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Rankings and the quest for excellence in the public higher education institution

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Rankings and the quest for excellence in the public higher education institution

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Business decisions are increasingly being made in the higher education institution (HEI) based on their impact to university rankings, sometimes to the detriment of the HEI mission. HEIs are not homogenous, and rankings are inadequate on their own in capturing HEI excellence. This dissertation took a three-pronged approach in addressing quality and excellence in the HEI. First, a case study adapted the Balanced Scorecard (BSC) for a Financial Aid office in a public HEI, illustrating that, with a few modifications, the BSC is an appropriate and holistic approach to addressing quality in the HEI. The primary modification was to place mission at the top of the BSC, reflecting that each of the strategic objectives should be made with mission in mind. Next, survey methods were used to gain insight from upper administrators at public four-year HEIs regarding perceived quality factors. According to survey results, respondents rated Graduation and Retention as the most important indicator of quality. These results were further used to calculate weights of importance for each quality factor, further comparing these weighted factors to methodologies of three rankings systems, and found that the perceived quality factors identified by the respondents did not align with rankings methodologies. Finally, historical data was used to consider which HEIs moved most in their U.S. News and World Report (USNWR) rankings and peer scores. Higher-ranked HEIs were found to have less movement, and lower-

ranked HEIs had more movement. Peer scores were found to be variable, although only by incremental amounts. Multiple regression analysis was used to compare USNWR rankings and objective data from the Integrated Postsecondary Education Data System (IPEDS) and Top American Research Universities (TARU) publication, finding graduation rate to have the strongest relationship with rankings. Ultimately, the wise HEI will find an appropriate mix of aiming for higher rankings and a focus on its mission, and ideally both would be in alignment.

DEDICATION

This dissertation is dedicated to my wonderful, amazing children: Jacob, Justin, Joshua, and Jenna. You continue to amaze me every day, and I am blessed beyond measure to have the gift of being your mom.

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I am deeply grateful to my major professor, Dr. Lesley Strawderman, who has been a tremendous resource and advocate as I pursued this degree. She has been patient and encouraging each step of the way, providing the perfect blend of steadiness with accountability to help me maintain the pace that I'd sought so early on. My sincere appreciation also goes to Dr. Stan Bullington, who first talked with me about the idea of pursuing a PhD in ISE and helped me to see that it was something very doable and very much in line with my education background. Thank you also to my other committee members, Dr. Kari Babski-Reeves and Dr. Brian Smith, who also helped me take a very abstract research idea and formulate it into something meaningful. I would also like to express my gratitude to all of the ISE faculty and staff members who supported me on this journey.

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videos playing in the background at night or hearing the word "dissertation" more times than they could count.

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CHAPTER I

INTRODUCTION

Quality and excellence are terms that have become commonplace in nearly all types of organizations today. Rare is the industrial and systems engineering graduate that has not had a course in which these words have been uttered. However, as much as these concepts have become a staple in society, consensus has yet to be met on how best to conceptualize or measure them, particularly in the area of higher education. Consequently, university rankings have become wildly popular, as they are often perceived as an external assessment of quality in the higher education institution (HEI) (Hazelkorn, 2014).

While rankings are often considered the "gold star" a college or university receives to designate it as a world-class leader, how effective are these rankings in capturing the true picture of the HEI? Many of these rankings systems rely on reputation and prestige of the HEI as one measure of success (Robinson, 2014). Given the inherent prestige of Ivy League HEIs and those with large endowments, how can a typical land-grant HEI in a state such as Mississippi ever compete? What sets these world-class HEIs apart, and how can other HEIs take note of those attributes to bring their own strengths to the forefront? How does one measure who is a "world-class leader" and who is considered "excellent"?

A common issue with rankings is that many HEIs place so much emphasis on these rankings that they make business decisions based on how those decisions might help them in the rankings (Robinson, 2014). They become so consumed with being in the "top 100", or whatever

aspiration they have, that they can lose sight of the real goal. To quote Stephen Covey, "The main thing is to keep the main thing the main thing" (Covey, 2005, p. 160). Is the main thing garnering high rankings in these surveys, or is the main thing producing quality graduates that employers want to hire? When the HEI loses sight of its "main thing", it loses the focus that is needed to serve its students and community well. The main thing should not be to rank in a list. The main thing should be the "why" of the HEI, and the rankings will hopefully follow when the HEI is successfully doing the "why".

One of the leading complaints about rankings systems is that they are biased and unfairly skewed toward power schools with large endowments and prestige. Hence, it is easy to get into the "victim mentality" of blaming uncontrollable variables, such as geography and limited funding, as the reason for not ranking highly. When factors such as peer evaluations and endowments comprise such a large weight in the rankings, do lesser-known HEIs even stand a chance of moving higher in rankings without completely abandoning their core mission? This question is one with which the HEI struggles when balancing the two, sometimes competing, desires.

It is impossible to adequately capture all of the beautiful and wonderful things that make an HEI what it is, when relying on rankings alone. The diverseness of universities makes it difficult to accurately and consistently place an objective measure on the institution (Marginson & van der Wende, 2007). Regardless, the HEI needs a way to measure performance excellence and quality. This dissertation explored the concept of quality in the HEI, with an attempt to provide insight into how industry tools for assessing quality can be implemented in the HEI. Additionally, perceived quality was explored through a survey of HEI administrators, and comparisons were made to the common rankings to see how connected these rankings were to

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the factors of perceived quality. Finally, objective HEI data was analyzed in relation to rankings to learn more about the data behind the data.

When considering how an institution can improve quality, having a better understanding of what others have done in this area can provide insight. While each institution is unique, small actions can make a big difference in improving the quality of the institution. By exploring and learning from the concept of quality in the HEI, even the lesser-known HEI can see success.

CHAPTER II

STUDY 1: ADAPTING THE BALANCED SCORECARD FOR HIGHER EDUCATION

Introduction

While quality standards have been developed and refined over the years for industry, higher education institutions (HEIs) are much further behind in developing such standards. HEIs have accreditation standards; however, these standards are typically specific to the educational programs and not to the institution as a whole. Similarly, while university rankings are thought to provide some measure of perceived quality, they are not specific to the mission of the individual institution (Beard, 2009).

Rather than create new standards specific to higher education, this study applied and modified an existing industry standard, the Balanced Scorecard (BSC) to measure quality in higher education.

Background

As society continues to expand its knowledge and embark on new ideas and territory, scientific quality is a key component (Tijssen, Visser, & Van Leeuwen, 2002). Unfortunately, quality is not a concept easily measured, as much subjectivity is involved in assessing quality. Consequently, the literature is rich with different approaches to defining and measuring quality, and a simple Google Scholar search on the keywords "defining quality" currently yields nearly four million matches!

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David Garvin (1984) described five approaches to defining quality in his often-cited article: "What Does 'Product Quality' Really Mean?", and many of these approaches can apply to the HEI as well. First, the transcendent approach sees quality as something that cannot be discretely defined but instead must be experienced. The product-based approach sees quality as something different about the product in question that determines quality, such as an extra ingredient or attribute in a product. The user-based approach relies on the personal consumer's preferences, so it is a subjective measure of quality. The manufacturing-based approach focuses on conformance requirements, viewing deviants and defects as reducing quality. Finally, the value-based approach considers value in relation to the cost of the product (Garvin, 1984).

In recognition of the conflict that can occur between the different approaches to defining quality, Garvin (1984) further identified eight dimensions of quality:

- Performance – how the product operates
- Features – supplemental characteristics of the product
- Reliability – probability of failure within a specific amount of time
- Conformance – how well the product meets standards
- Durability – how long the product will last
- Serviceability – product support after the sale
- Aesthetics – how the five senses perceive the product
- Perceived quality – evaluation of product by consumer

Garvin described these dimensions as working together, although he cautioned that all should not be pursued at the same time. The organization should find the right mix of these dimensions to determine its quality niche (Garvin, 1984). Some individuals find Garvin's dimensions difficult to apply in the education sector due to his heavy use of manufacturing

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terminology (Van Kemenade, Pupius, & Hardjono, 2008). However, with a few modifications and taxonomy changes, the HEI can find great usefulness in Garvin's approach and thoughts on quality.

From a service quality perspective, Parasuraman, Zeithaml, and Berry (1988) developed the SERVQUAL model that includes five dimensions of service quality: reliability, responsiveness, assurance, empathy, and tangibles. While they agreed with Garvin's assertion that perceived quality differs from objective quality, they also argued that service quality cannot be measured in the same way as that of a physical product, due to the heterogeneous nature of the services being provided. Thus, their SERVQUAL model was developed to assess the perceived quality of a service organization based on the dimensions of service quality and the factors listed under each (Parasuraman, Zeithaml, & Berry, 1988).

In addition to the SERVQUAL model, further works have emanated from Garvin's work, each with its own ideas on the best product quality taxonomy. For example, Forker, Vickery, and Droge (1996) combined "performance", "features", and "aesthetics" into one dimension "design quality", added "product improvement" as a dimension, separated "perceived quality" into two new dimensions "brand image" and "company reputation", and renamed "serviceability" to "customer service". Eric Hansen and Robert Bush (1999) developed a hybrid of Garvin's dimensions and the five dimensions of SERVQUAL, resulting in 11 dimensions by removing the "serviceability" dimension and combining "performance" and "conformance". Madu, Kuei, and Jacob (1996) considered Garvin's and others' works, as well as perceptions of middle managers, and proposed just four dimensions: customer satisfaction, employee satisfaction, employee service quality, and organizational performance. Alternatively, Curkovic, Vickery, and Droge (2000) refined Garvin's dimensions to just two overarching dimensions, product quality and

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service quality, further broken down into several other factors. From a higher education perspective, Owlia and Aspinwall (1996) considered product quality, service quality, and software quality to result in six dimensions of quality for higher education: tangibles, competence, attitude, content, delivery, and reliability.

All of these emanating works highlight the general lack of consensus when addressing quality in the organization, as each person or organization seems to have a different idea of the best way to assess quality. HEIs are not homogenous, so taking a "one-size-fits-all" approach can be problematic. Thankfully, there is a tool that can allow the HEI to tailor its approach in a way that is specific to the individual university or functional unit. While most commonly implemented in industry, with a few modifications, the balanced scorecard approach can also be used in the context of HEIs when considering excellence.

Balanced Scorecard (BSC)

Robert Kaplan and David Norton (1992) developed the balanced scorecard (BSC) as a means to consider financial and operational measures all in one place. The BSC provides "a holistic and balanced approach to the performance measurement" (Pietrzak, Paliszkiewicz, & Klepacki, 2015, p. 152). It also provides a way to simplify all of the data that comes in from so many sources into what matters most. The focus is less on the control of those measures and more on the consideration of strategy and vision. With so many HEIs making business decisions based on rankings and survey results, having a tool such as the BSC can encourage HEIs to focus on their core competencies and to strategize based on those competencies and desired states instead. Figure 2.1 provides an illustration of the BSC.
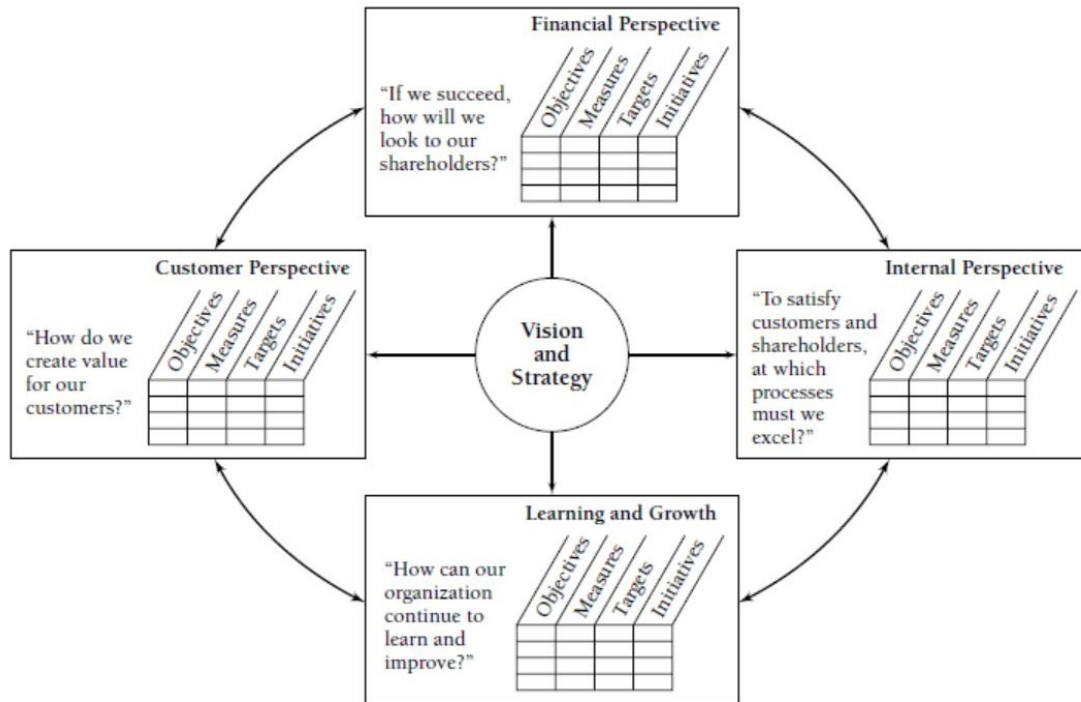
Figure 2.1   Illustration of the Balanced Scorecard

The Balanced Scorecard: Four Measures. Reprinted from Strategic Measurement Management and Performance in Nonprofit Organizations, by R. S. Kaplan, 2001

With the BSC, the HEI would need to determine the best measure for its particular strategy and need, and each business unit within the HEI would need to do the same. There is no universal approach, and that, perhaps, is the beauty of this tool. By focusing on strategy and mission, the HEI can look ahead to be sure it is staying on the path it needs or wants to be rather than continually looking in the past or at controls.

The BSC has many uses, as organizations use the BSC for activities such as "goal setting, compensation, resource allocation, planning and budgeting, performance improvement, strategic feedback and learning" (Barnabè, 2011, p. 451). The four classes of measure in the BSC are: (1) Customer Perspective, (2) Internal Perspective, (3) Learning and Growth Perspective, and (4)

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Financial Perspective (R. S. Kaplan, 2001; R. S. Kaplan & Norton, 1992, 1996). The BSC also includes "leading" and "lagging" measures, to show performance drivers and outcomes, respectively (Evans, 2011). The focus is on simplicity, rather than data overload, and only the most critical measurements are included. By viewing all of these measures in one place, management can consider trade-offs, as improvements in one area might make another area suffer.

Adaptations of BSC

Zahirul Hoque (2014) highlighted twenty years of literature on the BSC, from the introduction of BSC in 1992, to a variety of adaptations and refinements over the years. Hoque found that even Kaplan and Norton refined the BSC over time in subsequent publications, as the original classes of "Internal Business Perspective" and "Innovation and Learning" were renamed "Internal Business Processes" and "Innovation and Growth" in 1996. Likewise, later works of Kaplan and Norton began to link the BSC measures to a strategy map (Hoque, 2014).

