STATE APPROPRIATIONS AND ALLOCATION RATIOS TO PREDICT

FINANCIAL CONDITION AT PUBLIC HIGHER

EDUCATION INSTITUTIONS

by

Cassandra Bennett

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration

Liberty University

August 2018

Abstract

The higher education industry has faced increased competition in recent years from new institutions and learning platforms entering the marketplace. Public higher education institutions, in particular, have been forced to develop strategic plans due to limited state funding in recent years. These colleges and universities face the challenge of allocating their limited financial resources in a manner that will optimize financial strength and ensure long-term sustainability. Institutions classify their operating expenses into several different functional expense categories, including instruction, academic support, student services and operations and maintenance of plant. This paper analyzed the relationship between changes in state appropriations, allocation ratios of functional expenses, and an institution's financial condition. Bivariate and multiple regression analysis was performed to determine how fluctuations in state appropriations and financial allocation ratios impact an institution's financial condition. The research could aide higher education institutions in strategically allocating resources to improve their financial position. God has called us all to live in community and flourish. Higher education institutions promote community among students, faculty, and staff as well as provide knowledge and skills for individuals to flourish upon graduation.

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Dedication

This dissertation is dedicated to my family for their countless acts of support that enabled me to accomplish this dream.

To my parents, Tom and Francine, for all the love, support, and encouragement you have given throughout my life and the sacrifices you have made toward my educational goals, including my doctoral degree.

Thank you to my mother-in-law, Bonnie, and father-in-law, Jack, for not only welcoming me into the family, but assisting on my doctoral journey.

To my children, Paige, Piper, Jaxon, Colsen, and Preslee, may you fully understand that the sacrifices made throughout my doctoral pursuit were done out of the abundant love I have for all of you. I hope despite any obstacles or challenges you may face, you always chase your dreams.

My loving husband, Jeff, I cannot put into words how instrumental you were to this achievement. You stepped in and took on more than your fair share of responsibilities to allow me to pursue my degree. But more than anything, your inspiration and encouragement along the way spurred me to finish. You are my best friend, my partner, my love.

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Section 1: Foundation of the Study

The strategic allocation of financial resources is important in any industry; however, it has become an essential part of higher education as colleges and universities vie for students. Faced with limited state funding, Public State Systems of Higher Education are struggling to survive making effective investment decisions necessary. It is important to understand the relationship between state funding levels and the allocation of financial resources as well as their impact on an institution's financial condition. Insight into these relationships is critical to the survival of public higher education institutions.

Background of the Problem

State Systems of Higher Education Institutions across the United States have experienced a budget crisis over the past decade (Klein, 2015). The decline in the number of high school graduates in recent years coupled with minimal increases in state funding are main contributing factors. According to the December 2016 Western Interstate Commission for Higher Education (WICHE) report, the number of high school graduates in the United States is expected to be lower between 2013 and 2023 than the record high of 3.47 million in 2013 (Bransberger & Michelau, 2016). In the past few decades, state governments across the United States have considerably reduced funding of public higher education institutions (Klein). In fact, currently the amount of state funding per student for public higher education is less than it was in 1980 (Klein). According to Sav (2016), state appropriations as a percentage of total public college and university revenue declined from 32% in 2004 to 23% in 2013. Many state systems have been forced to compensate for the shrinking state appropriations through increased tuition costs for students, reduction in financial aid and a decline in faculty salaries (Weerts, 2014). For example, the State University System of Florida raised tuition by 32% from 2009-2011, while Minnesota

State Colleges and Universities System eliminated financial aid grants to approximately 9,400 students (Altundemir, 2012). The North Carolina State University eliminated 187 full-time equivalent positions during the 2014 academic year (Mitchell, Palacios, & Leachman, 2014). Many state systems have implemented similar initiatives to counteract the reduction in state funding. The sustainability of public higher education systems has become questionable and many of them are seeking guidance to develop strategic plans for long-term viability.

To offset the decrease in state appropriations, some public higher education institutions have focused on increasing tuition revenue. As state appropriations per full-time equivalent (FTE) fell in 48 of the 50 states by 23%, net tuition revenue per FTE rose by 19% (Li). Total net-tuition revenue rose from $35 billion in 2003–2004 to $56 billion in 2011-2012 across all public colleges and universities throughout the United States (Jaquette & Curs, 2015). Although, increases in tuition may help to balance the budget in the short-run, it is not a viable option in the long-run. These public colleges and universities must serve several stakeholders, such as students, employees, the state and taxpayers (Li). Approximately 75% of all students in the United States attend a public higher education institution (Hunter, 2013). High tuition rates contradict the purpose of public education – to provide affordable education to its citizens (Guzmán-Valenzuela, 2016). Increases in tuition also attempts to remove these institutions from the public realm in which they operate transforming them into private operations (Lebeau et al., 2012). Therefore, public institutions are limited in the maximum tuition and fees they can charge to students. Public institutions must learn how to balance quality education with minimal tuition increases.

Colleges and universities face the challenge of allocating limited financial resources in a manner that will optimize profitability and improve sustainability. The decline in state

appropriations may affect how these institutions allocate financial resources to specific functional categories. Institutions classify operating expenses into several different functional categories "according to the purpose for which the costs are incurred" (Phillips & Olson, 2015, p. 119). These categories help donors, creditors, and users of the financial statements grasp the different goals and activities of an institution and their role in its overall mission (Phillips & Olson). Examples of functional areas include instruction, academic support, student services and operations and maintenance of plant. This study analyzed the financial statements of each four-year institution within a public higher education system in the South Atlantic region of the United States to identify the impact of changes in state appropriations levels and financial allocation ratios of functional expenses on financial condition of the institution.

This study expanded upon the work done by Linda Marie Kempton in 1996. Kempton's study analyzed whether allocation ratios could be used as predictors of financial condition in Michigan K-12 school districts. The studies are similar because the Michigan school districts are also governmental agencies which rely on state funding. This study used similar terminology, methodology and analysis as the Kempton study; however, the population was different. The population shifts to institutions within a higher education state system in the South Atlantic region of the United States. Another difference is the Kempton study did not analyze the relationship between the percentage change in state appropriations and financial condition, rather it only focused on the correlation between allocation ratios and financial condition.

Problem Statement

The problem addressed was the lack of a defined methodology in the allocation of financial resources among State Systems of Higher Education institutions given a decline in state appropriations per student resulting in financial distress. Public institutions face two main

challenges: decline in state appropriations and limits on tuition increases. The most drastic

decline in state support for higher education occurred in the past decade from 2007 to 2012,

following the Great Recession (Li, 2017). In fact, from 2004 to 2013, state appropriations as a

percentage of total revenue fell from 32% to 23% (Sav, 2016). Public institutions were designed

to be assessable to its citizens (Guzman-Valenzuela, 2015); therefore, raising tuition rates

undermines the primary purpose of state system institutions.

Tasked with providing education to its citizens with limited state support and minimal

tuition increases, public institutions have been faced with critical decisions. Some institutions

are considering or have already begun implementing changes, including "academic

reorganization (closing departments or entire campuses), curtailing student enrollment, layoffs,

greater teaching workloads, and position eliminations" (Altundemir, 2012, p. 193). For instance,

faculty at Minnesota State Universities agreed to a pay freeze during the 2009 academic year

(Severns, 2012), the University of Florida cut 261 positions for full-time tenure and tenure-track

faculty from 2007 to 2011 (Mitchell et al., 2014), and the University of Idaho has imposed

furlough days on 2,600 state-wide employees (Altundemir). It is essential for public higher

education systems to develop a methodology for allocating resources to ensure their survival.

Purpose Statement

The purpose of this quantitative correlational study analyzed (a) whether fluctuations in

state appropriations affect an institution's financial condition and (b) whether the allocation

ratios can be used to predict the financial condition of an institution. Understanding the

relationship between state appropriations, allocation ratios and financial condition can provide

valuable information to government officials as well as institutional leaders. Reflecting on how

state appropriations ultimately affects an institutions financial condition will assist government

officials in deciding how to allocate state funds. In addition, the data can provide invaluable

information to administrators of public institutions to develop budgets that reflect efficient and

effective resource allocation. Budgets explain how resources are allocated to optimally meet an

institution's goals and objectives (Palmer, 2014). The functional areas of an institution, such as

instruction, academic support, student services and operations and maintenance of plant, reflect

the purpose of the expenses and activities in which the college or university invests.

Understanding the degree to which these functional areas contribute to an institution's financial

health could be the key to long-term survival. State Systems of Higher Education can utilize this

information in strategic planning models to develop efficient and effective methods for allocating

resources to ensure institutional sustainability.

Nature of the Study

A quantitative correlational study was conducted and was considered appropriate given

the research included historical financial data from institutions within a state higher education

system in the South Atlantic region of the United States. Quantitative research uses numbers and

closed-ended questions to analyze relationships among the data (Creswell, 2014). The audited

financial statements of each four-year institution in a state system in the South Atlantic region of

the United States for academic years 2008 through 2017 was obtained through the state system

website. State appropriations, unrestricted net assets, and functional expense amounts for each

year were summarized in an Excel spreadsheet. Creswell and Poth (2018) describe qualitative

research as an interpretive practice which transforms the world through the use of interviews,

recordings, photographs and observations. Human perception and understanding are the

underlying drivers of qualitative research (Stake, 2010). A qualitative study was not appropriate

for this study since the primary focus was objective data rather than personal feelings or experiences.

Correlational design was chosen since the purpose of the study was to discover whether changes in state appropriations and allocation ratios can predict financial condition. The research analyzed the relationships among the percentage changes in state appropriations, allocation ratios of functional expense categories and the financial condition of these Public State System Institutions. Frequency counts, percentages, chi-squares, t tests, ANOVAs, Mann-Whitney U-test, Wilcoxon signed ranks test and regression analysis are all tools which can be used to perform a quantitative study (Pionsky & Gass, 2011). Multiple regression is most appropriate for a correlational design since it can be used to evaluate whether certain independent variables can predict a dependent variable.

Regression analysis is a statistical tool used to analyze the relationship between a dependent variable and one or more independent variables (Ragsdale, 2015). The goal is to identify a function to describe the relationship among variables which can be used to predict the value of the dependent variable given specific values of the independent variables (Ragsdale, 2015). Multiple linear regression analysis was appropriate for this study given the purpose was to determine whether changes in state appropriation levels can predict financial condition and further investigate whether allocation ratios can also be used to predict financial condition. Once the multiple regression models were completed, the data were analyzed to identify if any patterns exist.

Research Question

This study further investigated the research performed by Kempton (1996), by expanding the population to public higher education institutions. It also expanded the study to include

changes in state appropriation levels. The research analyzed the data to determine whether there was a correlation between the independent variables (percentage change in state appropriations and the financial allocation ratios of functional expense categories) and the dependent variable (financial condition of an institution). If it is determined that the amount of state appropriations and financial allocation ratios can help to predict financial condition, policy makers can incorporate this information into state funding decisions. In addition, administrative personnel at public higher education institutions can apply the findings to the planning and budgeting processes. The research questions were as follows:

1. Is there a correlation between the percentage change in state appropriations of an institution and its financial condition?

2. Is there a correlation between the allocation ratios of an institution, individually or in combination, and its financial condition?

The state appropriation level for each institution was evaluated using the percentage change from the prior year. This was calculated by taking the difference in state appropriations from the current year less the prior year and dividing that amount by the prior year state appropriations.

The allocation ratios in the study were computed by dividing a functional expenditure category by Total Operating Expenditures (TOE) to form a percentage of TOE (Kempton, 1996). The allocation ratios were as follows:

Instruction/TOE

Research/TOE

Public Service/TOE

Academic Support/TOE

Student Services/TOE

General Institutional Support/TOE

Operations and Maintenance of Plant/TOE

Student Financial Aid/TOE

Auxiliary Enterprises/TOE

Depreciation/TOE

Other/TOE

For purpose of this study, the financial condition of an institution was measured by the percentage of unrestricted net assets maintained (Kempton, 1996) which is the accumulated amount of excess revenues over expenditures in a governmental fund (Kelly, 2013). The unrestricted net asset balance is often used as an indicator of financial condition by potential creditors, financial analysts, and state agencies (Kelly).

Financial   =   <u>unrestricted net assets</u>   x   100

Condition   TOE

Percentage

Based on the definition of financial condition noted above, institutions with larger financial condition ratios have a higher percentage of unrestricted net asset balance and will have the ability to finance its operations through its savings (Kelly, 2013). Institutions with higher financial condition percentages indicate stronger financial position.

Hypotheses (Quantitative Only)

The following hypotheses generated the problems inherent in the study and were tested empirically:

$H1_0$: There are no statistically significant associations among changes in state appropriations and financial condition.

$H2_0$: There are no statistically significant associations among allocation ratios of functional expenses and financial condition.

Theoretical Framework

The allocation of financial resources in public higher education is a current issue in the education realm due to a decline in state funding per student over the past few decades. There are two theories which can be applied to research in this area: agency theory and resource dependency theory.

Agency theory. Public institutions of higher education receive funding by their respective state to provide quality education at lower tuition rates to its students. This creates a principal and agent relationship between the state and education institution. Agency theory refers to the contract between the principals and agents where agents perform duties on the principal's behalf (Bendickson, Muldoon, Liguori, & Davis, 2016).

The states partially fund public higher education institutions through state appropriations to provide its citizens the opportunity to receive an education. These institutions are working on behalf of the states to deliver quality education to its students at lower tuition costs than private institutions. Agency theory suggests that given the fact that interests of the institutions may not align with its state's interests, public institutions may experience conflicts of interests (Bryant & Davis, 2012). During these tumultuous times for public higher education institutions, increasing tuition costs may be inevitable due to the decrease in state appropriations per student. This contradicts the interests of the state to provide education at a low price; however, if the states do not invest in the institutions, the principal agency relationship begins to diminish.

This study analyzed the effects of state funding on public higher education institutions. Agency theory can help to explain the administrative decisions public colleges and universities make to promote sustainability yet satisfy all its stakeholders.

Resource Dependency Theory. Colleges and universities across the United States are operating in an unstable environment, particularly, public higher education institutions which are affected by "increased accountability and assessment measures, declining state budgets, and diminutive endowments" (Powell & Rey, 2015, p. 94). To attract and retain students, these institutions need to provide quality faculty, an array of academic programs and attractive learning environments. Investing in these areas can be challenging given an institution's limited resources. The resource dependency theory describes behavioral implications throughout organizational processes resulting from scarce resources.

Public higher education institutions rely on various sources of income to survive. Two major financial sources are state appropriations and student tuition. The dependency on these stakeholders can influence an institution's strategic plan (Länsiluoto, Järvenpää, & Krumwiede, 2013). According to Powell and Rey (2015), there are three key elements to the resource dependency theory which can be applied to public higher education: (a) environmental factors which impact an organization, (b) an organization's strategic plan for environmental constraints, and (c) how environmental constraints affect an organization's internal structure and dynamics.

This study applied the resource dependency theory to help explain the functional areas in which a public higher education institution invests given the amount of state appropriations received. The level of funding an institution receives can influence the behavior of administrators and which areas they choose to allocate funds. The allocation ratios of an institution may further impact its bottom line and overall financial condition.

Definition of Terms

The following terms were defined in this study:

Financial Condition: Financial condition generally refers to a governmental agency's ability to perform services and continue operations by meeting current and future obligations (Maher & Deller, 2013). For purposes of this study, financial condition was measured by dividing an institution's unrestricted net asset balance by total operating expenditures.

Functional Expenses: Functional expenses describes costs that an institution incurs which can be categorized by their purpose (Phillips & Olson, 2015). Examples of functional areas include instruction, academic support, student services and operations and maintenance of plant.

Human capital: Human capital is an intangible asset which refers to an organization's employees and the value and competitive advantage they provide to the employer (Khasawneh, 2011).

Public institutions: Public institutions refer to state-owned universities and colleges which are funded and regulated by the state (Guzmán-Valenzuela, 2016).

State appropriations: State appropriations are state funds used to subsidize the cost of higher education for students of the respective state (Toutkoushian & Shafiq, 2010).

Total Operating Expenditures: Includes all major expenditure categories of the general fund budget of a governmental unit.

Assumptions, Limitations, and Delimitations

Assumptions. For the purpose of this study, the following assumptions were made:

1. It was assumed that financial statement information collected was accurate.

2. It was assumed that the operating expenses of the institutions were properly classified into the respective functional areas.

Limitations. The following limitations were imposed in conducting this study:

1. Collecting published budgets and financial statements from state universities systems may have been challenging as there was not a single repository which housed this information.

2. The process of allocation of state funds to higher education varied among states which could have affected the results of the study.

3. The study focused on solely on how state appropriations affects financial condition; however, other revenue sources may influence financial condition, such as tuition revenue and grants.

4. The study analyzed the relationship between functional expense allocation ratios and financial condition; however, there were several factors which may contribute to financial condition which were excluded from the study, such as tuition cost, location, programs offered and degree offerings.

Delimitations. The study focused solely on state university systems across the United States; therefore, private institutions were excluded. It was limited to data analysis over a 10-year period and included all four-year institutions from one state system. The remaining state systems were excluded from the study and years outside the scope of the study were ignored.

Furthermore, the areas of allocation of financial resources were limited to the functional expense categories listed in the notes to the financial statements of the selected institutions. Other factors may indicate financial condition of an institution; however, they were excluded from this study.

Significance of the Study

The research performed in this study can provide state system colleges and universities with strategies for allocating funds to the functional areas with the greatest benefit to enable them to survive the tumultuous times of the higher education industry. Consequently, the results may provide these institutions with the competitive advantage they need to provide a quality education at an affordable price.

Reduction of Gaps. Although there is research which describes investment decisions and their impact on enrollment and profitability at higher education institutions, a compilation of information from historical data and trends which dissects this information specific to public state higher education institutions is not currently available. Currently there are no predictors of financial condition identified for these institutions. The research could provide opportunities for colleges and universities to implement resource allocation techniques to ensure the sustainability of the institution. It is anticipated that the research will provide a forum which institutions can consult when determining how to allocate their limited financial resources.

