).

**The Importance of Higher Education**

An informed and educated mind is more essential than ever in contributing to the success of individuals, communities, and the nation. Distant people, companies, and nations are connected with instantly available information through the Internet. We are truly in the information age, and knowledge, skills, and the ability to understand and successfully deal with complex information is vitally important. The United Nations Educational, Scientific, and Cultural Organization (UNESCO) has observed that as the world has become more global and competitive, the social and economic viability of communities, states, provinces, and nations has become increasingly dependent upon a
strong system of higher education that is relevant and of high quality. The ability of these entities to meet their obligations both to advanced education and continuing education may well determine not only a nation’s legitimacy but also its very survival (Michael & Kretovics, 2005). The U.S. enjoyed a role as the world leader in higher education for decades following World War II. This leadership position has been surpassed by other nations in recent years. In fact, McKinsey and Company (2009) indicated that if the United States educational system had been at the same level of top-performing countries, such as Finland and South Korea, the U.S. Gross Domestic Product could have been between $1.3 trillion and $2.3 trillion higher in 2008. McKinsey (2011) asserted that the U.S. needs more college graduates. According to McKinsey, an additional one million college graduates will be required each year by 2020 to sustain the economic health of the U.S. That goal would mean increasing today’s annual number of college graduates by 4% (i.e., 2.5 million) by the end of this decade.

Individual achievement of higher education has been broadly acknowledged to be crucial in fully developing the economic and social success of U.S. citizens. Researchers and policy agencies, including Bok (2006) and the College Board (2013), have concluded that society as a whole benefits from higher levels of educational achievement by individuals. Personal health behaviors and outcomes are better among individuals who have earned at least a bachelor’s degree. There are fewer smokers, less obesity, and better health over the lifetimes of individuals who have achieved higher education degrees. The skills, attitudes, and thought patterns fostered by education lead to more responsible health-related behaviors. Higher levels of education have been correlated with civic participation, including voter registration, and voting rates. In the 2010 Congressional
election, 25-to-44-year-old college graduates were twice as likely to vote as high school graduates within the same age group. Individuals who have achieved higher education degrees demonstrate a deeper knowledge of current affairs and important political issues. Informed citizens are more apt to engage in and be constructive participants in electoral and political processes, seeking to solve problems and improve the quality of life in their communities. Higher educational attainment also has been associated with higher rates of volunteerism. The College Board (2013) has reported that the combination of higher earnings and higher employment rates means that college-educated adults are less likely than others to depend on unemployment insurance, supplemental nutritional assistance, Medicaid, and other programs designed to mitigate poverty. In fact, the direct tax revenues for governments from college graduates during their lifetimes are more than six times the gross government cost per college degree. Public universities, supported in part by tax revenue, serve the largest share of individuals who pursue higher education.

**Pressures for Improved University Performance**

Virtually all areas of society have an important stake in the availability, cost, and quality of higher education. Concern about the management of university accountability and performance has increased in recent years, especially since global and national economies have experienced a chronic downturn since 2006. Economic pressures, due to global recession, have resulted in loss of jobs and tax revenues in many areas of the U.S. Simultaneously, state governments have experienced increasing cost pressures and growing expenses related to social service programs, including Medicaid, law enforcement, prison incarceration, highway repair and construction, and other important components within the U.S. infrastructure. One strategy that states have implemented in
order to make up their financial deficits has been to reduce appropriations for higher education. There has been a long-term trend of funding reduction--i.e., disinvestment--in higher education by state policymakers in many states. Interestingly, at the same time that state policymakers have reduced their financial support of public universities, they also have turned to universities to conduct increased research and develop innovations that may create jobs and economic growth. States also have called upon colleges to improve their performance in terms of student outcomes. Universities recently have been required to report their performance outcomes to the state, and, in a growing number of states, university funding is determined in part by the achievement of performance goals identified by the state (Dougherty & Reddy, 2011).

McPherson and Shapiro (2003) explained that many forces have converged to create a pressing need for state policies to improve college readiness and success. The impact of outsourcing U.S. jobs and of the economic recession, which began in 2007, has led state political leaders to reduce the amount of state financial support provided to public universities. At the same time, state policymakers have asked universities to improve their performance in terms of the numbers of people graduating from college and in terms of stimulating new commercial products and services that create jobs and stimulate economic growth. In fact, the competitiveness of the U.S. workforce has been projected to decline during the next several decades unless states can improve the education of all students. The percentage of the U.S. workforce with a bachelor’s degree will decrease during the next 15 years, with a corresponding drop in personal income per capita.
The U.S., in fact, has been losing ground globally in the success of its citizens, as measured by higher education achievement. The U.S. led the world in the decades following World War II in the percentage of citizens who earned a college degree and has achieved an overall level of 41% of adults with a college degree. However, this is no longer a world-leading achievement. As further evidence that the world has become ever more competitive, the U.S. must acknowledge that it has been slipping from a leadership position in higher education achievement. As of 2015, the U.S. was ranked 11th in the world in the percentage of 25-34 year olds who hold a college degree (OECD, 2015) (see Figure 1)

**U.S. Once led The World in Higher Education: Now Ranks 11th**

Population of 25-34 year olds with tertiary education. 2015


*Figure 1*. Percentage of individuals 25-34 years old who have completed tertiary education.
Countries with the highest percentage of adults with a college degree include South Korea, Norway, Russia, Ireland, New Zealand, Australia, Denmark, Israel, Belgium, Luxembourg, the United Kingdom, France, and Sweden (OECD, 2011). The most recently available statistics have indicated that the average four-year public institution graduates less than 60% of its students within six years (Schneider, 2008). Observers have raised increasing concerns about the ability of U.S. institutions of higher education to adequately respond to societal needs for a highly trained labor force and to advance the goal of economic success (Schneider, 2008).

The Cost of College

Concerns about the ability of U.S. institutions of higher education to improve performance have been compounded further by skyrocketing costs of college tuition. College completion has exceeded the reach of many Americans (Fossey & Bateman, 1998). The cost of college has continued to increase consistently at rates in excess of inflation. Students from lower-income and middle-income families have been prohibited from earning a college degree because of these high costs (Hurtado, 2009). The Chronicle of Higher Education reported in its October 3, 2008, issue that a poll conducted by Public Agenda in May of 2007 reported that 62% of Americans believe that many well-qualified students have not been provided with opportunities to earn a higher education degree because of excessive cost. Furthermore, this issue pointed out that for more than 10 years, the percentage of cost increases has far exceeded those in housing, transportation, and even healthcare. Family incomes, for the most part, have not kept pace.

The intention of providing state support to public universities has been to make opportunities for higher education available to anyone who desires to benefit from the
college experience. Financial trends during the past several decades have resulted in reductions in the share of college costs that are funded by states within the U.S. As a result, colleges have increased tuition consistently at rates in excess of inflation. College tuition costs have been recognized as a serious constraint that has prevented access to higher education and lowered the success rate of students who begin a college education but cannot afford to graduate. Student debt has become a serious strain on many who attend college and has in fact grown to a level that exceeds the overall credit card debt in the U.S. The rate of increase in college tuition since 1995 has outpaced the inflation rate for all consumer items and has even exceeded the growth in the cost of gasoline and of medical care. Cost comparison trends have revealed that the rate of increase in the cost of tuition as has far exceeded other consumer goods and services (see Figure 2).

![Price Changes Since 1985](image)

**Figure 2.** Price changes since 1985 (Rempell, 2012).

As indicated in Figure 2, college tuition and fees have increased by 559% since 1985. In other words, they have nearly sextupled, while consumer prices have roughly doubled. Many observers, parents, students, and policymakers have assumed that this shocking
increase in college tuition surely must be a direct result of exorbitant cost increases at universities. On the contrary, however, the primary cause of persistent increases in college tuition has in fact been the steady disinvestment by states in higher education. Universities have experienced consistent declines in state funding support and have enacted tuition increases as a way to balance their budgets. Figure 3 illustrates the cost shifting that universities and students have experienced as states have disinvested from higher education and students have been charged with consistently increasing tuition and fees.

**Figure 3.** State funding versus tuition at U.S. public universities (Rampell, 2011).

Figure 3 depicts funding and tuition per full-time-equivalent (FTE) student. It contrasts the national trends in the amount of state funding (in gold) and the amount of tuition funding (in burgundy). These amounts are displayed in constant 2010 dollars, adjusted by SHEEO higher education cost adjustment (HECA) (Rampell, 2012). The Ohio Board of Regents (2010) published an updated report entitled *State Higher Education Finance in Ohio and the United States, FY 1995 to FY 2009*. The figures provided in the Board of Regents report (see Figure 4) indicated that the total revenue for
higher education in Ohio was only very slightly higher in 2009 compared to 1995. Total revenue in 2009 was $10,973 per FTE student compared to $10,894.00 in 1995. This is a mere $79.00 per student per year difference during a period of four years. How, then, is it possible that tuition has increased by 18% during that same time period? The answer is that SSI (and local appropriations) have declined by 28% since 2001. The dramatic rise of college tuition in Ohio has been driven by the State’s disinvestment in higher education.

Figure 4. Trends in state/local funding and tuition for higher education in Ohio from 1995 through 2009 (Ohio Board of Regents, 2010).
The actual amount of funding made available to universities from the State of Ohio has not increased during the time of this study. The table below identifies the total amount of SSI funding provided to bachelor’s-degree-granting universities in Ohio during between 2009 and 2015. The total pool of SSI funds actually declined in 2012 and 2013. The majority (9) of Ohio’s universities received less SSI funding in year 2015 than they did in 2010. Four universities were awarded increased SSI funding. As seen in this outcome, the PBF model has resulted in a “zero-sum-game” in which universities that receive increased SSI funding have done so at the expense of other universities. It therefore has been possible for some universities to improve their performance goals of
student success outcomes and experience a decrease in SSI funding if other universities have improved at a faster rate.

Table 2

SSI Funding for Four-Year Universities in Ohio 2009-2015*

<table>
<thead>
<tr>
<th>University</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Akron</td>
<td>$90,059,684</td>
<td>$103,764,165</td>
<td>$104,697,251</td>
<td>$90,578,644</td>
<td>$91,754,572</td>
<td>$98,897,538</td>
</tr>
<tr>
<td>Bowling Green</td>
<td>$80,140,728</td>
<td>$86,312,805</td>
<td>$84,882,409</td>
<td>$70,040,673</td>
<td>$67,239,045</td>
<td>$67,144,059</td>
</tr>
<tr>
<td>Cincinnati</td>
<td>$162,819,121</td>
<td>$178,780,846</td>
<td>$179,436,737</td>
<td>$153,804,658</td>
<td>$157,058,573</td>
<td>$190,307,818</td>
</tr>
<tr>
<td>Cleveland State</td>
<td>$70,458,462</td>
<td>$73,325,292</td>
<td>$73,378,020</td>
<td>$64,074,196</td>
<td>$63,782,173</td>
<td>$70,950,392</td>
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<tr>
<td>Central State</td>
<td>$6,120,352</td>
<td>$6,647,722</td>
<td>$6,537,554</td>
<td>$6,053,109</td>
<td>$6,059,694</td>
<td>$7,093,458</td>
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<td>Kent State</td>
<td>$95,725,070</td>
<td>$104,384,133</td>
<td>$106,683,144</td>
<td>$94,408,730</td>
<td>$96,012,554</td>
<td>$136,959,145</td>
</tr>
<tr>
<td>Neomed</td>
<td>$11,576,367</td>
<td>$14,168,314</td>
<td>$15,557,765</td>
<td>$14,950,606</td>
<td>$15,561,494</td>
<td>$16,149,924</td>
</tr>
<tr>
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<td>$352,978,071</td>
<td>$391,657,586</td>
<td>$390,830,256</td>
<td>$329,547,635</td>
<td>$331,744,083</td>
<td>$350,313,905</td>
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<td>Ohio University</td>
<td>$111,911,741</td>
<td>$119,893,512</td>
<td>$122,249,748</td>
<td>$109,418,758</td>
<td>$114,151,190</td>
<td>$154,085,218</td>
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<td>Shawnee State</td>
<td>$12,252,473</td>
<td>$14,545,394</td>
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<tr>
<td>Toledo</td>
<td>$86,110,184</td>
<td>$124,596,685</td>
<td>$124,614,278</td>
<td>$104,216,965</td>
<td>$102,706,753</td>
<td>$106,416,882</td>
</tr>
<tr>
<td>Wright State</td>
<td>$82,958,426</td>
<td>$89,226,532</td>
<td>$89,069,017</td>
<td>$75,380,134</td>
<td>$75,969,687</td>
<td>$80,431,124</td>
</tr>
<tr>
<td>Total</td>
<td>$1,296,693,330</td>
<td>$1,422,543,326</td>
<td>$1,426,234,261</td>
<td>$1,220,350,535</td>
<td>$1,231,386,916</td>
<td>$1,399,124,069</td>
</tr>
</tbody>
</table>

Note. *2014 information not available.

The Ohio Board of Regents, in a 1992 report entitled Managing for the Future: Challenges and opportunities for Higher Education in Ohio, explained that Ohio’s institutions of higher education have managed to hold costs below national norms and below those of peer institutions. Aggregate measures of higher education spending per student have tended to place Ohio below the national average, even though Ohio students have been enrolled in more expensive types of educational programs. Total spending per student in Ohio has been above average in instructional categories and below average in administrative categories. Total State funding support per FTE student declined by 23% between 1988 and 1993. As a result, college tuition increased by 61% during this time.
period. According to the Board of Regents report (1992), Ohio had the seventh highest public university tuition in the nation.