When considering non-profit organizations, Robert Kaplan (2001) recognized that implementation of the BSC in the non-profit entity would look different from that in the private sector. He suggested placing the customer at the top of the hierarchy, rather than the financial perspective, since financial profitability is not the main purpose of non-profits. Instead, the non-profit organization is focused on meeting its mission and the interests of society. For this reason, mission should always be first (R. S. Kaplan, 2001).

In addition to industry and non-profits, the BSC has also shown application in the university setting. Deborah Beard (2009) described two successful BSC implementations at the University of Wisconsin-Stout and the Kenneth W. Monfort College of Business, both Malcolm Baldrige National Quality Award winners, by translating many of the key Baldrige award

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measures to the BSC. Michal Pietrzak, Joanna Paliszkiewicz, and Bogdan Klepacki (2015) applied the BSC to a Polish university, emphasizing the importance of using information systems to monitor strategy with the BSC. While both studies provided noteworthy application to the HEI, Beard's application involved a large number of measurements, and Pietrzak et al's application relied on the implementation of a system acquired with external funding.

Implementation of BSC in Universities

When implementing the BSC in the HEI setting, each of the perspectives will need to be translated into a way that makes sense for this setting. By taking each of the scorecard perspectives and relating to academia, HEIs can have a better understanding of how to implement such a tool.

Customer Perspective

Customer perspective asks the question, "How do our customers see us?" or "How do we create value for our customers?" (R. S. Kaplan, 2001; R. S. Kaplan & Norton, 1992). With this class, the organization would consider what really matters to the customer. Often, those areas of importance to the customer would include time, quality, performance, service, and cost. When considering these factors within the context of the HEI, the HEI first needs to define who is actually the customer.

Both internal and external stakeholders need to be considered (Van Kemenade et al., 2008). Students and parents are obvious customers to the HEI, but other "shareholders" should be considered as well. What about including donors or funding sponsors on the research and development side of the HEI? Also, for land-grant universities, service is a critical component of the university mission, so the general public might be considered a "shareholder".

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As an HEI, how can customer perspective be measured? Ideally, university rankings, such as those administered by U.S. News and World Report, would be an objective measure of customer perspective. However, those rankings systems are not without their flaws. So, other methods of understanding the customer perspective should be considered as well, such as surveying the customers or analyzing student enrollment and retention numbers. Such "consumer ratings" have shown to be one valid measure of quality (Rothwell, 2019). Strategic measures in this area might be new customer acquisition, customer satisfaction, customer retention, and market share in targeted segments, such as nontraditional students or students in a particular geographical area (R. S. Kaplan & Norton, 1996).

Customer Perspective: Time. When considering the customer's perspective on "time" in the HEI setting, many factors and areas should be considered, depending on which type of customer is being served. From a student perspective, how long does it take to get admitted, to receive financial aid, or to register for classes? Even things such as timeliness in grading assignments might be a concern. How long does it take to graduate? From the donor's

perspective, how long does it take to get a response on his or her gift or for it to be processed? Also, how long does it take the donor to see an impact from his or her gift, and is he or she receiving timely updates from the HEI on the impact of that gift? From the funding sponsor perspective, how long does it take to get a research proposal from the HEI, and how long does it take the HEI to perform the work? Also, are reports and billings timely?

Customer Perspective: Quality. Quality from the HEI perspective could be both quality of service or the quality of the education itself. Quality of service measures would be similar to any other service organization and overlap some with performance and service measures. For example, the SERVQUAL model considers five dimensions of quality from a service perspective that could be applicable to HEIs as well: reliability, responsiveness, assurance, empathy, and tangibles (Parasuraman et al., 1988). The quality of education might consider accreditations and the curriculum. How much thought is put into the courses and updates as things change? Do graduate schools see an undergraduate degree from this particular HEI as competitive? From a Garvin's (1984) eight dimensions of quality perspective, how "durable" is the degree, and is the HEI ensuring its graduates can navigate changes in standards and technologies even after that degree is earned?

Quality in faculty and quality in students are also important measures. How do HEIs measure quality of faculty or students? For faculty, measures might be the number of faculty with national recognition or scholarly awards (Rouse, Lombardi, & Craig, 2018). For students, measures might be students' acceptance rates at prestigious graduate schools, job offers at graduation, and prestigious awards and honors, such as Goldwater or Fulbright awards. How much should ACT and SAT scores matter or factor into this equation? Also, how does diversity of the faculty and student bodies factor into quality of faculty and students? Further research should be done in these areas before depending too heavily in these measures.

Customer Perspective: Performance and Service. Performance and service measures would have some overlap with time and quality. Additionally, graduation rates and retention rates might be important measures. On the research and development arm, proposal success rates would be worth considering.

Customer Perspective: Cost. When considering the customer's perspective on cost, tuition is often the cost most commonly associated with an HEI. Public HEIs are expected to have lower costs than private HEIs. The HEI will need to determine how to measure the value of the HEI relative to the cost of tuition. If the HEI has a higher tuition cost, what is it doing to set itself apart to demand that price? From a donor perspective, is the HEI being cost effective with contributions and being a good steward of the funding? From the research perspective, is the cost of performing the work competitive with others, and does it seem reasonable? What type of "overhead" costs are being passed on to the funding sponsor?

Benchmarking. Finally, benchmarking is a way HEIs may gather information on the customer perspective. Many HEIs already have a group of other HEIs they consider their peer groups, and often sights are set on the peer-plus groups as well. Because so many factors go into a great HEI, expanding that view outside of the peer group to a "best in breed" analysis can help further determine who has the best admissions process, funding portfolio, retention rates, or whatever measures are deemed most important.

Internal Perspective

The internal perspective asks, "To satisfy customers and shareholders, at which processes must we excel?" (R. S. Kaplan, 2001). In this area, organizations need to think about what business processes are most impactful on customer satisfaction. From the HEI perspective, many

of the front-line offices should be considered, and those most visible to students and parents need to be excellent. Core competencies should also be considered, ensuring processes within those core competencies are at their peak. The HEI should consider how much "nimbleness" should factor into the equation as well. For example, how long do curriculum changes take at the HEI? From the donor side, again looking at front-line offices is important, as well as gift processing and alumni foundation activities too. From the research perspective, how well are the research administration and infrastructure offices running? Are the processes providing value to the customer?

In addition to looking at measures to help control and drive behavior, the HEI should also consider the robustness of information systems to help monitor those measures. Tight funding and "silos" at HEIs can result in HEIs not having these systems at any comprehensive level, with many departments utilizing a piecemeal or manual approach to gathering the needed information.

Learning and Growth Perspective

The learning and growth perspective asks, "How can our organization continue to learn and improve?" (R. S. Kaplan, 2001). In this area, organizations need to consider to what extent they are encouraging learning, innovation, and growth. While HEIs are in the business of educating students, they also need to consider their workforce itself to be sure they are encouraging their faculty and staff in their development and growth. Training and development of employees is considered a critical success factor of an organization (Brown, 2013). Unfortunately, while HEIs are good at teaching and learning, they rarely apply that and encourage it in their own organizations (Garvin, 1993). To succeed as a learning organization, the organization needs to be skilled in five areas: "systematic problem solving, experimentation with new approaches, learning from their own experience and past history, learning from the

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experiences and best practices of others, and transferring knowledge quickly and efficiently throughout the organization" (Garvin, 1993, p. 81). These same areas can apply in the HEI setting.

HEIs also need to be considering innovation and growth. William Rouse (2009) stated that if an organization is not purposefully growing, it is in decline. Therefore, the HEI needs to consider what it is doing to keep moving forward. Often the other areas of the balanced scorecard will help identify gaps in skills and capabilities that need to be addressed (R. S. Kaplan & Norton, 1996). HEIs, many having been around for at least a century, can become entrenched in tradition and the way it has always been done. William Pasmore's (1988) Proposition 3.14, in regards to the social system of an organization states, "The stronger the culture of the organization, the more it will constrain design possibilities" (p. 36). As HEIs typically do not have a significant amount of funding, they must be open to fundamental changes in the way they do business to remain competitive (Rouse et al., 2018). Other perspectives and innovation are key. Exposure to professional and trade organizations and networking with others can help faculty and staff to stay abreast of current and emerging trends, broadening horizons, while forming collaborations and developing new ideas (K. Kaplan, 2013).

In addition to personal growth from professional development, continuing education has been shown to have a positive effect for the organization. Training and development have been found to increase employee satisfaction and retention (Deery, 2008). The cost of hiring new employees is usually much more than that of retaining a current employee, so employee satisfaction and retention have a positive impact on the bottom line for the company. Likewise, training and education have been identified as one of many critical success factors to the organization (Brown, 2013).

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Financial Perspective

The financial perspective asks the question, "If we succeed, how will we look to our shareholders?" (R. S. Kaplan, 2001). First, the HEI needs to determine who would qualify as a "shareholder". For the public, state HEI, the taxpayers are a huge shareholder, so they will have an interest in how funds are being spent at the HEI. Additionally, the legislature and college boards are important shareholders, as they often determine the allocations of state funding to the HEIs. Students and parents would be considered shareholders, as they are paying tuition into the HEI and want to know that those funds are being put to good use. Donors are also shareholders, as, again, they are putting money into the system and want to know that the HEI is being a good steward of the funds and that the funds are having the intended impact. Most, if not all, public HEIs have transparency laws with which they must abide, so information on their spending is available to the public. Expenditures should be reasonable and appropriate, lest the shareholders have the impression that their funds are not being spent wisely.

With any HEI, financial solvency is a very important measure. What is the HEI doing to look to the future and economic impacts that may come from it? What is the HEI doing to diversify funds? While public HEIs have the quandary of shrinking state funds, most HEIs have some type of federal funding that might be in danger of cuts, and donors that might change their minds on priorities. For this reason, the HEI should be making sure it has different types of funding available and always keeping an eye on future projections of potential shortfalls or surpluses. The HEI should also investigate which financial ratios are important to monitor, and incorporate these measures into the BSC view. Additionally, when considering strategy from a financial perspective, for the typical HEI in the "sustain" stage of growth, the HEI should be looking to see how to reduce bottlenecks, improve, and expand where appropriate (R. S. Kaplan

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& Norton, 1996). A summary of each of these perspectives, and some important considerations of each, are included in Table 2.1.

Table 2.1   Balanced Scorecard Considerations in the HEI

Perspective	Overarching Question	Considerations
Customer Perspective	*"How do our customers see us and how do we create value for our customers?"*	Who is the customer? Who are the internal and external stakeholders - students, parents, donors, funding sponsors, public, legislature, others? How can customer perspective in general be measured? Specifically, how can we measure the customer perspective on time, quality, performance, service, and cost? What type of benchmarking can help us in our analysis of where we stand in relation to others?
Internal Perspective	*"To satisfy customers and shareholders, at which processes must we excel?"*	What business processes are most impactful to the customer? Are they creating value for the customer? Consider core competencies, front-line offices, nimbleness, robustness of IT.
Learning & Growth Perspective	*"How can our organization continue to learn and improve?"*	Are faculty and staff being encouraged in their growth and development? What are we doing to innovate and move forward? Have we become entrenched in our ways, and is our culture resistant to change?
Financial Perspective	*"If we succeed, how will we look to our shareholders?"*	Who are our shareholders - taxpayers, legislature, college boards, students, parents, donors, others? What are we doing to plan ahead and to mitigate shortfalls? How diversified is our funding portfolio? What financial ratios do we need to monitor?

Methods

This study sought to provide some "food for thought" in considering implementation, as well as application through a case study in the HEI setting. The 2001 version of the BSC in Kaplan's analysis of the BSC in non-profits was adapted for the HEI setting. Each perspective was considered in the context of the HEI to determine relevant measures to address these perspectives. A simple version of the BSC was developed through a case study involving a Financial Aid department at a public HEI, with the intention that the completed BSC could then

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be managed and refined over time as needs change within the HEI. Suggestions for managing and refining the completed BSC are presented as well.

Case Study

Harvaro State University (HSU) is a public, non-medical, land-grant institution in the southeastern United States. The university is classified as an R1 Doctoral University by the Carnegie Classifications of Institutions of Higher Education, meaning that it is considered to have very high research activity. HSU offers undergraduate and graduate degrees, including a professional degree program. The university has an enrollment of nearly 19,000 undergraduates and 3,500 graduate students. As with many other HEIs of its type, HSU offers a variety of courses and programs via distance education, in addition to the traditional classroom setting. The university is part of a state system of universities, governed by a board of trustees. This university was chosen for the case study due to its enrollment size, as well as its mix of research, teaching, and service.

While an HEI, such as HSU, has several areas in which the BSC could be applied and implemented, the researcher chose the Student Financial Aid Office in which to apply the BSC. Regardless of institution size or mission, most, if not all, HEIs have some form of financial aid services functional area. For this reason, this study can be applied in a variety of HEI settings.

The Student Financial Aid Office, herein referred to as SFA, at HSU, is a fairly large operation. The department is led by a director who reports to the assistant vice president of academic affairs, and the SFA staff include a hierarchy of associate and assistant directors, as well as counselors and several other staff members. The office has a total of about 25 staff members, including the director. SFA administers various types of financial aid, including federal, state, and institutional grants and loans. However, SFA does not award scholarship

funds, as those applications are received, and awards made, by the Office of Admissions instead. Financial aid funds are administered year-round, as HSU offers the traditional fall, spring, and summer semesters, as well as an intensive summer or winter session each year.

The largest source of funding administered by SFA is federal aid. This aid may be in the form of student loans, such as the Direct Subsidized or Unsubsidized loans, or the parent or graduate student PLUS loans. The other large source of federal financial aid is grant programs, such as the Pell Grant, Supplemental Educational Opportunity Grant (SEOG), and the Teacher Education Assistance for College and Higher Education (TEACH) Grant. The third main source of federal aid is the Federal Work-Study (FWS) Program. Some of the aid, such as the grants, FWS, and Subsidized loans, is need-based, meaning the student and his or her family must demonstrate financial need in order to receive. The student must complete the Free Application for Federal Student Aid (FAFSA) in order to be awarded federal aid.

In addition to federal aid, SFA works with the State Financial Aid office to award state aid, mostly consisting of grant programs. Additionally, SFA assists in directing students and parents to a variety of alternative loan programs to supplement other aid when it is not enough to cover the cost of attendance. Finally, SFA administers a special grant program through the university that is purely funded through donor gifts to the program.

With the many types of aid, SFA has specific criteria it must follow, as well as reporting requirements. Also, as financial aid packages are large drivers of whether a student can or will attend a certain university, having a good understanding of SFA's performance and key measures is imperative to the success of this functional area. Decisions made in this unit can have an effect on many other functions of the university, impacting the number and quality of students

enrolling and returning each year. A tool such as the BSC could help bring focus to those impactful areas, and the leading and lagging indicators to be considered.

Mission

Just as Kaplan (2001) noted when describing the applicability of the BSC for non-profits, the HEI setting should consider mission first. The mission of HSU's SFA office is perhaps similar to that of many other SFA offices, in that it seeks to bridge the financial gap for students and help to reduce student loan debt as much as possible. Each of the BSC perspectives were approached with this mission in mind.