Implications for Biblical Integration. God has called us all to live in community with one another. "It is not good for the man to be alone" (Genesis 2:18). Despite our ability to live independently, it was God's intention for us to be called to community with one another (Van Duzer, 2010). Higher education institutions provide students with not only a quality education, but the experience to share their lives with other fellow students, faculty and administrators. Discovering ways to preserve these institutions will allow us to uphold the community God intended.

God also wants humans to flourish and prosper during their time on earth. In fact, He sent His only son for that purpose. "I came that they may have life, and have it abundantly"

(John 10:10). Human flourishing focuses on the well-being of both the individual and the community including economic, psycho-social, spiritual and physical aspects. Higher education provides individuals with the knowledge and skills necessary to flourish and better themselves, financially, emotionally and mentally. It also enables these individuals to share their knowledge and develop new ideas and products for the betterment of society. Assisting higher education institutions with the strategic allocation of resources enhances their ability to provide quality education to their students to promote human flourishing.

Relationship to Field of Study. The field of accounting covers a wide range of responsibilities and areas of focus. The concept of strategic allocation of financial resources and strategic thinking is important in the accounting profession. Accountants must be aware that an institution's financial resources are finite; therefore, careful consideration must be given in allocating these resources for the institution to be successful. Developing budgets which assist higher education institutions in the allocation of resources is a key responsibility of accountants. It is important for these professionals to understand the relationships between state funding, resource allocation and its impact on financial condition to assist in developing strategies which assures an institution's longevity.

A Review of the Professional and Academic Literature

Today's global environment has created fierce competition among many industries, including higher education. The United States higher education system has enabled its citizens to better themselves in society by obtaining the knowledge and skills to develop products and services (Powell & Rey, 2015). Although an education can provide students with abundant opportunities, many higher education institutions struggle to remain financially stable (Woodhouse, 2015). Tuition costs, online learning platforms, lower unemployment rates, and a

decreasing number of high school graduates have threatened the survival of some of the brick and mortar institutions (Farber, 2016). Colleges and universities must identify ways to attract and retain students with limited financial resources. Public State System Institutions, in particular, face intense financial struggles due to the recent decline in state funding for higher education. Operating with finite financial resources makes it crucial for these institutions to allocate their funds efficiently and effectively to remain profitable and ensure their future success. Institutions should develop a strategic plan to define their direction for the future with careful consideration of how to optimally allocate their resources.

Public Colleges and Universities

Higher education in the United States has served various purposes throughout history, including promoting Christian civilization, progressing the nation, fostering research and expanding the global economy (Ford, 2017). Education can provide the nation with a competitive advantage by creating a highly skilled workforce. By educating its citizens, the nation can progress forward and provide innovative products and services in the global marketplace. Knowledge can assist individuals in their profession while also advancing society through the multiplier effect of knowledge and skill sharing in the workplace (Guzmán-Valenzuela, 2016).

College and universities fall into two basic categories: public or private. Public higher education institutions are primarily funded by state appropriations and are regulated by the state while private colleges and universities are funded by various revenue streams, such as tuition revenue, endowments, and grants. The state essentially owns public colleges and universities as they operate according to state policies and regulations (Guzmán-Valenzuela, 2016). Public

institutions were established to provide equal opportunity to all students to receive an education, regardless of background or income level (Bastedo & Gumport, 2003).

Although state higher education systems were designed to educate students, economic incentives were also considered (Calhoun & Kamerschen, 2010). The states anticipate a return on their investment in education by retaining their local residents. Tuition costs are differentiated between in-state and out-of-state students with in-state students paying lower tuition rates. The reason state governance allows for lower in-state tuition costs are due to the assumption that these students will stay in-state upon graduation and help generate future tax income for the state (Calhoun & Kamerschen). If the state can educate and develop a higher-earning workforce, it will benefit from an increase in tax revenue (Calhoun & Kamerschen).

According to the Integrated Postsecondary Education Data System (IPEDS), in 2016 there were 1,981 public higher education institutions in the United States which included 254 less-than two-year institutions, 986 two-year institutions and 741 four-year or above institutions. These colleges and universities provide education to its citizens through the funding and regulation of state governance. Government funding, referred to as state appropriations, is believed to be an integral component of the budget for public colleges and universities.

State appropriations. States may choose to fund higher education through several methods. State governments often subsidize the cost of tuition at a select set of colleges and universities through state appropriations (Toutkoushian & Shafiq, 2010). These subsidies are intended to develop and educate the workforce and expand human capital stock within the state (Dunn, 2015). States invest in higher education under the assumption that upon graduation, college graduates will reside in their home state (Toutkoushian & Shafiq). Graduates are expected to enter the workforce and boost the state's economy through income taxes paid on

wages and sales tax on purchases. However, if the state does not continue to provide financial support to its public institutions, the theoretical framework upon which these institutions were built may crumble. Public institutions will begin to take on the characteristics and closely resemble private institutions.

State funding for colleges and universities over the past thirty years has not matched the drastically rising costs to educate students (Weerts & Ronca, 2012). Including adjustments for inflation, state appropriations for higher education have decreased by 40% since 1978 (Weerts & Ronca, 2006). For example, "total state appropriations across all public baccalaureate granting institutions declined from $54.5 billion in 2001–2002 to $45 billion by 2011–2012" (Jaquette & Curs, 2015, p. 536). If states do not continue to invest financial resources into higher education, they may no longer receive the economic benefits they seek.

When states choose to fund public institutions in the form of state appropriations, they intend for those funds to be used to offset the tuition charged to in-state students (Toutkoushian & Shafiq, 2010). States utilize low tuition rates for its residents to provide incentive for those students to reside in their home state beyond graduation. However, when state appropriations decline and are no longer the primary source of funding, public institutions must find other alternatives. The easiest and most popular way to offset a decline in state funding is by increasing net-tuition revenue. One way to increase net-tuition revenue is to boost out-of-state enrollment because these students pay higher tuition rates. Therefore, a decline in state funding forces public higher education institutions to expand nonresident enrollment which contradicts the state's objective (Jaquette & Curs, 2015).

With a decrease in state funding and pressure from taxpayers to maintain reasonable tuition rates, state systems are forced to operate with limited financial resources (Li, 2017).

Identifying where to strategically allocate funds is a critical part of the sustainability of Public

State System Institutions. The operating expenses of public institutions are classified into

functional expenditure categories, which are characterized based on the purpose of the expense.

Identifying the allocation ratios among functional expense categories which predict financial

condition could improve the current economic state of public financial institutions.

Functional Expenditures

There are several ways in which public higher education institutions may choose to

strategically allocate their financial resources. This study analyzes the allocation ratios based on

functional expense categories. The Governmental Accounting Standards Board (GASB)

develops standards and provides guidelines for financial reporting for all state and local

government entities. GASB 34 (GASB, para. 41) requires government entities to report all

expenses by function in its statement of activities. At a minimum, governmental entities are

required to report all direct expenses, which relate to a particular service, program or department,

by function (GASB, para. 41). The standards are intended to demonstrate government's

accountability to the public by providing fund allocations (Voorhees & Kravchuk, 2002).

Guidance for the classification of functional expenses for public higher education

institutions is provided in the Financial Accounting and Reporting Manual (FARM) for Higher

Education published by the National Association of College and University Business Officers

(NACUBO). There are 11 major categories of functional expenses which include: instruction,

research, public service, academic support, student services, general institutional support,

operations and maintenance of plant, student financial aid, auxiliary enterprises, depreciation and

other. Institutions may choose to allocate resources differently among each of the functional

expense categories. Identifying the optimal resource allocation ratios which promote financial stability could assist in the budgeting process.

Instruction. The primary objective of a higher education institution is to educate its students. Instruction is one of the functional expense categories an institution may choose to invest. The instruction category includes activities related to an institution's academic, vocational, community education, remedial and tutorial instruction (FARM, para. 342.11). The cost of departmental research and public service are also represented in this category (FARM, para. 342.11). A major component of the instruction category relates to faculty salaries and benefits.

Faculty. Colleges and universities operate in the service industry which makes their employees a major asset. The theory of human capital recognizes employees as a valuable resource which if invested in can yield returns in the future (Nafukho, 2009). Faculty play a vital role in the success of colleges and universities because they are tasked with imparting their knowledge to students through lectures, reading and writing assignments, laboratory sessions and examinations (Mintrom, 2008). Their interactions with students can influence the overall campus environment. Although human capital can be a valuable asset to an organization, it is a risky investment because of the possibility of employee turnover. Colleges and universities must weigh the costs and benefits of human capital to decide whether investing additional resources in their employees is the right decision.

Deciding whether to allocate financial resources into attracting and retaining employees can be challenging. Faculty of colleges and universities contribute to the overall collegiate experience because they have direct contact with the students. The collective knowledge, skills and abilities of these employees is a critical component of student enrollment and thus it is

important for institutions to measure this value and its contribution to the bottom line (Mello, 2015). Because human capital can provide higher education institutions with a competitive advantage, they "now need strategies and initiatives that will bring improvements through their greatest asset" (Broadhurst, 2012, p. 27). Most colleges and universities attempt to align faculty needs based on the mission of the institution (Zhang, Yu, Yang, & Du, 2014). College and university administrators are constantly struggling to have the appropriate faculty in the right place at the right time (Khasawneh, 2011). To avoid talent deficits, colleges and universities should improve forecasting efforts of future talent needs using human capital planning (Khasawneh). Without the proper forecasting, universities can suffer the consequences of being overstaffed or understaffed and losing the talent necessary for a competitive advantage (Khasawneh). Providing quality educators that enhance the classroom experience can help satisfy student needs and contribute to the success of the institution. Public institutions can maintain quality faculty by attracting talented educators and expanding retention efforts of superior faculty members. These areas of investment can provide a valuable return by enhancing an institution's learning experience and increasing the overall quality of education it provides.

Attracting. Hiring quality individuals is essential to the sustainability of any organization. Higher education institutions are no exception. Faculty are of elevated importance in the knowledge-intensive education field where human and intellectual capital can provide an institution with a competitive advantage (Finch, Deephouse, O'reilly, Massie, & Hillenbrand, 2016). Attracting talented faculty members can further develop an institution in many ways, including enhancing the quality of the institution, attracting students and increasing overall productivity of the faculty community (Hunt, Eaton, & Reinstein, 2009).

Colleges and universities must plan recruitment efforts effectively by considering the factors which influence a prospective faculty's decision (Hunt et al., 2009). One of the main tools used to attract employees is a competitive salary and benefits package. Over the past several years, the gap between average faculty salaries at public and private institutions has grown (Rippner & Toutkoushian, 2015). Public institution's average faculty salaries are considerably less than their private counterparts. It is important for public institutions to recognize this disparity when competing for talented faculty. Compensation is a contributing factor for attracting and retaining quality employees (Rippner & Toutkoushian); therefore, public colleges and universities must decide whether to invest their financial resources in attracting these individuals.

Retaining. Approximately 10,000 baby boomers turn 65 everyday, which has left many fields of study struggling to find qualified workers to replace them (Lynch, Barrere, O'Connor, Karosas, & Lange, 2017). There are many disciplines within higher education that are struggling to replace a large number of retiring faculty, particularly in the professional schools where workers can earn higher wages practicing in their profession (Lynch et al.). Retaining quality faculty is important to a higher education institution's success. Finding individuals with terminal degrees who can research and teach can be a daunting task. Colleges and universities must realize the value of their faculty and find ways to retain talented educators.

Ensuring new faculty are acclimated to the institutional environment is an important component of faculty retention. Mentoring programs to assist new faculty members make this adjustment can require abundant resources; therefore, it is important to invest in mentoring programs that successfully assimilate new and inexperienced faculty (Lynch et al., 2017).

Research. The research functional expense category consists of the expenses of producing research whether funded by an institution or external agency (FARM, para. 342.12). Because research-based knowledge is identified as a crucial component of economic progress, many colleges and universities are placing greater emphasis on their research activities (Mintrom, 2008). Publicly-funded higher education institutions have a responsibility to the public to provide access for all students while maintaining an excellent curriculum and contributing valuable research (Weerts, 2017). Despite the necessity of research, state funding for public research universities has decreased by an average of 34% over the past ten years (Weerts).

Research plays an integral part of society by expanding the current knowledge base. It promotes innovation and drives productivity forward. Public research institutions have made astonishing contributions to the healthcare and technology fields and enhanced the standard of living for Americans (Weerts, 2017). Increasing research productivity among colleges and universities can provide direct benefits to faculty members, departments and the entire institution (McGill & Settle, 2012). Research has indicated that scholarly excellence can have a positive impact on an institution's reputation which can enable these colleges and universities to attract high-quality students and increase their ability to obtain external funding (McGill & Settle). Instructors are tasked with conveying knowledge to their students; therefore, it is important for these individuals to stay abreast of developments in their respective field of study. Performing research and producing scholarly works allows faculty members to maintain expert knowledge and communicate this information in their classrooms.

Institutions may choose to invest resources into research support. Research support can take on several aspects, including time needed to produce scholarship, monetary funding to

pursue research, and assistance and training necessary to produce quality scholarship (McGill &

Settle, 2012). Universities that consider research a critical component of its mission, carefully

select employees based on their research capabilities and often offer incentives (such as

monetary awards or release time) to staff members who generate scholarly works (Mintrom,

2008). Faculty are often evaluated for tenure status on the basis of their teaching skills, research

productivity and service to the institution and community (Sanford & Kinch, 2016).

      Public Service. Public service encompasses non-instructional aspects of the institution

and provides benefits to parties outside of the institution (FARM, para. 342.13). This category

includes community service activities, not including instructional programs (FARM, para.

342.13). Public service has been revered as a core principle of higher education, alongside

teaching and research (Lee, 2017). It is important for higher education institutions to improve

the surrounding community in which they operate through various forms of public service.

Colleges and universities have received recognition not only for their teaching and research

accomplishments, but their service as well (Harris, 2008). Higher accountability standards have

led higher education institutions to focus on demonstrating the tangible benefit they provide to

their community (Harris). Colleges and universities are not only responsible for preparing

students for employment and research, but also to contribute to society through public service

(Ford, 2017).

      Public service includes providing resources and support to human service organizations,

hospitals and other non-profit organizations (Harris, 2008). The goal of public service is to make

a difference in the surrounding communities by developing a combination of knowledge, skills

and values (Harris). Community service, cooperative extension service, public broadcasting

service and public service informational technology are all elements of the public service

function (FARM, para. 342.13). When higher education institutions invest in these areas, it not only benefits the community, but enhances the purpose of the institution by increasing student and faculty engagement (Harris).

Academic Support. Academic support is a broad category that includes expenses which support the institution's overall missions: instruction, research and public service (FARM, para. 342.14). This function can be broken down into the following subcategories: libraries, museums and galleries, educational media services, academic support informational technology, ancillary support, academic administration, academic professional development and course and curriculum development. The library and informational technology provides a platform for students to further their education. Faculty professional development and course and curriculum development are also major components of the academic support function.

Library. Libraries provide a vast array of knowledge and information and provide a hub for research. Higher education libraries have taken on the role of information, communication and education centers (Mihaljevic, 2015). With the development of the internet and advancement in technology, most academic libraries have hybrid features. College libraries now include "licensed digital collections such as CD-ROMS, DVD, or locally loaded databases obtained from external sources" (Kibirige & DePalo, 2001). They also provide remote access to internal and external databases through the Internet. Hard copy data are now developed into digital media files through the library function (Kibirige & DePalo). Library staff also provide training programs for staff and students on the features of the digital databases and how to access and utilize them (Kibirige & DePalo).

Informational technology. Another area where colleges and universities can look to improve enrollment is investing in technology. As technology continues to develop, more

efficient and effective software and equipment becomes available. Higher education institutions can utilize this technology to aide in educating its students. By providing advanced technology and enhancing education quality, institutions can expand their student enrollment rates and improve financial health. Just as companies in today's competitive business environment must have the ability to adjust their strategies in response to their competitors in order to survive and maintain a competitive advantage (Kengatharan, 2016), colleges and universities must adapt to new technology if they wish to survive. Information technology covers a vast array of support for academia, including learning platforms (course management systems), distance education and classroom technology.

Learning Platforms. Among many industries, technology has changed the way goods and services are exchanged among buyers and sellers. Higher education institutions have also adapted to advancements in technology by changing the way that knowledge is exchanged and classrooms are managed. Use of Course Management Systems (CMS), also referred to as Learning Management Systems (LMS) have become an inherent part of the learning environment among colleges and universities (Fita, Monserrat, Molto, Mestre, Rodriguez-Burruezo, 2016). Some examples of these systems include Sakai, Moodle, Itslearning, Blackboard, and Desire2Learn (Fita et al.).

Higher education institutions face pressure to implement these learning platforms to aid in student instruction. Instructors utilize learning management systems to interact with students and effectively communicate course material (Moreno, Cavazotte, & Alves, 2017). Typically, most of the functions of these learning platforms are expected to alleviate some of the teaching activity; however, most rely on asynchronous teacher and student interactions (Fita et al., 2016). Learning platform functionalities involve posting announcements, grading, uploading content,

discussion boards, and others. Recently, colleges and universities have begun to rely on course management systems to foster interactions between instructors and students and complement the traditional classroom structure (Arenas-Gaitán, Ramírez-Correa, & Rondán-Cataluña, 2011).

Distance Learning. Globalization has increased dependency on technology in many industries, including higher education. To stay competitive, it is critical that colleges and universities continue to develop more flexible and portable learning methods (Arenas-Gaitán et al., 2011). Computer mediated distance learning (CDL) programs which utilize Internet-based learning management systems (LMS) to support the teaching function experienced "a 5-year growth rate of 7.6% and expected revenues of $51.5 billion by 2016" (Moreno et al., 2017, p. 995). In addition to the asynchronous learning platforms discussed above, distance learning programs may offer additional Synchronous Virtual e-Learning tools (SVL), such as ConferenceXP, Skype, iVisit, WebEx, GoToMeeting, or TokBox (Fita et al., 2016). These tools can provide the student with a similar experience to being in a classroom setting through use of video conferencing and virtual classrooms that allow participants to engage in live conversations while sharing resources (Fita et al.). By investing in technology that enhances distance education, colleges and universities can attract and retain students outside their normal geographical boundaries.