Gee (2011), who at the time was the president of The Ohio State University, remarked in The Chronicle of Higher Education that this nation and our world are not merely in a recession; we are also experiencing a resetting of the global economy. All signs point to a new normal in which those of us engaged in higher education must accept that no amount of pleading or whining or denying will alter what now seems an inexorable reality. We will earn what support we get by virtue of our excellence and our hustle, our ingenuity, and our creativity. (Gee, 2011, p. 1)

The pressure on universities to control costs has likely never been greater. Tuition at four-year public institutions during the 2003-2004 academic year increased at the highest rate in three decades, an average of 14% more than the prior year (Farelle, 2003). State appropriations to public colleges and universities fell 2.1% from the 2002-2003 fiscal year to the 2003-2004 fiscal year, the first such decline in 11 years (Hebel 2001). Accordingly, the issue of the performance of public universities has been a matter that has attracted growing attention. State and federal policy makers, business leaders, students, and parents have expressed growing interest in how best to define, measure, and improve the performance of institutions of higher education (Dougherty & Reddy, 2011).

State policy makers have spent considerable energy seeking solutions that will improve the performance and cost-effectiveness of public institutions. Funding policies that link state funding to the achievement of objective benchmarks (or at least to the mandatory reporting of performance outcomes) have become the norm across the United
States. Mandatory reporting of performance data is now required in all but four states, which has resulted in increased accountability for universities (Burke & Minassians, 2003). A number of states have taken the next step and have adopted funding models that require universities to achieve predetermined performance goals in order to be eligible to receive state funding support. This model is referred to as performance-based funding.

**Performance-Based Funding**

The American Association of State Colleges and Universities (AASCU) identified performance improvement as the number-one issue for universities to address in 2013. As reported in AASCU’s Policy Matters Brief (January, 2013),

> The prevailing theme for state higher education policy in 2013 will likely be improvement in the performance of states’ public higher education systems and institutions, collectively aimed at boosting measures of college affordability, productivity and student success. These include implementation of state funding allocation systems designed to incentivize institutions to improve performance on a number of outcomes. (p. 2)

Colleges are expected to report their progress in addressing plans intended to increase college graduation rates and degree production. State legislatures are expected to apply continued attention to establishing funding models that reward and penalize the performance of universities--i.e., performance-based funding. As of January 2013, a total of 33 states were working on (or indicated that they were interested in) performance-based funding systems. This interest increased to 33 states from just 10 states as recently as two years earlier. States have continued to disinvest their financial support in higher education. Funding reduction has been recognized as one of the root causes of the
increasing state interest in funding models that produce more results without more money. The primary strategy has been to require universities to provide data on and demonstrate increased results for student success and institutional productivity. State policy makers have spent considerable energy seeking solutions that will improve the performance and cost-effectiveness of public institutions. Funding policies that link state funding to the achievement of objective benchmarks (or at least to the mandatory reporting of performance outcomes) have become the norm across the United States. Increased accountability of universities through mandatory reporting of performance data has now been required in all but four states (Burke & Minassians, 2003).

Performance-based funding has two major objectives: (a) it serves to hold institutions accountable for achieving results that have been identified as desirable by the state; (b) it compels universities to improve quality and efficiency (Burke, 2002). The intention is to align the incentives and motivate universities to pursue the goals of the state through the promise of rewards and the threat of punishment. However, the continued use of performance funding has had a somewhat volatile history. First appearing in 1979 in Tennessee, performance-based funding was enacted in an increasing number of states through the 1990s but then receded as many states abandoned their programs in the early 2000s. Some have observed that goals mandated by the state can have unintended consequences. Relatively little research exists to identify the specific outcomes that these goals produce. Dougherty and Reddy (2011) suggested allocating state funding based on performance goals serves to prompt several intermediate changes at the university level, including the following:
- Increased awareness of state priorities among college leaders but not necessarily among the faculty, department chairs and staff.
- Increased amount of internal data collection.
- Increased competition among the state institutions.
- Consolidation or elimination of academic departments having low enrollment.
- Reduction in the number of majors or degrees offered.
- Removal of graduation obstacles, such as courses that students found hard to pass.
- Working with faculty to reduce the rate of course withdrawals.
- Providing better support for first year students, including increased availability of tutoring

In terms of the ultimate impact of performance-based funding, however, research results have repeatedly and consistently failed to identify any statistically significant improvement in outcomes resulting from state-mandated performance-based funding. A study of Tennessee four-year institutions indicated that these institutions did not improve their student retention rates after implementing a performance-based funding model (Sanford & Hunter, 2011). However, a survey of 224 university administrators in Ohio yielded 11 respondents who reported higher retention rates as a positive outcome of the state’s Success Challenge performance-based funding program (Schaller, 2004). Unfortunately, these self-reports have not been supported by any corroborating data, particularly after controlling for competing causes of increasing retention rates beyond the presence of performance-based funding. The Ohio Board of Regents noted that the advent in 1995 of the Success Initiative in Ohio was followed by an increase in the
number of baccalaureate degrees awarded at Ohio public universities. In fact, the number of baccalaureate degrees increased by 18% between 1998 and 2007. However, Ohio Board of Regents quite properly cautioned against claiming that such increases in the number of graduates were attributable in whole or in part to performance-based funding, given that a myriad of other factors could be at work. One of the most important factors is that the increasing number of graduates could be due simply to increasing enrollment (Dougherty & Hong, 2006).

A case study in Ohio conducted by O’Neal (2007) as part of a dissertation examined the impact of Ohio’s Success Challenge funding on the performance of universities in Ohio. The Ohio Success Challenge, implemented in 1996, established a goal of increasing the level of baccalaureate degree attainment within the state. Financial rewards were established for universities that demonstrated more timely degree completion overall and more timely degree completion for at-risk students. “At risk” students were defined as students who were eligible to receive Ohio Instructional Grant (OIG) funds. The study indicated that respondents at Miami University and Cleveland State University could not directly link the Ohio Success Challenge funds to decisions made to improve at-risk graduation rates or time-to-degree rates.

Polatajko (2011) examined and compared the performance of universities located in performance-based funding states to universities located in non-performance-based funding states. The research question guiding this quantitative 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?” The findings indicated that the method of funding was not a statistically significant predictor either of the rate of change in graduation rates or retention rates during the eight-year period, although institution type and enrollment were statistically significant predictors. Polatajko recommended further research of performance-based funding outcomes, state funding levels, and other environmental factors. A different in-depth analysis was conducted of Pennsylvania’s long-running performance-based funding program. The analysis utilized a difference-in-differences (DiD) research design with multiple comparison groups to analyze the impact of Pennsylvania’s performance-based funding program on degree completions per full-time equivalent (FTE) student. The results indicated that there were only modest impacts, but when compared with other similar universities in other states, these impacts disappeared. Researchers concluded that the performance-based funding policy had not systematically increased degree completions within the state of Pennsylvania (Hillman et al., 2004). The performance of community colleges in Washington State was analyzed using data from the years 2002 through 2012. This time period paralleled the implementation of performance-based funding for community colleges in Washington State. The authors concluded that the productivity of community colleges in Washington State did not vary significantly from other comparable states and that the effects were delayed, occurring only several years after the policy had been implemented (Hillman et al., 2015).

An analysis of college performance change in a number of states with performance-based funding concluded that the performance-based funding had no systematic impact on graduation rates (Shin & Milton, 2004). As recently as 2014, results
of two national, state-level studies conducted by Hillman and Tandberg (2015) examined public university performance using difference-in-difference research designs. These studies compared university performance outcomes of degree completion in the four-year and two-year higher education sectors. On average, these researchers found that performance-based funding had little to no impact on associate or baccalaureate degree completion rates.

Approximately 35 states have developed (13 states) and or implemented (22 states) performance-based funding policies as of FY 2015. These state models vary on several details, including amount of funding associated with outcomes, the metrics used, and the sectors involved (Carey, 2014). The National Conference of State Legislatures (NCSL) has provided on its website a summary listing of the components of the state funding models for all states that have implemented or are planning to implement performance-based funding. The NCSL website has pointed out that the method that historically has been used in the U.S. to allocate state funding to universities is based on enrollment. Providing funds based on enrollment has been effective in rewarding universities for providing student access to higher education. In other words, an increase in the number of students has resulted in an increase in state funding support. Most states that have implemented performance-based funding as an element of the funding model have identified increased student persistence and student success as important outcome measures to be rewarded. Examples of performance goals that address student success have included the number of degrees awarded and the number of credit hours completed. A number of additional performance goals have been included in the state models. Some of the additional performance goals in use have included research funding, STEM
credential completion, conformity to the university mission, student employment success following graduation, student wages after graduation, undergraduate eligibility for Pell grants, first-year-to-second-year retention rates, and institution-specific goals established by the university’s board of trustees. The website of the National Conference of State Legislatures is www.ncsl.org/research/education/performance-funding.aspx.

Figure 6. Snapshot of state outcomes-based funding policies (as of July 2014). States having performance-based Funding policies as of 2014.

Success Challenge in Ohio

Performance outcomes that frequently have been required include student retention and degree completion. Funding models have been designed to positively and negatively impact the revenue awarded to the university in response to positive and negative changes in the performance outcomes. In addition, some states have experimented with models that provide a funding premium for graduation of at-risk
students. This is intended to encourage universities to take steps to increase the success
rate of students who historically have experienced lower rates of retention and of
graduation success (ASCU Policy Matters, 2013).

Ohio has experimented with models of performance-based funding within higher
education for a number of years. An initial performance-based funding model known as
the Success Challenge was created in 1996 with the goal of increasing the level of
baccalaureate degree attainment within Ohio. This challenge consisted of two
components that produced funding for public universities. The first was an “at-risk”
component for students defined as financially at risk; the second component was
designed to address timely degree completion, usually defined as four years.

**State Governance and the University System of Ohio**

Even before Ohio became a state, the Federal Congress made provisions for a
system of public education to be established for the public good. The Northwest
Ordinance in 1786 included grants of land and funding for the establishment of public
universities. The state of Ohio was formed by the Federal Congress in 1803, and Ohio
University opened in 1804 as the first legislated public university in the state. Students
were first enrolled in 1806. Miami University followed soon thereafter; it was initially
chartered in 1809 and enrolled students in 1824. Each of Ohio’s public universities
followed as the state of Ohio increased its population and gained in economic growth.
The Morrill Land-Grant Act, signed by President Lincoln in 1862, further assured the
allocation of federal lands in the growing states to be used for the purpose of creating
public universities. Still today, the states bear the primary responsibility for ensuring that
all citizens have appropriate access to higher education. The actions taken (or not taken)
by state policymakers determine the future course of higher education attainment in the United States. The states determine the levels and types of public financial resources to invest in postsecondary education. They create and oversee the systems of accountability of higher education. They establish and monitor goals for the performance of campuses (McClendon & Perna, 2014).

Public universities in Ohio are instruments of the State. They were created with significant autonomy and functional powers within the broad mandates of the Ohio Revised Code. Each university is governed by an independent board of trustees. University trustees are appointed by the governors of each state and are accountable for many of the important decisions at their respective universities, which include selecting and employing the university president; setting operating budgets; approving tuition and fees; granting degrees; and approving rules, programs, and policies, and the trustees are responsible for the overall operations and budget of the university (Excellence to Eminence, 2011). Important milestones in the leadership of higher education in Ohio include the creation in 1963 of the Ohio Board of Regents and appointment of the first Ohio Chancellor of Education by Governor James Rhodes.

University main campuses in Ohio

- University of Akron — Akron
- Bowling Green State University — Bowling Green
- Central State University — Wilberforce
- University of Cincinnati — Cincinnati
- Cleveland State University — Cleveland
- Kent State University — Kent
● Miami University — Oxford
● Northeast Ohio Medical University — Rootstown
● Ohio University — Athens
● Ohio State University — Columbus
● Shawnee State University — Portsmouth
● University of Toledo — Toledo
● Wright State University — Dayton
● Youngstown State University — Youngstown

http://en.wikipedia.org/wiki/Youngstown,_Ohio

**Strategic Plan of the University System of Ohio**

On August 2, 2007, then Governor Strickland issued an executive directive creating the University System of Ohio. With this action, the state’s existing institutions (consisting of 13 public universities, 23 community colleges, and one free-standing medical college) were for the first time formally linked as members of the university system. Also added to the system were the state’s adult career centers and adult basic and literacy programs. The University System of Ohio better enables the Ohio Board of Regents to address higher education policy in Ohio as a fully integrated adult education system ranging in levels from GED to Ph.D. Accompanying the governor’s announcement was the formal release of the first ever 10-year strategic plan for higher education. The strategic plan included three overarching goals: (a) graduate more students, (b) retain a larger number of graduates in Ohio, (c) attract more degree holders from out of state.
The plan was also described as a way to accomplish the goal of the governor and the general assembly to make higher education a principal driver of Ohio’s economic growth and prosperity in the 21st century. It explained that graduating people is the core business of higher education. Governor Strickland, in his first State of the State address, called upon Ohio’s universities to enroll 230,000 more students by 2017 and to increase the number of graduates by 20%.

Performance-Based Funding in Ohio

The strategic plan for the University System of Ohio identified as a key strategy the development of a model for allocating SSI funding that would support the goals of the strategic plan. The plan explained that “a core principle of higher education finance is that funding formulas must be systematically aligned with the goals and priorities of the state in order for colleges and universities to have the incentives and resources they need to achieve the targets set for them.

The state’s basic funding formula, the State Share of Instruction, was historically designed to reward enrollment growth and penalize enrollment decline. The plan prescribed that “a new funding formula will be recommended to the Governor and the General Assembly in the next biennial budget that will be aligned with the goals of this plan. The funding that is currently provided through the “Challenges” – Jobs Challenge, Access Challenge, Success Challenge and Economic Growth Challenge – will be incorporated into the new formula to better incentivize the goals of this plan. The formula itself will be developed in consultation with legislators and university officials who will be convened immediately after the release of this report. The following are the first four principles identified to guide the decision-making process as this plan becomes a reality.”
1. The funding formula should only reward those educational outcomes that align with Ohio’s priorities.