Customer Perspective

With the customer perspective, SFA needed to first identify who was a customer or shareholder. First, students and parents are customers to SFA, as they are the direct recipients of the services provided by SFA. Next, internal university units are considered shareholders, as they rely on this office as a recruiting partner or for data needs. Finally, the funders of the financial aid, such as the federal and state government, donors, and the university are shareholders who must also be considered.

The SFA office is one of the first exposures students and parents have to the university, and this interaction can make the difference in whether a student decides to attend HSU or not. Likewise, as graduation and retention are important goals of the university, current students need to feel as if their needs are being met. Therefore, SFA needed a way to measure the perspective of both students and parents, particularly in the area of customer satisfaction. Three groups of students were considered: incoming students, current students, and alumni. Through the

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implementation of short customer satisfaction surveys, this satisfaction could be measured and monitored.

Internal units to the university also rely on the SFA to provide timely and accurate data. Academic colleges and departments are seeking to recruit and retain students, and the actions of the SFA can either enhance that recruitment or hamper this recruitment and retention. Also, other units, such as the Controller's office and the Institutional Research office need timely responses and data from the SFA in order to complete tasks of their own.

Other shareholders, such as the funders of the financial aid need to feel as if their funds are being stewarded appropriately and for their intended purpose. Audits are one method used to provide this reassurance, so clean audit reports are an important measure. Additionally, SFA is often asked to complete surveys or to provide data to these constituents, so having the data available to report accurate numbers in a timely manner is important to meeting these needs.

In revisiting the core question asked in the Customer perspective of the BSC, "How do our customers see us and how do we create value for our customers?", some important strategic objectives for SFA are:

- Students and parents are satisfied with our services.
- Internal university units are satisfied with our services.
- Funders and constituents are provided the data they need in a timely manner.

Internal Perspective

Incoming students are often making decisions between multiple universities, and SFA must be able to send award notifications of financial aid packages in a timely manner since several universities may be competing for the same student. Likewise, current students rely on timely and accurate awards in order to purchase books, housing, and other needs for the

semester. For these reasons, SFA's award process was considered the most critical core competency in which it should excel and continually measure.

In addition to parent and student customers, SFA has multiple stakeholders that rely on this office to function well. As competition among colleges and universities becomes fiercer, many of the decisions impacting enrollment or degree offerings impact the financial aid processes in some way. The university relies on SFA to be responsive and nimble to these changes in order to address emerging trends in the university landscape. For example, a change in the semester structure or length can impact financial aid disbursement dates, so SFA's processes and information technology systems must be able and ready to adapt accordingly. Having an eye on enrollment targets and corresponding disbursement numbers and schedules will help SFA to be prepared to respond.

In revisiting the core question asked in the Internal perspective of the BSC, "To satisfy customers and shareholders, at which processes must we excel?", some important strategic objectives for SFA are:

- Financial aid packages are awarded in a timely and accurate manner.
- Funds are disbursed in a timely and accurate manner.

Learning and Growth

In a world of ever-changing program rules, regulations, and policies, the staff involved in the administration of financial aid must maintain a current working knowledge of the latest requirements. The SFA staff regularly participate in conferences, training, in-service activities, and webinars, and their external auditors typically ask about learning and growth in their annual audits of HSU and SFA. SFA has an in-house position devoted to training and compliance, and

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that individual is responsible for training new employees and regularly audits areas within SFA for compliance with applicable rules and regulations.

While the SFA provides in-house training, staff members are also involved in external organizations, such as professional societies, for their professional development. This development may be incorporated into annual or semi-annual society meetings, publications from the society, webinars, or self-paced learning programs. Another benefit of this involvement is the networking opportunities provided through the societies, as the staff member's horizon is often expanded through these networking opportunities. Members of professional societies often get an insider's look into how other institutions operate (K. Kaplan, 2013). Such a perspective can help SFA to see other ways to do things and can help prevent the time-consuming "reinvention of the wheel" that can often result when starting from scratch on a new idea or path that others have already forged at other organizations. This insight can save SFA a significant amount of time and money that would be spent on the trial-and-error that others have already experienced.

In revisiting the core question asked in the Learning and Growth perspective of the BSC, "How can our organization continue to learn and improve?", some important strategic objectives for SFA are:

- Employees engage in professional societies related to the mission of SFA.
- Employees exhibit a current knowledge of applicable federal, state, and institutional regulations, policies, and procedures.
- Employee goals and departmental goals are S.M.A.R.T. stretch goals focused on continual improvement and innovation.

Financial Perspective

While SFA is not in the business of making a profit, money is certainly a driving factor in the activities of this office. A key measure of importance for the U.S. Department of Education is the student loan default rate, and universities with high default rates can be in danger of losing federal aid funds ("National Federal Student Loan Cohort Default Rate Continues to Decline | U.S. Department of Education," 2019). Fortunately, HSU has a default rate that is lower than the national average, and SFA continues to seek ways to lower that rate. One of SFA's methods for doing so is through a financial literacy program. Likewise, some leading indicators of that default rate include: gainful employment numbers and average debt load of HSU graduates.

Another aspect of the financial perspective is whether funds are being utilized to their fullest extent when making financial aid awards. Obviously, the university would prefer to use external sources of funding, such as federal or state financial aid, before using its own funds. So, some measure of prioritization in awarding funds should be considered to be sure funds are being allocated and deployed to provide maximum benefit.

In revisiting the core question asked in the Financial perspective of the BSC, "If we succeed, how will we look to our shareholders?", some important strategic objectives for SFA are:

- Student loan default rates continue to be below the national average.
- Funds are allocated and deployed for maximum benefit.

Discussion

The completed BSC is in Table 2.2. As recommended by Kaplan (2001) the SFA mission is listed at the top of the BSC to reflect that this mission was the driving force behind each one of the objective measures. Also, as recommended by Van Kemenade et al. (2008), both internal and

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external stakeholders were considered in the development of the customer perspective section of the BSC. The financial perspective is listed last, to reflect a lesser prominence than that of the other perspectives. Past BSC adaptations in higher education, such as those identified earlier in this study (Beard, 2009; Pietrzak et al., 2015), included a large number of measures or required the acquisition of a new computing system to maintain, so this study sought to simplify the BSC developed in this case study. With a total of ten objectives, this BSC should be simple enough to manage and maintain. As recommended by Evans (2011), both leading and lagging indicators were included in this BSC. Likewise, refinements may be made over time should new measures become important to the mission. Particularly as the SFA continues to look to innovation and growth, the expectation is that this BSC will morph over time to meet those new goals and aspirations. Even so, SFA will need to be sure not to allow the addition of measures to result in too much complexity to the BSC.

Table 2.2   Balanced Scorecard for Harvaro State University's Student Financial Aid Office

Mission: We seek to bridge the financial gap for students while reducing student loan debt as much as possible.			
Focus	**Objectives**	**Measures**	**Targets**
Customer Perspective	Students and parents are satisfied with our services.	Customer service survey administered each semester after aid is awarded.	90% of students and parents indicate they are satisfied with our services.
	Internal university units are satisfied with our services.	Annual customer service survey administered to key departments.	90% indicate they are satisfied with our services.
	Funders and constituents are provided the data they need in a timely manner.	Survey responses are sent to appropriate offices by deadline.	100% compliance with deadlines.
Internal Perspective	Financial aid packages are awarded in a timely and accurate manner.	Days from complete application until award notification; Number of potential awardees who have not submitted a complete application.	Awards made within 7 business days of complete application.
	Funds are disbursed in a timely and accurate manner.	Days from first possible disbursement date for semester until funds are actually disbursed.	95% of disbursements made within 1 business day of first available disbursement date.
Learning and Growth Perspective	Employees engage in professional societies related to the mission of SFA.	Contact hours with professional societies.	Staff have at least 8 contact hours in the form of meeting attendance, webinars, or other learning modules.
	Employees exhibit a current knowledge of applicable federal, state, and institutional regulations, policies, and procedures.	Internal compliance checks on financial aid award packages.	95% of award packages are found to be accurate upon review.
	Employee goals and departmental goals are S.M.A.R.T. stretch goals focused on continual improvement and innovation.	Timeliness of performance appraisals, presence of goals with appraisal package, and "stretch" factor assigned to individual goals.	100% of employees with stretch factor of at least "moderate".
Financial Perspective	Student loan default rates continue to be below the national average.	Number of students participating in financial literacy events; Percentage of student borrowers with gainful employment upon graduation.	90% participation in events; 75% with gainful employment.
	Funds are allocated and deployed for maximum benefit.	Amount of available funds left unobligated.	No more than 20% of available funds left unspent at year-end.

When considering how this BSC implementation in the HEI differed from traditional implementations in industry, perhaps the greatest difference is in the main focus of the BSC. The overall mission was considered first, and each objective was developed with that mission in mind. Unlike the non-profit, the SFA does not have fund-raising responsibilities, as those tasks fall within another unit of HSU, or even at the state and federal level. So, from a financial perspective, SFA can focus more on meeting the mission of bridging the financial gap for students, reducing debt burden, and providing good stewardship of funds.

One of the limitations of this study was the lack of collaboration in developing this particular BSC, as this adaptation was limited to a review of existing literature, historical background and publically-available information, and the researcher's perspective. In a true adaptation and implementation of the BSC, collaboration is critical to success. This collaboration would most likely be in the form of a well-rounded task force, which would include multiple perspectives on the team. Each person in the organization needs to be informed of how their actions contribute to the BSC and the overall mission of the organization. Also, leadership needs to buy into the concept of the BSC, or it will be doomed to failure.

Conclusion

The HEI has accreditation standards to evaluate quality in the educational programs; however, those standards and accrediting bodies are typically specific to a particular academic program rather than viewing the HEI as a whole. A lack of consensus exists on how to otherwise measure quality in the HEI, so this study considered how an industry tool, such as the BSC could fill the void.

While initially created with industry in mind, the BSC can be adapted and used for the higher education field. This study took this adapted BSC, based on Kaplan's (2001) BSC for non-profits and applied it for use in the Student Financial Aid office of a public university. Similar to implementation in the non-profit sector, mission and customer perspective were primary focuses of this adapted BSC, with the financial perspective being last.

Rather than simply duplicating this BSC and applying in other HEI settings, those wishing to use the product of this exercise should consider all of the points of this chapter and adapt in a way that fits that particular organization best. Both internal and external stakeholders should be defined and considered in each of the perspectives, and measures developed with each of these groups in mind. Also, while it can be tempting to add multiple measures to the BSC, the focus must be on simplicity. The HEI will need to consider what measures are most important to each of the BSC perspectives for that particular setting and mission. Finally, the BSC is not meant to be a one-time exercise. It is a tool that should continue to be revisited and adjusted as the HEI continues to grow and innovate, or soon the BSC will lose its usefulness for its intended purpose.

CHAPTER III

STUDY 2: PERCEIVED QUALITY FACTORS IN HIGHER EDUCATION

Introduction

Universities often tout their latest placement in the various sets of rankings that exist at both at the national and international levels. In the area of research, common rankings of importance include the Times Higher Education (THE) World University Rankings, the U.S. News and World Report (USNWR) Best Colleges report, the QS World University Rankings, and the National Science Foundation (NSF) Higher Education Research and Development (HERD) survey, among several others. University offices of Institutional Research receive more and more survey requests each year, as rankings organizations try to further refine a set of rankings in a new way. Students make decisions about which college or university to attend based on these rankings (Kim, 2018). This decision process can become very complex, leading students to seek something simpler, such as a list of ranked universities, for that decision (Meyer, Hanson, & Hickman, 2017). Indeed, university business decisions are also often made based on how they might impact the rankings (Robinson, 2014). Even national policy has been known to be impacted by the influence of international rankings (Blanco-Ramírez & Berger, 2014).

While attributes, such as faculty-student ratio, international outreach, and research awards, contribute to rankings and standings, peer evaluations also have an impact. For example, the USNWR and THE Supplement both include a peer review survey component (Enserink, 2007). So, regardless of how the higher education institution rates in quantitative factors,

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perception matters. Unfortunately, this subjectivity can cause concern with the survey and the rankings that result (Lukman, Krajnc, & Glavič, 2010).

According to William Pasmore (1988), often the individual does not necessarily even know what he or she needs, and those preferences change over time and across individuals. While Pasmore was describing the creation of a work design, this same concept can be seen when considering the difficulty in developing one set of quality standards for universities that will be accepted by all people and for all time. Perhaps this conundrum is one of the reasons for the many different ranking structures in the field of higher education, and the continued criticism regarding rankings in higher education.

Given the large stake people are putting into rankings, and the known variability of human behavior and subjectivity, are rankings really a true reflection of the quality of the institution? This study explored several of the more widely-known ranking systems and the breakdown of factors included in a particular ranking. The study also sought to determine which factors are of importance to university administrators in determining the quality of an institution, further comparing those factors to what the rankings systems are actually measuring to see if an alignment exists between the two. As such, this study sought to answer the following research questions:

1. What attributes are perceived to contribute to quality in the higher education institution?

2. Do these perceived attributes correspond to factors used to calculate rankings? If so, where and how? If not, why not?

3. Do personal and institutional factors influence ratings of perceived importance for quality attributes?

Background

David Webster (1992) detailed an exhaustive review of the history of rankings, noting that some form of ranking has been in existence since at least 1925, when Raymond Hughes published his study of the top graduate schools. Since then, a variety of reputational rankings studies have been developed, each serving a particular need or demand. Webster credits the United States as being the inventor of these "academic quality rankings", using them for decades before any international groups caught on to their charm (Webster, 1992, p. 267). While rankings have had their place in history for some time, they are increasingly becoming a basis for decision-making in the institution, even reaching into legislative decisions. Universities have realized the impact rankings have on "admissions, financial resources, and reputation", so they have responded by seeking ways to improve in those rankings (Kim, 2018, p. 58).

The state of Florida is perhaps one of the most recently and widely known cases of legislative attention to university rankings. Over the past five years, the state legislature in Florida has allocated $1 billion to its state universities in order to improve their strategic and performance outcomes ("PRESS RELEASE: Florida soars in U.S. News & World Report public university rankings - State University System of Florida," 2019). The thought behind this decision was that higher rankings would allow the university to attract higher quality faculty and students, thus injecting more funding into the institution ("As University of Florida aims for Top 5, here are reasons why - News - Gainesville Sun - Gainesville, FL," 2019). Presumably as a result of these efforts, the University of Florida has risen from number 19 to 7 in the USNWR ranking of best public universities during the time period of 2012 to 2020, while Florida State University moved from number 43 to 18 from 2016 to 2020 ("DeSantis touts UF, FSU rankings in US News & World Report's list of top schools - News - The Palm Beach Post - West Palm

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Beach, FL," 2019). With such a large amount of attention on university rankings, one must consider whether these rankings are truly the best indicator of high quality in the higher education institution.

Peer Evaluations in Rankings

Most of the rankings structures have some type of peer evaluation component in them (Ghiasi, Fountas, Anastasopoulos, & Mannering, 2019). For example, the 2020 methodology for the THE World University Rankings states that 33% of the ranking (15% for teaching and 18% for research) is based on peer evaluation ("THE World University Rankings 2020: methodology | Times Higher Education (THE)," 2019). Likewise, USNWR allocates 20% of its ranking tabulation to the peer evaluation component ("How U.S. News Calculated the 2020 Best Colleges Rankings | Best Colleges | US News," 2019).