Classroom Technology. Significant advancements in technology and computer devices over the last number of years have impacted classroom pedagogy. The fast-paced global industry has raised the expectations for college graduates from simply exhibiting the ability to regurgitate information to using that information to solve problems across disciplines and communicate through various formats (Siegel & Claydon, 2016). A majority of faculty at colleges and universities have moved away from using basic chalkboards that were a staple of

teaching methodologies of the past to integrating power point presentations on projectors (Siegel & Claydon), showing Internet videos and polling the class using electronic clickers. As the functionality of the hardware has improved, this has opened an array of opportunities for faculty members to implement the use of technology in their classes.

Another area which has gained interest in the realm of classroom technology is the use of mobile devices as part of the learning environment. Mobile learning increases portability of information allowing students to access course materials from anywhere. Another benefit of mobile learning is its ability to foster active learning which develops critical thinking and enhances problem solving skills (Davison & Lazaros, 2015). These are essential skills that today's organizations require of potential employees (Siegel & Claydon, 2016). While other classroom technology can be costly, mobile technology does not require a significant amount of financial resources (Davison & Lazaros).

Faculty Development. Higher education institutions may choose to invest resources into developing research and teaching skills of its faculty. Due to increased competition in the higher education sector and "demands for public accountability and improved teaching and learning, institutions are recognizing the need to strengthen their faculty development programs" (Lowenthal, Wray, Bates, Switzer, & Stevens, 2012, p. 149). Employee development is critical to furthering the skills and knowledge of not only individual employees, but also the organization as a whole (Chay Hoon & Bruvold, 2003). Faculty development has become a major focus over recent years. The faculty workload has increased to include teaching, scholarship and service while assessment guidelines have grown more prominent and often drive state funding (Carpenter, Sweet, & Blythe, 2016).

Faculty development has evolved from simply sabbatical leaves to include a wide variety of program offerings covering topics from scholarly research to teaching strategies (Austin & Sorcinelli, 2013). Today, expectations of faculty are high as administrators believe they should be adept researchers as well as skilled educators (Lowenthal et al., 2012). It is presumed that because faculty possess a terminal degree, they are expert educators; however, institutions must provide teaching tips and training sessions to these individuals to enhance the student learning experience. Investing in faculty development is a crucial factor in allowing institutions to maintain quality standards and support changes in higher education (Austin & Sorcinelli).

Course and curriculum development. The development and implementation of new academic programs is another element of the instruction category. Institutions can invest in these programs to attract new students and enhance their overall mission. Administration and faculty must work together to identify potential majors and minors that may appeal to today's college students. Many institutions may go through a detailed analysis of their existing academic programs to identify areas of weakness and consider reallocating assets and faculty to new academic programs.

Colleges and universities must also keep abreast of the changing needs of employers to determine demand for college graduates. Many institutions have developed majors and minors to meet industry needs and technological advancements over the past ten years. Extensive data, including labor market demand for graduates and the resources necessary for implementation should be carefully considered among proposals for new academic programs (Dee & Heineman, 2016). Institutions that can identify these emerging areas and provide the required education for their students to obtain these jobs can gain a competitive advantage over other institutions.

Student Services. The student services category includes expenses incurred for activities which contribute to students' emotional, intellectual and physical well-being outside of formal instruction (FARM, para. 342.15). This includes subcategories, such as the offices of admissions and financial aid as well as student life/activities (FARM, para. 342.15). Student life/activities which stimulate social and cultural development consists of student organizations, both intramural and intercollegiate athletics, health services and outdoor activities.

Admissions. Staff can also play a major role as a profit generator for a college or university. They may have direct contact with students and contribute to the overall collegiate experience. Today, students face complex issues; therefore, student service staff must be innovative to meet student needs and gain a competitive advantage (Felix & Lerner, 2017). Staff members in the admissions area are primarily responsible for attracting new students. They reach out to prospective students through presentations, tours, administrative tasks and working with faculty and staff members to promote their institution (Gansemer-Topf, Von Haden, & Peggar, 2014). Their success in recruiting and ability to meet enrollment numbers directly influences gross tuition revenue which is critical to an institution's success (Gansemer-Topf et al.). Although admission counselor positions are generally entry-level positions, they require professional skills such as business and marketing as well as knowledge of institutional policies (Gansemer-Topf et al.). Colleges and universities need to recognize individuals with this valuable skillset because those that have significant turnover or disruption in this area can feel a negative ripple effect on their income statement as gross tuition can be impacted in a negative way.

Financial Aid. Financial aid staff are tasked with determining the amount of financial aid for which the students are eligible. They serve as a resource for students to help them

understand how they are going to pay the cost of college (McKinney & Roberts, 2012). As costs

for attending college continue to rise, additional pressure is placed on financial aid to properly

balance the overall price of college for students with generating the desired amount of net tuition

revenue necessary for the college or university to meet budgeted figures. Financial aid

packaging for admitted students can require a level of skill and expertise in order to attract the

required number of students without providing financial aid in excess of budgeted amounts.

These counselors also help students complete the necessary paperwork, such as the FAFSA, loan

and scholarship applications and identify alternative sources of financial aid (McKinney &

Roberts). Colleges and universities can suffer financially without this level of knowledge and

proficiency in this department.

Student life/activities. Colleges and universities may also consider focusing resources on

enhancing the student life environment. Identifying the preferences outside of the classroom for

the incoming generation of prospective students can be a key recruitment and retention tool. A

prospective student's ability to relate to activities and organizations is important to them.

Higher education institutions can focus on maintaining student organizations, athletics,

health services as well as outdoor activities in an effort to attract students. Although colleges

and universities cannot directly influence a student's ability to flourish, they can create a positive

environment to enhance the collegiate experience (Marks & Wade, 2015). In order to develop

new programs and activities, administration has to evaluate the current student life programming

and reallocate resources where necessary to invest in programming that is attractive to the new

generation of students.

Student organizations. For many students, college is their first step into adulthood. With

new found independence also comes apprehension to become part of society by initially

integrating into the campus community. One way for students to become involved is by

participating in clubs and organizations which also provide learning and developmental benefits

(Case, 2011). A student club represents a group of individuals with a common interest who meet

on a regular basis to advance towards common goals (Pittaway, Gazzard, Shore, & Williamson,

2015). Clubs and organizations allow students to pursue interests they value while also forming

social bonds with peers. Student organizations, such as fraternities, sororities, ethnic student

organizations and religious groups provide social environments that can potentially foster

interracial friendships and expose individuals to cultural diversity (Park, 2014).

Athletics. Athletics can provide a significant impact to the campus community. It allows

student athletes to follow their passion and the student body to unite and rally behind their teams.

With increased pressures in the higher education marketplace, smaller colleges and universities

may be able to boost enrollment through athletic program offerings (Wright, 2017). Higher

education institutions who are struggling financially, can enhance revenues by targeting the

customer segment of scholar-athletes (Wright).

In addition to expanding enrollment, athletics can also improve a student's overall

collegiate experience by developing relationships among team members. Bonding with others is

a critical factor in determining whether a student will persist through graduation. Hickman and

Meyer (2016) contended that having successful athletic teams can actually have a positive effect

on freshman retention rates. Participation in athletics has also been suggested to "enhance

learning and character development, including leadership, interpersonal skills, self-esteem,

discipline, personal health, motivation, dedication, and life lessons" (Hirko, 2009, p. 91).

Colleges and universities that choose to invest in their athletic programs can expand student

enrollment, increase retention rates and develop well-rounded individuals.

Health services. College and university health centers provide medical care to students. The transition to college can be overwhelming for young adults as parents play less of a role in health care decisions (Angelini, Sutherland, & Heidi, 2017). On-campus health service centers can help ease the burden of having to schedule appointments at a major health care center. Some higher education institutions have invested in their health centers to enable them to provide not only primary and acute care, but specialized care as well which may include dermatology, orthopedics, gynecology, and psychiatry (Nguyen, Liu, Patel, Tahara, & Nguyen, 2016). Being able to obtain the medical attention they need is important to students as they enter society. Health centers can help students adapt from their reliance on parental guidance to understanding how to deal with health insurance and medical issues on their own.

Outdoor activities. Many institutions that are located in rural settings have made outdoor activities part of their strategic initiatives. Outdoor activities and leadership opportunities are not typically academically driven and do not provide college credit. These activities provide chances for enrolled students to enhance their collegiate experience and participate in experiential learning. Outdoor activities play an important role in the experiential learning model with over 25,000 participants on an annual basis (Bell, Gass, Nafziger, & Starbuck, 2014).

Outdoor activities can include skiing, hiking, camping, biking, boating and many other opportunities depending upon the location of the college or university. Some schools have begun to incorporate a leadership component to their outdoor education model in order to introduce a learning element to these types of events. By integrating experiential learning opportunities in outdoor activities with a focus on developing leadership skills, colleges and universities not only hope to attract new students but also help improve student retention, increase GPAs and educate students in life skills such as problem solving and functioning within

a team atmosphere. Studies have concluded that outdoor activities also enhance a student's ability to "fit-in" with their peers and allow students the opportunity to develop healthy relationships with other students (Bell et al., 2014).

Institutional Support. Institutional support refers to expenses for activities which involve long-term planning for the entire institution (FARM, para. 342.16). This is an important category which relies heavily on several layers, including executive management, fiscal operations, general administration, administrative informational technology and development (FARM, para. 342.16).

Executive Management. The executive management function is responsible for guiding the overall direction and mission of the college through long-range strategic planning (FARM, para. 342.16). Executive management includes the duties of the individuals, such as the president, provost, chief business officer, chief student affairs officer and chief development officer (FARM, para. 342.16). With changes to the higher education sector over the past 20 years, including increased competition, accountability and restructuring has placed greater responsibility and importance on the executive management team (Jones, Lefoe, Harvey, & Ryland, 2012). Higher education institutions must invest in developing sustainable leadership because they are tasked with the unique role of developing new knowledge and delivering existing knowledge to its students (Jones et al.)

Fiscal Operations. Fiscal operations relates to financial activity of the institution and is typically housed within the business office. Employees in the business office primarily monitor the expenditures of the institution. The budget monitoring process is an important tool that provides management of the college or university the information that they need to make "real-time" decisions related to future expenditures. The role of the bursar in the business office can

also have a major impact on tuition, room and board revenue. The bursar is in charge of billing

students and collecting payments (Felix & Lerner, 2017). Colleges and universities can incur

substantial losses related to writing off uncollectible accounts if the billings and collections

process is not managed properly.

     General Administration. Administration activities of a college or university, excluding

informational technology and fiscal operations, fall into the category of general administration

(FARM, para. 342.16). Some examples of areas included in general administration are human

resources, communication and transportation and print shops (FARM, para. 342.16).

     Human resources. Human capital is an important component of any business as

employees provide organizations with a unique set of skills, knowledge and abilities (Mello,

2015). It is particularly important in the higher education sector where the overall goal is to

develop and share knowledge. Knowing how to manage human capital is an invaluable part of

the overall business strategy. Human resource personnel can influence leadership's perspective

on understanding the inherent value of the institution's employees (Mello). The human resource

staff members in higher education must possess vast knowledge and skills to handle the

responsibility of monitoring the college community. This includes promoting behaviors that

allow for instructors, students and staff to live and work synergistically as well as contributing to

an increase in the overall quality of education (Vacarescu-Hobeanu, 2013).

     Communication and transportation. Communication is important for the campus

community. There is certain information which needs to be shared with students, instructors and

staff. While most of these communications can now be done via email, there are certain

communications which are urgent in nature. For example, emergency situations require

immediate notification. With the attention given to terrorist events, it is essential that college

campuses take the steps to ensure safety of its members (Cheung, 2014). "Building a Disaster-Resistant University" published by the Federal Emergency Management Agency (FEMA) in 2003 describes four phases of emergency management – preparedness, prevention-mitigation, response, and recovery (Cheung). Communication, such as an emergency alert system, is a key piece of an effective emergency management system.

Colleges and universities often place less emphasis on transportation when analyzing their sustainability (Kaplan, 2015). Campuses often influence the travel behavior in surrounding communities (Kaplan). While generally institutions are designed for pedestrians and promote non-motorized travel, they face pressures from a culture that encourages driving which leads them to invest in parking lots and roadways (Kaplan).

Print shops. College and university print shops provide duplicating and printing for the entire campus. Instructors may use print shops to print course materials, including exams. Posters and brochures can be printed to support marketing efforts. Students may also utilize the print shops for projects for student-led clubs and organizations.

Administrative Informational Technology. Administrative informational technology supports the overall campus mission, excluding technological support for academic activities. Technology used for marketing and campus infrastructure are two types which may be included in this category.

Marketing. A higher education institution's website is an extension of the campus environment and culture which can be displayed on the network to improve its popularity across the internet community (Liu, 2014). The appearance, content and features of a university's website is important as it provides a platform to promote the institution. In today's rapidly

developing technology age, network and network communication are of upmost importance and are critical to the sustainability of educational environments (Liu).

Infrastructure. Technology has been used across many industries to increase efficiency and share information throughout the organization. Colleges and universities also utilize technology to allow faculty, staff and students to connect and interact with one another (Wang & Zhang, 2014). Most colleges and universities have moved to a digital campus where networks connect all aspects and functions of the institution. This allows faculty, staff, administration and students to easily transfer information.

Development. The development function of a college or university is responsible for conducting activities to maintain relationships with alumni, the community and other groups. The primary purpose of these activities is to promote the college or university and build relationships in order to solicit support. As competition in higher education has grown, limiting the income streams (especially for public institutions), the development function has faced increased pressure to fundraise to ensure institutional sustainability (Daly, 2013). Typically, development seeks support that is financial in nature but it could also help to identify potential board or alumni committee members, enhance connections that would provide internships and future jobs for students, and recognize occasions where the college or university could support community events and organizations.

Operations and Maintenance of Plant. The operations and maintenance of plant functional classification encompasses expenditures related to operation, maintenance, supervision, administration and protection of the college or university's physical plant (FARM. para. 342.17). Typical types of expenditures that fall into this category consist of the following: repairs to the buildings, equipment and furniture on campus; custodial services for cleaning of

the academic spaces as well as the residence halls; maintenance for all utilities for the buildings and other plant facilities; care of the grounds; hazardous waste disposal; facility planning and management and overseeing campus renovations and construction projects (FARM, para. 342.17).

Colleges and universities operate in a highly competitive marketplace; therefore, they face increased pressure to attract quality students (Roberts & Taylor, 2016). One of the major branding tools institutions use to gain a competitive advantage are their buildings and overall campus appearance (Roberts & Taylor). Campus facilities support the college or university's core functions, such as education and research (Kärnä & Julin, 2015). Investing in the buildings which support academic growth and enhance the campus could help colleges and universities achieve optimal enrollment. Maintaining the plant and equipment on campus is an integral part of the overall process and facilities on college campuses last for many generations. The management of facility resources of an institution plays an important role in achieving its goals of providing a quality learning environment and a sustainable infrastructure for university functions (Kärnä, Julin, & Nenonen, 2013). Recently, a majority of universities have realized the importance of improving the physical assets of the campus to address institutional objectives, such as attracting prospective students; enhancing the quality of life of current students, faculty and staff; fostering a learning environment; and creating a stable environment which benefits the surrounding community (Hajrasouliha, 2017).

Despite the research that supports investing in buildings and capital projects throughout the campus, state systems have fallen behind when it comes to investing financially in these areas. In fact, the gross capital spending in higher education across all 50 states totaled $10.3 billion in 2009 (Ness & Tandberg, 2013). This only represents 13% of the state general fund

appropriations and equates to approximately $700 per student enrolled in Public State System

Institutions (Ness & Tandberg). Capital budgeting decisions are crucial to the future of higher

education institutions since tuition discount rates are at record highs, and admission targets are

becoming more difficult to maintain as enrollments drop (Staton, 2014). There are many capital

projects higher education institutions may choose to invest in, including residence halls,

academic buildings, landscaping, and student facilities.

  Residence Halls. Residential halls are an important part of the overall college experience

for students since it is where they will spend a majority of their time. Maintenance and

cleanliness of the residence halls can play a significant factor in the students' satisfaction level

and can impact retention. The features, types and variety of on-campus housing can play a major

role in the overall campus experience (Jensen & Winters, 2012). "Student housing has allowed

community colleges to raise enrollment, increase revenue, add diversity and provide a complete

college experience" (Aquije, 2011, para. 6). Many colleges must balance between the number of

beds they have available and the types of rooms they offer while taking into consideration that

many students choose to live off campus (Tietjen, 2015). Higher education institutions have

many different options available for residential housing: traditional dorm style, suites and

apartments.

  The cost as well as the revenue generated from each type of housing option varies.

Colleges and universities must also consider other qualitative factors when making a decision on

which housing option to choose to add to their campus footprint. It is important to consider

student preferences when choosing a housing model because it can expand an institution's

enrollment. When all other aspects of colleges and universities are equal, prospective students

have made their choice based upon the best housing options offered (McBride, 2017). Although

certain models may generate more revenue per square foot, if they cannot attract prospective students and maintain capacity they should not be built. This is a constant struggle which most colleges and universities face today. Students and parents have become extremely selective and student housing can determine which college they will attend; therefore, investing in quality housing options can provide colleges and universities with a competitive advantage (Cheskis-Gold & Danahy, 2012).

Dorm style. The first standard dorm style model offers double to quadruple occupancy in each room with a communal bathroom and shower. This style of student housing has been around for decades and was the model once used by most colleges and universities for student housing. This model would maximize the number of rooms and beds that could be included in the footprint of the building and it typically generates higher revenue per square foot than the other models. Because of their social purpose of developing bonds for a lifetime and promoting an overall sense of community, colleges and universities continue to utilize the standard dorm room model throughout their campuses (McBride, 2017).