2. The funding formula should be designed to continuously support and improve systematic, cost effective collaboration among state colleges and universities in the achievement of state goals.

3. The outcomes that are rewarded should take into consideration differences in institutional missions, including differences between community colleges and universities, and provide appropriate levels of state support for each mission, including not only the teaching mission of all colleges and universities, but other relevant contributions such as research, technology transfer, workforce development, globalization, and community revitalization.

4. Increases in enrollments or degrees granted, or improvements in other activities or outcomes that advance state goals, should be supported by appropriate increases in state funding (The University System of Ohio, 2008).

Ohio Lags in Investment in Higher Education

Compared to the national average, college students in Ohio have paid higher tuition and amassed greater amounts student debt. This is because Ohio has invested less in higher education than all but five other states. The rate of investment in higher education in Ohio as a percentage of the state’s budget was 25% less in 2005 than it was in 1985. Tuition rates in Ohio have ranged from 28% to 67% above the national averages at four-year universities and two-year universities, respectively.

Ohio’s higher education attainment rate is low. In 2010, just 26.7% of adults in Ohio had earned at least a bachelor’s degree, compared to 29.9% of adults in the United
States. Ohio currently has been ranked 37th in the nation in college attainment. While national college enrollments grew by 52% between 1990 and 2010, the rate of growth in Ohio was just 32% during the same time period.

Ohio has exhibited a pattern of disinvesting in higher education. The SSI per FTE student has experienced a 35% decline in funding during the past 20 years. Tuition rates have increased in response to declines in state support. Ohio’s public four-year institutions recently have been ranked as the third most expensive in the nation relative to family income. With tuition at $8,387 in 2010, Ohio’s in-state students pay $2,130 more than the average college student in the nation (*Below the Curve*, 2010).

**Ohio as a Role Model in Performance-Based Funding Requirement**

Dr. Matthew Filipic, in a telephone interview conducted in May of 2014, explained that the Ohio Board of Regents at the request of the Ohio General Assembly in 2008 developed a new model for awarding funds to Ohio’s universities. At the time, Dr. Filipic served on the Ohio Board of Regents as director of budgets and resource planning, vice chancellor of administration, and senior vice chancellor. He indicated that a primary goal of the Ohio Board of Regents and the legislature was to move the funding formula away from simply rewarding colleges and universities for increasing enrollment headcount and shift the funding formula toward rewarding the successful graduation of more students. It was critically important that the revised formula serve to level the playing field by recognizing the importance of successfully serving at-risk students. The revised funding formula therefore includes performance indicators for the number of credit hours completed by at-risk students and the number of graduations of at-risk students. Dr. Filipic indicated that this approach was recognized at the time as a critically
important innovation and attracted national attention. Ohio’s new performance model was considered to be a potential national model for state funding of higher education.

Consistent with Ohio’s history of providing access to all Ohioans, the current Ohio funding formula has been designed to attempt to fairly compensate those universities that enroll students who are considered to be at risk. Recognizing that course completion rates and graduation rates are lower for at-risk students, the funding formula includes performance goals specific to at-risk students. For the purpose of this funding formula, “at risk” students have been identified as those students who qualify for OIG funds. Eligibility for an Ohio Instructional Grant requires that the applicant’s household income be less than $30,000 per year. Beginning with the 2010 Fiscal Year (July 1, 2010 through June 30, 2011), the SSI formula incorporated four new performance measures in determining the allocation of SSI funding to Ohio’s universities. The performance measures are somewhat different at university main campuses, university regional campuses, and community and technical colleges. This current research project is focused on the impact of the SSI performance-based funding model on university main campuses. The performance indicators implemented in FY 2010 include the following: (a) number of credit hours completed, (b) at-risk credit hours completed, (c) degrees awarded, and (d) at-risk degrees awarded.

The change in SSI funding was designed to be incremental. As a result, the total amount of SSI funding affected by the four student success performance goals was 5% of the total SSI funding in FY 2010 and increased to 10% in FY 2011. This funding model was continued in FY 2012 and FY 2013. However, in FY 2012 and 2013, the definition of “at risk” was modified and expanded to include a total of five indicators: (a) Age--over
25 at the time of graduation; (b) Effective Family Contribution (EFC)--less than $2,190.00 in the last three years prior to degree attainment; (c) ACT Score--less than 17 on the ACT exam in either math or English; (d) Developmental Status--No ACT data available or the completion of any developmental course; (e) Race--African American, American Indian, or Hispanic as indicated by the student entrance table (Ohio Board of Regents, SSI Handbooks, 2010-2011 and 2012-2013).

With the election of Governor John Kasich in 2010, the PBF formula went through its most recent revision. The governor appointed Dr. Gordon Gee, then president of The Ohio State University, to serve as chairman of a committee to revamp the PBF formula. The committee was charged by the governor in the fall of 2012 with a charge that included “speeding up the process so that we can fund higher education based on graduation rather than based on enrollment” (Fields, 2012, para.4). In an April 2013 article in Inside Higher Ed, Kevin Kiley reported that debates about the structure of the funding formula were contentious and played out behind closed doors and that there was very little public discussion. He reported that Committee Chairman Gee explained that the idea of revamping higher education funding in a way that encourages degree completion and other goals had been a longstanding interest of his. The committee recommended increasing to 50% the amount of state funding based on degree completion, up from 20% in the previous formula. The formula had rewarded universities based on overall graduation rates rather than on increases in those rates. The percentage of funding based on course completion was lowered from 61% to just 30%.

Kiley (2013) reported that higher education officials in Ohio said that the new plan’s emphasis on graduation rates would almost certainly benefit the state’s more
selective institutions, particularly The Ohio State University and Miami University. Four-year graduation rates at both universities have been higher than 50%, and six-year graduation rates have been approximately 80%.

The Gates Foundation and the Aspen Institute were among those who watched the progress of the Ohio task force. The redesign of the funding formula took place in 2008 and 2009. The new funding formula was implemented at the beginning of FY 2010 and revised again in 2013. Dr. Filipic indicated that he was confident that there had been ongoing assessment of the impact of the funding changes at the staff level in the Ohio Board of Regents. However, he was not aware of and this researcher has not identified any published research to evaluate the changes in university performance in response to the performance indicators that were implemented in 2010. This research will address the following unanswered question: Has the performance of Universities in Ohio changed in response to the performance goals established by the Ohio Board of Regents in 2010?

**University Performance and the Use of Performance-Based Funding**

Woodley (2005) conducted a national study to evaluate the relative effectiveness of mandated improvement in university outcomes. Her research used quantitative data that represented the most common indicator of performance outcomes used in the state systems--i.e., graduation rates. She compared the outcomes in states that have implemented performance-based funding systems vs performance budgeting systems vs neither performance funding or performance budgeting systems. Analyzing data from the time period 1997 through 2003, Woodley concluded that performance-based budgeting and performance-based funding systems did not result in increased university performance. She reported that only one test out of 180 statistical tests indicated
otherwise and that problems with the data collection were likely to blame for that one exception. Woodley, in fact, had predicted before her analysis that state-imposed accountability systems were not likely to achieve the desired results in terms of driving improved university outcomes. She explained that the origin of higher education performance systems can be traced to corporate models, such as management by objectives and balanced scorecard. She pointed out that others have argued that these corporate approaches, when applied to higher education, would not have a positive effect on stimulating change, increasing efficiency or cost effectiveness, or creating institutional effectiveness (Birnbaum, 2000; Kezar & Eckel, 2004; Marginson & Considine, 2000).

Woodley offered the opinion that institutions of higher education should not be expected to behave as a business. She offered several reasons supporting her assertion that change management in a university is different than it is in a business: (a) differences in the decision-making processes between universities and corporate entities, (b) complicated governance structures and cultures in higher education, (c) lack of agreement between universities and policy-makers about the performance objectives, and (d) unique higher education economic factors. A fundamental principle in achieving improved organizational performance is to take steps that will achieve clear agreement among people within an organization, especially the leaders of the organization, about the common goals (Longenecker & Simonetti, 2001).

On the topic of university governance, Birnbaum (1988) explained that decision making in a university is spread among trustees, the president, and faculty members. The purpose of a business is to make a profit for its owners. The authority to make decisions is clearly established, and the accountability for implementing goals follows the chain of
command within the business organization. The clarity of purpose and integration of management inherent in such a business organization are absent in higher education institutions. The problem is not that educational institutions cannot identify their goals but rather that they simultaneously embrace a large number of conflicting goals (Gross & Grambsch, 1974).

There is no metric in higher education comparable to money in business. There is no goal comparable to profits. The goals and activities valued in higher education cannot be quantified into an educational balance sheet (Birnbaum, 1988). The imposition of a goal from outside an institution based on a financial reward may not impact university performance in the same way as it would be expected to in a business. Birnbaum further explained that the exercise of power within institutions may cause alienation.

In their analysis of performance indicators at community colleges, Hillman, Tandberg, and Fyar (2015) compared 31 community colleges in Washington State that were subject to performance-based funding with 176 community colleges in other western states that were not. They examined changes in performance indicators at the schools between 2002 and 2012. They reported that they found no evidence that the desired outcomes of improved retention and associate’s degree production occurred (on average) among Washington State community colleges. They offered as a plausible explanation the possibility that achieving the goals of increased retention and degree completion is a more complicated process than the designers of the incentive system may have thought. They pointed to a large body of research in the field of student success that has identified a wide range of factors influencing students’ persistence to successful degree completion, including the following: student engagement levels, academic support
services, campus climate, student satisfaction, financial aid, and a host of additional factors.

**Conceptual Framework**

The conceptual framework that guided the quantitative portion of this study was policy analysis. The conceptual framework that guided the qualitative portion of this study was grounded theory. Policies, as defined by Thissen and Valker (2013), are the set of forces within the control of policymakers that affect the structure and performance of the system. According to Thissen and Valker, a policy is a set of actions taken by a problem owner to control the system, to help solve problems within it, or to obtain benefits from it. For each policy goal, criteria are used to measure the degree to which policy actions serve to help to reach the goal. These criteria are directly related to the outcomes produced by the system and determine which outcomes are relevant. Those system outcomes that are related to the policy goals and objectives are called outcomes of interest. The exploration of the effects of policies on the outcomes of interest under a variety of scenarios requires a structured analytical process—i.e., the traditional policy analysis process that supports the policy making process (Walker 2000).

Policymakers have a responsibility to develop and implement policies that have the best chance of contributing to the health, safety, and well-being of their constituents. Policy making is not easy. Uncertainties abound. Data are limited. Identifying the key issues is a difficult task. However, without proper analysis and guidance, important policy choices may be based on hunches and guesses, and policy processes may get stuck for long periods, sometimes with regrettable results. Policy analysis provides independent, science-based knowledge for participants in a policy process who may
subsequently enter into negotiations, make value tradeoffs, and make joint or individual decisions. From this perspective, the extent to which the information provided is objective, science-based, and value-free is an important, if not central, quality criterion along with relevance and timeliness (Thissen & Walker, 2013).

Policy Analysis

Thissen and Walker (2013) defined “policy” as the set of forces within the control of policymakers that affect the structure and performance of the system. Policy consists of a set of actions taken by problem owners and or stakeholders to control the system, to help solve problems, or to help gain improvements or benefits from the system. It is believed that performance outcomes in the system can be affected by changes in policy design and implementation. According to Walker (2013), analysis of public policy can be accomplished by following an eight-step process: (a) identify the problem, (b) specify objectives, (c) decide on criteria, (d) select alternatives, (e) analyze alternatives, (f) compare alternatives, (g) implement chosen alternatives, (h) monitor and evaluate results.

Step one: Identify the problem. This step serves to identify the people affected by the policy and allows decisions about the initial step to take in analyzing the problem (as cited in Burke & Minassians, 2003). All but four states in the U.S. have enacted requirements for reporting university performance outcomes. The State of Ohio has adopted even more stringent requirements and, effective as of 2010, instituted a funding model referred to as Performance-Based Funding 2.0. This funding model ties the allocation of SSI funding directly to performance outcomes, including student graduation rates and course completion rates (Filipic, 2014). A number of researchers, including O’Neal (2007), Polatajko (2011), and Dougherty and Reddy (2013) analyzed
performance-based funding in Ohio and found no conclusive evidence that it brought about the desired changes in student success outcomes. Dougherty and Reddy concluded that there is a great need for studies at this time that examine the more recent models of performance-based funding. They specifically pointed out that Ohio is one of four states that recently implemented a Performance-Based Funding 2.0 formula and indicated that this new form of performance-based funding should be studied carefully.

**Step two: Identify the objectives of the policy.** In this step, the policy objectives are determined. Most public policy problems involve multiple objectives. Burke and Manassians (2003) reported that all except four states in the U.S. currently require performance reporting from their public universities. The state of Ohio has gone further and has implemented performance-based funding. The Ohio PBF model links the allocation of a portion of SSI funding directly to the achievement of student performance outcomes. The objective of this policy change, as explained in the state’s strategic plan, is to provide an incentive for Ohio’s universities to improve their performance with regard to student outcomes (Strategic Plan for Higher Education, 2008-2017). Ohio’s PBF policy identifies four student performance outcomes that are measured and used to determine the amount of SSI funding to universities (State Share of Instruction Handbook: Ohio Board of Regents, 2009). The four performance outcomes include the following: (a) number of credit hours completed, (b) number of at-risk credit hours completed, (c) number of degrees awarded, and (d) number of at-risk degrees awarded. This study examined the effectiveness of the PBF policy by measuring the change in student outcomes at all public, four-year universities in Ohio during the five-year period between 2009 and 2014.
**Step three: Decide on criteria.** This step involves identifying the measures of performance and cost with which to evaluate the policy. The measures of performance used in the Ohio PBF model were identified by the Ohio Board of Regents in 2009 and implemented in 2010. For the purpose of this research, data from the Ohio Board of Regents database was accessed to enable an analysis of the four outcomes measures at each university in Ohio during the five-year period between 2009 and 2013. This time period includes the year immediately prior to the implementation of Ohio’s PBF model as well as the first four years of its implementation.