With such a large percentage of the rankings being based on peer standings, universities would hope that the peer evaluation process would be fair, objective, and consistent. Unfortunately, that is not the case. In fact, in 2009, one university official shocked the academic world with her admission that her upper administration purposefully ranked their peers as low as possible as one way of helping their own institution rise in the rankings ("'Manipulating,' Er, Influencing 'U.S. News,'" 2009). Besides the intentional misrepresentations of peer status, human factors and subjectivity must be considered as well.

Limitations of Peer Evaluations

Humans are ever-changing, multi-faceted, and widely diverse. The very qualities that make humans unique are the very qualities that make it difficult to standardize responses or feedback from these individuals. One academic, Moshe Vardi, admitted that he put very little

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thought in the peer evaluation survey completion, as he often would attempt to rank over 100 programs in a short amount of time (Vardi, 2016). In addition to the simple lack of knowledge regarding each and every university listed, limitations, such as the anchoring effect, the halo effect, and rater bias, can cast doubt into the accuracy of the reputation factor of rankings due to the widely variable and highly subjective nature of this feedback.

Nicholas Bowman and Michael Bastedo (2011) identified the "anchoring effect" as one concern with peer evaluations in rankings. This effect occurs when participants are asked to make a judgement on something vague or intangible, such as many of the qualitative attributes included in the peer evaluations of other universities. The survey respondent uses a value he or she knows as the baseline and then adjusts the final number based on that baseline. The authors suggest that this same anchoring effect occurs when respondents are asked to rate universities, and their starting value or baseline is one or more of the prestigious universities at the top of the rankings. They then adjust from that starting value, often incorrectly. Likewise, the mere fact that they have seen the names of those universities high in rankings will cause them to think more highly of them even in other attributes not related to the rankings.

The "halo effect" is also an issue with peer evaluation. Often, name recognition is enough for the respondent to rate something more highly than possibly deserved. For example, when individuals were asked to rank law schools based on which were best, Princeton's law school was rated very highly, even though Princeton did not have a law school (Frank & Cook, 1996, p. 149). Such a situation causes one to ask how accurate peer evaluations really are.

Finally, "rater bias" must be considered in rankings. Individuals are complex and bring all of their background, perspectives, and experiences into the rating process, which can result in

rater bias (Hazelkorn, 2014). In many cases, the respondent has nothing to go off of in reviewing or rating except for his or her own background.

Varying Definitions of Attributes

In addition to perception bias and the halo effect, many times people do not define attributes in the same way. This phenomenon can be seen with employee performance appraisals. While organizations try to make them as standardized as possible, one person's idea of the attribute "inclusion" may only consider diversity from a physical standpoint, rather than also considering diversity of ideas or personalities. So, two different supervisors may rate the same employee very differently on this attribute depending on their ideas of what this attribute means. Likewise, even the Likert scale can be completed differently by two different individuals, as one might see a "5" as perfect and never possible, while another might see that same "5" as meaning that all is well.

Some of the most common attributes seen in rankings structures include some version of the concepts of "excellence", "research performance" or "research productivity", "impact", and "brand value". Just as perception and bias can be introduced into the peer review portion of the rankings surveys, the same types of differences in interpretation exist. Universities complete the surveys differently based on their interpretation of the data being requested. Since rankings are seen as a huge marketing point, some universities are very liberal in what they include in those numbers. The subjectivity of the data collected poses a problem with the rankings themselves (Lukman et al., 2010). Likewise, differing interpretations of the significance of a particular ranking can have an impact on the decision-making of users of that data.

Excellence, as an intangible, can be difficult to define objectively. Garvin (1984) lists quality as a measure of excellence. Quality itself is often looked upon as something defined via

external measures (Elken & Stensaker, 2018). Likewise, excellence may be synonymous with "world-class" particularly as competition has become much more global. Further, many of the survey and rankings structures attempt to define excellence by some rubric comprised of multiple weighted factors. Even so, quality in higher education is still an area without agreement as to its definition (Blanco-Ramírez & Berger, 2014).

Because teaching and learning can be so difficult to quantify across varying types of institutions and countries, research performance or productivity tends to be a primary measure in the rankings structures (Marginson & van der Wende, 2007). Of course, research productivity can mean different things to different people. Some rankings, such as the THE World University Rankings, consider research income rather than research expenditures. Research income measures the research awards of the institution, which can be an indicator of the success rate of research proposals and the quality of the potential work to be performed. However, research expenditures, which are the actual funds spent on research activities, may be considered a better indicator of the annual investment or cost of research and how much the university would need to invest to maintain status quo in research should the external funding go away (Rouse et al., 2018). Even the calculation of research expenditures can vary, as the NSF HERD Survey includes research expenditures from all sources, while the USNWR survey only includes research expenditures from externally-sponsored projects.

Another measure of research productivity involves some type of "impact" factor, and, impact, as an attribute, can also vary in its interpretation. In some cases, impact may be determined based on number of citations on publications stemming from research activities. The h-index was quickly adopted as the standard for quantifying citations; however, this measure also has its drawbacks, such as not being able to easily apply across disciplines for comparisons

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(Radicchi, Fortunato, & Castellano, 2008). Alternatives to the h-index have been proposed with the hopes of overcoming the shortcomings of the h-index, such as the Relative Citation Ratio (RCR) that considers the article's co-citation network and is said to be independent of discipline (Hutchins, Yuan, Anderson, & Santangelo, 2016). So, again, defining this attribute in a way that generates consensus can be problematic.

Finally, brand value is an attribute that can vary in definition. According to Rouse (2018), brand value is a "proxy" for rankings. This attribute is perhaps the most subjective, as it relies much on the perceptions of others to quantify. In many of the rankings structures, this attribute considers the reputation and prestige of the university, as both are often considered when thinking about the success of the university (Robinson, 2014).

In addition to subjective measures, even something that might seem very objective, such as graduation rate, can be controversial in its interpretation. For example, a primary measure of graduation rate is based on first-time, full-time freshmen that maintained continuous full-time enrollment and graduate from the same institution within six years. Howard Cohen and Nabil Ibrahim (2008) expressed concern with this measurement, stating that it completely excludes community college transfer students and nontraditional students. Imagine the university that adjusts business practices in response to impact on rankings and how the recruiting focus of this university might change based on the knowledge of how this rate is calculated.

Validity of Rankings Structures

One of the chief complaints about rankings is that universities are not homogeneous, and the rankings cannot adequately capture all of the complexities that make up a university in any type of statistical manner that would be a valid representation of the quality of the university (Robinson, 2014). While publications, number of awards, ratios of students-to-faculty can be

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measured, many times the things that really count cannot be counted at all! To try to place an objective number on something subjective leaves room for error and inconsistencies, and trying to place all universities into a standard model does a disservice to the diverseness that makes each university uniquely its own (Marginson & van der Wende, 2007).

Another concern is that much of the data is self-reported, which leaves room for questionable reporting. Just as recently as 2019, it was discovered that one university had been misreporting data to USNWR for 20 years (Levenson, 2019). As rankings have become the hot topic, many universities have shifted business practices and made business decisions with the primary goal of rising in the rankings rather than on the quality of the university or the public good (Marginson & van der Wende, 2007; Robinson, 2014). Consequently, many groups have boycotted rankings altogether, stating that the rankings are meaningless and should be avoided (Hazelkorn, 2014; Hoffman, 1998).

Many universities have fought back against the rankings systems, boycotting them because they do not think they provide a true measure of the quality of their institution. For example, a group of law schools refused to participate in the surveys or in the peer evaluation, stating how unfair it was that wealthier schools could afford large marketing campaigns to help boost their rankings (Hoffman, 1998). Other boycotts have involved large groups within the United States, Canada, or even the European Research Universities (Hazelkorn, 2014). Regardless of boycotts and frustrations with the perceived unfairness of the reputational factors, over half of the universities still complete the survey, according to U.S. News editor, Brian Kelly (Enserink, 2007).

Interpretations of Rankings

In addition to the peer evaluation component of rankings, exploration of the actual interpretation of the results should be considered. Just as attributes can be defined in different ways among different people, the significance of a high or low ranking can mean different things to different people. In the absence of a true definition of quality in higher education, consumers look for third-party reviews or rankings to help make their decisions (Rothwell, 2019). Therefore, it is important that these consumers understand what the rankings are really measuring and if they are indeed a true indicator of quality in higher education.

Focus of Study

When considering a way to determine the excellence of a university and attributes that contribute to that excellence, rankings systems cannot be the only source of data, particularly as rankings structures have their own flaws. A better understanding from university shareholders of what they consider attributes of quality and excellence is needed. One perspective to collect is that of university administrators, as they often have a larger perspective of where their universities rate in relation to other universities and where they want their universities to be.

A couple of appropriate methods for collecting data from administrators might be surveys and interviews. Both methods are useful for conducting research when the researcher wants to gather information on perceptions of individuals toward a certain product or service. With both methods, the researcher needs to determine the population and series of questions to be asked. Of course, each method has its advantages and disadvantages. Also, as administrators are very busy individuals, the researcher needs to be considerate of their time regardless of method used. Many administrators are difficult to reach, and understanding the best way to reach that administrator is important. Likewise, questions should be developed in the most concise way possible that will

allow the researcher to gain the information needed while also limiting the amount of time it will take the administrator to complete the survey or to participate in the interview.

Due to the target participants of this study and the large reach needed to provide a meaningful sample size, the survey method was determined to be more appropriate for this type of study. Surveys can be administered to a high volume of individuals, and can be administered in a variety of channels, such as electronically, via mail, or even in person. They are often anonymous, so participants might be more willing to be honest in their answers. The researcher can perform statistical analysis on the responses if questions and answers are worded in such a way to allow standardization. Surveys often take less time to administer than interviews, as they do not require the back-and-forth communication involved in an interview, nor do they require the researcher to personally visit with each respondent.

Surveys also have their disadvantages. Often the response rate can be low, and SPAM filters or junk mail settings may make it difficult for the potential respondent to even receive the survey. Particularly when thinking about surveying administrators, it could be difficult to get past their "noise" or SPAM filters due to the large number of requests that enter their inboxes each day. If the survey is a paper survey that is mailed, it may not even make it to the intended administrator and instead be passed on to someone else at the institution to complete. Also, while surveys can have open-ended questions or free-form fields, they do not really allow for the researcher to ask clarifying questions. For this reason, some answers may be misinterpreted. All of these disadvantages must be considered when designing a study of this type.

Methods

Design

This study used survey research methods to collect data from participants regarding factors they deemed important when assessing the perceived quality of the public higher education institution. The survey opened in late November 2019, once approval was obtained from the Institutional Review Board (IRB). The survey remained open for approximately three weeks.

For this study, public higher education institution (HEI) was defined as a public four-year college or university. Upper administrator was defined as an individual in the role, or role-equivalent, of President, Chancellor, Vice President, Vice Chancellor, or Provost. The criteria for selecting the sample considered both of these factors. A measure of success to this study was that a sufficient number of complete responses would be received in order to draw conclusions from the data collected. Realizing that the target participants were upper administrators who had multiple demands for their time, the aim was to collect at least 100 valid, complete responses, rather than focusing on the response rate of the survey.

Participants

Participants were recruited by email, with the target population being upper administrators at public HEIs. Each participant was required to meet the following criteria:

1. Participant is in the role of "upper administrator" at his or her institution.

2. Participant is employed at a public HEI.

3. Participant can read and respond to survey, or has accommodations in place to do so.

www.manaraa.com

The target participants were identified by first identifying potential institutions that met

the requirement of being a public HEI and then searching the websites and email directories of

those institutions for anyone matching the role of President/Chancellor, Provost, Vice

President/Vice Chancellor of Academic Affairs, Research, Student Affairs, Advancement, or

Finance, or any other similar roles that were found on the leadership page of the university's

website. The potential institutions were identified through a collection of public HEIs that fell

within the following categories, many of them overlapping:

1. Public HEIs identified for Study 3 of this dissertation, meaning that they appeared in both the 2017 USNWR list of Best National Universities and in the Center for Measuring University Performance's 2017 publication of the Top American Research Universities (TARU).

2. Public HEIs in the "Power Five" athletic conferences, to include: the Southeastern Conference (SEC), Big 12 Conference, Big Ten Conference, Pac-12 Conference, and the Atlantic Coast Conference (ACC).

3. Public HEIs in Conference USA and Sun Belt Conference. These two conferences were chosen, as they seemed to include many public HEIs not already captured in earlier selections.

4. Public HEIs considered either a land-grant institution or a Historically Black College and University (HBCU).

5. Other public HEIs readily known by the author but not already captured in any of the other selections above (e.g., public HEIs in Mississippi).

In all, a total of 164 public HEIs were identified, resulting in the identification of 969 potential

participants from those institutions.

Survey Instrument

Participants were sent a survey link via email. The questions on this survey were divided

into two sections. The first section included questions regarding the participant's perception of

quality, and the second section included questions regarding the background of the participant

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and characteristics of his or her HEI. The first question on the survey asked the respondent to rate each of the listed characteristics based on how important he or she thought it was when considering the quality of a college or university. A Likert scale of 1-7 was used, with 1 being "not important at all", 4 being "neutral", and 7 being "critically important". The next question asked the respondent to select the five characteristics he or she considered most important. The remaining questions asked about the respondent's current and previous roles in higher education, as well as gathered data regarding the respondent's current university. See APPENDIX A for full list of survey questions.

Procedure

Participants were selected as described above, with a total of 969 potential participants identified. The email was sent to each group of administrators for a particular HEI, and the email to the potential participants included:

- Description of the study and its purpose

- IRB approval number

- How the results of this data would be used

- Assurance that their responses to this survey would be confidential and not tied to their names or to any other identifying information

- Approximate time it would take to complete the survey

- Link to the survey

- Copy of the survey

The survey was open approximately three weeks. A follow-up email was sent to each group approximately a week before the survey closed, letting them know the survey would be closing soon. If a particular person had already responded to the initial email stating that he or

she either declined to participate or had completed the survey, that person was not sent a follow-up email. A copy of both the recruitment email and the follow-up email are included in APPENDIX A.

Once the survey closed, the results were tallied to determine the mean rating of importance for each characteristic, as well as the top five characteristics chosen by respondents. The results were further analyzed by the type of respondent (e.g., position, number of years in current role, number of years in administrative role) and by the type of institution (e.g., enrollment size, research expenditures) to determine whether a statistical difference occurred between these different types of administrators or institutions. Additionally, the survey results were compared to the methodologies for three of the common rankings systems to see how closely they aligned.

Results

A total of 155 participants responded to the survey, with 119 of those responses submitting a complete survey. Of those 119 completed surveys, two were excluded due to not meeting the definition of public HEI, and four were excluded due to not meeting the definition of upper administrator. A total of 113 responses fell within the inclusion criteria for the study, and were included in the analysis. The median time of completion for the survey was 5.63 minutes. The mean time was much larger (37.16 minutes), due to a few rather large outliers in the data (3,087.80 and 314.12 minutes). APPENDIX B includes a summary of the survey participants by personal and institutional characteristics.