Suites. Another housing model offers a suite-style which range from single occupancy to a grouping of students with a common living area (Khozaei, Hassan, Kodmany, & Aarab, 2014). These models generally offer private or semi-private bathrooms. The bathroom configurations can vary in suite-style models from Jack-and-Jill bathrooms which are shared between two rooms or multiple individual bathrooms (Cheskis-Gold & Danaby, 2012). The standard suite style of residence halls has become popular in the last couple of decades and provides a limited amount of privacy that the new generation of students and their parents were seeking. The suites model generates lower revenue per square foot but adds additional amenities which provides for a more admirable living space. The suite-style attempts to provide students with more privacy

than the standard common living space of traditional dorms. In order to accommodate student privacy, the suites model was created which have private bedrooms, common living rooms and bathrooms shared by multiple suitemates. However, recently, the suites model has been known to create isolation instead of promoting socialization and community among students (McBride, 2017).

Apartments. Many colleges and universities have moved to the apartment or micro-dorm model as an option for juniors and seniors. The micro-dorms are equipped with private kitchens and bathrooms (McBride, 2017). The apartments also have private kitchen and bathrooms; however, they usually have more than one bedroom as well as a common living space. These models offer more privacy and independence for upper class students and helps to provide a smoother residential transition for the student after graduation (McBride). Similar to the suite-style model, the apartments offer students a more private alternative than traditional dorms; however, they foster isolation rather than promote relationship development among peers.

Academic Buildings. Another area of focus for plant improvement is academic buildings. Students spend a significant amount of time in the classroom; therefore, academic buildings support a student's educational experience. Academic buildings should provide a space to foster active and collaborative learning (Leather & Marinho, 2010). "Buildings should contain teaching and learning spaces that enable highly interactive work, both formal and informal areas for students and faculty groups to gather and for students and faculty to meet with each other, and spaces for impromptu face-to-face and/or technologically mediated interaction" (Leather & Marinho, p. 42). Academic buildings should also reflect the professional environments students will become a part of upon graduation (Leather & Marinho). The

cleanliness and overall look of the academic spaces can also be a significant factor in attracting potential first-year students and retaining students already on campus.

Landscaping. The land and buildings of a campus support the overall function of a college or university which is to promote quality education and research (Kärnä et al., 2013). The campus infrastructure can influence student, faculty and staff satisfaction. In addition, aesthetics and the overall campus appearance can influence the decision of potential students. Students seek colleges and universities they consider to be their home throughout their academic career. The appearance of an institution's campus can create an inviting environment. As colleges and universities invest in building and construction, one area of focus is landscaping.

The campus landscape can provide college and universities with a green space dedicated to environmental and ecological harmony (Wang, 2012). The landscape design can also provide a place for teachers and students to meet and study (Wang). Providing a green space on campus for students to relax or study can improve their overall quality of life (Hajrasouliha, 2017). The landscape can create an atmosphere which allows students to cope with the stress of college life, including social and academic challenges (Hajrasouliha). Investing in campus landscape supports a robust learning environment for faculty and students.

Student Facilities. Student facilities such as dining halls and recreational facilities contribute to the overall campus atmosphere. Due to increased competition, institutions attempt to draw students in with their unique and abundant amenities. Colleges and universities have upgraded from the traditional college food selections to now including Starbucks as well as other fancy meal plan options (Archibald & Feldman, 2011). Recreational facilities such as gyms, pools and rock walls are now being built to entice students to enroll and reside on campus. These types of facilities can require unique types of repairs and maintenance services that may

need to be outsourced to experienced third-party vendors. Students value the lifestyle and campus culture when making the decision regarding which school to attend.

Student Financial Aid. Typical financial resources provided by a college or institution, such as scholarships, to support student financial aid are classified as a reduction to tuition revenue rather than as a functional expense (FARM, para. 342.18). Scholarships that are awarded to students in excess of the amounts owed to the college or university by the students and are required to be refunded to the students are recorded under functional expenses (FARM, para. 342.18).

Auxiliary Enterprises. Functional expenses in this classification typically relate to auxiliary enterprises established to provide services to the college or university as well as the surrounding community (FARM, para. 342.20). These services are outside of the main mission of the college or university. The differentiating quality of an auxiliary enterprise relates to the fact that it is managed as a self-sustaining business unit (FARM, para. 342.20). Some examples are parking and housing for faculty-staff, health clinics and restaurants.

Depreciation. Depreciation represents an estimated expense related to the usage and wear on significant capital items such as buildings, furniture and equipment. The estimated useful lives of these items is determined by management of the college or university and the cost is typically written off over a period of time in an effort to approximate when the asset may need to be removed from service or be replaced. Depreciation is a significant estimate in college and university financial statements and can have some variations based upon geographical locations and various levels of use items incur.

Financial Condition

Public higher education institutions experience significant pressure of accountability for financial management given that they are owned by the state and partially funded by taxes imposed on its citizens (Sav, 2016). Recently, public colleges and universities endured another hurdle during the Great Recession – a significant decrease in state appropriations. From 2008 to 2013, state funding dropped from 32% to 23% of total public college and university revenues (Sav, 2016).

The decrease in state funding has caused many public institutions to analyze their overall financial condition. In order to alleviate the financial strain brought on by a decline in state appropriations, some states have increased tuition rates, reduced financial aid and have frozen faculty salaries (Weerts, 2014). Long-term strategic plans rely first on the evaluation of financial condition. The first step is to understand the meaning of financial condition and then potential measurements.

Definition. Financial condition is a complex concept which can be affected by various factors, such as the fiscal structure and capacity of governmental entities, their potential challenges and future possibilities and financial techniques they implement (Ryu, Kim, & Yang, 2017). "The Governmental Accounting Standards Board (GASB) defines a government's financial condition as 'a composite of a government's financial health and its ability and willingness to meet its financial obligations and commitments to provide services'" (Clark, 2015, p. 66). The financial condition of public higher education institutions could be defined as its ability to provide educational degrees to students while tolerating economic downturns.

The healthier the financial condition of an institution the more likely it is to be able to continue to serve its students despite changes in the economy. Colleges and universities whose

financial health is questionable, may need to re-evaluate their spending activity if they wish to survive in times of economic crisis. There are several measures which may be used to understand the financial condition of a public higher education institutions.

Measurements. Maher and Délier presented a paper at the 2012 Association for Budgeting and Financial Management (ABFM) conference titled, "Government-wide Statements as a Basis for Fiscal Condition Analysis: A Study of Wisconsin Counties," which analyzed the objective and subjective measurements of financial condition (Maher & Deller, 2013). The measures of financial condition included the following descriptions and ratios (Maher & Deller, 2013, p. 21):

Financial Position (unrestricted net assets/expenses)

Financial Performance (change in net assets/total net assets)

General Support Rate ([general revenues + transfers]/expenses)

Liquidity ([cash + current investments + receivables]/current liabilities)

Solvency (long-term debt/assets)

While each of these measurements may be used to determine an institution's overall financial status, the financial position ratio is widely used because it explains how many times an entity is able to pay its expenses.

The unrestricted net assets refers to the accumulated amount of additional revenues over expenditures in a governmental fund (Kelly, 2013). A fund-based analysis compares the fund revenues to fund expenditures (Maher & Deller, 2013). Creditors, financial analysts and governmental agencies often use the net assets as an indicator of financial condition (Kelly).

Research Method. Quantitative correlational research uses numbers to analyze relationships among data points (Creswell, 2014). Quantitative methods typically use statistical

techniques to analyze correlations among figures (Pionsky & Gass, 2011). Several types of tools and techniques can be used in a quantitative study, such as frequency counts, percentages, chi-squares, t tests, ANOVAs, Mann-Whitney U-test, Wilcoxon signed ranks test and regression analysis (Pionsky & Gass). Multiple regression is one tool which is typically used to determine whether certain variables can be used to predict other variables.

Regression analysis. Regression analysis is a quantitative correlational tool which analyzes the relationship between a dependent or continuous variable and one or more independent variable (Ragsdale, 2015). Multiple regression refers to analyzing the combination of two or more independent variables to determine whether they can predict results of the dependent variable (Pandis, 2016). The purpose of developing a multiple regression model is to discover a function that illustrates the correlation between variables, which can be used to predict the outcome of a dependent variable when the independent variables are known (Ragsdale). It is similar to mixing ingredients for the perfect cake. The baker must use the perfect proportions of sugar, flour, eggs, oil, and other ingredients to produce a tasteful dessert. Similarly, regression analysis can provide researchers with the amount of independent variables which will cause the dependent variable to be a specific value.

Multiple regression analysis can be used to analyze whether a correlation exists between state appropriations, allocation ratios and financial condition of public higher education institutions. The independent variables include the percentage increase or decrease in state appropriations from year to year and the percent of a functional expenditure category compared to total expenses. The dependent variable refers to the financial condition percentage of an institution (calculated as the unrestricted net assets divided by total operating expenses multiplied by 100). The results of the multiple regression analysis could provide insight into the

impact of state appropriations on financial condition ratios and also the impact of allocation ratios on an institution's financial condition.

Summary

The current economic environment for colleges and universities is much more challenging than it was 10 or even 20 years ago. The competition for students is at an all-time high at the same time that appropriations from state budgets allocated to public colleges and universities is continuing to decline. The financial pressures that these factors cause is forcing trustees and administrations at public colleges and universities to make strategic decisions related to the allocation of the decreased program funding that is received. Institutions that can develop a methodology to make the best use of state appropriations in order to focus current and future expenditures on high-impact, high-reward areas can provide a competitive advantage over their competition and potentially deliver enhanced financial results.

Other factors that are also placing additional pressure on public college and universities financial outlooks consist of competition from online learning platforms as well as a decreasing number of high school graduates that are choosing to continue their educational pursuits at the college level. The institutions that are able to provide the maximum strategic impact with the reduced state appropriations they have been allocated will be able to position themselves in a stronger financial position to weather the current economic storm brewing in the higher education industry.

Transition and Summary

This section describes the background of the problem being studied which is a lack of methodology in allocation of resources at public higher education institutions. The importance of the study, research questions, theoretical framework, and review of literature are also included

in this section. The following section further outlines the details of the study, including the role of the researcher, participants. It also describes the research method and design, data collection and techniques, and identify reliability and validity surrounding the study.

Section 2: The Project

The objective of the study was to add to the body of knowledge regarding state appropriations and resource allocation among public higher education institutions. By analyzing the relationships between state appropriations, allocation ratios and financial condition, the study attempted to determine predictors of financial condition. The results from the study could be incorporated into the budgeting process at public higher education institutions to promote long-term stability.

The purpose of this section was to explain the role of the researcher and identify participants. Furthermore, it illustrated the research method and design utilized, described data collection and techniques, and provided support for reliability and validity of the study.

Purpose Statement

The purpose of this quantitative correlational study was to analyze (1) whether fluctuations in state appropriations affect an institution's financial condition and (2) whether the allocation ratios can be used to predict the financial condition of an institution. Understanding the relationship between state appropriations, allocation ratios, and financial condition can provide valuable information to government officials as well as institutional leaders. Reflecting on how state appropriations ultimately affects an institutions financial condition will assist government officials in deciding how to allocate state funds. In addition, the data can provide invaluable information to administrators of public institutions to develop budgets that reflect efficient and effective resource allocation. Budgets explain how resources are allocated to optimally meet an institution's goals and objectives (Palmer, 2014). The functional areas of an institution, such as instruction, academic support, student services and operations and maintenance of plant, reflect the purpose of the expenses and activities in which the college or

university invests. Understanding the degree to which these functional areas contribute to an institution's financial health could be the key to long-term survival. State Systems of Higher Education can utilize this information in strategic planning models to develop efficient and effective methods for allocating resources to ensure institutional sustainability.

Role of the Researcher

The role of the researcher was to collect and summarize the financial statement data from all four-year institutions of the state system selected. The audited financial statement information was found via the state system webpage. Data were collected and summarized using Excel. Once the information is culminated in Excel, the researcher imported the data into IBM SPSS software and utilized multiple regression analysis to determine whether strong relationships existed between the variables. Because archival data were used for the study, the researcher had no interaction with representatives of the institution.

Participants

Historical financial statements of all four-year institutions within a public state system in the South Atlantic region of the United States were used to collect the data. Since the study used archival data, participants were not used.

Research Method and Design

The study was quantitative correlational and utilized multiple regression analysis to determine whether state appropriations and financial allocation ratios of functional expenditures can be used to predict financial condition.

Method. The study was quantitative given that it utilizes numbers to analyze relationships among the data (Creswell, 2014). Quantitative method was appropriate for the study because it included historical financial data from institutions within a state higher

education system in the South Atlantic region of the United States. Qualitative research was not

appropriate for the study because qualitative focuses on human perceptions and understanding

(Stake, 2010), while this study analyzed objective financial data.

Data were gathered from the audited financial statements of each four-year institution

within a state system institution in the South Atlantic region of the United States. Evaluation

research was performed on the correlation between state appropriations, allocation ratios, and

financial condition for academic years 2008 through 2017. State appropriations, unreserved fund

balance, and functional expense amounts for each year were summarized in an Excel spreadsheet

and regression analysis performed in IBM SPSS software to determine whether any of the

variables could predict an institution's financial condition.

Research Design. Correlational design is used in determining whether a relationship

exists among variables (Morgan, Leech, Gloeckner, & Barrett, 2013). Correlational design

utilizing multiple regression analysis were used to analyze whether a correlation exists between

changes in state appropriations, allocation ratios of functional expense categories, and financial

condition of a selected number of four-year public higher education institutions. The objective

of this study was to determine whether fluctuations in state appropriations and financial

allocation ratios impact an institution's financial condition. The purpose was to find predictors

of financial condition which institutions could utilize in their budgeting process.

"Regression analysis is a modeling technique for analyzing the relationship between a

continuous (real-valued) dependent variable Y and one or more independent variables"

(Ragsdale, 2015, p. 433). Multiple regression analysis includes more than one independent

variable which can be added to the model to assess the combined effect of the predictors on the

results (Pandis, 2016). The overall goal of regression analysis is to detect a function that

describes the relationship among variables to predict the value of a dependent variable given

certain values of the independent variables (Ragsdale). Because the objective of the study was to

analyze the relationship between the independent variables (changes in state appropriations and

allocation ratios of functional expense categories) and the dependent variable (financial

condition of an institution), multiple regression analysis was an appropriate research design.

Population and Sampling

The objective of the study was to determine whether variations in state appropriations

and allocation ratios can predict financial condition of four-year public institutions across a

single state system in the South Atlantic region of the United States. According to the Integrated

Postsecondary Education Data System (IPEDS), there were 775 four-year or above public higher

education institutions in the United States in 2017. The South Atlantic region, which consists of

Delaware, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida

and the District of Columbia, had a total of 149 four-year or above public higher education

institutions in 2017 (IPEDS). A single state system in the South Atlantic region of the United

States was chosen for the population of the study because the data were publicly and readily

available on the state system's website. The sample included all four-year institutions within this

particular state system. The sample included state appropriations and the functional expense

categories (excluding "other") from each institution over a ten-year period (2008-2017). Kelley

and Maxwell (2003) explained that sample size, as it relates to multiple regression analysis "can

be approached from at least four different perspectives: (a) power for the overall fit of the model,

(b) power for a specific predictor, (c) precision of the estimate for the overall fit of the model,

and (d) precision of the estimate for a specific predictor" (p. 306). The sample was considered

appropriate for a quantitative study using multiple regression analysis because the entire
population was being tested.

Data Collection

Instruments. The study culminated the data in a Microsoft Excel spreadsheet. Stout
(2017) described Microsoft Excel as "a flexible and powerful tool" (para. 3) which can aide
managers in planning and decision making. Once the data were summarized in Excel, they were
imported into IBM Statistical Package of the Social Sciences (SPSS) version 25 software for
analysis. The IBM SPSS software was used to perform multiple regression analysis on the
variables selected to determine whether they could be used to predict financial condition. IBM
SPSS is used to analyze large amounts of data and aide in the modelling process of "choosing
and using appropriate mathematics and statistics to analyze empirical situations, to understand
them better and to improve decisions" (Xiao, Xu, & Xu, 2015). SPSS can be used to run a
multiple regression analysis and also provide additional diagnostics. The analysis of variance
(ANOVA) was also presented for each model that was determined to be a significant indicator of
financial condition. Tables are included in the results section of the study.

Data Collection Technique. The data for this study included state appropriations and
functional expense figures for all four-year institutions within a state system of higher education
in the South Atlantic Region of the United States. This information was collected through the
audited financial statements of each institution located on the state system's webpage. Any
financial statements not provided on the state system's website was acquired through the
individual school's website. Data were collected and summarized using Excel and then imported
into IBM SPSS version 25.

Data Organization Techniques. The data were organized in an Excel spreadsheet with information for each institution tabulated on a separate worksheet. A summary tab included the percentage change in state appropriations, allocation ratios, and financial condition percentage necessary for the regression analysis. This tab was uploaded into IBM SPSS software to run the multiple regression analysis. It was secured on the researcher's computer which is password protected.

Data Analysis Technique

This study investigated two null hypotheses: (a) there are no statistically significant associations among changes in state appropriations and financial condition and (b) there are no statistically significant associations among allocation ratios of functional expenses and financial condition. A bivariate linear regression was used to test the first hypothesis since there was a single dependent variable (financial condition) and a single independent variable (change in state appropriations). Multiple linear regression analysis was used to test the second hypothesis because there was a single dependent variable (financial condition) with multiple independent variables (allocation ratios of functional expense categories).

Bivariate Regression Model. A bivariate regression is used to predict outcomes of a single (normal/scale) dependent variable from a single (normal/scale) independent variable (Morgan et al., 2013). For purposes of the study, the dependent variable was financial condition. Financial condition is defined as percentage of unrestricted net assets over total expenses. The measurement of this variable was scale. Scale refers to a measurement that has five or more ordered categories or value and is normally distributed (Morgan et al, 2013). Since financial condition was measured in a percentage, it was considered to be scale. The independent variable was the percentage changes of state appropriations. The percentage change in state

appropriations was calculated for each institution as the change in current year and prior year state appropriations divided by the prior year amount. The measurement of this variable was also scale since it was in a percentage format. Analyzing the correlation between changes in state appropriations and financial condition address the first research question: Is there a correlation between the percentage change in state appropriations of an institution and its financial condition? The null hypothesis related to this research question is there are no statistically significant associations among changes in state appropriations and financial condition. Because the null was an association question, the variables were scale and there was a single dependent and independent variable, a bivariate regression was used. The following steps were completed to perform the bivariate regression:

1. Test assumptions of bivariate regression. There were three assumptions of bivariate regression: (1) the two variables have a linear relationship, (2) scores are normally distributed, and (3) outliers are removed (Morgan et al., 2013).

   a. A scatterplot was visually inspected to determine linear functionality and detect outliers.

   b. Descriptive statistics, including ranges, minimums, maximums, means, standard deviations and skewness were performed for both the independent (state appropriations) and dependent (financial condition) variables.