In a telephone conversation with Penelope Parmer, assistant director of data management and analysis on March 10, 2015, she indicated that these data were available from the Ohio Board of Regents and that she was unaware of any other research that has addressed this specific topic. She indicated that this analysis would be beneficial and that the Ohio Board of Regents would like to have access to the results of the analysis when it became available.

**Step four: Identify the policies to be evaluated.** Current policy was examined in order to determine whether desired results were being achieved and whether alternative policies might render better results. State policy has been instrumental in shaping the development of higher education in Ohio. Governor James Rhodes in 1962 campaigned on a promise to locate a college within 30 miles of every boy and girl in Ohio. As governor, he oversaw the issuance of voter-approved bonds for financing and constructing a network of community colleges and university branch campuses. Ohio’s universities were also greatly expanded in the 1960s with the creation of Cleveland State University, The Medical University of Ohio at Toledo, Wright State University, The
University of Toledo, and the University of Akron. The state policy was designed to increase the access to higher education facilities among Ohio’s citizens. Likewise, the distribution of SSI funding was based on the enrollment headcount at each university, thus rewarding growth in enrollment. However, the state’s level of financial commitment in recent decades has not kept pace. Ohio’s manufacturing base has declined. The state has lost thousands of jobs, and spending on higher education has lagged. Today, the state of Ohio ranks 39th in the U.S. in higher education spending per FTE student (Strategic Plan for Higher Education, 2008).

On August 2, 2007, then Governor Strickland issued an executive directive creating the University System of Ohio. With this action, the state’s existing institutions, which consisted of 13 public universities, 23 community colleges, and one free-standing medical college, were for the first time formally linked as members of the system. Also added to the system were the state’s adult career centers and adult basic and literacy programs. The University System of Ohio better enabled the Ohio Board of Regents to address higher education policy in Ohio as a fully integrated adult education system offering certifications that range from GED to Ph.D. Accompanying the governor's announcement was the formal release of the state’s 10-year strategic plan for higher education. The strategic plan included three overarching goals: (a) graduate more students, (b) keep more graduates in Ohio, and (c) attract more degree holders from out of state. The plan also was described as a way to accomplish the goal of the governor and general assembly to make higher education a principal driver of Ohio’s economic growth and prosperity in the 21st century. It explained that graduating people is the core business of higher education. Governor Strickland, in his first State of the State address, called
upon Ohio’s universities to enroll 230,000 more students by 2017 and to increase the number of graduates by 20%.

**Step five: Analyze the policy.** Measure consequences of the policy, as determined by the criteria chosen in step three.

**Step six: Compare alternatives.** Compare the results in terms of the estimated costs and effects of the selected policy.

**Step seven: Implement the chosen policy.** This step involves training people and performing other tasks necessary to put the policy into effect.

**Step eight: Monitor and evaluate the results.** Evaluation is necessary to make sure that the policy is effectively accomplishing its intended objectives (Walker, 2000).

**The Process of Policy Development**

Walker developed the process chart shown below (see Figure 7) to enable a visual model of the process of policy development. The process begins with external forces. Such forces as the recognized need for increased production of college graduates and improved efficiency of universities are considered by policy makers--i.e. the people involved in developing policies regarding higher education. In Ohio, these include the governor, legislators, and officials at the Ohio Board of Regents. Analysis and action are undertaken to produce improved results in the outcomes of interest. Important roles are played during the process by stakeholders that include university presidents and board members. The deliverables that are produced to impact the desired outcomes include policies, administrative rules, budget allocations, and funding allocation models, including performance goals.
Figure 7. Linear model of policy process. Adopted from Porter and Hicks (1995).

**Grounded Theory**

Grounded theory is a systematic method of analyzing qualitative data that enables researchers to identify the core message in the data (see Figure 8).
Summary: Review of Literature

This literature review has documented that higher education is widely recognized as a very important factor in the success of individuals, communities, and nations. Public universities, created by individual states within the U.S., serve as the largest provider of higher education in America. State policy leaders have been pressured to allocate funding support to an array of important social services. States generally have “disinvested” in higher education as a way to provide funding support to other needed services. Universities have consistently increased student tuition at rates in excess of inflation as a way to balance their budgets. University education has grown beyond the reach of many in America, and student loan debt has now exceeded the nation’s total debt for credit cards. State governors, legislators, and policy makers have engaged in a movement
toward the application of performance-based funding systems that are intended to
incentivize universities to improve the outcomes of student retention and degree
completion rates. As of 2013, a total of 22 states had performance-based funding systems
in place, and 17 more were either in transition or had considered moving to a PBF
system. Research findings on the impact of PBF systems have indicated that there is
minimal statistically significant evidence to suggest that the desired outcomes are being
realized. The available research is consistent in concluding that state-imposed university
performance policies have not worked. Researchers have suggested that the achievement
of PBF goals is a complex undertaking and requires a number of years to achieve. Others
have suggested that the imposition of business-like goals on universities is not an
appropriate process for bringing about change in university performance (Birnbaum,
1988; Gross & Grambsch, 1974). Researchers generally have agreed that additional
research on this important topic is needed to understand how best to proceed in the future
(Woodley, 2005).
Chapter 3
Methodology

This research focused on the impact that performance goals established by the Ohio Board of Regents have had on the performance outcomes of four-year public universities. In addition, this study evaluated the impact of the four performance outcome goals, which are central to the allocation of state share of instruction (SSI) funding to the 13 public universities in Ohio. This study employed both a quantitative and a qualitative component. The quantitative research consisted of analyzing six years of university performance results data to determine whether university performance outcomes changed in response to the performance goals implemented by the Ohio Board of Regents in 2010. Data reports from the Higher Education Information System (HEI) and the Ohio Board of Regents were analyzed from the years 2009, 2010, 2011, 2012, 2013, and 2014. The data included the performance outcomes for the year prior to the implementation of the performance-based funding (PBF) formula as well as the results of the first five years of implementation of the new funding formula. The four performance goals included the following: (a) number of credit hours completed, (b) at-risk credit hours completed, (c) degrees awarded, and (d) at-risk degrees awarded.

The qualitative research consisted of an interview with an administrative official at each of the universities to identify their perceptions of the impact that the PBF funding model has had at their respective universities. The interviews were conducted with the provost or vice president of finance (or with one of their designees) who had been charged with administrative responsibility for administering and overseeing the PBF model. The interview questions included the following: (a) In what ways has the
performance-based funding model impacted your university? Please share examples. (b) Have you seen changes in the rates of success in the four performance goals? Please clarify with examples. (c) Have operational changes been made which are designed to impact the outcomes of the four performance goals? Please share examples. (d) If you could make one change to the Ohio PBF model going forward, what would it be?

The University System of Ohio has 13 four-year, public universities. Approximately 20% of the cost of operating Ohio’s universities has been supported by the provision of SSI to these universities. The four specific outcome-based measures of performance as identified by the Ohio Board of Regents were analyzed. The four performance goals included the following: (a) number of credit hours completed, (b) at-risk credit hours completed, (c) degrees awarded, and (d) at-risk degrees awarded.

Research Questions

The following research question guided this study:

RQ1: Does university performance at each of Ohio’s 13 four-year, public universities as measured by the four performance indicators established by the Ohio Board of Regents change significantly from time N-to-N+five, 2009 through 2014? The four measures of university performance included the following: (a) number of credit hours completed, (b) at-risk credit hours completed, (c) degrees awarded, and (d) at-risk degrees awarded

Data Collection and Data Analysis

Aggregate data from each of Ohio’s 13 four-year, public universities were accessed via the Ohio Board of Regents database, located at http://www.ohiohighered.org/node/685#fy12-13. The specific items of data analyzed
included course completions, at-risk course completions, degree completions, and at-risk degree completions for each academic year of the study period (i.e., 2009 through 2014). Data for this analysis were provided to the researcher by the office of Data Management and Analysis, Ohio Board of Regents. Statistical analyses were conducted utilizing Hotelling's T-squared Test to determine whether the four performance indicators experienced a statistically significant change during the time period of the analysis in response to the state’s four performance goals. The time period spanned six fiscal years. N = 2009, the year prior to the beginning of performance measurement period; N+1 = 2010, the first year of the performance funding period; N + 2 = 2011; N + 3 = 2012; N + 4 = 2013; and N + 5 = 2014. The qualitative analysis of the interviews consisted of identifying patterns and sorting themes and keywords that reflected concepts, concerns, or observations about the impact of the PBF model, as perceived by each participant. Theme identification is fundamental to qualitative analyses (Ryan & Bernard, 2003).

Variables

**Dependent variables.** Each of the four selected performance goals was a dependent variable. The dependent variables included the following: (a) number of credit hours completed per year, (b) at-risk credit hours completed per year, (c) degrees awarded per year, and (d) at-risk degrees awarded per year.

**Independent variable.** The independent variable is the incentive for change created by the state’s implementation of the four performance goals.

Statistical Test

Hotelling’s T-squared Test was used to determine whether there were statistically significant changes over time (Shier, R. 2004).
Null hypothesis. The null hypothesis was that there is no change in the performance outcomes from one time period to the next. The null hypothesis is $H_0: d = \mu_1 - \mu_2 = 0$, where $d$ is the mean value of the difference. This null hypothesis was tested against one of the following alternative hypotheses, depending on the question posed: $H_1: d = 0$, $H_1: d > 0$, $H_1: d < 0$ (Shier, 2004).

Qualitative Survey

In addition to the quantitative analysis of the performance data, the researcher conducted interviews of the Provost or a Provost-designated administrative official at each university to identify their perceptions of the impact that the PBF funding model has had at their university. The administrator to be interviewed was the university provost or other high level administrator who was directly responsible for assessing and or implementing the PBF performance goals. The interview questions included the following: (a) in what ways has the performance-based funding model impacted your university? Please share examples. (b) Have you seen changes in the rates of success in the four performance goals? Please clarify with examples. (c) Have operational changes been made which are designed to impact the outcomes of the four performance goals? Please share examples. (d) If you could make one change to the Ohio PBF model going forward, what would it be?

The interview transcripts were analyzed based on a grounded theory framework. Interview responses were assessed and systematically categorized to identify and categorize the most important and most often repeated themes and concepts (Bryant & Charmaz, 2007).
This chapter has identified the methods utilized in the collection of data and analysis of data for the two phases of this study. Student success outcomes data for four-year university students in Ohio were obtained from the Office of Information Management of the Ohio Board of Regents for the years 2009-2014. These data were analyzed to determine whether changes occurred in student success for the four performance measure identified in the Ohio PBF model. The four performance measures for student success are:

1. Student credit hours completed
2. At-risk credit hours completed
3. Degrees awarded
4. At-risk degrees awarded

Interviews were conducted with the Provost or designated administrator at Ohio’s Universities and analyzed to determine their perceptions of the impact of Ohio’s PBF funding model in their university. The interview questions asked of the Provosts are:

1. In what ways has the Performance Based Funding model impacted your university?
2. Have you seen changes in the rates of success in the 4 performance goals?
3. Have operational changes been made designed to impact the outcomes of the 4 performance goals?
4. If you could make one change to the Ohio PBF Model going forward, what would it be?
In the following, Chapter 4, the results of this research are presented followed by the concluding Chapter 5 which provides discussion, conclusions, and recommendations of the author.
Chapter 4

Results

Introduction

Research on the effectiveness of the performance-based funding model in universities has been limited and is inconclusive regarding the effectiveness of this model in bringing about improved university performance. According to Carey (2014), 14 states have adopted and then abandoned such models. The purpose of this study was to analyze the outcomes at Ohio’s universities in response to the four performance outcomes that are included in the State of Ohio’s performance-based funding model. This mixed-methods research study was conducted using a two-stage analysis of the question of the impact on university performance resulting from the adoption in 2010 of a performance-based funding model for four-year, public universities in Ohio. First, the quantitative portion of this study consisted of analyzing changes in student success outcomes at the 13 bachelor’s-degree-granting universities in Ohio during the six-year period between 2009 and 2014. The analysis evaluated the changes in performance outcomes during the year immediately prior to the implementation of the performance-based funding model, 2009, and each of the first five years (i.e., 2010 to 2014) of the funding model’s implementation. The four performance outcomes are as follows:

1. Credit hours completed per year
2. At-risk credit hours completed per year
3. Degrees awarded per year
4. At-risk degrees awarded per year
Secondly, the qualitative portion of this research consisted of conducting survey interviews with university provosts at Ohio’s bachelor’s-degree-granting universities. The Provost interviews assessed their perceptions of the impact of the performance-based funding model on their respective universities. The interviews were conducted in April and May of 2016. The questions asked of the university Provosts were:

1. In what ways has the Performance Based Funding model impacted your university?
2. Have you seen changes in the rates of success in the 4 performance goals?
3. Have operational changes been made designed to impact the outcomes of the 4 performance goals?
4. If you could make one change to the Ohio PBF Model going forward, what would it be?

University performance data for this study were obtained from the Office of Data Management and Analysis of the Ohio Board of Regents. The data were in aggregate form for bachelor’s degree students at each of Ohio’s 13 four-year, public universities for each year (2009 through 2014). The aggregate totals of all 13 universities were analyzed to identify changes in performance. The performance measures analyzed were the four measures of student success outcomes that are embedded in Ohio’s PBF model. The four performance outcomes include the following: (a) number of credit hours completed per year, (b) number of at-risk credit hours completed per year, (c) number of degrees awarded per year, and (d) number of at-risk degrees awarded per year.