Perceived Importance of Quality Factors

The survey results were used to create a frequency of response table, listing each factor and the percentage of times selected under each of the numbers on the Likert scale. The mean and standard deviation for each factor were calculated, and the table was sorted by mean in descending order. This sort allowed an overall picture of how heavily each of the factors contributed to the perceived quality of a college or university, and the overall top 10 highest-ranked quality factors are reflected in Figure 3.1.
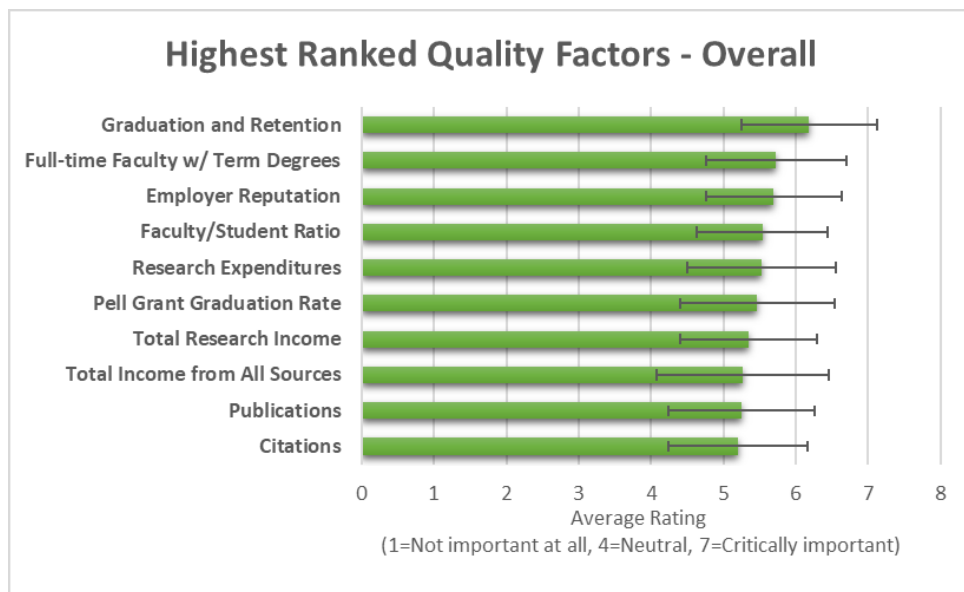
Figure 3.1   Overall Highest Ranked Quality Factors

Additional frequency of response tables were developed in the same way, but separated by each of the personal and institutional characteristics of the survey respondent. This separation allowed further analysis of the most highly ranked quality factors. Chi-square tests were performed to provide further insight into how the personal and institutional factors may have

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influenced how the perceived quality factors were rated. Summaries of the overall top five

perceived quality factors, broken down by personal and institutional characteristic, are included

in Table 3.1, Table 3.2, Table 3.3, Table 3.4, and Table 3.5. APPENDIX C contains greater

detail on how each of the quality factors was rated by respondents, based on the different

personal and institutional characteristics.

Table 3.1   Quality Factor #1 – Graduation and Retention

	Rank	n	Mean	Std Dev
Overall	**1**	**113**	**6.19**	**0.93**
Admin Experience at Another HEI				
Some Previous Experience	1	42	6.21	0.98
No Previous Experience	1	71	6.17	0.91
$\chi^2(2, N = 113) = 4.67$, $p = .097$				
Number of Years as Administrator				
Low (0 - 10)	1	19	6.37	0.60
Mid (11 - 25)	1	59	6.05	1.12
High (> 25)	1	34	6.32	0.68
$\chi^2(6, N = 113) = 5.75$, $p = .451$				
Current Role				
President/Chancellor/Provost	2	38	6.16	0.82
Other VP/VCs	1	75	6.20	0.99
$\chi^2(2, N = 113) = 0.57$, $p = .753$				
HEI Research Expenditures				
Under $40M	1	24	6.25	0.74
$40M - $125M	1	31	6.13	0.96
$125M - $250M	1	30	6.17	0.75
Greater than $250M	1	26	6.15	1.26
$\chi^2(8, N = 113) = 6.23$, $p = .621$				
HEI Enrollment				
1,000 - 9,999	1	18	6.22	0.73
10,000 - 19,999	1	35	6.20	0.96
20,000 - 29,999	1	25	5.88	1.30
30,000 or Above	1	34	6.35	0.60
$\chi^2(8, N = 113) = 9.44$, $p = .307$				
HEI Other Characteristics				
HBCU	1	9	6.44	0.73
Land-Grant	1	48	6.19	0.94
PUI	1	38	6.13	1.09

Table 3.2   Quality Factor #2 – Full-time Faculty with Terminal Degrees

	Rank	n	Mean	Std Dev
Overall	**2**	**112**	**5.72**	**0.97**
Admin Experience at Another HEI				
Some Previous Experience	5	42	5.48	1.19
No Previous Experience	2	70	5.87	0.78
$\chi^2(2, N = 112) = 4.97, p = .083$				
Number of Years as Administrator				
Low (0 - 10)	3	19	5.79	1.55
Mid (11 - 25)	2	59	5.80	0.78
High (> 25)	3	34	5.56	0.86
$\chi^2(4, N = 112) = 9.01, p = .061$				
Current Role				
President/Chancellor/Provost	1	38	6.21	0.66
Other VP/VCs	5	74	5.47	1.01
$\chi^2(2, N = 112) = 15.55, p < .001$				
HEI Research Expenditures				
Under $40M	4	24	5.71	1.33
$40M - $125M	2	30	5.73	0.74
$125M - $250M	2	30	5.80	1.00
Greater than $250M	5	26	5.62	0.85
$\chi^2(8, N = 112) = 5.82, p = .667$				
HEI Enrollment				
1,000 - 9,999	4	18	5.78	0.81
10,000 - 19,999	2	34	5.91	1.16
20,000 - 29,999	4	25	5.48	0.87
30,000 or Above	4	34	5.71	0.91
$\chi^2(8, N = 112) = 11.63, p = .169$				
HEI Other Characteristics				
HBCU	8	9	5.78	0.97
Land-Grant	3	48	5.75	0.86
PUI	3	37	5.70	1.15

Table 3.3   Quality Factor #3 – Employer Reputation

	Rank	n	Mean	Std Dev
Overall	**3**	**113**	**5.69**	**0.94**
Admin Experience at Another HEI				
Some Previous Experience	2	42	5.57	0.86
No Previous Experience	3	71	5.76	0.98
$\chi^2(1, N = 113) = 1.32, p = .250$				
Number of Years as Administrator				
Low (0 - 10)	2	19	5.89	0.99
Mid (11 - 25)	3	59	5.69	0.97
High (> 25)	4	34	5.56	0.86
$\chi^2(3, N = 113) = 1.57, p = .665$				
Current Role				
President/Chancellor/Provost	5	38	5.53	1.03
Other VP/VCs	2	75	5.77	0.88
$\chi^2(1, N = 113) = 0.39, p = .535$				
HEI Research Expenditures				
Under $40M	2	24	6.04	1.00
$40M - $125M	3	31	5.61	0.84
$125M - $250M	4	30	5.60	0.89
Greater than $250M	6	26	5.54	1.03
$\chi^2(4, N = 113) = 4.58, p = .333$				
HEI Enrollment				
1,000 - 9,999	3	18	6.00	0.97
10,000 - 19,999	3	35	5.63	1.00
20,000 - 29,999	5	25	5.44	0.82
30,000 or Above	3	34	5.74	0.90
$\chi^2(4, N = 113) = 2.51, p = .644$				
HEI Other Characteristics				
HBCU	2	9	6.33	1.00
Land-Grant	4	48	5.71	0.99
PUI	2	38	5.76	0.97

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Table 3.4   Quality Factor #4 – Faculty/Student Ratio

	Rank	n	Mean	Std Dev
Overall	**4**	**112**	**5.54**	**0.91**
Admin Experience at Another HEI				
Some Previous Experience	4	42	5.52	1.09
No Previous Experience	5	70	5.54	0.79
$\chi^2(1, N = 112) = 0.19, p = .660$				
Number of Years as Administrator				
Low (0 - 10)	8	18	5.44	0.98
Mid (11 - 25)	6	59	5.51	0.95
High (> 25)	2	34	5.62	0.82
$\chi^2(3, N = 112) = 1.76, p = .624$				
Current Role				
President/Chancellor/Provost	6	38	5.39	0.79
Other VP/VCs	3	74	5.61	0.96
$\chi^2(1, N = 112) = 2.58, p = .108$				
HEI Research Expenditures				
Under $40M	3	24	5.71	0.91
$40M - $125M	7	31	5.35	0.91
$125M - $250M	6	30	5.33	0.96
Greater than $250M	2	25	5.84	0.80
$\chi^2(4, N = 112) = 6.15, p = .188$				
HEI Enrollment				
1,000 - 9,999	2	18	6.06	0.64
10,000 - 19,999	8	35	5.37	0.91
20,000 - 29,999	3	25	5.52	1.00
30,000 or Above	6	33	5.45	0.90
$\chi^2(4, N = 112) = 11.38, p = .023$				
HEI Other Characteristics				
HBCU	4	9	6.11	0.78
Land-Grant	5	47	5.49	0.88
PUI	4	38	5.68	0.99

Table 3.5   Quality Factor #5 – Research Expenditures

	Rank	n	Mean	Std Dev
Overall	**5**	**113**	**5.53**	**1.03**
Admin Experience at Another HEI				
Some Previous Experience	3	42	5.57	0.99
No Previous Experience	6	71	5.51	1.05
$\chi^2(2, N = 113) = 1.34, p = .513$				
Number of Years as Administrator				
Low (0 - 10)	9	19	5.37	1.07
Mid (11 - 25)	4	59	5.56	1.10
High (> 25)	5	34	5.56	0.89
$\chi^2(6, N = 113) = 3.40, p = .757$				
Current Role				
President/Chancellor/Provost	3	38	5.63	1.05
Other VP/VCs	4	75	5.48	1.02
$\chi^2(2, N = 113) = 15.03, p = .001$				
HEI Research Expenditures				
Under $40M	13	24	5.00	1.18
$40M - $125M	5	31	5.52	0.93
$125M - $250M	3	30	5.70	1.02
Greater than $250M	3	26	5.77	0.86
$\chi^2(8, N = 113) = 6.88, p = .550$				
HEI Enrollment				
1,000 - 9,999	18	18	4.72	1.13
10,000 - 19,999	4	35	5.63	1.09
20,000 - 29,999	2	25	5.80	0.91
30,000 or Above	5	34	5.65	0.81
$\chi^2(8, N = 113) = 10.42, p = .237$				
HEI Other Characteristics				
HBCU	13	9	5.33	1.00
Land-Grant	2	48	5.79	0.85
PUI	8	38	5.18	1.33

The highest-ranked quality factor overall was "Graduation and Retention", with an average rating of 6.19 and standard deviation of 0.93. Table 3.1 shows the breakdown for this factor between each of the personal and institutional characteristics. Nearly every type of group analyzed placed this factor as the top factor of perceived quality, with the exception of those in the role of President/Chancellor/Provost. There was no statistically significant difference in the importance rating of this factor based on respondent characteristics. Corresponding chi-square test results are displayed in Table 3.1.

The second highest overall factor of "Proportion of Full-time Faculty with Terminal Degrees in Their Fields" showed more variability between groups. Overall, the average rating was 5.72, with a standard deviation of 0.97. Table 3.2 shows the breakdown for this factor between each of the personal and institutional characteristics. There was a statistically significant difference in rating based on current role of the respondent, with President/Chancellor/Provost rating this characteristic as significantly more important than respondents in other roles ($\chi^2(2, N = 112) = 15.55$, $p < .001$). Corresponding chi-square test results are displayed in Table 3.2.

Trailing not far behind "Proportion of Full-time Faculty with Terminal Degrees in Their Fields", the third highest-ranked quality factor of "Employer Reputation" had an average rating of 5.69 and standard deviation of 0.94. The breakdown of this factor is in Table 3.3. There was no statistically significant difference in the importance rating of this factor based on respondent characteristics. Corresponding chi-square test results are displayed in Table 3.3.

The fourth highest-ranked factor of "Faculty/Student Ratio" had an average rating of 5.54 and standard deviation of 0.91. The breakdown of this factor is in Table 3.4. There was a statistically significant difference in rating based on HEI enrollment, with those with enrollment of 1,000 to 9,999 rating this characteristic as significantly more important than respondents in

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other enrollment categories ($\chi^2(4, N = 112) = 11.38, p = .023$). Corresponding chi-square test results are displayed in Table 3.4.

Ranking fifth was "Research Expenditures", and the breakdown for this factor is in Table 3.5. The overall average rating was 5.53, and the standard deviation was 1.03. As might be expected, those HEIs with lower amounts of research expenditures tended to rate this factor lower than those HEIs with a higher dollar of research expenditures. There was a statistically significant difference in rating based on current role of the respondent, with President/Chancellor/Provost rating this characteristic as significantly more important than respondents in other roles ($\chi^2(2, N = 113) = 15.03, p = .001$). Corresponding chi-square test results are displayed in Table 3.5.

Top Five Quality Factors

In addition to rating each of the 24 quality factors, respondents were asked to select which five characteristics they considered most important. An additional table was created in response to survey question number two, to show the percentage of respondents who chose each of the factors as one of their top five factors. This list was then sorted by this percentage, in descending order, and the top 15 factors identified as being one of the most important are included in Table 3.6. The factor with the highest percentage of respondents selecting it was "Graduation and Retention", with 84.68% of respondents listing this factor in their top five, while the second-highest factor of "Faculty/Student Ratio" had 55.86% of respondents including it in their top five most important characteristics.

Table 3.6   Top 15 Factors Based on Percentage of Respondents Listing in Top 5

Quality Factors	Percentage of Respondents who listed factor in Top 5
Graduation and Retention	84.68%
Faculty/Student Ratio	55.86%
Class Size	43.24%
Research Expenditures	38.74%
Pell Grant Graduation Rate	36.94%
Full-time Faculty with Terminal Degrees	35.14%
Employer Reputation	31.53%
Total Income from All Sources	21.62%
Alumni Giving	19.82%
Peer Evaluation	13.51%
Doctorates-Awarded/Faculty Ratio	13.51%
SAT/ACT Scores	13.51%
Citations	12.61%
Faculty Salary	11.71%
Prestigious Faculty Awards	11.71%

These top 15 factors were then assigned a weight of importance by calculating the proportion of 100 points that would be assigned to that particular factor, based on the proportion of total percentage of all 15 factors. The calculated weights ranged from 19.07% for "Graduation and Retention" to 2.64% each for "Faculty Salary" and "Prestigious Faculty Awards". Table 3.7 lists these 15 factors and their calculated weights, along with the weighted factors for the USNWR, THE World University Rankings, and QS World University Rankings for 2020.