2. Determine the coefficient of determination R and the proportion of shared variance (R^2). The Pearson correlations were computed to determine the practical significance of the independent variable.

3. Determine whether the model was statistically significant. The p values were evaluated to determine whether the model was statistically significant.

4. Determine the relative importance of the predictor variable. In bivariate regression, the independent variable (state appropriations) should demonstrate a high correlation with the dependent variable (financial condition) and have a p value of less than .05. In addition, the R^2 should demonstrate that the independent variable contributes to the overall variance of the dependent variable.

Multiple Linear Regression. Multiple regression analyzes two or more independent variables to determine whether they can predict results of a single dependent variable (Pandis, 2016). The dependent variable was financial condition for the multiple regression analysis and was calculated the same as noted above for the bivariate regression. The measurement of this variable was scale. The independent variables were the allocation ratios of functional expenses. There were 10 functional expense categories tested: instruction, research, public service, academic support, student services, general institutional support, operations and maintenance of plant, student financial aid, auxiliary enterprises and depreciation. The allocation ratios in the study were computed by dividing a functional expenditure category by Total Operating Expenditures (TOE) to form a percentage of TOE. These variables were also scaled in nature as they were percentages. Analyzing the correlation between allocation ratios and financial condition addressed the second research question: Is there a correlation between the allocation ratios of an institution, individually or in combination, and its financial condition? The null hypothesis related to this research question was there are no statistically significant associations among allocation ratios of functional expenses and financial condition. Because the null was an association question, the variables were scale and there were multiple independent variables, a

multiple linear regression was used. The following steps were completed to perform the multiple linear regression:

1. Test assumptions of multiple linear regression. There are four assumptions of multiple regression: (1) the variables have a linear relationship with the dependent variable, (2) scores are normally distributed, (3) outliers are removed, and (4) issues of multicollinearity are eliminated (Morgan et al., 2013).

    a. Scatterplots for each independent variable were visually inspected to determine linear functionality and detect outliers.

    b. Descriptive statistics, including ranges, minimums, maximums, means, standard deviations and skewness will be performed for all the independent (allocation ratios of functional expenses) and dependent (financial condition) variables.

    c. Pearson correlations were computed to examine the intercorrelations of the variables. Variables which are highly correlated (.50 or .60 and above) should either be combined into a single variable or one or more of the highly correlated variables may be eliminated if they do not provide meaningful data (Leech, Barrett, & Morgan, 2005). The variables were examined for multicollinearity by first examining the Pearson coefficients with a positive correlation of $\geq .50$. If there were any issues of multicollinearity are noted, they were corrected prior to finalizing the model.

2. Determine the coefficient of determination R and the proportion of shared variance (R^2). The Pearson correlations was computed to determine the practical significance of the independent variable.

3. Determine whether the model was statistically significant. The p values were evaluated to determine whether the model was statistically significant.

4. Determine the relative importance of the predictor variables. In multiple regression, independent variables (functional expenditure allocation ratios) should demonstrate a high correlation with the dependent variable (financial condition), have low correlations among themselves and have a p value of less than .05. In addition, the R^2 should demonstrate that the independent variables contributed to the overall variance of the dependent variable.

Reliability and Validity

Reliability. Reliability refers to the consistency of a measurement (Heale & Twycross, 2015). An exact measurement of reliability cannot be calculated; however, reliability can be estimated using different measures (Heale & Twycross). The data used for the study were the audited financial statements for all the four-year institutions within a state system of higher education over a 10-year period. This data were aggregated into the appropriate groups including various functional expense categories using required methods as prescribed by the Governmental Accounting Standards Board (GASB). The data in the study were subject to auditing procedures and reported under a required methodology which has been certified by an independent auditor. This information is publicly available and provides a financial data set which is not subjective in nature and allows others to potentially verify and replicate the study.

The reliability of the instruments refers to "the extent to which a research instrument consistently has the same results if it is used in the same situation on repeated occasions" (Heale & Twycross, 2015, p. 66). The basic premise of the study relied on multiple regression analysis modeling which is an accepted mathematical calculation for analyzing variables in a data set. This methodology was acknowledged as a technique to predict an unknown variable from the known predictors. Because this study used a standard mathematical calculation that other researchers can replicate, it provides reliability to the study.

Validity. Ragsdale (2015) described a valid model as one which depicts the main attributes of the research questions surrounding the study. The validity of the internal attributes of the study were based upon comparable sets of financial information for similar periods from higher education institutions within the same state system of higher education. These schools were subject to the same state appropriations process and allocation methodologies. The financial information was required to be reported in the same format across all schools. The financial statements were obtained from the state system website which has accumulated and provided comparable information for a significant period of years. This information is public information and has been opined on by certified public accountants as free from material misstatements.

The basic structure and methodology used for the study provided a logical approach because the uniform data used were subjected to rigorous testing to support its reliability and the mathematical calculations identified to analyze the data are commonly known and understood. This would support the overall validity of the study to external users.

External validity of the study was provided given the following factors: the study had a consistent time period of 10 fiscal years for data from each institution; a quantitative

methodology was selected for the study which aligned with the financial data and calculations used in the study; the sample size of schools included in the study was suitable to achieve the desired outcome levels for the study; and finally the data used for the study was not manipulated or interpreted differently by others when the study was analyzed.

Transition and Summary

This section presented the role of the researcher, identified participants and explained the research method and design, including the data collection and analysis techniques. In addition, the section included support for reliability and validity surrounding study.

The next section provides the findings of the study and how their implementation can improve current business practices. Recommendations for action and future research as well as summary and conclusions are also presented in the next section.

Section 3: Application to Professional Practice and Implications for Change

The purpose of the study was to provide practitioners and legislators with the information necessary to make budgetary and resource allocation decisions which will alleviate the financial distress of public higher education institutions. The following section provides an overview of the study, presents the findings of the study and how their implementation can improve current business practices. Recommendations for action and future research and conclusions are also included in this section.

Overview of Study

The sustainability of public higher education institutions has come into question as state funding diminishes. This study provides insight into the allocation ratios of functional expenses that can enhance financial condition. The results of the study offer budgeting strategies for allocating funds to the functional areas which have a strong positive correlation to an institution's financial condition. The survival of these institutions depends on their ability to optimally invest their finite resources in the unstable higher education industry and gain the competitive advantage needed to offer quality education to its citizens at an affordable price.

The quantitative correlational study analyzed whether an association exists between changes in state appropriations and allocations ratios of functional expense categories and an institution's financial condition. Analyzing the relationship between state appropriations, allocation ratios, and financial condition was crucial information which can influence the overall budgeting process of government officials and institutional leaders. Determining the impact of state appropriations on an institution's financial condition can influence how government officials allocate state funds. The results of the research can also support budget and strategic

planning decisions of the administrators of these public higher education institutions by identifying functional expense categories which have the highest impact on financial condition.

Presentation of the Findings

The percentage change in state appropriations and 10 functional expense allocation ratios were hypothesized as possible predictors of financial condition. The single dependent variable of financial condition percentage, percentage change in state appropriations and 10 functional expense allocation ratios were calculated for all four-year institutions in a state system in the South Atlantic region of the United States for 10 consecutive fiscal years (2008-2017). The two hypotheses were addressed below.

H1: Financial Condition/State Appropriations

The first hypothesis tested investigates whether an association exists between the percentage change in state appropriations and the dependent variable of financial condition percentage. $H1_0$ states there are no statistically significant associations among changes in state appropriations and financial condition. A simple or bivariate regression is used to "predict scores on a normal/scale dependent (outcome) variable from one normal or scale independent (predictor) variable (Morgan et al., 2013, p. 149). Descriptive statistics as well as a scatterplot was used to determine that a bivariate regression model was appropriate to test the hypothesis.

Descriptive Statistics. The data were first tested to meet the assumptions of bivariate regression. According to Morgan et al. (2013), there are three assumptions of bivariate regression: (1) the two variables have a linear relationship, (2) scores are normally distributed, and (3) outliers are removed. To begin, the scatterplot (see Figure 1) was visually inspected to determine linearity and detect outliers. The inspection revealed a linear relationship; therefore, the Pearson correlation is the appropriate statistic for practical significance (Morgan et al.).
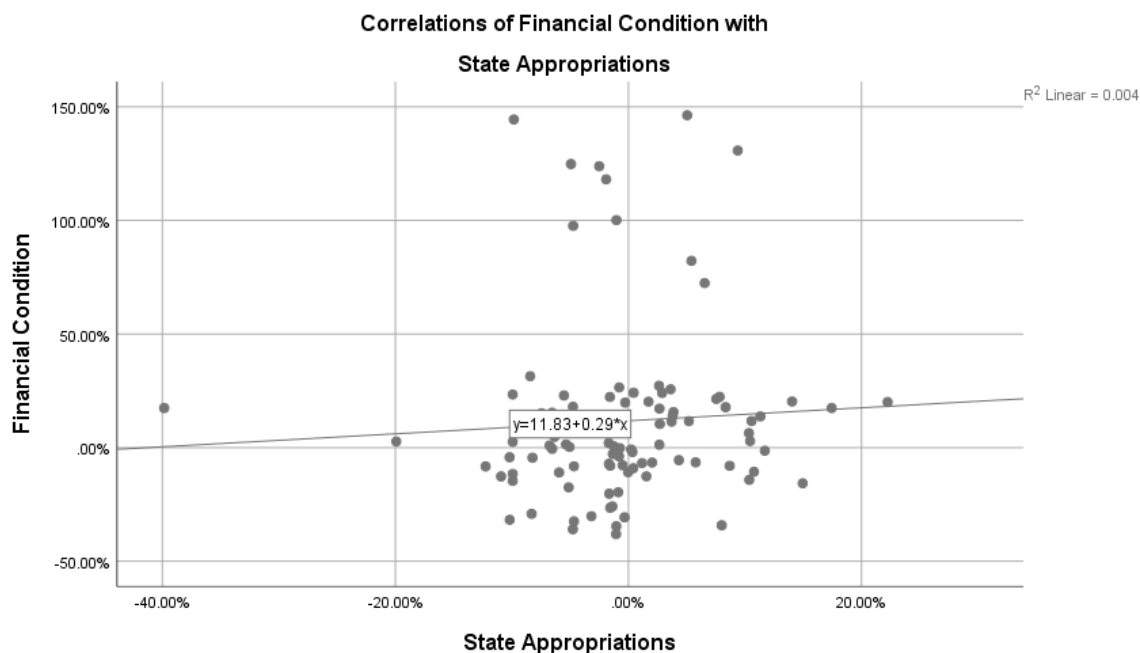
Figure 1. Scatterplot – Financial Condition/State Appropriations.

Next, descriptive statistics descriptive statistics were performed for both the independent (state appropriations) and dependent (financial condition) variables. The ranges, minimums, maximums, means, standard deviations and skewness can be found on Table 1 below. N represents the number of samples – 100. Note that no data were omitted from any of the samples; therefore, the entire sample was included (10 institutions for 10 years). The independent variable of change in state appropriations is scale in nature; however, the percentages can have significant fluctuations from year to year and from one institution to the next; therefore, the mean appears reasonable. The skewness of financial condition was 1.977 which is higher than 1; however, if it divided by the standard error of .241 the result is less than 2.5 (which is the approximate level of $p = .01$; Morgan et al., 2013); therefore, the data appears to be normally distributed.

Table 1

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
Financial Condition	100	184.35%	-38.07%	146.28%	11.6901%	38.80308%	1505.679	1.977	0.241
State Appropriations	100	62.08%	-39.84%	22.24%	-0.4777%	8.08584%	65.381	-0.799	0.241
Valid N (listwise)	100								

Practical Significance. Because each of the variables were normally distributed and the assumption of linearity was not markedly violated, Pearson correlations were computed to examine the practical significance and intercorrelations of the variables. The Pearson Correlation is a common correlation statistic that is "calculated using an equation that relates two sets of scores for two different measures" (Emerson, 2015, p. 242) which results in the correlation coefficient. Table 2 provides the results of the correlations among all the independent variable of state appropriations and the single dependent variable of financial condition.

Table 2

Correlations

		Financial Condition	State Appropriations
Pearson Correlation	Financial Condition	1.000	0.060
	State Appropriations	0.060	1.000
Sig. (1-tailed)	Financial Condition		0.278
	State Appropriations	0.278	
N	Financial Condition	100	100
	State Appropriations	100	100

The coefficient (r) can fall between -1 and 1 (Morgan et al., 2013). The closer to 1 or -1, the stronger (positive or negative) the relationship between the independent and dependent variables (Emerson, 2015). When determining significance levels, Cohen (1988) defined a coefficient of .10 as small, .30 as medium, and .50 as large (Weller, 2014). Gatsonis and Sampson (1989) provided a table of necessary sample size to detect a given effect size which states that a sample size (N) of at least 84 can detect a medium correlation (r = .30). "Another way to consider the effect size is that r^2 estimates the proportion of the explained variance"

(Weller, p. 337). This means that (r = .30) explains at least 15% of the total variance in the dependent variable (financial condition).

Morgan et al. (2013) provides guidelines for five common effect size measures (d, r, ø, R and η). For r and ø, |.10| is small or smaller than typical, |.30| is medium or typical, |.50| is large or larger than typical and ≥ |.70| is much larger than typical (Morgan et al.). Based upon the Pearson correlation coefficients in Table 2, general interpretation of the strength of the relationship between the independent variable (state appropriations) and the dependent variable (financial condition) was less than a small effect.

Statistical Significance. Next, to investigate the statistical significance of the independent variable (state appropriations) with the dependent variable (financial condition), the p values were analyzed from the correlations table (see Sig. [1-tailed] in Table 2). According to Morgan et al. (2013), the p value represents a comparison of a calculated value to a critical value which describes the probability of rejecting a null hypothesis that is actually true. Typically, if the p value is ≤ .05 the results are considered to be statistically significant (Morgan et al.). Because state appropriations had a p value of less >.05, it was deemed not to be statistically significant in relation to financial condition.

Model Summary. The model summary (Table 3) and ANOVA (Table 4) was used to evaluate the significance of the model. The model summary provides R (.06), the standardized coefficient, which is the same as r noted in the correlations table (Table 2) above. In addition, this table presents the R^2 and adjusted R^2 (-.007). The R^2 signifies the proportion of the variance of financial condition that can be explained from changes in state appropriations.

Table 3

Model Summary

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	529.921	1	529.921	0.350	.556[b]
	Residual	148532.271	98	1515.635		
	Total	149062.192	99			

a. Dependent Variable: Financial Condition

b. Predictors: (Constant), State Appropriations

The ANOVA table (Table 4) shows the statistical significance of the regression test. The p value of the model is .556. Since the p value is $>.05$, it indicates that changes in state appropriations are not a statistically significant predictor of financial condition.

Table 4

ANOVA

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.060[a]	0.004	-0.007	38.93116%	0.004	0.350	1	98	0.556

a. Predictors: (Constant), State Appropriations

b. Dependent Variable: Financial Condition

The coefficients table (Table 5) shows the standardized beta coefficients which are used to develop the regression equation noted in the results below.

Table 5

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	11.827	3.900		3.033	0.003	4.087	19.566
State Appropriations	0.286	0.484	0.060	0.591	0.556	-0.674	1.246

Results. Simple (bivariate) regression was conducted to investigate how well changes in state appropriations predict financial condition of public higher education institutions within a state system located in the South Atlantic region of the United States. The results were not statistically significant, $F(1,98) = .35$, $p > .05$. The identified equation to understand this relationship was financial condition $= 11.83 + .29$ x (percentage change in state appropriations). The adjusted R^2 value was -.007 which indicates that financial condition is not explained by changes in state appropriations. Based on these findings, $H1_0$, stating there are no statistically significant associations among changes in state appropriations and financial condition is not rejected. Changes in state appropriations are not a good indicator of financial condition at institutions within a state system located in the South Atlantic region of the United States.

For research question 1, there was not a statistically significant association between the change in state appropriation levels and the financial condition of an institution. This result is surprising considering the literature has indicated a recent decline in state appropriations which coincides with a decline in financial stability of state institutions. It appears that state appropriations have become an insignificant part of the overall revenue stream for state institutions. Considering state institutions were developed to provide affordable education to its citizens, the research suggests there is a disconnect between the underlying agency theory.

Agency theory describes the relationship between a principal and agent where an agent performs

tasks on behalf of the principal (Bendickson et al., 2016). The states fund these higher education

institutions under the assumption they will provide quality education at an affordable price to the

public. However, if state appropriation levels have no impact on an institution's financial

condition, the principal agency relationship weakens as public institutions rely on other revenue

streams, such as increasing tuition rates. These institutions face a conflict of interest when state

appropriation levels force them to increase tuition rates, contradicting the state's interests

(Bryant & Davis, 2012).

H2: Financial Condition/Functional Expense Allocation Ratios

The second hypothesis tested investigates whether an association exists between the

allocation ratios of functional expense categories and the dependent variable of financial

condition percentage. $H2_0$ states there are no statistically significant associations among

allocation ratios of functional expenses and financial condition. "Associational inferential

statistics test for associations or relationships between variables and use, for example, correlation

or multiple regression analysis" (Leech et al., 2005, p. 5). Multiple regression is a complex

associational statistic "used to predict a scale/normal dependent variable from two or more

independent variables" (Morgan et al., 2015, p. 149). Descriptive statistics, scatterplots and

evaluation of correlations to identify multicollinearity was used to determine that a multiple

regression model was appropriate to test the hypothesis.