The data were analyzed to identify changes from year to year for each year examined in this study (i.e., 2009 through 2014). Tests of statistical significance were conducted to identify changes in performance outcomes. These statistical tests were conducted using IBM SPSS Statistics. The analyses included a general linear model...
(GLM) procedure, multivariate analysis of variance (MANOVA), Wilks’ Lambda, Pillai’s Trace, Hotelling-Lawley Trace, and Roy's Greatest Root. The services of the Center for Data Analytics in the College of Business Administration at Bowling Green State University were used to identify whether changes in the four performance measures during the five year time period between 2009 and 2014 were statistically significant (see Appendix A).

Summary of the Results

The null hypothesis of this research was that there would be no change in the performance outcomes at the universities in Ohio in response to the addition of student success goals to the SSI funding model in 2010. Significant evidence from the existing literature indicates that the use of performance based funding models has not been effective in producing significant improvement in student success outcomes. Shin & Milton (2004), Dougherty & Hong (2006), O’Neal (2007), Polatajko (2011), Dougherty & Reddy (2013), Hillman et al., (2015).

In addition, existing research indicates that top-down goal setting is not an effective model for accomplishing change in the performance of universities. Woodley (2005), Birnbaum (2000), Kezar & Eckel (2004), Marginson & Considine (2000), Gross & Grambsch (1974)).

However, the findings of this research conclude that each of the student success outcomes identified in the goals of the performance based funding model in Ohio did in-fact improve during the time period of the study, 2009-2014. Furthermore, Ohio’s universities developed and implemented operational changes designed to contribute to the on-going
success of students and hence the achievement of the PBF goals. As a result of these findings the null hypothesis is rejected.

A more detailed presentation of the research results follows:

**Summary of the Quantitative Results**

The results of the quantitative analysis of performance data are as follows:

Performance Goal I: Ratio of Credit Hours Completed: Results: Yes, positive change occurred during the years 2009 through 2014. Positive change increased later in the time period.

Performance Goal II: Ratio of At-Risk Credit Hours Completed: Results: Yes, positive change occurred during the first two years of the study period (i.e., 2009 and 2010). No statistically significant change occurred after 2010.

Performance Goal III: Graduation Rate: Results: Yes, rates of graduation within six years showed consistent improvement during each year of the six-year period between 2009 and 2014, and the amount of improvement increased over time. There was a total improvement of 4 percentage points in the rate of graduations during the six-year period between 2009 and 2014. When viewed as the actual number of college graduates earning a bachelor’s degree, the performance improved by 19.77% during the six-year period between 2009 and 2014. The number of graduates increased from 40,049 in 2009 to 47,966 in 2014, representing an increase of 7,917 graduates.

Performance Goal IV: At-Risk Graduation Rate: Results: Yes, positive change occurred during the six-year period between 2009 and 2014.
Summary of the Qualitative Results

The qualitative research of the perceptions of university provosts in Ohio consisted of interviews with the Provost or a designee of the Provost. The provost’s office at each of Ohio's 13 four-year, public degree-granting universities was contacted to arrange a telephone interview with the provost (or a designee of the provost) who was responsible for implementing or assessing the performance-based funding model. Four survey questions were developed to elicit the provosts’ perception of the impact that the PBF model has had at their respective universities. The provost interview questions were as follows: (a) In what ways has the performance-based funding model impacted your university? Please share examples. (b) Have you seen changes in the rates of success in the four performance goals? Please clarify with examples. (c) Have operational changes been made which are designed to impact the outcomes of the four performance goals? Please share examples. (d) If you could make one change to the Ohio PBF model going forward, what would it be?

Telephone interviews were conducted with the provost (or a designee of the provost) at 11 of Ohio’s universities to assess their perceptions of the impact of the PBF model at their respective universities. The interviews were recorded and transcribed. The transcripts were provided to the participants to enable them to make corrections if they wished to do so. The transcripts were analyzed following the conceptual theory of grounded theory (Charmaz, 2006), and major points, themes, impressions, and perceptions were identified. The results of the analysis are as follows:

Provost Question 1: In what ways has the Performance-Based Funding model impacted your university? Perceptions of the impact of the PBF model were mixed, with
a majority providing neutral or negative views of the impact of the PBF model. Specifically, four participants stated that the PBF model has had a positive impact; five participants indicated a neutral, a little, or no impact; and two participants indicated a negative impact.

Provost Question 2: Have you seen changes in the rates of success in the four performance goals at your university? Eight participants indicated that all four student success measures had improved during the six-year period between 2009 and 2014. Five of these eight participants explained that the PBF model was co-incidental to and not the cause of these increases.

Provost Question 3: Have operational changes been made which are designed to impact the outcomes of the four performance goals? All participants indicated that operational changes have been made that are a result of or are consistent with the PBF goal of improved success outcomes for students. A list of operational changes was identified.

Provost Question 4: If you could make one change to the Ohio PBF model what would it be? All participants provided a recommendation for improving the PBF model. The majority of responses addressed the concern that the PBF model is overly complicated, making it difficult to understand, difficult to explain to others, and difficult to forecast or plan for the budgetary impact of PBF funding.
Results: Quantitative

Following is additional detail about the results of this research:

Performance Goal I: Credit Hours Completed: All Public Four-Year Universities in Ohio Bachelor’s Degree Credit Hours Completed as a Ratio of Total Eligible Credit Hours 2009-2014

The credit hours completed (FTEs), as a ratio of eligible credit hours (FTEs), for all bachelor’s-degree-seeking students at all public universities in Ohio for each year 2009-2014 are shown in Table 3 and in Figure 9. Analysis of the data indicated that the ratio of (a) completed credit hours to (b) eligible credit hours increased by 1.7 percentage points during the six-year period between 2009 and 2014. The annualized change of 0.35 percentage points was modest. It also was noted that the ratio actually declined in the years 2010 and 2012. A modest increase in the ratio occurred in 2009, and the most significant increases occurred in the years 2011 and in 2013, toward the end of the six-year period between 2009 and 2014.

Performance Goal I: Credit Hours Completed: The Ratio of Credit Hours Completed versus Eligible Credit Hours: Results: Yes, positive change occurred during the six-year period between 2009 and 2014. Positive change increased later in the time period, and the change was statistically significant.
Table 3

*Ratio of Credit Hours Completed to Total Eligible Credit Hours*

<table>
<thead>
<tr>
<th>Year</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ratio</td>
<td>0.88</td>
<td>0.88</td>
<td>0.88</td>
<td>0.89</td>
<td>0.89</td>
<td>0.90</td>
</tr>
</tbody>
</table>

Source: Ohio Board of Regents, Office of Data Management and Analysis, April 2015.

Performance Goal II: At-Risk Credit Hours Completed: All Public, Four-Year Universities in Ohio: At-Risk Credit Hours Completed as a Ratio of Total Credit Hours Completed (Bachelor’s-Degree-Seeking Students) 2009-2014

The at-risk credit hours completed as a ratio of total credit hours completed for bachelor’s-degree-seeking students in all public universities in Ohio for each year during the six-year period between 2009 and 2014 are shown in Table 4 and Figure 10. Analyses of the data indicated that significant improvement occurred in the first two years of the six-year period between 2009 and 2014. The ratio remained virtually constant after 2010.
The positive change that occurred was an improvement of 8.9 percentage points during the six-year period between 2009 and 2014. The change is statistically significant. The change was limited to the first two years so of the period and did not continue after 2010.

Table 4

*At-Risk Credit Hours Completed as a Ratio of Total Credit Hours Completed*

<table>
<thead>
<tr>
<th>Year</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ratio</td>
<td>0.21</td>
<td>0.24</td>
<td>0.39</td>
<td>0.39</td>
<td>0.40</td>
<td>0.40</td>
</tr>
</tbody>
</table>

Source: Ohio Board of Regents, Office of Data Management and Analysis, April 2015.
Performance Goal III: Graduation Rate: Rate of Bachelor’s Degree Completions within Six Years at All Four-Year, Public Universities in Ohio 2009-2014

The rates of degree completion, identified as bachelor’s degree completion within six years at the same university, for all public universities in Ohio during the six-year period between 2009 and 2014 are shown in Table 5 and Figure 11 below. As seen in Figure 11, the rate of degree completion improved from year to year, and the amount of improvement increased across time. There was a total improvement of 4 percentage points in the rate of graduations during the six-year period between 2009 and 2014.

Table 5
Graduation Rate, Bachelor’s Degree, within Six Years

<table>
<thead>
<tr>
<th>Year</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ratio</td>
<td>0.47</td>
<td>0.47</td>
<td>0.48</td>
<td>0.49</td>
<td>0.50</td>
<td>0.51</td>
</tr>
</tbody>
</table>

Source: Ohio Board of Regents, Office of Data Management and Analysis, April 2015
When viewed as the actual number of college graduates earning a bachelor’s degree each year, the performance improvements were even more impressive. The total number of bachelor’s degrees awarded in Ohio in 2014, the final year of the study, was 47,966. This number is 19.77% higher than the number of graduates in 2009. This is a striking achievement in view of the strategic goal identified by then Governor Strickland in 2007 to “increase the number of college graduates by 20% by the year 2017.” The goal of increased college graduations was in fact achieved as of 2014.

Table 6

*Degrees Completed within Six Years at All Public Universities in Ohio between 2009 and 2014*

<table>
<thead>
<tr>
<th>College</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>05 AKRN</td>
<td>2504</td>
<td>2640</td>
<td>2990</td>
<td>2991</td>
<td>3126</td>
<td>3181</td>
</tr>
<tr>
<td>05 BGSU</td>
<td>3391</td>
<td>3146</td>
<td>2820</td>
<td>2842</td>
<td>2895</td>
<td>3060</td>
</tr>
<tr>
<td>05 CINC</td>
<td>3778</td>
<td>3895</td>
<td>4284</td>
<td>4710</td>
<td>4876</td>
<td>5119</td>
</tr>
<tr>
<td>05 CLEV</td>
<td>1815</td>
<td>1902</td>
<td>2027</td>
<td>2184</td>
<td>2229</td>
<td>2365</td>
</tr>
<tr>
<td>05 CNTL</td>
<td>182</td>
<td>212</td>
<td>231</td>
<td>266</td>
<td>258</td>
<td>293</td>
</tr>
<tr>
<td>05 KENT</td>
<td>4028</td>
<td>3949</td>
<td>4146</td>
<td>4566</td>
<td>4910</td>
<td>4880</td>
</tr>
<tr>
<td>05 MIAM</td>
<td>3872</td>
<td>4005</td>
<td>4105</td>
<td>4121</td>
<td>4001</td>
<td>4327</td>
</tr>
<tr>
<td>05 OHSU</td>
<td>9830</td>
<td>10533</td>
<td>11373</td>
<td>12056</td>
<td>10070</td>
<td>10679</td>
</tr>
<tr>
<td>05 OHUN</td>
<td>4171</td>
<td>4337</td>
<td>4974</td>
<td>5824</td>
<td>6353</td>
<td>6698</td>
</tr>
<tr>
<td>05 SHAW</td>
<td>376</td>
<td>345</td>
<td>360</td>
<td>350</td>
<td>426</td>
<td>435</td>
</tr>
<tr>
<td>05 TLDO</td>
<td>2477</td>
<td>2358</td>
<td>2855</td>
<td>3002</td>
<td>3029</td>
<td>3061</td>
</tr>
<tr>
<td>05 WSUN</td>
<td>2148</td>
<td>2219</td>
<td>2163</td>
<td>2584</td>
<td>2448</td>
<td>2275</td>
</tr>
<tr>
<td>05 YNGS</td>
<td>1477</td>
<td>1455</td>
<td>1514</td>
<td>1497</td>
<td>1558</td>
<td>1593</td>
</tr>
<tr>
<td>Total</td>
<td>40049</td>
<td>40996</td>
<td>43842</td>
<td>46993</td>
<td>46179</td>
<td>47966</td>
</tr>
<tr>
<td>Mean</td>
<td>5721</td>
<td>5857</td>
<td>6263</td>
<td>6713</td>
<td>6597</td>
<td>6852</td>
</tr>
</tbody>
</table>
Performance Goal IV: At-Risk Graduation Rates at All Four-Year, Public Universities in Ohio as a Ratio of Total Degree Completions Within Six Years 2009-2014

The graduation rate of at-risk students, as a ratio of total graduation rates, increased by a total of 9 percentage points during the six-year period between 2009 and 2014. This is a statistically significant change. The number of at-risk graduations increased at an annualized rate of 1.8 percentage points per year. The pattern of increase was consistently positive during the six-year period between 2009 and 2014.

Table 7

At-Risk Degree Completions/Total Degree Completions within Six Years

<table>
<thead>
<tr>
<th>Year</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ratio</td>
<td>0.60</td>
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<td>0.64</td>
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Source: Ohio Board of Regents, Office of Data Management and Analysis, April 2015
Results: Qualitative

Provost Interviews: Perception of Impact of the Performance-Based Funding Model in Ohio

The provost's office at each of Ohio’s 13 four-year-degree-granting universities was contacted by e-mail and by telephone to establish agreement, consent, and an appointment time to conduct a telephone interview with the researcher. Ten universities participated in telephone interviews, and one university provided written responses to the survey questions. Two universities declined to participate. The two non-participating universities were each contacted three times by e-mail and three times by telephone by the researcher. Interviews with the participating universities were conducted in April, May, and June of 2016. Interviews were transcribed and analyzed. The positions and/or titles of the participants were as follows: university provost: 7 respondents; designee of the provost: 4 respondents. The titles of designees included the following: vice president of finance/CFO; vice president deputy CFO; and director of business affairs, office of budget and management. The interview questions included the following: (a) in what ways has the performance-based funding model impacted your university? Please share examples. (b) Have you seen changes in the rates of success in the four performance goals? Please clarify with examples. (c) Have operational changes been made which are designed to impact the outcomes of the four performance goals? Please share examples. (d) If you could make one change to the Ohio PBF model going forward, what would it be?
Interview Question 1

*In what ways has the Performance-Based Funding model impacted your university? Please share examples...*

Analysis of the Provost interviews for Question number one found that 4 of the 11 participants perceived the PBF funding model to have a positive impact at their respective university. Provosts who viewed the PBF impact as positive frequently cited that the PBF measures have enabled their respective universities to better clarify their priorities and to increase their accountability. They pay more attention now to the goal of improved student outcomes and have instituted changes in academic and administrative functions to support improved student retention and graduation rates.