Table 3.7   Comparison of Quality Factor Weights of Survey Results vs. Other Rankings

Factors	Results	USNWR	THE World	QS World
Graduation and Retention	19.07%	30.00%	-	-
Faculty/Student Ratio	12.58%	1.00%	4.50%	20.00%
Class Size	9.74%	8.00%	-	-
Research Expenditures [a]	8.72%	10.00%	-	-
Pell Grant Graduation Rate	8.32%	5.00%	-	-
Full-time Faculty with Terminal Degrees	7.91%	3.00%	-	-
Employer Reputation	7.10%	-	-	10.00%
Total Income from All Sources	4.87%	-	2.25%	-
Alumni Giving	4.46%	5.00%	-	-
Doctorates-Awarded/Faculty Ratio	3.04%	-	6.00%	-
Peer Evaluation	3.04%	20.00%	33.00%	40.00%
SAT/ACT Scores	3.04%	7.75%	-	-
Citations	2.84%	-	30.00%	20.00%
Faculty Salary	2.64%	7.00%	-	-
Prestigious Faculty Awards	2.64%	-	-	-
Total Research Income	-	-	6.00%	-
Doctorate/Bachelor Ratio	-	-	2.25%	-
Publications	-	-	6.00%	-
Research Income from Industry	-	-	2.50%	-
International Faculty Ratio	-	-	2.50%	5.00%
International Research Collaborations	-	-	2.50%	-
High School Class Standing	-	2.25%	-	-
International Student Ratio	-	-	2.50%	5.00%
Proportion of Full-Time Faculty	-	1.00%	-	-
Total	100.00%	100.00%	100.00%	100.00%

Note: Data for USNWR, THE World University Rankings, and QS World University Rankings from websites: https://www.usnews.com/education/best-colleges/articles/how-us-news-calculated-the-rankings, https://www.timeshighereducation.com/world-university-rankings/world-university-rankings-2020-methodology, https://www.topuniversities.com/qs-world-university-rankings/methodology ("How U.S. News Calculated the 2020 Best Colleges Rankings | Best Colleges | US News," 2019; "QS World University Rankings – Methodology | Top Universities," n.d.; "THE World University Rankings 2020: methodology | Times Higher Education (THE)," 2019)
[a] While USNWR does not limit to just research expenditures, this was the closest match to USNWR's "Financial Resources" quality factor.

To determine whether a statistical difference existed between the survey results and the

weighted factors for each type of ranking, the absolute value of the difference in weight for each

quality factor was calculated, and then one sample t-tests were performed to determine whether

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the differences were statistically different from a mean of zero. As shown in Table 3.8, the difference in weighted factors was found to be statistically different when comparing the quality factor weights of the survey results against each ranking type.

Table 3.8   T-test Results Comparing Quality Factor Weights of Survey Results vs. Other Rankings

Factor Weight Differences	n	Mean Diff	SD	t	df	p
Survey - USNWR	24	3.50	4.34	3.96	23	0.001
Survey - THE World University	24	7.03	7.78	4.42	23	<0.001
Survey - QS World University	24	6.20	8.32	3.65	23	0.001

Discussion

This study sought to provide some clarity to the idea of "quality" as the term relates to the HEI. Survey results were used to identify the factors of perceived quality and then compared to three of the common rankings systems to determine whether an alignment exists between each rankings system and these perceived quality factors. Of further interest was whether personal and institutional factors had an influence in how the factors were rated. This section will discuss some of the key findings of this study and potential areas of future research.

By far the factor identified as contributing the most to quality was Graduation and Retention. Considering that the HEI is in the business of education, it makes sense that completing that education would be important. Likewise, retention of students is necessary to seeing completion. The survey instrument used the same definition as the one used in USNWR, so, while others have argued about how best to define this attribute (Cohen & Ibrahim, 2008), the concept of Graduation and Retention is indeed considered of great importance in the assessment of quality in the HEI.

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Interestingly, while Graduation and Retention was rated very highly in the survey results, of the three rankings systems listed: USNWR, THE World University Rankings, and QS World University Rankings, only the USNWR includes Graduation and Retention as a weighted factor in its methodology. Since the THE World University Rankings and QS World University Rankings include international HEIs too, this factor may be considered less important on an international scale. Further research into perspectives of upper administrators at non-U.S. HEIs is needed.

As discussed earlier, peer evaluations are not without their limitations (Bowman & Bastedo, 2011; Frank & Cook, 1996; Hazelkorn, 2014; Vardi, 2016). Regardless of the limitations, each of the three rankings systems listed in Table 3.7 included some form of peer evaluation. In fact, peer evaluations were the highest-weighted factors in the 2020 THE World University Rankings and QS World University Rankings and second highest-weighted in USNWR. However, the survey results from this study showed Peer Evaluation to have a much lower measure of perceived quality, ranking it as the 13th most important measure of quality, with an overall average rating of 4.92. As these same "peers" rating each other are likely competing for the same students, how appropriate is it that this peer score have such an impact, particularly if this study's survey results do not even indicate it to be a high measure of perceived quality?

Another factor which measures the perception of outside groups is Employer Reputation. The respondents rated this factor higher than Peer Evaluation, ranking it as the third most important measure of quality. Interestingly, neither the USNWR nor THE World University Rankings include this factor in their methodology. Only the QS World University Rankings considers this factor when calculating a ranking. Presumably, most students earn a degree with

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the hopes of entering the workforce, so it would stand to reason that the employers' perception of the quality of the HEI would be an important measure to any rankings system that aims to capture or quantify the excellence of a college or university. If the employers are not happy with the product (i.e., college graduates) coming out of that HEI, then can the HEI really claim to be doing a high-quality job in educating its students?

With so many colleges and universities emphasizing the need for globalization, the related quality factors ranked remarkably low in the survey results. International Research Collaborations ranked 19th, International Student Ratio ranked 21st, and International Faculty Ratio ranked 23rd, having overall average ratings of 4.74, 4.34, and 4.17, respectively. If the HEI truly views globalization as an important need in enriching the educational and research experience, key measures to determine whether globalization is happening will need to be considered. At the very least, better communication on why these international collaborations and increase in international faculty and students are important would be warranted.

Another surprising rating was SAT/ACT Scores, as this factor was ranked lowest of all 24 factors, having an overall average rating of 4.02. If the survey respondents, being upper administrators at their respective HEIs, viewed this factor as least important of all of the listed factors in determining quality, what does this view mean for the admissions and scholarship funding strategies of the HEI? These standardized exams have historically been used in admissions requirements and decisions, as well as in determining the amount of scholarships the entering freshman may receive. Recently, some universities have removed this requirement for admission, resulting in an outcry from those who view these scores as the best standardized way to compare potential college students (Strauss, 2019). Given the low ranking from the survey results, further research might be worthwhile in this area, particularly when determining the best

way to allocate a limited pool of scholarship funding among a large number of students. Of course, the USNWR includes this factor in its methodology, so the HEI seeking a high ranking may be hesitant to consider such a paradigm shift, even if it otherwise makes sense to do so.

When comparing the weighted factors from the survey results with the USNWR, THE World University Rankings, and QS World University Rankings, the weighted quality factors for each of these rankings systems were not in alignment with the survey results. Such a difference calls into question whether these rankings are truly reflective of the quality of the HEI, particularly as seen by upper administrators. If the same people being asked to provide a peer evaluation of the HEI do not even consider the peer evaluation score to be an important indicator of quality, why would this factor be weighted so heavily in university rankings? Also, as many U.S. HEIs are trying to find their way into the international rankings, how does the fact that the methodology for two of the most popular international rankings do not even consider Graduation and Retention as a weighted factor align with this aspiration? Again, placing such a high emphasis on obtaining a high ranking should be approached cautiously, particularly if that ranking does not place institutional priorities or mission as a heavily-weighted factor.

While this study provided much insight into the perceived quality factors of the HEI, the study did have some limitations. First, as discussed earlier in this chapter, reaching an audience at this role level in the HEI proved challenging. The initial hope was that an existing, reputable listserv, such as that administered by the Association of Public and Land-grant Universities (APLU) could have been utilized to have possibly resulted in a larger response rate; however, permission was not granted to do so. Instead, the survey was emailed directly from the researcher's email account, which, in most cases, was someone unknown to the potential participant, perhaps decreasing the likelihood of the email being read.

An area of future research would include expanding the inclusion criteria to consider the perspectives of those individuals at private HEIs as well as international HEIs. Additionally, expanding the group to include other levels within the HEI, such as deans and department heads, could illuminate differences in perceived quality factors as seen by the different levels of hierarchy within the HEI. Finally, removal of the more highly-ranked subjective component of Employer Evaluation might be meaningful to see if the distributions change when focusing on only the objective components.

Conclusion

University rankings have been an implied measure of quality and excellence in the higher education setting. HEIs are continually seeking ways to improve in the rankings and to have a point of pride based on ranking highly. Due to the simplicity of looking at a list of ranked universities, or perhaps for other reasons, many individuals and organizations refer to these rankings as a means of assessing the brand value of the HEI. However, these rankings often include subjective measures, which have their own limitations and biases.

This study included a survey of upper administrators at public HEIs to gather their perspective of quality in the HEI setting, realizing that this same set of administrators are very likely the same individuals rating each other in the peer evaluation components of university rankings. The survey results identified the top five most important quality factors as: Graduation and Retention, Proportion of Full-time Faculty with Terminal Degrees in Their Field, Employer Reputation, Faculty/Student Ratio, and Research Expenditures. Graduation and Retention was by far the highest-rated factor, indicating that the ultimate measure of quality in the HEI, according to upper administrators, is whether the HEI is retaining students and seeing them through to

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graduation. In most cases, a significant difference did not exist in the ratings for the perceived quality factors based on personal and institutional factors.

Additionally, the weighting of factors identified in the survey results were shown to be statistically different from the weighting factors for USNWR, THE World University Rankings, and QS World University Rankings. Such a misalignment is intriguing, given the emphasis so many HEIs have put on the improvement of their universities' rankings. The researcher wonders whether those seeking to rise in the rankings are aware of this misalignment and if a change in focus, either of those who develop the rankings, or of the HEI, is on the horizon.

CHAPTER IV

STUDY 3: ASSESSING THE IMPACT OF INSTITUTIONAL DATA ON UNIVERSITY

RANKINGS

Introduction

While earlier chapters in this dissertation have pointed to some of the criticism of current rankings systems, some form of quality measurement will likely always exist for colleges and universities. Regardless of rankings, universities want to be able to market what sets them apart from others, and that need will likely not change in the future, even if rankings structures as we know them change. Likewise, parents and students want to have a way to distinguish universities from one another, and will demand something similar to a "Consumer Reports" on universities to aid them in their decision-making. In the absence of a "perfect" methodology of assessing the quality of the college or university, the U.S. News and World Report (USNWR) is one of the more widely known systems, and, thus, perhaps one of the more influential ranking systems in regards to prospective students and their parents. Therefore, the university would be wise to focus some attention on shifts and changes of university rankings.

Osaretin Omoregie (2019) described benchmarking as a management tool organizations use to seek standards in order to identify strengths and opportunities for improvement. Just as companies use the benchmarking process to consider their standings in relation to their competitors, universities can use data from other universities to consider gaps or competitive advantages. While the public university is not seeking to make a profit, it is seeking to attract

quality students and faculty. By having a better understanding of the data behind the changes of a particular university's ranking, benchmarking can be performed, as a thorough evaluation of the data will allow the university to see drivers of university rankings and then use that data to determine whether the university has an advantage in that particular area, or if a gap exists. Further, this understanding will allow the university to more strategically invest resources in areas that might be bigger drivers of the rankings, within the context of the mission of the university. As state financial support for the public university continues to shrink, the importance of spending each dollar wisely becomes a necessity.

This study sought to better understand the characteristics of the universities being ranked, including changes in key measures over time. The study used the USNWR as the rankings system to be analyzed, coupled with data from the "Top American Research Universities" (TARU) annual publication, as well as data from the Integrated Postsecondary Education Data System (IPEDS).

Research questions in this study were:

1. Which USNWR tiers see the most variation in ranked universities, and which are most stable?

2. Which public universities had the largest variation in ranking over time?

3. Focusing on a peer or comparison group of universities, when shifts in USNWR rankings occurred, what other data shifts occurred for those universities? Which of those data shifts had the greatest impact on changes in a university's ranking? For the selected group of universities, how stable was the reputation factor reported by USNWR over time?

Background

Organizations often use benchmarking as one way to better understand others, as well as where they stand in relation. Xerox is credited as one of the first companies to use the concept of benchmarking in an effort to determine gaps between itself and its competitors, to set clear goals

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to improve, and to eventually win the Baldrige award (Evans, 2016). Just as organizations such as Xerox have benefited from benchmarking, universities seeking to improve quality can also benefit. While benchmarking efforts often initiate at lower levels in the university, support and interest from upper administration is essential to their success (Tee, 2015).

Levels of University Benchmarking

Pervaiz Ahmed and Mohammad Rafiq (1998) described benchmarking as a process with varying definitions and interpretations, with the main goal being improvement of the organization through some type of comparison with others. The authors further suggested benchmarking should be an integrated approach, using several frameworks, such as gap analysis, the balanced scorecard, and SERVQUAL to facilitate the process. Miles Nicholls (2007) partially agreed with their approach; however, he suggested both the balanced scorecard and gap analysis were not appropriate when benchmarking research quality in the university, due to their broad focus and aspects considered. Consequently, Nicholls proposed the use of just four of Ahmed's and Rafiq's identified levels of benchmarking when applying to the concept of research quality: internal, external, competitive, and generic.

According to Nicholls (2007), the internal level of benchmarking would include the view of a single unit within the university, and this unit would then compare itself to its own measures over time. This view is more narrowly-defined than that of Ahmed and Rafiq (1998), as their focus was on the organization as a whole, rather than on subunits or functional areas within the organization. Further, Kong Fah Tee (2015) described the internal level as one where best practices from one department within the university become the set of standards used by other departments in the same university. While measuring at the unit level can help unit heads better

understand their changes over time, as programs and funding began to more frequently cross disciplines, some true comparisons might be difficult at this granular of a level.

Nicholls (2007) defines the external level as units within the university comparing themselves with other units in the same university, as well as with external non-competing units. Alternatively, Ahmed and Rafiq (1998) view this level as the comparison with external organizations with similar practices and structures. Comparisons at this level under Nicholls' view can be challenging in the university setting, as units at the same university do not always function similarly, and each often has its own view of matters of importance. For example, one academic department may view faculty publications as the most important measure of research productivity, while another may place more value on research awards.

The competitive level is viewed by Nicholls (2007) as those units at other universities in direct competition. So, this level might have the Industrial and Systems Engineering department at University X looking at the same department at University Y. Nicholls' view is similar to that of Ahmed and Rafiq (1998), as they compare similar functions at external competitors at this level. At this level, understanding that all universities are not homogenous is key. The programs that make up the Information Systems department at University X may not be in full alignment with the programs that make up the Information Systems department at University Y, for example.