Descriptive Statistics (10 Independent Variables). The data were first tested to meet

the assumptions of multiple regression. According to Morgan et al. (2013), there are four

assumptions of multiple regression: (1) the variables have a linear relationship with the

dependent variable, (2) scores are normally distributed, (3) outliers are removed, and (4) issues

of multicollinearity are eliminated. To begin, the scatterplots for each of the independent

variables (see Figures 2-11 in Appendix A) were visually inspected to determine linearity and

detect outliers. The inspection revealed linear relationships for all independent; therefore, the

Pearson correlation was the appropriate statistic for practical significance (Morgan et al.).

Next, descriptive statistics descriptive statistics were performed for all the independent

variables (allocation ratios of functional expenses) and the dependent variable (financial

condition). The ranges, minimums, maximums, means, standard deviations and skewness can be

found on Table 11 in Appendix A. N represents the number of samples - 100. Note that no data

were omitted from any of the samples; therefore, the entire sample was included (10 institutions

for 10 years). All the functional expenditure independent variables fall within a scale from 0%

to 100%; therefore, the mean and for all ten of these variables appears reasonable. The skewness

of financial condition (1.977) and research (1.488) were higher than 1; however, if the skewness

for each of these variables is divided by the standard error of .241 the result is less than 2.5

(which is the approximate level of $p = .01$; Morgan et al., 2013); therefore, the data appears to be

normally distributed.

Multicollinearity (10 Independent Variables). Because each of the ten independent

variables was normally distributed and the assumption of linearity was not markedly violated,

Pearson correlations were computed to examine the intercorrelations of the variables. According

to Leech et al. (2005),

If variables are highly correlated (e.g., correlated at .50 or .60 and above), then one might

decide to combine (aggregate) them into a composite variable or eliminate one or more of

the highly correlated variables if the variables do not make a meaningful composite

variable. (p. 91)

The variables were examined for multicollinearity by first examining the Pearson coefficients

with a positive correlation of $\geq$ .50 on Table 12 (Appendix A). One set of independent variables

which appeared to be highly correlated with each other were Instruction and Academic Support

with a coefficient of .674. Instruction is comprised mainly of faculty salaries and benefits which

can be difficult to alter given the fact that they are based upon union contracts. Because of the

nature of this category, it was eliminated from further analysis. Another set of independent

variables which appear to be highly correlated are Research and Public Service with a coefficient

of .679. Since Research was not considered to be statistically significant (p value of .056 which

is greater than .05). It will be excluded from the second data set. The review for

multicollinearity resulted in the elimination of two independent variables: Instruction and

Research.

As noted above, Instruction and Research were eliminated from the model due to issues

of multicollinearity. The multiple regression analysis was rerun with the remaining eight

independent variables. The variables were examined for multicollinearity by first examining the

Pearson coefficients with a positive correlation of $\geq$ .50 on Table 14 (Appendix A). No further

issues of multicollinearity were noted.

Revised Model (7 Independent Variables). Because each of the eight independent

variables noted above were normally distributed, the assumption of linearity was not markedly

violated and there were no issues of multicollinearity, the Pearson correlations and p values were

examined for practical and statistical significance (see Table 14 and Table 15 in Appendix A).

One variable, Depreciation, appeared to have a smaller than typical effect size (r = .018). In

addition, Depreciation was not statistically significant with a p value >.05 (p = .430).

Depreciation was not included in the final model because of its small effect size and it was not

considered statistically significant. The multiple regression analysis was rerun with the seven

remaining independent variables. No issues of multicollinearity were noted. See correlations

below in Table 6.

Table 6

Correlations (7 Independent Variables)

		Financial Condition	Public Service	Academic Support	Student Services	General Institutional Support	Operations and Maintenance of Plant	Student Financial Aid	Auxiliary Enterprises
Pearson Correlation	Financial Condition	1.000	-0.204	0.774	0.218	0.185	0.284	-0.519	-0.581
	Public Service	-0.204	1.000	-0.044	-0.645	-0.243	-0.544	0.047	-0.143
	Academic Support	0.774	-0.044	1.000	0.237	-0.147	0.155	-0.267	-0.547
	Student Services	0.218	-0.645	0.237	1.000	0.200	0.352	0.286	-0.103
	General Institutional Support	0.185	-0.243	-0.147	0.200	1.000	0.301	-0.313	-0.428
	Operations and Maintenance of Plant	0.284	-0.544	0.155	0.352	0.301	1.000	-0.234	-0.334
	Student Financial Aid	-0.519	0.047	-0.267	0.286	-0.313	-0.234	1.000	0.355
	Auxiliary Enterprises	-0.581	-0.143	-0.547	-0.103	-0.428	-0.334	0.355	1.000
Sig. (1-tailed)	Financial Condition		0.021	0.000	0.015	0.032	0.002	0.000	0.000
	Public Service	0.021		0.331	0.000	0.007	0.000	0.321	0.078
	Academic Support	0.000	0.331		0.009	0.072	0.061	0.004	0.000
	Student Services	0.015	0.000	0.009		0.023	0.000	0.002	0.154
	General Institutional Support	0.032	0.007	0.072	0.023		0.001	0.001	0.000
	Operations and Maintenance of Plant	0.002	0.000	0.061	0.000	0.001		0.010	0.000
	Student Financial Aid	0.000	0.321	0.004	0.002	0.001	0.010		0.000
	Auxiliary Enterprises	0.000	0.078	0.000	0.154	0.000	0.000	0.000	

Practical Significance (7 Independent Variables). Because each of the seven

independent variables were normally distributed, the assumption of linearity was not markedly

violated, and no issues of multicollinearity were noted, Pearson correlations were computed to

examine the practical significance of the variables. The Pearson Correlation is a common

correlation statistic that is "calculated using an equation that relates two sets of scores for two

different measures" (Emerson, 2015, p. 242) which results in the correlation coefficient. Table 6

provides the results of the correlations among all seven independent variables (functional

expense allocation ratios) and the single dependent variable (financial condition).

Based upon the Pearson correlation coefficients in Table 6, general interpretation of the

strength of the relationship between each of the independent variables and the dependent variable

(financial condition) were noted in Table 7 below. Morgan et al. (2013) provides guidelines for

five common effect size measures (d, r, ø, R and η). For r and ø, |.10| is small or smaller than

typical, |.30| is medium or typical, |.50| is large or larger than typical and $\geq$ |.70| is much larger

than typical (Morgan et al.). Each of the independent variables were analyzed for their effect

size and practical significance based upon this guidance. Note the findings in Table 7 below.

Table 7

Interpretation of Relationships – Effect Size (7 Independent Variables)

Independent Variables	Correlation with Financial Condition Percentage
Public Service	Smaller than typical
Academic Support	Much larger than typical
Student Services	Smaller than typical
General Institutional Support	Smaller than typical
Operations and Maint. of Plant	Smaller than typical
Student Financial Aid	Larger than typical
Auxiliary Enterprises	Larger than typical

Statistical Significance (7 Independent Variables). Next, to investigate the statistical significance of the independent variables with the dependent variable, the p values were analyzed from the correlations table (see Table 6). According to Morgan et al. (2013), the p value represents a comparison of a calculated value to a critical value which describes the probability of rejecting a null hypothesis that is actually true. Typically, if the p value is $\leq .05$ the results are considered to be statistically significant (Morgan et al.). Based upon this criteria, all seven independent variables were considered to be statistically significant because they had a p value < .05.

Model Summary (7 Independent Variables). The model summary (Table 8) and ANOVA (Table 12) was used to evaluate the significance of the model. This table presents the R^2 and adjusted R^2 (.740). The R^2 signifies the proportion of the variance of financial condition that can be explained from the seven functional expense category allocation ratios. This indicates that 74% of the change in financial condition can be explained by the model.

Table 8

Model Summary (7 Independent Variables)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.871[a]	0.759	0.740	19.77385%	0.759	41.318	7	92	0.000

a. Predictors: (Constant), Auxiliary Enterprises, Student Services, General Institutional Support, Operations and Maintenance of Plant, Student Financial Aid, Academic Support, Public Service

b. Dependent Variable: Financial Condition

The ANOVA table (Table 9) shows the statistical significance of the regression test. The p value of the model is <.000. Since the p value is <.05, it indicates that the seven independent variables (functional expense allocation ratios) are statistically significant predictors of financial condition.

Table 9

ANOVA (7 Independent Variables)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	113089.726	7	16155.675	41.318	.000[b]
	Residual	35972.466	92	391.005		
	Total	149062.192	99			

a. Dependent Variable: Financial Condition

b. Predictors: (Constant), Auxiliary Enterprises, Student Services, General Institutional Support, Operations and Maintenance of Plant, Student Financial Aid, Academic Support, Public Service

The coefficients table (Table 10) shows the standardized beta coefficients which are used to develop the regression equation noted in the results below.

Table 10

Coefficients (7 Independent Variables)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	-30.292	35.177		-0.861	0.391	-100.156	39.573
Public Service	-2.118	1.233	-0.168	-1.718	0.089	-4.567	0.330
Academic Support	12.024	1.608	0.645	7.477	0.000	8.830	15.217
Student Services	0.486	2.028	0.021	0.240	0.811	-3.541	4.513
General Institutional Support	1.062	0.772	0.112	1.376	0.172	-0.471	2.594
Operations and Maintenance of Plant	-1.083	1.457	-0.054	-0.743	0.459	-3.977	1.811
Student Financial Aid	-2.767	0.725	-0.279	-3.819	0.000	-4.206	-1.328
Auxiliary Enterprises	-0.697	0.579	-0.121	-1.203	0.232	-1.847	0.454

Results (7 Independent Variables). Simultaneous multiple regression was conducted to investigate the best prediction of financial condition of public higher education institutions within a state system located in the South Atlantic region of the United States. The combination of variables to predict financial condition from public service, academic support, student services, general institutional support, operations and maintenance of plant, student financial aid and auxiliary enterprises were statistically significant, $F(7,92) = 41.32$, $p < .001$. The identified equation to understand this relationship was financial condition = -30.29 – 2.12 x (allocation ratio of public service) + 12.02 x (allocation ratio of academic support) + .49 x (allocation ratio of student services) + 1.06 x (allocation ratio of general institutional support) – 1.08 x (allocation ratio of operations and maintenance of plant) – 2.77 x (allocation ratio of student financial aid) - .70 x (allocation ratio of auxiliary enterprises). The adjusted R^2 value was .740 which indicates that 74% of the variance in financial condition is explained by the model. Based on these findings, $H2_0$ which states there are no statistically significant associations among allocation

ratios of functional expenses and financial condition is rejected. Public service, academic support, student services, general institutional support, operations and maintenance of plant, student financial aid and auxiliary enterprises are good indicators of financial condition at institutions within a state system located in the South Atlantic region of the United States.

For research question 2, there was a statistically significant positive association between four independent variables (Academic Support, Student Services, General Institutional Support and Operations and Maintenance of Plant) and a statistically significant negative association between three independent variables (Public Service, Student Financial Aid and Auxiliary Enterprises) and the dependent variable of financial condition. There was not a statistically significant association between the remaining three independent variables (Instruction, Research and Depreciation) and financial condition.

The resource dependency theory refers to behavioral consequences resulting from limited resources. Since public higher education institution's financial resources are finite, it is important to understand how to allocate those resource to reach optimal financial performance. Powell and Rey (2015) explained that one element of the resource dependency theory can be applied to an organization's strategic plan for environmental constraints. Based upon the results above, investing in academic support, student services, general institutional support and operations and maintenance of plant has a statistically significant positive impact on an institution's financial condition. However, equally important is that investments in public service, student financial aid and auxiliary enterprises have a statistically significant negative influence on an institution's financial condition.

Summary

The study was conducted to test two null hypotheses to determine predictors of financial condition of public higher education institutions within a state system located in the South Atlantic region of the United States. The first hypothesis states there are no statistically significant associations among changes in state appropriations and financial condition. Simple (bivariate) regression was conducted to investigate the hypothesis. The first hypothesis was not rejected as the results showed the model was not statistically significant; therefore, changes in state appropriations are not a good predictor of financial condition. The second hypothesis states there are no statistically significant associations among allocation ratios of functional expenses and financial condition. A multiple linear regression analysis was performed resulting in a rejection of the second hypothesis. Although there was not a statistically significant association between the three independent variables (Instruction, Research and Depreciation) and financial condition; seven of the independent variables did demonstrate statistically significant associations with financial condition. Four were positively correlated – Academic Support, Student Services, General Institutional Support and Operations and Maintenance of Plant. Three were negatively correlated – Public Service, Student Financial Aid and Auxiliary Enterprises. The second hypothesis was rejected, considering these seven independent variables are good predictors of financial condition and represent a significant portion of the variance of the dependent variable.

Applications to Professional Practice

Effective resource allocation is a critical component of business process management and is recognized for its importance for process performance improvement (Zhao, Liu, Dai, & Ma, 2016). A set of rules surrounding resource allocation is often implied; however, current

approaches do not sufficiently draw conclusions surrounding the resource allocation rules (Huang, Lu, & Duan, 2011). This study offers an initial methodology for public higher education institutions to use for resource allocation purposes. Analyzing the relationship between state appropriations, functional expense categories and financial condition reveals which functional areas are most influential on financial condition and how these institutions may be affected by fluctuations in state appropriations.

The results of this study may be used by the administration and board of directors of higher education institutions during strategic planning discussions as well as during the annual budget preparation. The budgeting process can be adjusted using the guidance of this study to make changes that could potentially be beneficial to the financial future of the institution.

The overall findings of this study provide data that higher education institutions could use to reallocate resources in order to remain viable in the future. The purpose of higher education institutions is to provide ways for individuals to obtain an advanced level of knowledge and better themselves. The knowledge gained by these individuals in turn benefits the overall community of God as families can flourish and grow. "Business serves by providing the goods and services that enable people as consumers to flourish; opportunities for meaningful and creative work that enable people as workers along the value-chain to flourish; and, support that enables communities to flourish" (Karns, 2011, p. 341).

The accounting industry can benefit from the outcomes of this study through improved allocation of expenditures during the budgeting process providing potentially stronger financial results of the institution. Accountants can use the predictive model to identify various areas for cost savings and reallocation of resources that can benefit the institution financially moving forward. One of the main goals for many accountants is to identify financial models and patterns

that would assist in the budgeting process and help drive towards more profitable results for businesses and their owners, shareholders or trustees.

Recommendations for Action

Several conclusions were drawn from the study regarding correlations between changes in state appropriations, functional expenditure categories and an institution's financial condition.

State Appropriations

The results of the research indicate a weak correlation between state appropriations and an institution's financial condition, r = .06. This is an interesting observation as public higher education institutions are essentially owned by the state and are guided by state policies and regulations (Guzmán-Valenzuela, 2016). These institutions were intended to provide quality education to all students through the support of state funding (Bastedo & Gumport, 2003). State appropriations are subsidies which attempt to offset the cost of tuition at public colleges and universities (Toutkoushian & Shafiq, 2010). The states invest in public higher education institutions with the intention of developing and educating their citizens and expanding the workforce (Dunn, 2015). States assume their students will remain in their home state upon graduation and contribute to the state economy through various taxes (Toutkoushian & Shafiq).

The data show no statistically significant association between changes in state appropriations and an institution's financial condition. One explanation is that state appropriations have become an insignificant portion of the overall revenue stream of public higher education institutions. State appropriations as a percentage of total revenue at public colleges and universities decreased by 9% from 2004 to 2013 (32% to 23%, respectively; Sav, 2016). If state officials wish to continue to regulate operations at these state-run institutions, they should consider increasing state appropriation to levels which would have an impact on an

institution's financial condition. From an institution's perspective, they should review their relationship with the state to determine whether it would be more beneficial to privatize. Unless states provide a significant amount of additional funding, students are impacted by increasing tuition rates.

Functional Expense Categories

The functional expense categories of an institution describe the various areas an institution may choose to invest its financial resources. The study initially analyzed the relationship between the allocation ratios of 10 functional expense categories and an institution's financial condition. Three of the functional expense categories did not have a strong correlation with financial condition (Instruction, Research and Depreciation). Since these were deemed not to be statistically significant, administrators and boards of trustees should not weigh them as heavily in the budgetary process of allocating resources. Seven of the functional expense categories showed a significant correlation to financial condition (Public Service, Academic Support, Student Services, General Institutional Support, Operations and Maintenance of Plant, Student Financial Aid and Auxiliary Enterprises). The recommendations on how to allocate resources to each of the categories is described below.

Public Service. Based upon the research, a negative correlation was present between public service and financial condition ($r = -.204$). As additional funds are allocated to public service, this would account for 10.2% of the overall impact in financial condition. The association between public service and financial condition was statistically significant as its p value was less than .05.

Public service activities provide assistance to external constituencies from the institution (FARM, para. 342.13). Functional expenses included in this category consist of community

service activities, support for hospitals, other non-profit entities and the surrounding community (FARM, para. 342.13). Public service continues to be a focus of higher education institutions going forward. The main issue for institutions is to carefully weigh the negative impact on financial condition related to public service with the surrounding community perception of the college as a partner contributing to the success of the local neighborhood.

Public service plays an integral component for any institution of higher education in the fact that participation increases awareness and engagement in the local community for students and faculty. Recognition for these types of service-oriented investments can provide positive media coverage and gain significant support from the local community which can also provide a method of attracting new students and bolster enrollment. However, based on the results of the study, additional investments in public service negatively impact an institution's financial condition.

Academic Support. A practical significant positive correlation (r = .774) and statistically significant (p <.05) was noted between academic support and financial condition. An increase in academic support represents approximately 38.7% of the total increase in financial condition. Based upon this information, those involved in strategic planning for public higher education institutions should consider additional investment opportunities in the academic support functional expenditure category.

Academic support encompasses expenses related to an institution's overall missions: instruction, research and public service (FARM, para. 342.14). It includes the following subcategories: libraries, museums and galleries, educational media services, academic support informational technology, ancillary support, academic administration, academic professional development and course and curriculum development. The data could be shared with the

campus community to support faculty and staff requests for funding which enhances the classroom and learning experience.

Student Services. Student services displayed a statistically significant (p<.05) positive correlation to financial condition (r = .218). Increases to student services expenditures would relate to nearly 11% of the overall increase in financial condition.