Specific comments and examples of positive impacts included the following:

- We are more attentive to student success (4 responses).
- We increased our admissions standards.
- We are more results oriented.
- Our responsibility-based budgeting system has enabled us to reinforce the performance outcomes that are identified in the State’s PBF model.

**Neutral or little impact: 5 of 11 participants.** Five participants indicated that the state’s PBF model has had very little or no impact at their respective universities. Provosts who responded that the PBF model has had little or no impact explained that their respective universities already had been focused on improving student outcomes and that the PBF model addressed goals that were already in place. Specific comments and examples of neutral impact included the following:
• The priorities and goals of this university were already closely paralleled to the performance measures of the state’s PBF model.

• We were already doing these things.

• Our responsibility-centered management approach has focused in part on student success outcomes.

• Our student retention and graduation rates were already quite positive.

• The ACT scores of our incoming students have historically been high.

• It is unclear how much opportunity exists to further increase our retention and graduation rates.

**Negative or problematic impact: 2 of 11 participants.** Two participants indicated that the state’s PBF model has had a negative or problematic impact on their respective universities. Participants who viewed the PBF model as having a negative impact explained that the missions of their respective universities are to provide open access to everyone in Ohio who has earned a high school diploma. By prioritizing and rewarding student success measures, the PBF model has penalized their institutions. They recognized that there is a funding differential in the PBF model designed to provide increased funding amounts for at-risk student success, but they explained that this is not sufficient to cover the costs associated with achieving high levels of measured success by their student population. The majority of participants indicated that student retention rates, the number of credit hours completed, and the number of at-risk credit hours completed have increased during the six-year period between 2009 and 2014. They also suggested that, given additional time, there will be more impact on the six-year graduation rates.
Specific comments about negative impacts included the following:

- The pool of SSI funding is a fixed sum, so even if you improve your student retention and graduation outcomes, you might still lose money if other universities also improve.
- Our mission is to provide open access to students who are high school graduates. The performance measures of student retention rates and graduation rates place us at a disadvantage in terms of receiving the SSI funding.
- Even if one particular year saw an increase in enrollment by at-risk students, the overall performance outcomes are likely to be reduced for a number of years in the future.

Interview Question 2

*Have you seen changes in the rates of success in the 4 performance goals?*

Analysis of the Provost interviews for Question number two found that 8 of the 11 participants perceived student success outcomes as measured by the PBF funding model have improved at their university.

**Yes: 8 of 11 participants.** Eight of eleven participants indicated that student retention rates and graduation rates have improved at their respective universities.

**Yes and No: 1 of 11 participants.** One participant indicated that student retention rates have increased but that more time will be needed for the six-year graduation rate to improve.

**No: 2 of 11 participants.** Two participants indicated that the performance rates for their respective universities have remained essentially flat. One participant explained
that this was the result of the university’s mission, and one participant explained that the university’s rates historically have been high and have remained high.

**Interview Question 3**

*Have operational changes been made which are designed to impact the outcomes of the 4 performance goals? Please share examples....*

**Analysis of the Provost interviews for Question number three found that 11 of the 11 participants perceived that operational changes have been made at their university in response to or which are consistent with the four student success goals of the PBF funding model.**

**Yes: 11 of 11 respondents.** All 11 participants indicated that operational changes have been made either in response to or that are consistent with the state’s PBF model. Examples of operational changes that participants identified include the following:

- Increased the admissions standards of incoming students.
- Reviewed and reduced the number of credit hours required to earn a degree.
- Reviewed the rates of “DFW” grades (i.e., a grade of “D,” a grade of “F,” and withdrawal from the class) for courses and implemented modifications to services provided in order to reduce the incidences of “DFW” grades.
- Increased resources for student advising (e.g., personnel and technology).
- Implemented success coaching.
- Adopted a responsibility-based accounting system.
- Awarded associate’s degrees to regional campus students who earned sufficient credits as they pursued a bachelor’s degree.
- Provided degree maps to students.
● Created some three-year pathways to degree completion.

● Increased availability of developmental courses to enhance student readiness.

● Opened a new student success center.

● Added a summer bridge program for incoming freshmen.

● Proactively identified students who were at risk in the classroom and provided advising services.

**Interview Question 4**

*If you could make one change to the Ohio PBF model going forward, what would it be?*

**Analysis of the Provost interviews for Question number four identified perceived opportunities for improving Ohio’s PBF funding model going forward.**

The participants each identified a suggestion for improving the PBF model.

Following is a synthesis of these suggestions:

- The model is very complicated. It is difficult to understand the model. It is difficult to explain it to others. It is difficult to forecast what future revenue will be available through SSI. Simplification of the model would be the most important thing to change.

- Provide funding specifically for serving at-risk students.

- Provide more money in the pool, and make the revenue amount more predictable.

- Ohio has the most complicated PBF model in America. Make it less complicated.

- Better clarity of the definition of an “at-risk student.”
• The model calculations are extremely complex. Simplification of the model is something that should be looked at. Also, clarification about how to handle online programs should be provided.

• We are concerned about the use of age as an indicator of students who are at risk.

• The model is very, very complicated. It is very difficult to plan the budget. Budget managers need to be able to forecast the amount of revenue and the changes in the revenue from the model.

• Universities are different; we serve different missions; however, with a fixed pool of money, the success of some of our universities means there is funding available for others.

• The computation of the funding currently includes 18 different models. It could be made simpler to use and simpler to understand.

• The funding model needs to provide more money. The question that has been raised about the current funding models is, “Does it incentivize you to weed out the student who may have a harder time being successful?” I’ve already said it does.

Summary

This research examined the impact which Ohio’s Performance Based Funding model has had on public universities in Ohio during the time period 2009-2014. Quantitative analysis of changes in student success outcomes were analyzed. Interviews were conducted with university Provosts to assess their perspective of the impact of the PBF model. The findings conclude that Ohio’s PBF model has resulted in beneficial impact in
terms of each measure of student success. The majority of Provosts view the PBF model as positive or neutral in its impact on student success. All Provosts reported that their university has made operational changes designed to contribute to current and future improvements in student success outcomes. This research concludes that Ohio’s PBF model has had a positive impact, consistent with the policy’s intended purpose.
Chapter 5  
Discussion, Conclusions, and Recommendations  

Introduction  

The State of Ohio added four performance measures in 2010 related to student success. These measures were added to the funding formula utilized in awarding university State Share of Instruction (SSI) funding. Known as performance-based funding (PBF), this new funding model incentivized universities to improve performance on four measures of student outcomes. The purpose of the new funding model was to increase the accountability and performance of Ohio’s public universities. This research study was conducted to assess the impact of Ohio’s PBF policy during the first five years of its implementation.

Increasing the number of college-educated individuals in U.S. society has been demonstrated to produce important benefits for individuals, communities, and the economy (Baum, Kurose & Ma, 2013; McKeown-Moak & Mullin, 2014). The U.S. historically has led the world in the percentage of citizens who have earned a college degree. However, the U.S. ranking has slipped in recent years to 11th in the world in this important competitive measure, and the U.S. has continued to lose ground. There has been growing concern about the ability of U.S. institutions of higher education to adequately respond to societal needs for a highly trained labor force and to advance the goal of economic success (Schneider, 2008). The majority (80%) of college students in the U.S. attend public universities. However, the average four-year public university in the U.S. has graduated fewer than 60% of its students within six years (Dougherty &
Reddy, 2011; Schneider, 2008). The statewide, six-year graduation rate for public universities in the Ohio is 61% (Ohio Board of Regents, 2011).

Policy leaders, including the governor and state legislators in Ohio, have identified two important strategic goals for the state: (a) increasing performance of Ohio’s public universities and (b) increasing the number of college graduates in Ohio (Strategic Plan for Higher Education 2008-2017). Pursuant to these goals, the State of Ohio adopted a new PBF model in 2010 to establish financial rewards and consequences for university performance related to four student performance measures. The four performance measures include the following: (a) number of credit hours completed per year, (b) number of at-risk credit hours completed per year, (c) number of degrees awarded per year, and (d) number of at-risk degrees awarded per year. Existing research on the effectiveness of PBF funding models has been limited and has provided mixed results. A number of states have adopted PBF models only to revoke them after experiencing disappointing results (Hillman et al. 2015; Polatajko, 2011; Sanford & Hunter).

**Contribution of the Study**

This research analyzed the impact of the addition of four performance goals at Ohio’s public, bachelor’s-degree-granting universities. Quantitative analyses were conducted to assess the changes in performance outcomes related to each of the four performance goals at all of Ohio’s public, bachelor’s-degree-granting universities during the six-year period between 2009 and 2014. In addition, interviews of the provosts at these same universities were conducted to assess the perceptions of the provosts regarding the impact of the PBF model on their university. The interview questions
included the following: (a) In what ways has the performance-based funding model impacted your university? Please share examples. (b) Have you seen changes in the rates of success in the four performance goals? Please clarify with examples. (c) Have operational changes been made which are designed to impact the outcomes of the four performance goals? Please share examples. (d) If you could make one change to the Ohio PBF model going forward, what would it be?

Findings/Conclusions

The impact of Ohio’s PBF model has been positive. Measured benefits have been demonstrated in each of the four measures of student success during the first five years of implementation. Provosts indicated that they view the PBF model as beneficial in bringing improved clarity to the goals of their respective universities. The majority of provosts perceived the overall impact of the PBF model as either beneficial or at least consistent with the goals of their respective universities. Two provosts perceived the impact of the PBF model as detrimental or not consistent with the mission of their respective universities. All provosts indicated that they have identified opportunities to improve the PBF model moving forward.

Quantitative Research: Student Outcomes

The null hypothesis of the quantitative portion of this research project was that there would be no change in the performance outcomes from one time period to the next. The results indicated that the null hypothesis should be rejected because statistically significant positive change occurred in each of the four measures of student success identified in the Ohio PBF model. The number of credit hour completed, measured as a ratio of credit hours completed by all eligible students, experienced a modest overall
increase of 2 percentage points during the six-year period between 2009 and 2014. The rate of increase in the number of credit hours completed was greatest during the last year of the six-year period between 2009 and 2014. The number of at-risk credit hours completed experienced a jump of 15 percentage points in the first year after the new PBF model was implemented. However, no significant improvement occurred in this measure during the last three years of the six-year period between 2009 and 2014.

The rates of degree completion and at-risk degree completion, measured as four-year degree completion within six years at the same university, each improved. These measures experienced improvement of 4 and 9 percentage points, respectively. The rates of improvement in each of these two measures were highest in the last year of the six-year period between 2009 and 2014.

When viewed as the actual number of college graduates earning a bachelor’s degree each year, the performance improvements were even more impressive. The total number of bachelor’s degrees awarded in Ohio in 2014, the final year of the study, was 47,966. This number is 19.77% higher than the number of graduates in 2009. This was a striking achievement in view of the strategic goal identified by then Governor Strickland in 2007, which was to “increase the number of college graduates by 20% by the year 2017.” The goal of increased college graduations was in fact achieved as of 2014.

**Qualitative Research: Provost Interviews**

This results of this research study indicated that the perception of Ohio’s provosts varied from positive to neutral to negative regarding the impact of the PBF model. Of the 11 provosts interviewed, four indicated that the impact of the PBF model at their respective universities has been positive, five indicated that there has been little or no
impact, and two indicated that the impact has been negative. Selected quotations from the provosts’ responses are as follows:

**Provost quotations indicating positive impact of Ohio’s PBF model.**

- “It focused us on production. We are more attentive to student success – getting them to return for a second year, and we are motivated to see them continue through to graduation”
- “I would say it has caused us to have much more of a focus on student performance.”

**Provost quotations indicating a mixed, little, or no impact of Ohio’s PBF model.**

- “We had already been moving in the direction of the new performance-based funding goals, so we did not see major impacts from the new model.”
- “It’s increased our state subsidy based on something we were gonna do anyway.”
- “Yes, we would have these best practices as goals anyway. Yes, we are seeing annual increases in those performance measures, but I would not necessarily attribute that to the PBF model since we were focused on these outcomes already.”
- “Performance funding goals were very consistent with the priorities and values for the university.”
- “For the most part, it has been positive for us because I think we had been paying attention to the kind of things that state funding is trying to
incentivize anyway just because that makes us make our bottom line better overall.”

**Provost quotations indicating a negative impact of Ohio’s PBF model.**

- “The new PBF formula and performance-based funding adversely affected our university.”
- “This type of funding formula is really problematic.”

All provosts identified operational changes that have been made at their respective universities that were consistent with or were in direct response to the PBF measures. These operational changes are identified on pages 89 & 90 in Chapter 4.

Provosts identified suggestions for future improvement to the PBF model. The majority of participants recommended that the PBF formula should be simplified. They explained that a simpler funding model would improve their ability to forecast the financial impact of the SSI funding and to better communicate and explain to others at the university how the model works as well as the outcomes and actions expected. A second concern identified by the provosts for improving the PBF model was the fact that the SSI funding consists of a fixed pool of money. A number of provosts commented that the universities in Ohio are different and that they serve different missions. However, with a fixed pool of money, the success of some universities means there is less funding available for other universities.
Word Cloud 1

Word Cloud 1, below, provides an interesting visual of the most frequent words used by participants in response to Question 1: “In what ways has performance-based funding impacted your university? Clearly, the word most frequently used in the responses is “students.” Other frequently used words included “successful,” “performance,” “funding,” “model,” “completion,” and “increase.”