Finally, Nicholls (2007) defines the generic level as the level where the unit compares itself to industry standards or practices. Ahmed and Rafiq (1998) also described this level as a comparison with best practices; however, they also specified that best practices were not limited to that of a particular industry or business type. Tee (2015) had a similar view. So, at this level, the university would not only look at other university practices when benchmarking, but also at

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those of all types of organizations. While the subject content and mission may vary, many functions are needed irrespective of type of organization. For example, a retail organization often has some type of outside sales position. Compare that position or function to that of the donor prospect office at a university. Both positions can learn from best practices at a much more generic level than that of a retail or higher education institution.

Peer and Comparison Groups

In order to effectively benchmark, the organization needs a basis for comparison. In the case of the external or competitive levels of benchmarking, understanding which organizations fit in each of these levels is key. Universities often turn to a peer or comparison group analysis to determine which universities would be the best candidates against which comparisons can be made. Peer institution comparisons are most meaningful at the institutional level, as drilling-down to comparisons at the individual program level within those institutions may be challenging due to differing characteristics those programs may have depending on the structure within the institution itself (Kim, 2018).

According to Sarah Carrigan (2012), universities have been attempting to identify comparison groups for over 40 years, for purposes of benchmarking. She identified several sources of data to assist in this benchmarking process, including: National Center for Education Statistics (NCES) IPEDS data, salary data from the College and University Professional Association for Human Resources (CUPA-HR), and the Carnegie Foundation classification data. Likewise, some university systems, such as the University of North Carolina (UNC) system, require their universities to follow a specific methodology in determining peer groups (Carrigan, 2012).

Deborah Teeter and Paul Brinkman (1987) described the different types of comparison groups and the best uses of these groups. The first group, the competitor group, consists of those institutions "that compete with one another for students or faculty or financial resources" (p. 92). The peer group is that group of institutions with similar "role and scope, or mission" (p. 93). The aspiration group consists of those institutions that are "dissimilar… but worthy of emulation" (p. 93). Finally, the predetermined group includes institutions that are "natural, traditional, jurisdictional, and classification-based" (p. 93). While the authors' words were written over 30 years ago, they are still very much applicable to the university environment today.

Integrated Postsecondary Data System (IPEDS)

The Integrated Postsecondary Education Data System (IPEDS) is a system of data collected through surveys by the National Center for Education Statistics (NCES), and all institutions participating in federal financial aid programs must provide this data, in accordance with the Higher Education Act of 1965, as amended ("The Integrated Postsecondary Education Data System," 2019). The Center has been collecting data since 1993, and this data is easily-accessible for retrieval and downloads, allowing a rich data set for trend analysis and descriptive statistics (Carrigan, 2012). The IPEDS survey components are listed in Table 4.1.

Several decades of IPEDS data are available on the IPEDS website, so comparisons can be made with the data, and trends may be analyzed without needing to purchase a publication or dataset. Likewise, the data is quantitative and objective in nature, so the aforementioned concerns with peer evaluations would not be an issue with the numbers reported. Another valuable feature of the IPEDS website is the ability to define a specific set of characteristics (e.g., institution size, highest degree offered, Carnegie classification) or mission (e.g.,

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Historically Black College or University, Land Grant Institution) and seeing the data for all of these comparative institutions side-by-side.

Table 4.1   IPEDS Survey Components

Survey Component	Description
12-Month Enrollment	*measures the "unduplicated" enrollment over 12 months (each student is only counted once)*
Academic Libraries	*count of physical and digital library collection, usage and circulation of the collection, interlibrary loans, and library expenditures*
Admissions	*application considerations and rates, test scores*
Completions	*completions by program of study, level, gender, ethnicity/race, age, and whether via distance*
Fall Enrollment	*snapshot of enrollment for fall semester*
Finances	*revenue, expenditures, balance sheet data, scholarships and fellowships*
Graduation Rates	*how many "full-time, first-time degree and certificate-seeking undergraduate students" enter the university, number of those students that graduate within a particular timeframe or transfer to another institution*
Human Resources	*employee counts and demographics, full-time instructional faculty counts and demographics*
Institutional Characteristics	*contact information, tuition/fees, calendar system, programs offered*
Outcome Measures	*award status of cohorts and sub-cohorts over time*
Student Financial Aid	*financial aid data for different types of students*

Note: Data for Survey components from IPEDs website: https://nces.ed.gov/ipeds/use-the-data/survey-components (2019)

Top American Research Universities (TARU)

The Center for Measuring University Performance (MUP) is a collaborative effort between the University of Massachusetts Amherst and the University of Florida, with support from the University of Buffalo, and past support from Arizona State University ("Measuring University Performance," 2019). The Center is perhaps best known for the annual report it

publishes of the Top American Research Universities (TARU), in which specific data points are included for each of these universities. The data on their website is available back to 2000, and the most recent annual report at the time of this study was the 2017 report.

According to the 2017 report, universities include only those that have at least $40 million in federal research expenditures, as has been the case since the 2008 edition (Lombardi, Abbey, & Craig, 2018). The report provides measures as described in Table 4.2.

Table 4.2   Measurements in the Top American Research Universities (TARU) Report

Measurement	Description
Total Research Expenditures	*federal and nonfederal research expenditures reported by institution through the National Science Foundation (NSF) Higher Education Research and Development (HERD) Survey*
Federal Research Expenditures	*federal research expenditures reported in the NSF HERD Survey*
Research by Major Discipline	*as reported on the NSF HERD Survey*
Endowment Assets	*market value of endowments as reported by the institution to the National Association of College and University Business Officers (NACUBO) Commonfund Study of Endowment*
Annual Giving	*institutional reporting of gifts received via the Council for Aid to Education's (CAE) Voluntary Support of Education (VSE) Survey*
National Academy Membership	*as reported in the National Academy of Sciences (NAS), National Academy of Engineering (NAE), and the National Academy of Medicine (NAM)*
Faculty Awards	*collected from various grant and fellowship program directories and websites*
Doctorates Awarded	*from IPEDS data*
Postdoctoral Appointees	*institutionally-reported through the NSF Survey of Graduate Students and Postdoctorates in Science and Engineering*
SAT Scores	*from IPEDS data*
National Merit Scholars and Achievement Scholars	*from the National Merit Scholarship Corporation Annual Report*

Note: Data for TARU measurements from 2017 Annual Report of the Top American Research Universities (Lombardi et al., 2018)

U.S. News & World Report (USNWR)

David Webster (1992) studied the history of rankings and credits the U.S. News and World Report (USNWR) as being one of the best known and most popular set of rankings. Webster further noted USNWR as the first to garner a large following, as it introduced rankings of undergraduate education in 1983. Originally, the rankings in USNWR were based strictly on reputation, until criticism of this methodology resulted in USNWR expanding to include objective measures in 1988. The USNWR rankings have continued to refine their factors and weights over time in response to continued criticism (Webster, 1992). The 2020 factors and weights are listed in Table 4.3.

Despite the criticism with the USNWR, this set of rankings is still regarded as one of the most popular in the U.S., and these rankings have been shown to have an impact on institutional policy as well (Ghiasi et al., 2019). In fact, just a simple page break after the top 50 in the printed publication has been shown to influence the number of student applications by approximately 5% (Meyer et al., 2017).

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Table 4.3   U.S. News & World Report (USNWR) Factors and Weights

Outcomes			**35.00%**
Graduation & Retention		22.00%	
Four-year rolling average of proportion of each entering class (fall 2009-fall 2012) earning a degree in six years or less	17.60%		
Four-year rolling average of proportion of first-year entering students (fall 2014-fall 2017) who returned the following fall	4.40%		
Graduation Rate Performance		8.00%	
Social Mobility (average of fall 2011 and fall 2012 cohorts)		5.00%	
Pell Grant graduation rates (Six-year graduation rate of Pell Grant students, with adjustments)	2.50%		
Pell Grant graduation rate performance (Comparison of Pell recipient graduation rates with that of non-Pell students)	2.50%		
Faculty Resources			**20.00%**
Class Size (fall 2018)		8.00%	
Faculty Salary (average of 2017/2018 and 2018/2019)		7.00%	
Proportion of full-time faculty with terminal degrees in their field		3.00%	
Student-faculty ratio		1.00%	
Proportion of faculty who are full-time		1.00%	
Expert Opinion (peer assessment)			**20.00%**
Financial Resources (2017 and 2018 fiscal years)			**10.00%**
Student Excellence			**10.00%**
Standardized Tests (fall 2018 entrants)		7.75%	
High School Class Standing (fall 2018 entrants)		2.25%	
Alumni Giving (2016/2017 and 2017/2018)			**5.00%**

Note: Data from USNWR website: https://www.usnews.com/education/best-colleges/articles/how-us-news-calculated-the-rankings ("How U.S. News Calculated the 2020 Best Colleges Rankings | Best Colleges | US News," 2019)

Focus of Study

The large amount of attention given to the USNWR rankings leaves university administrators continuing to seek ways to improve their institutions' rankings. While universities can engage in some activities in an attempt to influence the peer evaluation component of USNWR, this portion of the ranking has been shown to remain fairly stable over time (Gnolek,

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Falciano, & Kuncl, 2014). For this reason, a further examination of the objective data behind rankings shifts may provide insight as to the overall shifts in the universities themselves. Unfortunately, examining the objective measures within the USNWR has been difficult, as many of the measures cannot be replicated (Gnolek et al., 2014). Fortunately, sources such as the IPEDS and TARU data are readily available for analysis.

This study evaluated USNWR data shifts, in regards to ranking and peer score, for a specific set of public universities. The IPEDS and TARU data for these universities was then examined in relation to the USNWR rankings in order to identify other data shifts occurring for the reported universities during that same time period.

Methods

Quantitative research methods were used to analyze historical data in order to determine whether the independent variables: all of the quantifiable factors listed in Table 4.1 and Table 4.2 from IPEDS and TARU, had an impact on the dependent variable: university ranking. The independent variables were evaluated over multiple years in order to analyze multiple points in time and changes over that time period.

University ranking was measured as the "Rank" assigned by USNWR in the annual "Best National Universities" list. The criteria for selecting the sample included whether the university was on the USNWR list, as well as whether the university was included in the list of "Top American Research Universities" by the Center for Measuring University Performance, and considered only public universities.

Selection Criteria

Data for a selected group of universities was studied, resulting in a group of 92 public universities that appeared in both the TARU list and the USNWR list of Best National Universities. To be included in the study, the university must have met the following criteria:

- University is a public university.

- University is included in the 2017 Annual Report of the Top American Research Universities, meaning that it also had at least $40 million in annual federal research expenditures.

- University is included on the list of Best National Universities in the 2017 edition of the U.S. News and World Report Best Colleges publication.

Data Sources

Data sources included the USNWR Best Colleges publication, TARU, and IPEDS data for three-year intervals: 2017, 2014, 2011, and 2008. Prior to 2008, the USNWR ranked a smaller set of universities in its first tier, resulting in groups of institutions simply being classified as "second tier", "third tier", or "fourth tier". For this reason, this study did not seek to go back prior to 2008. Likewise, while the 2020 publication of USNWR had been released at the time of this study, the TARU and IPEDS data were not yet available. For this reason, this study did not seek to bring 2020 into the data selection.

Because the USNWR past years were not available online, the past printed publications were acquired via multiple sources and used in this analysis. The TARU and IPEDS data were available online for all of these years, so that data was obtained from the subsequent websites.

Procedure

Universities were selected as described in the inclusion criteria above. The 2017 TARU list was exported from the MUP Center website and downloaded into an Excel spreadsheet. The

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TARU data indicated which of the universities were public or private, so that indicator was used to exclude any private universities. The public universities that remained were compared to the 2017 USNWR list of Best National Universities to determine which of those universities were also included in USNWR, and the USNWR rank of that matched university was recorded in a separate column in the spreadsheet. Any universities not having a match in USNWR were excluded from the sample. The remaining universities, consisting of 92 public universities, were considered the sample and were sorted in ascending order based on their 2017 USNWR ranking, and further divided into quartiles based on the 2017 USNWR ranking.

USNWR Ranking Data

Historical USNWR data was reviewed to determine the historical rankings for the specified time period for each university in the sample. If the university was not ranked in a certain time period, the ranking for that university was coded as "UR" for that year and not included in the standard deviation calculations. If the university was listed in the lower tier, meaning the rank was not provided but rather a range (e.g. 231-300), the median ranking for that particular tier was calculated and then used as the ranking for each of the universities in that tier. Otherwise, if the university was ranked in the consulted time period, the ranking for that university was entered into the column for that particular year as an integer value. In addition to the ranking, the reputation score was also entered into a separate column of the spreadsheet for that particular year and university, with 5.0 being the highest possible score. USNWR changed the reputation factor scale in 2011 to a 100 point scale, so these values were converted to a 5-point scale to align with the scale for the other years.

The standard deviation of the ranking for all years was calculated for each university, as well as the standard deviation of the Peer Assessment Score. The standard deviations within each

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quartile of universities were also evaluated to determine if a statistical difference existed between each quartile.

TARU and IPEDS Data

Using the same sample as in the USNWR analysis, each data attribute (independent variable) and value was entered into a spreadsheet by university and for each year captured in the USNWR. The standard deviation of each variable for all years was then calculated for each university. Because the attributes varied in units of measure (e.g., dollars, FTE, count), the standard deviation alone was not enough to compare the variation between each variable, and a unitless measure needed to be used instead. So, the standard deviation was then divided by the mean in order to arrive at the coefficient of variation (CV):

$$CV = \frac{\sigma}{\mu} * 100 \qquad (4.1)$$

The CV for each independent variable was analyzed for each university to determine which had greater variability (larger CV) over the time periods than others. Likewise, the mean CV across all universities was calculated for each variable to provide insight into which variables had most movement in the data.

Correlation of Attributes with Rankings

The correlation coefficient was used to determine whether either a strong correlation existed between the changes in each attribute of an individual university with the change in ranking for that university:

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$$\rho_{x,y} = \frac{Cov(x,y)}{\sigma_x \cdot \sigma_y}$$

Where $\rho_{x,y}$ = Correlation Coefficient of x and y;
$Cov(x,y)$ = Covariance of x and y; (4.2)
σ_x = Standard Deviation of University Ranking (x);
σ_y = Standard Deviation of UniversityAttribute (y)

The resulting correlation coefficient was a number between -1 and 1, with negative numbers indicating a negative correlation, and positive numbers indicating a positive correlation. Any number greater than 0.70 or less than -0.70 was determined to have a "strong" correlation between that particular attribute and the ranking for that university. Because each attribute may have had varying strengths, a regression analysis was also performed on the university data points, and a predictive model developed.

Results

A total of 92 public universities fell within the inclusion criteria to be studied. However, one of these universities, Augusta University, was later excluded for lack of consistent data about this university due to merging with another university in 2012 and then a second name change in 2015. Data for the remaining 91 universities was collected and analyzed.

Rankings Variability

The standard deviations of university rankings were used to determine what type of variability existed for each public university, and which universities experienced large changes in rankings over the time period studied. The universities were separated into quartiles to determine whether some tiers were more stable (less variable) than others. Table 4.4 lists the average standard deviations in rankings by quartile.

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Table 4.4   Average Ranking Variability by Quartile

Quartile	Std Dev
1	3.10
2	6.73
3	11.26
4	14.77

Quartile 1, which consisted of the top 25% highest-ranked universities in this study, was the least variable of the quartiles, with an average standard deviation of 3.10, indicating that this quartile did not see much movement in ranking within it. Quartile 4, the lowest-ranked of the universities, had the most variability in rankings (14.77).