Functional expenses related to student services mainly provide support for the students' physical, emotional and intellectual well-being outside of academics (FARM, para. 342.15). Admissions, financial aid and student life/activities represent the more significant subcategories of student services (FARM, para. 342.15). Social and cultural development is an important component of student life/activities and can consist of various intramural and intercollegiate athletic teams, an array of student organizations as well as outdoor leadership activities.

Many colleges and universities have identified the benefit of investing financial resources in student services. As the competition to attract new students continues to heighten, investments in areas such as admissions and athletics have been implemented and based upon the results of the study, have made a positive impact on the overall financial condition of the entity.

General Institutional Support. The results of the correlation testing at Table 9 indicate a statistically significant (p<.05) positive correlation between general institutional support and financial condition (r = .185). As general institutional support increases, this would account for 9.25% of the total increase in financial condition.

General institutional support references expenditures for strategic initiatives and long-term planning for the entire institution (FARM, para. 342.16). This functional expense classification is an important category as it relies on various areas such as administrative

informational technology and development, fiscal operations, executive management of the college and overall general administration (FARM, para. 342.16).

The overall vision and strategic plan of the college or university plays a significant role in the direction and future of the institution. By choosing to invest additional resources in this area, institutions can be proactive related to their future success by implementing comprehensive strategic plans which allow for improved financial condition.

Operations and Maintenance of Plant. A positive correlation that is statistically significant ($p<.05$) exists between operations and maintenance of plant with financial condition ($r = .284$). An increase in spending related to operations and maintenance of plant would account for around 14% of the total increase in financial condition.

Operations and maintenance of plant expenditures pertain to the overall repair, management and supervision of the physical plant of the college (FARM, para. 342.17). Many of the expenditures related to this functional expense category deal with overall maintenance and repairs to facilities and equipment on campus, cleaning and upkeep related to buildings and grounds, housekeeping services for cleaning of residence halls and academic spaces, utilities, hazardous waste disposal and management/oversight of new construction as well as campus renovations (FARM, para. 342.17).

Institutions of higher education strive to be proactive related to the operations and maintenance of plant to leverage financial resources as much as possible to create the most significant upgrades to facilities and grounds to attract and retain students. The overall perception of campus is an important quality that most potential students and their families use to assist in their selection of their future college.

Student Financial Aid. Student financial aid has a statistically significant (p<.05) inverse relationship with financial condition (r = - .519). This relationship expresses that an increase in student financial aid accounts for approximately 26% of the total decrease in financial condition.

Student financial aid has been an area of significant scrutiny during recent years. Higher education institutions must weigh the financial impact of awarding additional financial aid to students that allow families to feel that a college education is affordable and worthy of the investment. The study shows institutions that continue to enhance financial aid packages to attract additional students negatively impact the future financial condition of the institution.

Students and families could be affected by this information as institutions may decide to reduce the amount of student financial aid offered. State officials may need to analyze the data to ensure that quality education remains affordable to its residents.

Auxiliary Enterprises. The auxiliary enterprises allocation ratio has an inverse relationship with financial condition (r = - .581). Increasing funding in auxiliary enterprises indicates approximately 29% of the total decrease in financial condition. Budget officers and strategic planning committees should contemplate reducing the amount of funds invested in auxiliary enterprises because of its inverse relationship to financial condition.

Functional expenses classified as auxiliary enterprises refer to services outside the main mission of the institution with the purpose of providing services to the college or university and surrounding community (FARM, para. 342.20). These activities are run as a separate business unit and include parking, housing, health clinics and restaurants (FARM, para. 342.20).

Not only does this information impact staff at these auxiliary enterprises, but it could also influence citizens in the surrounding community. Individuals seeking medical attention at health

clinics or customers of restaurants could be affected by a decision to reduce funding to these business units. However, since these activities are not related to an institution's primary mission, administrators must consider whether they should continue to fund these auxiliary enterprises given the results of the study.

Recommendations for Further Study

Research into predictors of financial condition is an important component of an entity's sustainability. Understanding which areas of investment contribute to the financial stability of an institution or organization could potentially change the budgeting process and improve business practices. Organizations who utilize this information can gain a competitive advantage in the global marketplace.

This study examined the correlation among the percentage change in state appropriations and allocation ratios among functional expense categories of all the four-year higher education institutions of a state system located in the South Atlantic region of the United States. There are several areas for further research which can supplement the information presented above and increase the reliability of the study.

The model presented could be extended to include the breakdown within each of the functional expense categories, such as salaries and wages, benefits, supplies and other services and utilities, rather than only the totals. The data are also available in the financial statements. This information could provide a more in depth understanding of which subcategories correlate to the financial condition of an institution.

Expanding the model to include other state systems institutions across the United States or even to private institutions could further identity whether a correlation exists between allocation ratios among functional expense categories and an institution's financial condition.

Although state appropriations would not be a factor for private institutions, other categories may be explored, such as grants and donor funds.

The current study focuses on allocation ratios as an indicator of financial condition; however, other qualitative factors may also play an important role in financial condition. Qualitative factors, such as geographical location, number of academic program offerings, student body demographics, accreditation, etc., could potentially be strong indicators of financial condition.

While this study focused on the financial condition of public higher education institutions, there are other indicators which define the success of an institution. For instance, further research could investigate how allocation ratios of functional expense categories may impact student academic performance. The primary mission of a higher education institution is to educate its students; therefore, focusing on student success may be meaningful.

The percentage change in state appropriations was considered as an independent variable to predict financial condition of a public higher education institution. With the recent decline in state appropriations among state systems, state appropriations make up a smaller percentage of total revenue. Further research could analyze the potential impacts of tuition increases on the financial condition of public higher education institutions. The correlation between state appropriations and tuition revenue can be analyzed to determine whether one can predict the other.

The research could also be extended beyond the higher education sector and applied to other business industries – manufacturing, healthcare, non-profit, retail. Any business entity could benefit from identifying areas of resource allocation which correlate to financial condition.

Reflections

The researcher is an employee of a public state system of higher education; therefore, there was a personal interest in the data collected. Since the study did not include participants and the data were gathered through audited financial statements, personal biases were not a factor.

Summary and Study Conclusions

Higher education is facing a paradigm shift in their business model. As state appropriations are reduced, the number of college going students in various geographical areas have decreased and the affordability of a college education has become a significant issue for students and their families, institutions must identify improved ways to analyze their financial models and budgeting processes in order to insure their future sustainability.

This study provides insight into the relationships between financial condition and state appropriations and functional expenses for institutions of higher education. The results of the model can be used to assist administrators in higher education with future budgeting strategies that can position their institutions for financial viability into the future.

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Appendix A: Multiple Regression Results
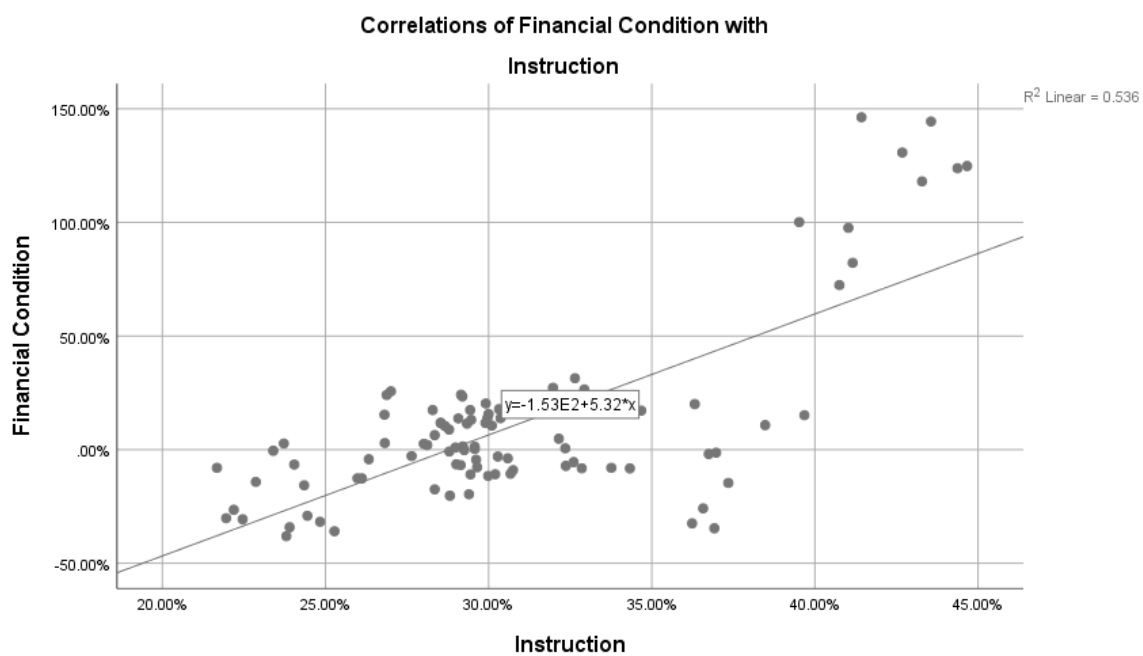
Figure 2. Scatterplot – Financial Condition/Instruction.
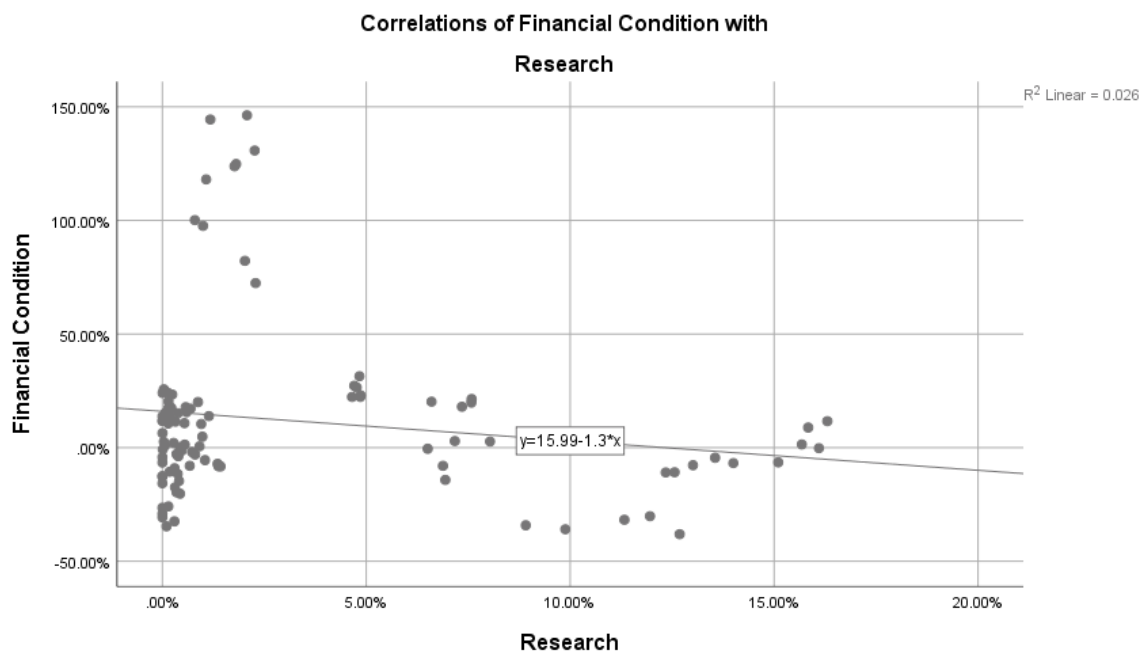
Figure 3. Scatterplot – Financial Condition/Research.
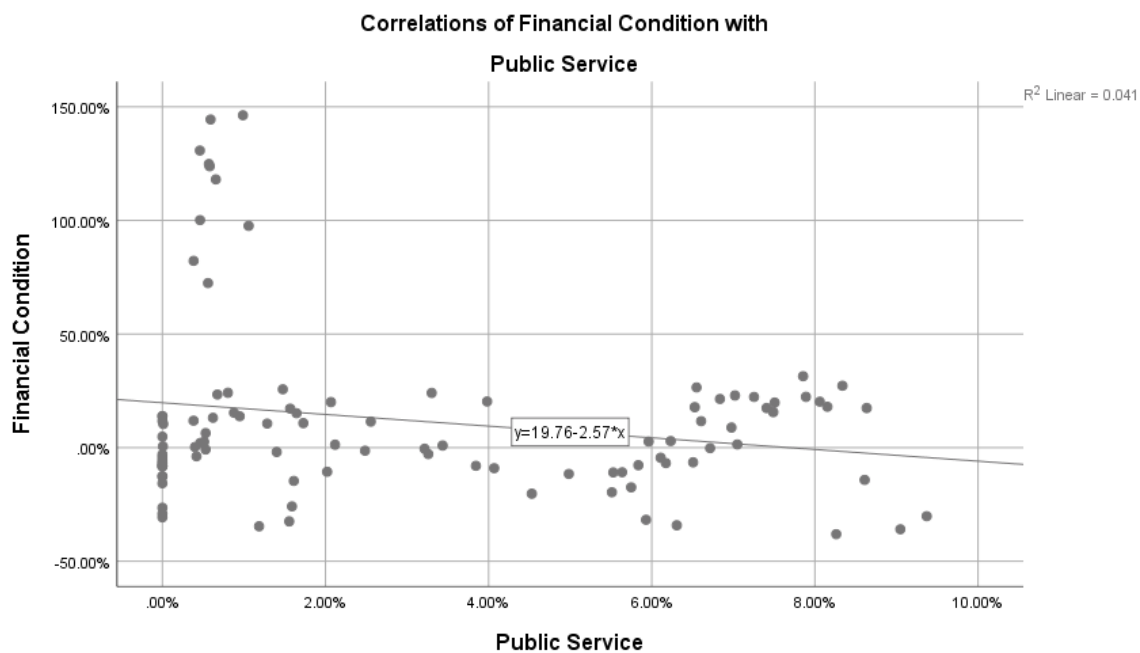
Figure 4. Scatterplot – Financial Condition/Public Service.
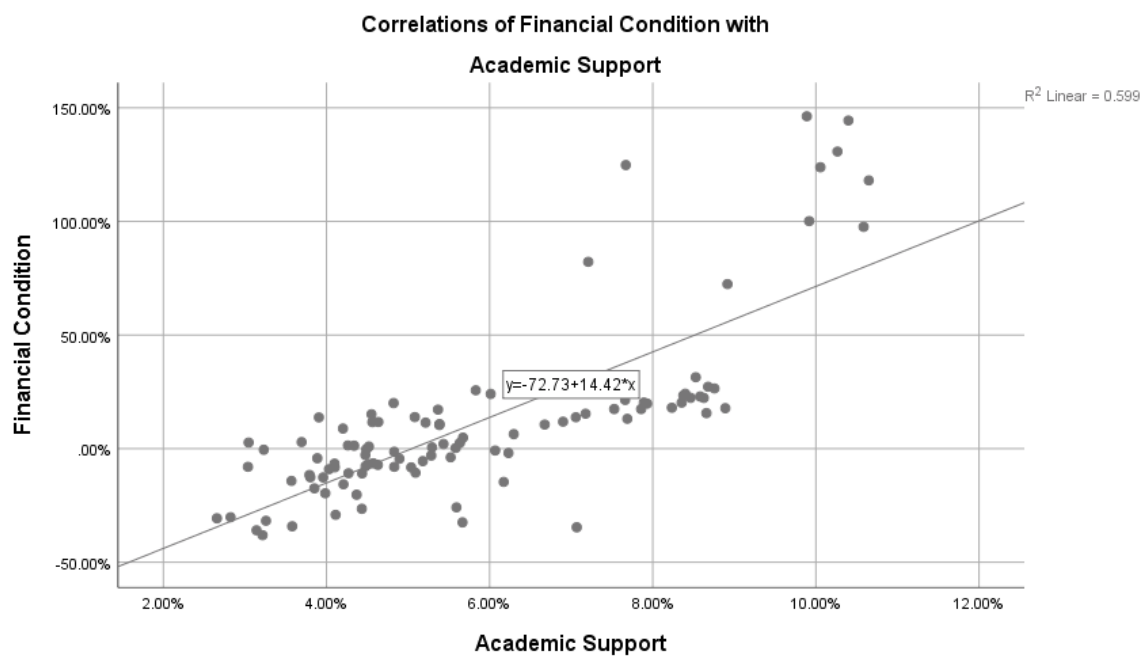
Figure 5. Scatterplot – Financial Condition/Academic Support.
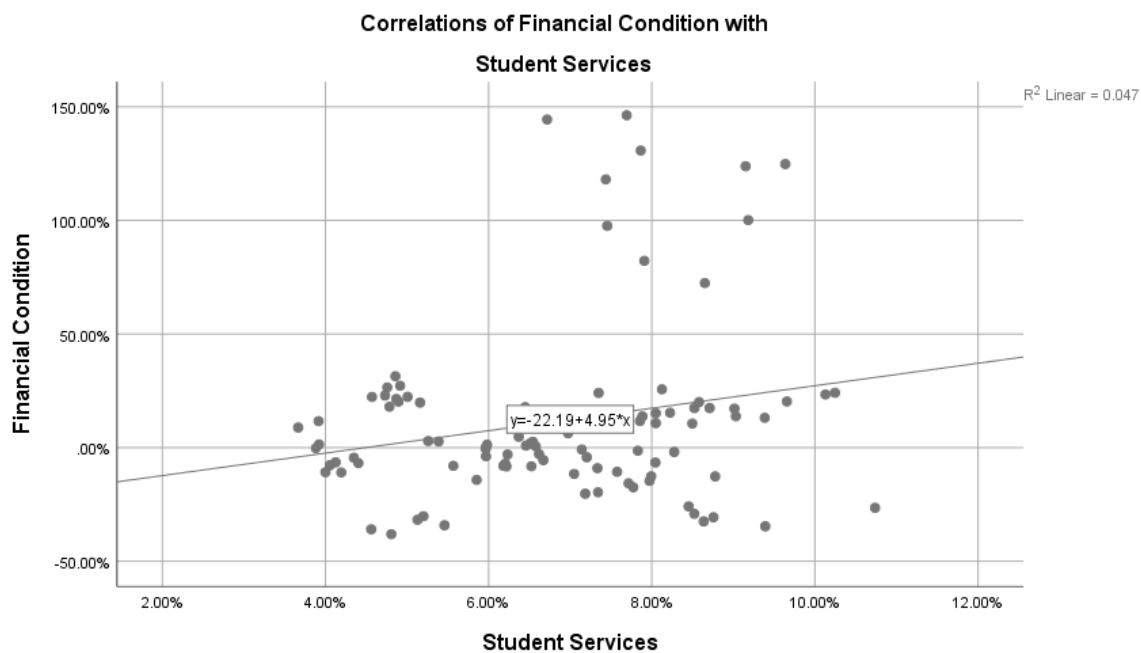
Figure 6. Scatterplot – Financial Condition/Student Services.
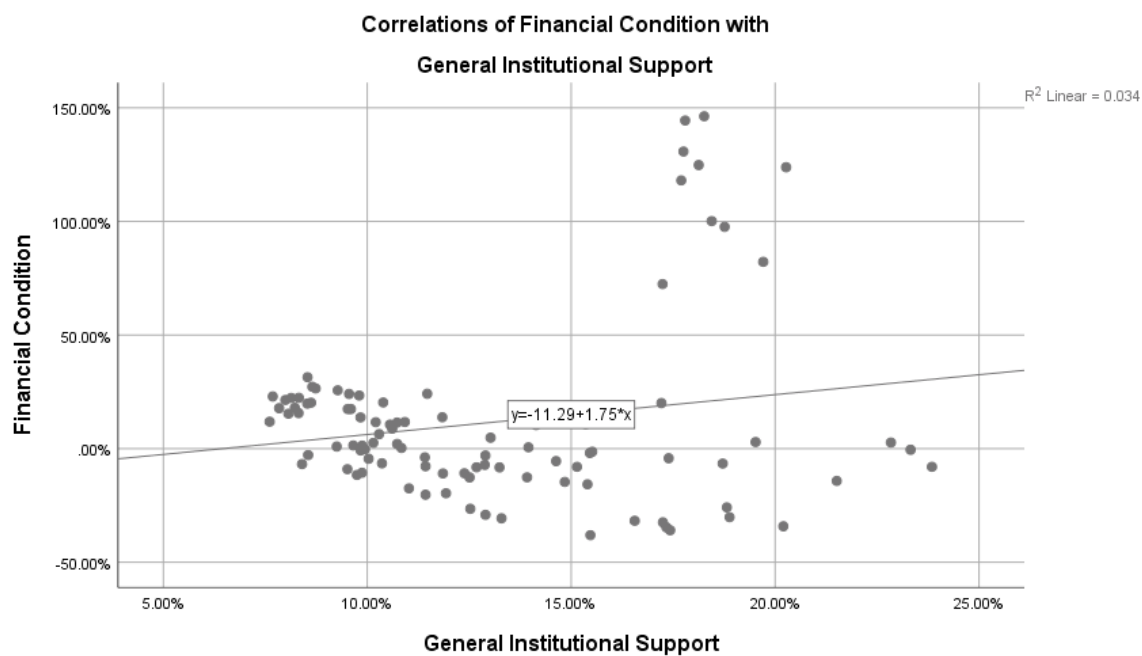
Figure 7. Scatterplot – Financial Condition/General Institutional Support.
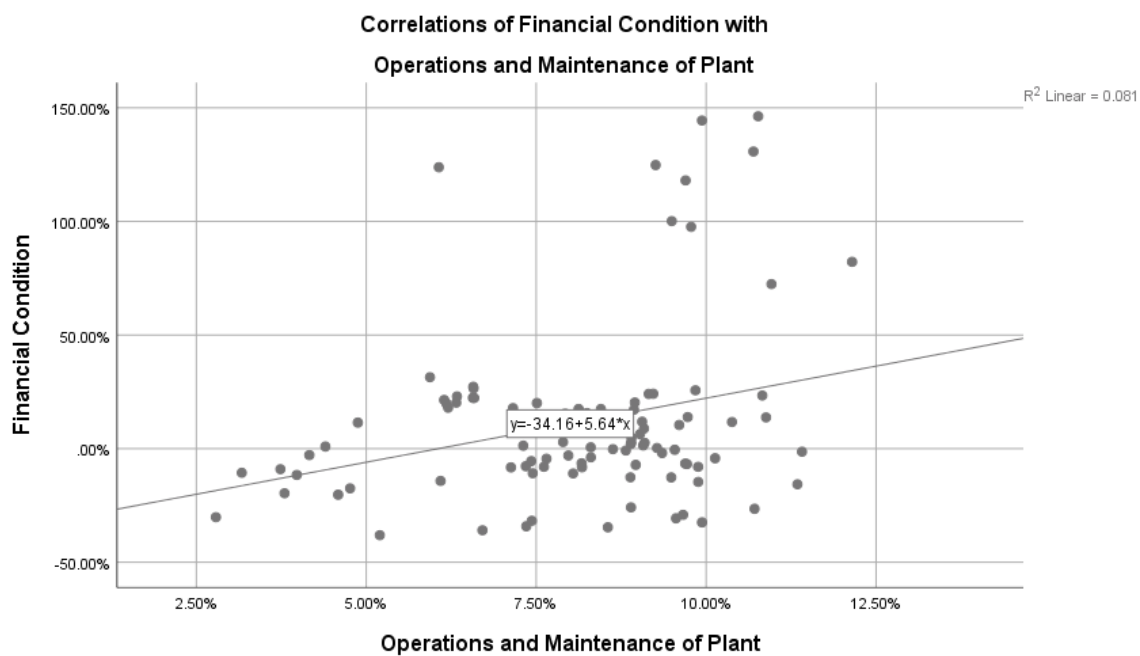
Figure 8. Scatterplot – Financial Condition/Operations and Maintenance of Plant.
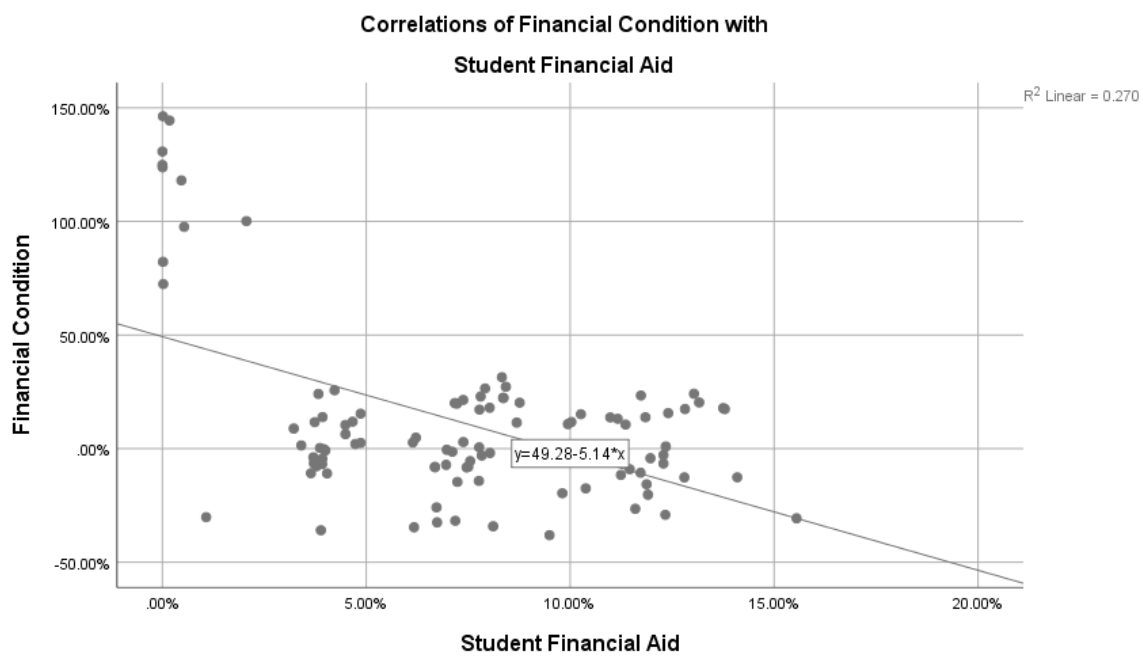
Figure 9. Scatterplot – Financial Condition/Student Financial Aid.
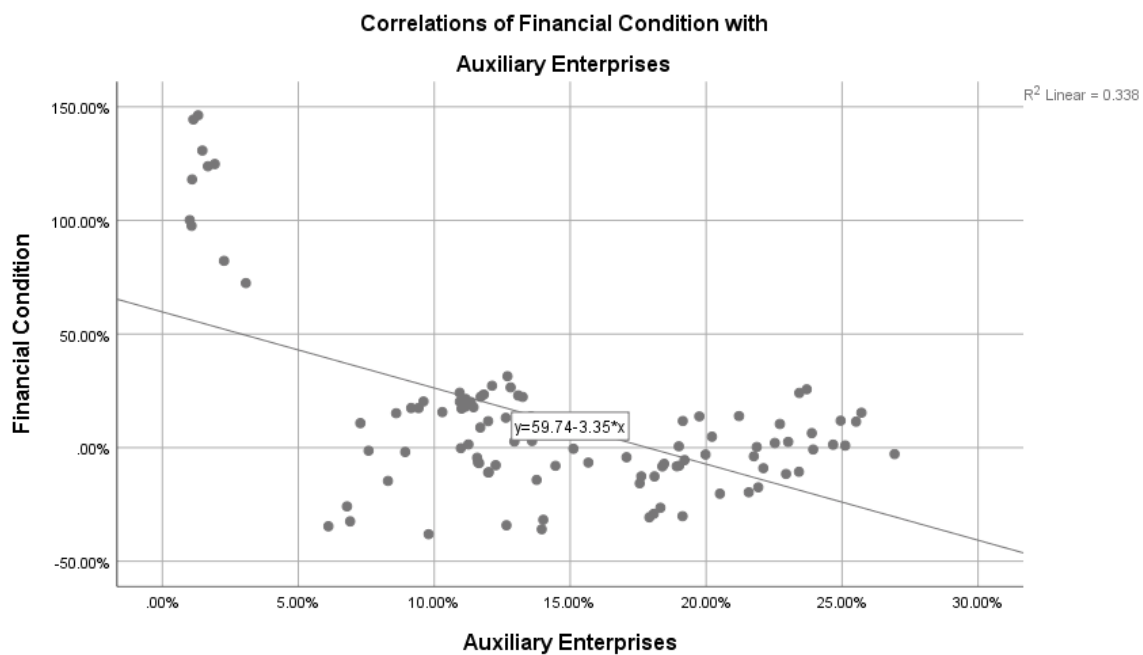
Figure 10. Scatterplot – Financial Condition/Auxiliary Enterprises.