Figure 13. Word Cloud 1 – Provost responses: “In what ways has performance-based funding impacted your university?”
Word Cloud 2

Word Cloud 2 provides a visual representation of the participants’ responses from Question 2: “Have you seen changes in the rates of success in the four performance goals?” Again, the word “students” is among the most frequently used words, along with “completions,” “graduation,” “degree,” “year,” “rate,” and “risk.”

Figure 14. Word Cloud 2 – Provost responses: “Have you seen changes in the rates of success in the four performance goals?”
**Word Cloud 3**

Word Cloud 3 represents the words used by the participants in responding to Question 3: “Have operational changes been made which are designed to impact the outcomes of the 4 performance goals?” The word “student” was the most frequently used word by participants in response to this question, and other words frequently used included the following: “success,” “changes,” “degree,” “completion,” “advising,” “increase,” “trying,” “expanded,” “risk,” “created,” “proactive,” and “help.”

*Figure 15. Word Cloud 3 – Provost responses: “Have operational changes been made which are designed to impact the outcomes of the four performance goals?”*
Word Cloud 4

Word Cloud 4 reflects participants’ responses to Question 4: “If you could make one change to the Ohio PBF formula, what would it be?” The most frequently used word was “funding.” As noted, Ohio has lagged among other states in the U.S. in funding for higher education, and the amount of SSI funding for bachelor’s-degree-granting universities has declined. Other key words seen with high frequency are: performance, graduation, complicated, simplification, and achieve.

Figure 16. Word Cloud 4 – Provost responses: “If you could make one change to the Ohio PBF formula, what would it be?”

The four word clouds each represent a visual illustration of the transcribed interviews provided by the university Provosts. The word clouds provide a brief visual illustration
which is consistent with and reinforcing of the findings of this research. The four PBF performance goals each identify an outcome that is important in successful student experiences at Ohio’s universities. Large word size in the word cloud serves to identify the words that were repeated the most frequently in the Provost interview responses. It is very positive to see the words students, completion, degree, graduation, and rate as words that are among the largest in each word cloud and which appear consistently and repeatedly on each of the four word clouds. This pattern is strongly reinforcing of the findings of this research that the Ohio PBF model has been beneficial in its impact on student performance at Ohio’s universities.
Concerns Raised by this Research

While the findings of this research indicate that student success in Ohio is increasing, there are a number of serious concerns raised by this research. Primary among these are the following:

Student Access

A theme that was observed consistently throughout the provost interviews is that the simplest way to gain improved performance, as measured by the PBF model, is to increase the recruiting standards at universities. Interview participants also expressed concern that SSI/PBF funding is not allocated in sufficient amounts to provide resources required to serve at-risk students. The important question this raises is whether the PBF model’s focus on student success incentivizes a shift in student admissions to a preference for higher-achieving students and, consequently, less opportunity for at-risk students to gain admission at Ohio’s universities. This is an important aspect of the model’s design that should be more fully assessed in the future. The original strategic goal that fostered the development of the PBF funding model was to increase the percentage of Ohio’s adults who successfully complete a college degree. If the PBF model results in reduced access for Ohio’s citizens to a college education, that would be a very serious shortcoming of the policy.

Cost of Compliance

All of the interview participants identified operational changes that have been made in support of improved student success. These are enumerated on pages 89 and 90. Operational changes typically require the allocation of additional resources or the employment of additional personnel. These costs have been added to the operational
costs of the universities. However, the amount of SSI funding has not increased and in fact has declined in Ohio during the six-year period between 2009 and 2014. The concern is that the operational changes can be viewed as “un-funded mandates” that are increasing the costs at universities while not providing corresponding revenue. If so, this will auger towards future increases in student tuition.

**Insufficient Funding**

The total amount of state funding allocated for SSI awards to bachelor’s-degree-granting universities did not increase during the six-year period between 2009 and 2014. In fact, it declined. See discussion of this important concern in the recommendations for future research which follow.

**Competition among Universities**

The SSI funding allocation is a fixed amount. As a result, a university may in fact improve its performance and experience a decrease in SSI funding if other universities have improved at a faster rate. This places universities in a position of unhealthy competition against each other.
Significance of the Findings

An important question which must be considered is why the findings of this research indicated positive results in response to performance-based funding when previous research has found mixed or negative results. National studies by Polatajko, (2001), Woodley (2005) and Hillman & Tandberg (2015) concluded that PBF funding had little or no impact on student graduation rates. Analysis of student outcomes following PBF adoption in Pennsylvania by Hillman et al., (2004) and in Tennessee by Sanford & Hunter (2011) reached similar conclusions, PBF funding models have not improve student outcomes.

Some authors have explained that universities should not be expected to alter their performance in response to goals imposed from outside the organization. Birnbaum (1988) found that the process of setting goals among universities, as used in a business model, cannot be expected to produce changes in higher education performance. Birnbaum explained that the goals and activities valued in higher education cannot be quantified into an educational “balance sheet” and that the exercise of power by imposing goals on these institutions may result in alienation. In addition, numerous research findings have reported that PBF models are not effective in higher education (Hillman et al., 2015; Sanford & Hunter, 2011; Polatajko, 2011).

This research, in one state, indicated that Ohio’s PBF model has had a beneficial effect as intended by its developers. Student success, as measured by the number of credit hours completed and degrees completed, has improved in Ohio. Operational changes have been made in every university in Ohio designed to improve student success outcomes. One reason for the success of PBF in Ohio may be the alignment of the state’s
goals with the performance goals inherent in the mission of the state’s universities. Who can argue that four-year, degree-granting universities should actively facilitate the successful graduation of their students within six years? A number of university Provosts explained in their interviews that the State’s PBF goals are consistent with the mission and purpose of their university. Examples of statements in this regard are shown below:

- “The priorities and goals of this university were already closely paralleled to the performance measures of the state’s PBF model.”
- “We were already doing these things.”
- “Our responsibility-centered management approach has focused in part on student success outcomes.”
- “Our student retention and graduation rates were already quite positive.”
- “The ACT scores of our incoming students have historically been high.”

The state’s PBF goals and the missions of the universities each place student success as the highest priority. This goal congruence helps explain why the Ohio PBF model has been successful.

A serious concern that surfaces from the results of this study is the persistent disinvestment by the state of Ohio in higher education. The SSI per FTE student has experienced a 35% decline in funding during the past 20 years. Tuition rates have increased in response to declines in state support. Ohio’s public four-year institutions recently have been ranked as the third most expensive in the nation relative to family income. With tuition at $8,387 in 2010, Ohio’s in-state students pay $2,130 more than the average college student in the nation (Below the Curve, 2010). During the time of this study, 2009-2014, the amount of SSI funding provided to universities in Ohio declined.
One participant who identified the SSI funding constraint as a problem suggested that:

- “if the state actually provided more funding and really paid us to be successful as opposed to just paying lip service that would be a hell of a lot more impactful.”

This research provides information for higher education leaders and policy makers that can help shape future policy in Ohio. This research offers examples of operational changes that have been implemented in Ohio’s universities that are designed to enhance student success. This research identifies recommendations from university provosts for improvements to the Ohio PBF formula.

**Recommendations for Future Research**

This research explored data from the six-year period between 2009 and 2014 because this was the most recently available data at the time that the study was conducted. Clearly, there are benefits from continuing this research or similar research exploring trends in student success. The question of how to increase access to college education to an increasing number of Ohio citizens is one that requires additional research. The question of what constitutes the optimal rate of student success remains open to examination. Can a university hope to achieve a 100% graduation rate? If so, how can that goal best be accomplished? If not, then what rate is ideal? The issue of identifying the mechanisms that are most effective in improving student success is an important matter for future research. The issue of the rising cost of higher education has been suggested as a very high priority for Ohio. As illustrated in this study, Ohio’s policymakers have defunded higher education during a period of several decades. The
State’s disinvesting in higher education has continued at the time of this writing. The changes in the PBF model in 2010 were, in essence, a requirement that Ohio’s universities “do more with less”. Ohio’s universities, in fact, rose to that challenge, and the measured rates of student success improved, even during years when the amount of SSI funding was reduced. University students in Ohio pay the seventh highest tuition in the nation. Research is needed to identify ways to develop policy solutions to Ohio’s persistent disinvestment in higher education.
References


Schaller, J. Y. (2004). *Performance funding in Ohio: Differences in awareness of success challenge between student affairs administrators and academic affairs*


APPENDIX A: Dissertation Higher Education Performance Goals:

Data and analyses: Performance Based Funding: Universities in Ohio, 2009-2014

The services of the Center for data analytics, Bowling Green State University were utilized in the analyses of the data.

### Table I A

**Credit Hours: Eligible FTE All Public Universities in Ohio 2009-2014**

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Eligible FTE

Hotelling’s T-squared Test for Eligible FTE

Ho: \( \mu_1 - \mu_2 = \mu_2 - \mu_3 = \mu_3 - \mu_4 = \mu_4 - \mu_5 = \mu_5 - \mu_6 = 0 \)

Ha: at least one difference of eligible fte is not equal to 0.

```r
> View(efte)
> attach(efte)
> efte=cbind(V1,V2,V3,V4,V5,V6)
> sample.mean=apply(efte,2,mean)
> sample.mean
            V1       V2       V3       V4       V5       V6
19265.46  20189.08  20822.00  20607.62  19452.62  19386.31
> sample.mean
            V1       V2       V3       V4       V5       V6
19265.46  20189.08  20822.00  20607.62  19452.62  19386.31
> contrast=cbind(c(1,0,0,0,0),c(-1,1,0,0,0),c(0,-1,1,0,0),c(0,0,-1,1,0),c(0,0,0,-1,1),c(0,0,0,0,-1))
> tras.data=contrast%*%t(efte)
> tras.data
[3,]   175  637  -756    43   -73  -162  428  662  405    -49  697  317 463
[4,]   962  160  1021   -39  212  1056  478  5906  1829  145  836  1798 651
[5,]  1282  303  -1588  -130   100  862    79  -776  -798  269  742  160 357
> tras.data=efte%*%t(contrast)
> tras.data
[1,]  -1439  -932  175  962  1282
[2,]   466    3  637  160  303
[3,]  -1794 -881 -756 1021 -1588
[4,]  -654 -527   43   -39  -130
[5,]  -176   23  -73  212  100
[6,] -3552 -1703 -162 1056  862
[7,]  -378  -634  428  478   79
[8,]  -628  -633  662 5906 -776
[9,] -1765 -1943  405 1829 -798
[10,] -308 -277   -49  145  269
[11,] -599  100  697  836  742
[12,] -644 -654  317 1798  160
[13,] -536 -170  463  651  357
> sample.mean=apply(tras.data,2,mean)
> sample.mean
[1] -923.61538 -632.92308  214.38426  1155.00000  66.30769
> var(tras.data)
[1,] 1025004.0897 526458.4679 394734.0808 70023.4700 421969.0000
[2,] 526458.4679 394734.0808 70023.4700 421969.0000 98292.4744
[3,] 199039.5897 70023.4700 169365.2626 199437.5806 99789.1218
[4,] -183847.8333 -241969.0000  199437.5806 2386987.3000 -435340.3333
```
> 13*t(sample.mean)%%solve(var(tras.data))%%sample.mean
[1,] 27.66266
> (8/(12*5))*27.66266
[1] 3.688355
> 1-pf(3.688355,5,8)
[1] 0.04997147

\[ T^2 = n(\bar{X})'S^{-1}(\bar{X}) = 27.66266 \]

\[ \frac{v-p+1}{v_p} T^2_{p,v} = 3.688355, \text{ the corresponding } p\text{-value}=0.04997147<.05, \text{ we reject } H_0. \text{ There is strong evidence to show that at least one difference of eligible fte is not equal to 0.} \]

MANOVA

---

**The GLM Procedure**

**Repeated Measures Analysis of Variance**

<table>
<thead>
<tr>
<th>Repeated Measures Level Information</th>
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</thead>
<tbody>
<tr>
<td>Dependent Variable</td>
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<tr>
<td>Level of time</td>
</tr>
</tbody>
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**MANOVA Test Criteria and Exact F Statistics for the Hypothesis of no time Effect**

- Type III SSCP Matrix for time
- Error SSCP Matrix

\[ S=1 \quad M=1.5 \quad N=3 \]

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Value</th>
<th>F Value</th>
<th>Num DF</th>
<th>Den DF</th>
<th>Pr &gt; F</th>
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<td>8</td>
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<tr>
<td>Roy's Greatest Root</td>
<td>2.30522135</td>
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</tbody>
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**One-Sample T: u1-u2, u2-u3, u3-u4, u4-u5, u5-u6**

Test of \( \mu = 0 \) vs \( \neq 0 \)

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<th>StDev</th>
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Table II A

Credit Hours: Completed FTE

All Public Universities in Ohio

2009-2014

Completed FTE

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Credit Hours: Completed FTE

Hotelling’s T-squared Test for Completed FTE

Ho: $\mu_1 - \mu_2 = \mu_2 - \mu_3 = \mu_3 - \mu_4 = \mu_4 - \mu_5 = \mu_5 - \mu_6 = 0$

Ha: at least one difference of eligible fte is not equal to 0.

```r
> view(cfte)
> attach(cfte)
> cfte=cbind(V1,V2,V3,V4,V5,V6)
> sample.mean=apply(cfte,2,mean)
> sample.mean
   V1    V2    V3    V4    V5    V6
17031.38 17851.54 18347.31 18332.92 17301.77 17436.15
> contrast=cbind(c(1,0,0,0,0),c(-1,1,0,0,0),c(0,-1,1,0,0),c(0,0,-1,1,0),c(0,0,0,-1,1),c(0,0,0,0,-1))
> tras.data=contrast%*%t(cfte)
> tras.data
```
 tras.data=cfte%*%t(contrast)
> tras.data

> sample.mean=apply(tras.data,2,mean)
> sample.mean

> var(tras.data)

> 13*t(sample.mean)%*%solve(var(tras.data))%*%sample.mean

p=5, v=12

\[ T^2 = n(\bar{X})'S^{-1}(\bar{X}) = 18.91184 \]

\[ \frac{v-p+1}{v_p}T^2_{p,v} = 2.521579, \] the corresponding p-value=0.1176784>.05, we fail to reject Ho.
There is insufficient evidence to show that at least one difference of completed fte is not equal to 0.