Figure 11. Scatterplot – Financial Condition/Depreciation.

Table 11

Descriptive Statistics (10 Independent Variables)

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
Financial Condition	100	184.35%	-38.07%	146.28%	11.6901%	38.80308%	1505.679	1.977	0.241
Instruction	100	22.99%	21.67%	44.66%	30.9808%	5.33358%	28.447	0.724	0.241
Research	100	16.30%	0.00%	16.30%	3.3113%	4.78954%	22.940	1.488	0.241
Public Service	100	9.37%	0.00%	9.37%	3.1402%	3.07236%	9.439	0.523	0.241
Academic Support	100	7.99%	2.66%	10.65%	5.8566%	2.08258%	4.337	0.657	0.241
Student Services	100	7.07%	3.66%	10.74%	6.8512%	1.70943%	2.922	-0.037	0.241
General Institutional Support	100	16.24%	7.61%	23.84%	13.1088%	4.10002%	16.810	0.667	0.241
Operations and Maintenance of Plant	100	9.36%	2.79%	12.15%	8.1316%	1.95263%	3.813	-0.701	0.241
Student Financial Aid	100	15.55%	0.00%	15.55%	7.3123%	3.91830%	15.353	-0.123	0.241
Auxiliary Enterprises	100	25.92%	1.01%	26.93%	14.3481%	6.73178%	45.317	-0.183	0.241
Depreciation	100	9.69%	2.13%	11.82%	6.4857%	1.97759%	3.911	0.636	0.241
Valid N (listwise)	100								

Table 12

Correlations - Pearson Correlations (10 Independent Variables)

		Financial Condition	Instruction	Research	Public Service	Academic Support	Student Services	General Institutional Support	Operations and Maintenance of Plant	Student Financial Aid	Auxiliary Enterprises	Depreciation
Pearson Correlation	Financial Condition	1.000	0.732	-0.160	-0.204	0.774	0.218	0.185	0.284	-0.519	-0.581	0.018
	Instruction	0.732	1.000	-0.229	-0.264	0.674	0.237	0.163	0.181	-0.468	-0.648	-0.074
	Research	-0.160	-0.229	1.000	0.679	-0.252	-0.786	-0.007	-0.173	-0.356	-0.223	-0.234
	Public Service	-0.204	-0.264	0.679	1.000	-0.044	-0.645	-0.243	-0.544	0.047	-0.143	-0.405
	Academic Support	0.774	0.674	-0.252	-0.044	1.000	0.237	-0.147	0.155	-0.267	-0.547	0.101
	Student Services	0.218	0.237	-0.786	-0.645	0.237	1.000	0.200	0.352	0.286	-0.103	0.146
	General Institutional Support	0.185	0.163	-0.007	-0.243	-0.147	0.200	1.000	0.301	-0.313	-0.428	-0.350
	Operations and Maintenance of Plant	0.284	0.181	-0.173	-0.544	0.155	0.352	0.301	1.000	-0.234	-0.334	0.277
	Student Financial Aid	-0.519	-0.468	-0.356	0.047	-0.267	0.286	-0.313	-0.234	1.000	0.355	-0.199
	Auxiliary Enterprises	-0.581	-0.648	-0.223	-0.143	-0.547	-0.103	-0.428	-0.334	0.355	1.000	0.291
	Depreciation	0.018	-0.074	-0.234	-0.405	0.101	0.146	-0.350	0.277	-0.199	0.291	1.000
	Depreciation	100	100	100	100	100	100	100	100	100	100	100

Table 13

Correlations – Sig. (1-tailed) (10 Independent Variables)

		Financial Condition	Instruction	Research	Public Service	Academic Support	Student Services	General Institutional Support	Operations and Maintenance of Plant	Student Financial Aid	Auxiliary Enterprises	Depreciation
Sig. (1-tailed)	Financial Condition		0.000	0.056	0.021	0.000	0.015	0.032	0.002	0.000	0.000	0.430
	Instruction	0.000		0.011	0.004	0.000	0.009	0.052	0.036	0.000	0.000	0.233
	Research	0.056	0.011		0.000	0.006	0.000	0.473	0.043	0.000	0.013	0.010
	Public Service	0.021	0.004	0.000		0.331	0.000	0.007	0.000	0.321	0.078	0.000
	Academic Support	0.000	0.000	0.006	0.331		0.009	0.072	0.061	0.004	0.000	0.158
	Student Services	0.015	0.009	0.000	0.000	0.009		0.023	0.000	0.002	0.154	0.073
	General Institutional Support	0.032	0.052	0.473	0.007	0.072	0.023		0.001	0.001	0.000	0.000
	Operations and Maintenance of Plant	0.002	0.036	0.043	0.000	0.061	0.000	0.001		0.010	0.000	0.003
	Student Financial Aid	0.000	0.000	0.000	0.321	0.004	0.002	0.001	0.010		0.000	0.023
	Auxiliary Enterprises	0.000	0.000	0.013	0.078	0.000	0.154	0.000	0.000	0.000		0.002
	Depreciation	0.430	0.233	0.010	0.000	0.158	0.073	0.000	0.003	0.023	0.002	

Table 14

Correlations - Pearson Correlations (8 Independent Variables)

		Financial Condition	Public Service	Academic Support	Student Services	General Institutional Support	Operations and Maintenance of Plant	Student Financial Aid	Auxiliary Enterprises	Depreciation
Pearson Correlation	Financial Condition	1.000	-0.204	0.774	0.218	0.185	0.284	-0.519	-0.581	0.018
	Public Service	-0.204	1.000	-0.044	-0.645	-0.243	-0.544	0.047	-0.143	-0.405
	Academic Support	0.774	-0.044	1.000	0.237	-0.147	0.155	-0.267	-0.547	0.101
	Student Services	0.218	-0.645	0.237	1.000	0.200	0.352	0.286	-0.103	0.146
	General Institutional Support	0.185	-0.243	-0.147	0.200	1.000	0.301	-0.313	-0.428	-0.350
	Operations and Maintenance of Plant	0.284	-0.544	0.155	0.352	0.301	1.000	-0.234	-0.334	0.277
	Student Financial Aid	-0.519	0.047	-0.267	0.286	-0.313	-0.234	1.000	0.355	-0.199
	Auxiliary Enterprises	-0.581	-0.143	-0.547	-0.103	-0.428	-0.334	0.355	1.000	0.291
	Depreciation	0.018	-0.405	0.101	0.146	-0.350	0.277	-0.199	0.291	1.000

Table 15

Correlations – Sig. (1-tailed) (8 Independent Variables)

		Financial Condition	Public Service	Academic Support	Student Services	General Institutional Support	Operations and Maintenance of Plant	Student Financial Aid	Auxiliary Enterprises	Depreciation
Sig. (1-tailed)	Financial Condition		0.021	0.000	0.015	0.032	0.002	0.000	0.000	0.430
	Public Service	0.021		0.331	0.000	0.007	0.000	0.321	0.078	0.000
	Academic Support	0.000	0.331		0.009	0.072	0.061	0.004	0.000	0.158
	Student Services	0.015	0.000	0.009		0.023	0.000	0.002	0.154	0.073
	General Institutional Support	0.032	0.007	0.072	0.023		0.001	0.001	0.000	0.000
	Operations and Maintenance of Plant	0.002	0.000	0.061	0.000	0.001		0.010	0.000	0.003
	Student Financial Aid	0.000	0.321	0.004	0.002	0.001	0.010		0.000	0.023
	Auxiliary Enterprises	0.000	0.078	0.000	0.154	0.000	0.000	0.000		0.002
	Depreciation	0.430	0.000	0.158	0.073	0.000	0.003	0.023	0.002	