MANOVA
Table III A

At-Risk Credit Hours: FTE

All Public Universities in Ohio

2009-2014

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<td>5792</td>
<td>5401</td>
<td>5039</td>
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</table>
At-risk Credit Hours: FTE

Hotelling’s T-squared Test for At-risk FTE

\[ H_0: \mu_1 - \mu_2 = \mu_2 - \mu_3 = \mu_3 - \mu_4 = \mu_4 - \mu_5 = \mu_5 - \mu_6 = 0 \]

Ha: at least one difference of At-risk fte is not equal to 0.

```r
> View(afte)
> attach(afte)
> afte=cbind(V1,V2,V3,V4,V5,V6)
> sample.mean=apply(afte,2,mean)
> sample.mean
V1       V2       V3       V4       V5       V6
3504.000 4233.308 7085.231 7176.923 6852.769 6799.308
> contrast=cbind(c(1,0,0,0,0),c(-1,1,0,0,0),c(0,-1,1,0,0),c(0,0,-1,1,0),c(0,0,0,-1,1))
> tras.data=contrast%*%t(afte)
> tras.data
[,1]  
[1,]  -422  
[2,]  -3231  
[3,]  -38  
[4,]  337  
[5,]  685  
[6,]  2044  
[7,]  550  
[8,]  5197  
[9,]  5197  
[10,]  5485.231  
[11,]  5769  
[12,]  6799.308  
> sample.mean=apply(tras.data,2,mean)
> sample.mean
[1]  -729.30769  
[2]  -2851.92308  
[3]  -91.69231  
[4]  324.15385  
[5]  53.46154  
> var(tras.data)
[,1]      
[1,] 286727.90  
[2,] 169293.69  
[3,] 2450476.7  
[4,] 114292.2  
[5,] 521925.364  
[6,] 182985.064  
[7,] 133090.079  
[8,] 1012256  
[9,] 133090.079  
[10,] 1012256  
[11,] 133090.079  
[12,] 1012256  
[13,] 133090.079  
> sample.mean=apply(tras.data,2,mean)
> sample.mean
[1]  -729.30769  
[2]  -2851.92308  
[3]  -91.69231  
[4]  324.15385  
[5]  53.46154  
> var(tras.data)
[,1]      
[1,] 286727.90  
[2,] 169293.69  
[3,] 2450476.7  
[4,] 114292.2  
[5,] 521925.364  
[6,] 182985.064  
[7,] 133090.079  
[8,] 1012256  
[9,] 133090.079  
[10,] 1012256  
[11,] 133090.079  
[12,] 1012256  
[13,] 133090.079  
```
p=5, v=12

\[ T^2 = n(\bar{X})'S^{-1}(\bar{X}) = 90.32373 \]

\[ \frac{v-p+1}{vp}T^2_{p,v} = 12.04316, \] the corresponding p-value = 0.00147205 < 0.05, we reject Ho. There is strong evidence to show that at least one difference of At-risk fte is not equal to 0.

MANOVA

The GLM Procedure
Repeated Measures Analysis of Variance

Repeated Measures Level Information

<table>
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<tr>
<th>Dependent Variable</th>
<th>Y1</th>
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<th>Y3</th>
<th>Y4</th>
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<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
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</table>

MANOVA Test Criteria and Exact F Statistics for the Hypothesis of no time Effect

\[ \mathbf{H} = \text{Type III SSCP Matrix for time} \]
\[ \mathbf{E} = \text{Error SSCP Matrix} \]

\[ S=1 \quad M=1.5 \quad N=3 \]

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Value</th>
<th>F Value</th>
<th>Num DF</th>
<th>Den DF</th>
<th>Pr &gt; F</th>
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</thead>
<tbody>
<tr>
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<td>0.11727485</td>
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<td>12.04</td>
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One-Sample T: u1-u2, u2-u3, u3-u4, u4-u5, u5-u6

Test of \( \mu = 0 \) vs \( \neq 0 \)

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>StDev</th>
<th>SE Mean</th>
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Table IV A

Degrees Completed (within six years)

All Public Universities in Ohio

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<td>46993</td>
<td>46179</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td>5721</td>
<td>5857</td>
<td>6263</td>
<td>6713</td>
<td>6597</td>
</tr>
</tbody>
</table>

Degrees Completed

Hotelling’s T-squared Test for Degrees Completed

Ho: $\mu_1 - \mu_2 = \mu_2 - \mu_3 = \mu_3 - \mu_4 = \mu_4 - \mu_5 = \mu_5 - \mu_6 = 0$

Ha: at least one difference of Degrees Completed is not equal to 0.

> View(dgreeecom)
> attach(dgreeecom)
> degreecom = cbind(V1, V2, V3, V4, V5, V6)
> sample.mean = apply(degreecom, 2, mean)
> sample.mean

3080.692 3153.538 3372.462 3614.846 3552.231 3689.692
> contrast = cbind(c(1, 0, 0, 0), c(-1, 1, 0, 0), c(0, -1, 1, 0),
>                   c(0, 0, -1, 1), c(0, 0, 0, -1))
> tras.data = contrast %*% t(degreecom)
> tras.data

[1,] -136  245  -117  -87  -30   79  -133 -703 -166  31   119  -71
[6,]  79  -197 -420  -344  30
[7,] -133  -100  -16  120  -326
[8,] -703 -840  -683 1986  -609
[9,] -166  -637  -850  -529  -345
[10]  31  -15  10  -76   -9
[12] -71  56  -421  136  173
> tras.data = degreecom %*% t(contrast)
> tras.data

[1,]  -136  -350  -1  -135  -55
[2,]  245  326  -22  -53  -165
[3,]  -117  -389  -426  -166  -243
[4,]  -87  -125  -157  -45  -136
[5,]  -30  -19  -35  8  -35
[6,]  79  -197  -420  -344  30
[7,] -133  -100  -16  120  -326
[8,] -703 -840  -683 1986  -609
[9,] -166  -637  -850  -529  -345
[10]  31  -15  10  -76   -9
[12] -71  56  -421  136  173
> sample.mean = apply(tras.data, 2, mean)
> sample.mean

-72.84615 218.92308 242.38462 62.61538 137.46154
> var(tras.data)

[1,] 49836.31  50518.74  36086.48 -106689.85  32681.41
[2,] 50518.74  98921.41  61432.95  -80958.55  39353.62
[3,] 36086.48  61432.95  84080.42  -45267.41  27469.81
[4,] 106689.85  80958.55  45267.41  365433.76  72913.03
[5,] 32681.41  39353.62  27469.81  72913.03  41059.77
> 13*t(sample.mean) %*% solve(var(tras.data)) %*% sample.mean

[,1]
[1,] 14.21143
> (8/(12*5))*14.21143

[1] 1.894857
> 1-pf(1.894857, 5, 8)

[1] 0.2010153

p=5, v=12

\[ T^2 = n(\bar{X})S^{-1}(\bar{X}) = 14.21143 \]
\[
\frac{v-p+1}{vp} T_p^2, v = 1.894857, \text{ the corresponding } p\text{-value}=0.2010153>.05, \text{ we fail to reject } H_0. \\
\text{There is insufficient evidence to show that at least one difference of Degrees Completed is not equal to 0.}
\]

MANOVA

The GLM Procedure
Repeated Measures Analysis of Variance

<table>
<thead>
<tr>
<th>Repeated Measures Level Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variable</td>
</tr>
<tr>
<td>Level of time</td>
</tr>
</tbody>
</table>

MANOVA Test Criteria and Exact F Statistics for the Hypothesis of no time Effect
H = Type III SSCP Matrix for time
E = Error SSCP Matrix

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Value</th>
<th>F Value</th>
<th>Num DF</th>
<th>Den DF</th>
<th>Pr &gt; F</th>
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</thead>
<tbody>
<tr>
<td>Wilks' Lambda</td>
<td>0.45781548</td>
<td>1.89</td>
<td>5</td>
<td>8</td>
<td>0.2010</td>
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<tr>
<td>Pillai’s Trace</td>
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<td>Hotelling-Lawley Trace</td>
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<td>1.89</td>
<td>5</td>
<td>8</td>
<td>0.2010</td>
</tr>
</tbody>
</table>
Table VA:

At-Risk Degrees Completed (within six years)

All Public Universities in Ohio

2009-2014

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
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<tbody>
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<td>1678</td>
<td>1965</td>
<td>1924</td>
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<td>BGSU</td>
<td>1949</td>
<td>1884</td>
<td>1796</td>
<td>1772</td>
<td>1860</td>
<td>2077</td>
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<tr>
<td>CINC</td>
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<td>2475</td>
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<td>211</td>
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<td>2806</td>
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<td>2300</td>
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<td>2914</td>
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<td>OHSU</td>
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<td>SHAW</td>
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<td>257</td>
<td>269</td>
<td>246</td>
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<td>330</td>
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<td>TLDO</td>
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<td>1523</td>
<td>1918</td>
<td>1950</td>
<td>1988</td>
<td>2153</td>
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<tr>
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<td>1515</td>
<td>1518</td>
<td>1846</td>
<td>1751</td>
<td>1659</td>
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<td>YNGS</td>
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<td>1053</td>
<td>1053</td>
<td>1091</td>
<td>1141</td>
<td>1219</td>
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<td>28026</td>
<td>30240</td>
<td>30264</td>
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<tr>
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<td>3578</td>
<td>4004</td>
<td>4320</td>
<td>4323</td>
<td>4733</td>
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</tbody>
</table>

At-risk Degrees Completed

Hotelling’s T-squared Test for At-risk Degrees Completed

Ho: $\mu_1 - \mu_2 = \mu_2 - \mu_3 = \mu_3 - \mu_4 = \mu_4 - \mu_5 = \mu_5 - \mu_6 = 0$

Ha: at least one difference of At-risk Degrees Completed is not equal to 0.

```r
> attach(degreerisk)
> degreerisk=cbind(V1,V2,V3,V4,V5,V6)
> sample.mean=apply(degreerisk,2,mean)
> sample.mean
     V1       V2       V3       V4       V5       V6
1854.692 1926.692 2155.846 2326.154 2328.000 2548.769
> contrast=cbind(c(1,0,0,0,0),c(-1,1,0,0,0),c(0,-1,1,0,0),c(0,0,-1,1,0),c(0,0,0,-1,1),c(0,0,0,0,-1))
> tras.data=contrast%*%t(degreerisk)
> tras.data
[1,] 1854.692 1926.692 2155.846 2326.154 2328.000 2548.769
```

130
 tras.data=degreerisk%*%t(contrast)
 tras.data
[3,]  41  24 -336 -163 -34 -390  34 -276 -739  23 -32 -328 -
[4,] -159 -88 -110  14  7 -192  18 1063 -519 -65 -38  95 -

> sample.mean=apply(tras.data,2,mean)
> sample.mean
> var(tras.data)
[1,] 19480.33 27490.92 11340.17 35372.08 30233.33
[2,] 27490.92 70845.64 33675.70 29466.56 59672.54
[3,] 11340.17 33675.70 54329.23 13152.30 25514.91
[4,] 35372.08 29466.56 13152.30 124919.81 43287.87
[5,] 30233.33 59672.54 25514.91 43287.87 68335.36
> 13*t(sample.mean)%*%solve(var(tras.data))%*%sample.mean
[,1]
[1,] 13.26115
> (8/(12*5))*13.26115
[1] 1.768153
> 1-pf(1.768153,5,8)
[1] 0.225598

p=5, v=12

\[ T^2 = n(\bar{X})'S^{-1}(\bar{X}) = 13.26115 \]

\[ \frac{v-p+1}{v} T^2_{p,v} = 1.768153, \text{ the corresponding p-value}=0.225598>.05, \text{ we fail to reject Ho.} \]

There is insufficient evidence to show that at least one difference of At-risk Degrees Completed is not equal to 0.
The GLM Procedure
Repeated Measures Analysis of Variance

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Y1</th>
<th>Y2</th>
<th>Y3</th>
<th>Y4</th>
<th>Y5</th>
<th>Y6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of time</td>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
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</table>

MANOVA Test Criteria and Exact F Statistics for the Hypothesis of no time Effect
H = Type III SSCP Matrix for time
E = Error SSCP Matrix
S=1 M=1.5 N=3

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Value</th>
<th>F Value</th>
<th>Num DF</th>
<th>Den DF</th>
<th>Pr &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wilks' Lambda</td>
<td>0.47503771</td>
<td>1.77</td>
<td>5</td>
<td>8</td>
<td>0.2256</td>
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<tr>
<td>Pillai's Trace</td>
<td>0.52496229</td>
<td>1.77</td>
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<td>0.2256</td>
</tr>
<tr>
<td>Hotelling-Lawley Trace</td>
<td>1.10509603</td>
<td>1.77</td>
<td>5</td>
<td>8</td>
<td>0.2256</td>
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<tr>
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<td>1.10509603</td>
<td>1.77</td>
<td>5</td>
<td>8</td>
<td>0.2256</td>
</tr>
</tbody>
</table>

End of Data

September 12, 2016