The universities within each quartile were sorted in descending order, based on standard deviation to determine which universities had the most variability in their rankings. Table 4.5 lists the top five most variable universities for each quartile, in regards to ranking. The complete list of universities, and their corresponding rankings, are included in APPENDIX D.

Table 4.5   Universities with Most Highly Variable Ranking by Quartile

University	2017 Quartile	USNWR Ranking 2008	2011	2014	2017	Std Dev
University of Washington - Seattle	Q1	42	41	52	54	6.7020
Pennsylvania State University - University Park	Q1	48	47	37	50	5.8023
University of Texas - Austin	Q1	44	45	52	56	5.7373
University of Connecticut - Storrs	Q1	64	69	57	60	5.1962
Purdue University - West Lafayette	Q1	64	56	68	60	5.1640
University of Utah	Q2	159	129	121	111	20.6882
North Carolina State University	Q2	85	111	101	92	11.2657
University of Massachusetts - Amherst	Q2	96	99	91	74	11.1654
Iowa State University	Q2	85	94	101	111	10.9962
Florida State University	Q2	112	104	91	92	10.0789
San Diego State University	Q3	227	183	152	146	37.0675
Temple University	Q3	159	132	121	118	18.6637
Louisiana State University - Baton Rouge	Q3	159	124	135	135	14.7733
Washington State University - Pullman	Q3	118	111	128	143	13.8804
University of Kansas - Lawrence	Q3	85	104	101	118	13.5401
University of New Mexico - Albuquerque	Q4	159	229	181	176	30.0153
Utah State University	Q4	159	170	190	220	26.7753
Montana State University - Bozeman	Q4	159	183	201	210	22.5000
University of Houston - University Park	Q4	227	229	190	194	20.8646
New Mexico State University - Las Cruces	Q4	227	229	190	220	18.0831

Peer Score Variability

       The standard deviations of university peer scores were used to determine what type of variability existed for each public university, and which universities experienced large changes in peer score over the time period studied. The universities were further separated into quartiles to determine whether some tiers were more stable (less variable) than others. Table 4.6 lists the average standard deviations in peer score by quartile.

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Table 4.6   Average Peer Score Variability by Quartile

Quartile	Std Dev
1	0.07
2	0.09
3	0.11
4	0.15

In considering variability of peer score, the upper quartile had the least amount of variability in peer score (0.07), and the lowest quartile had the most (0.15). Table 4.7 lists the top five most variable universities for each quartile, in regards to peer score. The complete list of universities, and their corresponding peer scores, are included in APPENDIX D.

Table 4.7   Universities with Most Highly Variable Peer Score by Quartile

University	2017 Quartile	USNWR Peer Score				Std Dev
		2008	2011	2014	2017	
Clemson University	Q1	3.1	3.5	3.1	3.2	0.1652
Pennsylvania State University - University Park	Q1	3.8	3.9	3.6	3.7	0.1109
Purdue University - West Lafayette	Q1	3.8	3.9	3.6	3.7	0.1109
University of North Carolina - Chapel Hill	Q1	4.2	4.2	4.1	4.0	0.0957
Georgia Institute of Technology	Q1	4.0	4.2	4.1	4.1	0.0816
University of New Hampshire - Durham	Q2	2.9	3.2	2.9	2.8	0.1493
North Carolina State University	Q2	3.1	3.3	3.0	3.1	0.1258
University of Massachusetts - Amherst	Q2	3.3	3.5	3.2	3.3	0.1258
University of Delaware	Q2	3.1	3.4	3.1	3.1	0.1250
University of California - Santa Cruz	Q2	3.2	3.4	3.1	3.1	0.1181
George Mason University	Q3	2.9	3.3	2.9	3.0	0.1652
University of Illinois - Chicago	Q3	3.1	3.3	3.0	2.9	0.1493
Kansas State University	Q3	2.9	3.2	2.9	3.0	0.1414
Louisiana State University - Baton Rouge	Q3	2.9	3.1	2.8	2.8	0.1414
University of Kentucky	Q3	3.0	3.2	2.9	3.0	0.1258
Mississippi State University	Q4	2.4	2.9	2.3	2.5	0.2394
University of Alabama - Huntsville	Q4	2.5	2.9	2.4	2.4	0.2136
Utah State University	Q4	2.6	2.9	2.4	2.5	0.1931
University of Texas - El Paso	Q4	2.3	2.6	2.2	2.3	0.1732
Virginia Commonwealth University	Q4	2.7	3.1	2.8	2.8	0.1732

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IPEDS and TARU Data Analysis

The IPEDS and TARU data was analyzed for each of the universities to determine which attributes for those universities had the largest change over time. The overall coefficient of variation (CV) for each of the attributes is included in Table 4.8. The higher value of the CV indicated those attributes with the largest changes across universities. Total Other Revenue and Additions was the attribute with the largest change, while Retention Rate of students was the least changed attribute.

Table 4.8   Mean CV Across All Universities by Variable

Variable	CV	Variable	CV
Total Other Revenue & Additions	57.40	Total Research Expenditures	16.08
National Merit & Achieve Scholars	55.73	State-Approp Rev per Student FTE	15.40
Prestigious Faculty Awards	39.44	Doctorates Awarded (per TARU)	13.24
Annual Giving	30.66	Master's Degrees Awarded	11.24
Doctor's Degrees Awarded (IPEDS)	29.79	Admissions Rate	9.55
National Academy Membership	25.36	Bachelor's Degrees Awarded	9.33
Postdoctoral Appointees	25.32	Avg Salary of Full-time 9-mth Faculty	7.86
Total Non-Operating Revenue	24.88	Total FTE Faculty/Staff	7.23
Endowment Assets	21.60	Fall Enrollment	6.60
Total Operating Revenue	20.83	12-Month Unduplicated Headcount	6.38
Equity Ratio	20.50	Graduation Rate (cohort)	5.51
Total All Revenue & Other Additions	18.08	Personnel Cost as % of Total Expense	3.77
% 1st-Time UG Receiving Fed Grants	16.89	SAT Scores	2.54
Federal Research Expenditures	16.43	Retention Rate	2.12
Student Cost of Attendance	16.28		

An overall correlation coefficient was calculated for each IPEDS and TARU attribute to indicate which of those attributes were most closely correlated, either positively or negatively, with university rankings, thus indicating the amount of impact that particular attribute might have had on ranking. The overall correlation coefficient (r) for each of the attributes is included in Table 4.9. A correlation coefficient of greater than 0.70 or less than -0.70 was considered a

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strong relationship to university rankings. Graduation Rate was found to have the strongest

relationship to university ranking, with a correlation coefficient of -0.91. So, as graduation rate

grew larger, the number value of the ranking grew smaller, meaning that the university was

ranked more highly. Other strong relationships were found with Retention Rate (r = -.085),

Doctorates Awarded – TARU (r = -.072), and SAT Scores (r = -0.72). A complete list of the CV

for each attribute on an individual university basis is included in APPENDIX D.

Table 4.9   Correlation of Ranking by Variable

Variable	r	Variable	r
Graduation Rate (cohort)	**-0.91**	% 1st-Time UG Receiving Fed Grants	0.51
Retention Rate	**-0.85**	Endowment Assets	-0.48
Doctorates Awarded (per TARU)	**-0.72**	Bachelor's Degrees Awarded	-0.47
SAT Scores	**-0.72**	Admissions Rate	0.47
Prestigious Faculty Awards	-0.68	Total Non-Operating Revenue	-0.41
Postdoctoral Appointees	-0.62	Total Other Revenue & Additions	-0.40
Total Research Expenditures	-0.62	National Merit & Achieve Scholars	-0.37
Annual Giving	-0.62	Fall Enrollment	-0.36
Avg Salary of Full-time 9-mth Faculty	-0.61	Student Cost of Attendance	-0.32
Total FTE Faculty/Staff	-0.60	Master's Degrees Awarded	-0.31
Total All Revenue & Other Additions	-0.58	12-Month Unduplicated Headcount	-0.29
Federal Research Expenditures	-0.57	State-Approp Rev per Student FTE	-0.10
National Academy Membership	-0.56	Personnel Cost as % of Total Expense	-0.07
Total Operating Revenue	-0.54	Equity Ratio	0.02
Doctor's Degrees Awarded (IPEDS)	-0.53		

Regression Analysis

Due to the large number of independent variables in the model and the shifts that could

change with the addition of each variable, a stepwise regression model was used to further

analyze the relationship of the independent variables to the dependent variable of university

ranking, using a probability of Entry of .05 and probability of Removal of .10. The stepwise

regression model brought in one variable at a time, removing a previous variable from a previous

step, if needed, based on the fit at that particular step. Additionally, because each year of

rankings may have a different methodology, the regression model was split by year to determine the strength and coefficients by year. Finally, because the independent variables had varying units of measure, the independent variable values were normalized (transformed into z-scores), and those normalized values were used as the independent variables instead. Table 4.10 shows the results of the regression analysis.

Table 4.10   Regression Analysis Results

All Years					
Variable	**B**	**S.E.**	**Beta**	**t**	**Sig.**
Constant	0.008	0.017		0.474	0.636
Graduation Rate (cohort)	-0.636	0.045	-0.628	-14.227	<0.001
Doctorates Awarded (per TARU)	-0.387	0.045	-0.390	-8.658	<0.001
Bachelor's Degrees Awarded	0.209	0.029	0.204	7.174	<0.001
Master's Degrees Awarded	0.167	0.030	0.169	5.624	<0.001
% of First-Time UG Receiving Fed Grants	0.067	0.020	0.066	3.282	0.001
Retention Rate	-0.137	0.044	-0.136	-3.130	0.002
Total FTE Faculty/Staff	-0.135	0.035	-0.136	-3.833	<0.001
National Merit & Achievement Scholars	-0.064	0.020	-0.065	-3.226	0.001
Personnel Cost as % of Total Expense	-0.049	0.017	-0.049	-2.843	0.005
Doctor's Degrees Awarded (per IPEDS)	0.095	0.038	0.095	2.533	0.012
$F(10, 325) = 327.04, p<.001$ Adjusted $R^2 = .91$					
Year 1 (2008)					
Variable	**B**	**S.E.**	**Beta**	**t**	**Sig.**
Constant	-0.615	0.074		-8.279	<0.001
Graduation Rate (cohort)	-0.507	0.066	-0.504	-7.733	<0.001
Doctor's Degrees Awarded (per IPEDS)	-0.834	0.137	-0.456	-6.070	<0.001
Master's Degrees Awarded	0.321	0.067	0.281	4.806	<0.001
% of First-Time UG Receiving Fed Grants	0.191	0.057	0.144	3.323	0.001
Avg Salary of Full-time 9-mth Faculty	-0.239	0.073	-0.189	-3.287	0.002
$F(5, 77) = 129.42, p<.001$ Adjusted $R^2 = .89$					

Table 4.10 (continued)

Year 2 (2011)					
Variable	**B**	**S.E.**	**Beta**	**t**	**Sig.**
Constant	-0.108	0.033		-3.248	0.002
Graduation Rate (cohort)	-0.693	0.062	-0.695	-11.120	<0.001
Bachelor's Degrees Awarded	0.197	0.050	0.196	3.945	<0.001
Doctorates Awarded (per TARU)	-0.309	0.059	-0.302	-5.256	<0.001
Admissions Rate	-0.157	0.038	-0.159	-4.153	<0.001
Student Cost of Attendance	-0.169	0.051	-0.114	-3.320	0.001
SAT Scores	-0.265	0.082	-0.208	-3.221	0.002
$F(6, 79) = 181.93, p<.001$ Adjusted $R^2 = .93$					
Year 3 (2014)					
Variable	**B**	**S.E.**	**Beta**	**t**	**Sig.**
Constant	0.081	0.027		3.021	0.003
Graduation Rate (cohort)	-0.825	0.042	-0.819	-19.531	<0.001
Doctorates Awarded (per TARU)	-0.251	0.064	-0.273	-3.952	<0.001
12-Month Unduplicated Headcount	0.244	0.036	0.252	6.682	<0.001
Admissions Rate	-0.075	0.032	-0.076	-2.358	0.021
Doctor's Degrees Awarded (per IPEDS)	-0.108	0.051	-0.118	-2.105	0.039
$F(5, 78) = 267.50, p<.001$ Adjusted $R^2 = .94$					
Year 4 (2017)					
Variable	**B**	**S.E.**	**Beta**	**t**	**Sig.**
Constant	0.247	0.032		7.588	<0.001
Graduation Rate (cohort)	-0.935	0.045	-0.858	-20.602	<0.001
State-Appropriated Rev per Student FTE	-0.081	0.030	-0.084	-2.735	0.008
Bachelor's Degrees Awarded	0.216	0.049	0.212	4.405	<0.001
Doctorates Awarded (per TARU)	-0.402	0.062	-0.385	-6.515	<0.001
Master's Degrees Awarded	0.134	0.046	0.142	2.927	0.004
$F(5, 77) = 220.00, p<.001$ Adjusted $R^2 = .93$					

As expected, due to methodology changes for USNWR over the years, the regression results also differed among the years. Regardless of these differences, Graduation Rate was considered the factor with the strongest relationship to ranking in each year. Doctorates Awarded was also a variable with a strong relationship to ranking each year, either based on the TARU number or on the IPEDS number. Those two factors were the only ones that consistently showed up in the final model each year.

Discussion

This study sought to better understand the data behind the USNWR rankings and what data shifts occurred with changes in the ranking of a university. As many universities continue to seek ways to affect their USNWR ranking, another aim of this study was to evaluate the variability of university rankings and peer scores in order to provide insight into which tiers might have the greatest potential for growth in those areas.

As might be expected, the top tiers within the USNWR rankings had less movement. The stableness of rankings in these tiers suggests that those universities will have a harder time getting any higher. Particularly when considering the large number of private universities in these upper tiers, many of these highly-ranked universities have a large amount of resources to invest in attracting and retaining high quality faculty and students, further increasing the prestige of those universities. This difficulty in rising at this level, or into this level if at a lower tier, further reinforces the findings of Gnolek et al (2014). Likewise, the lower tiers, with greater variability in their rankings, are the more likely universities to achieve a rise in rankings with dedicated efforts.

While Gnolek et al (2014) found that peer evaluation scores remained fairly stable over time, their data only included USNWR peer scores prior to 2011. In the more recent time span

covered by this study, peer score was shown to be highly variable. Still, the highest standard deviation of 0.2394 (Mississippi State University) indicates only an incremental change in the actual peer score is likely. Therefore, while peer scores contribute a large part to the USNWR rankings, this area would be very difficult to influence by any great margin. For this reason, the university seeking higher rankings would probably be better served by focusing on the improvement of other areas rather than on the peer score.

An important consideration is that any shifts one university might make will not occur in a vacuum, as many others are likely shifting as well. So, the universities seeking to improve their rankings need to understand that others are shifting all around them as well. For this reason, doing nothing will probably ensure a drop in rankings unless the university is focused on some of the larger drivers of university rankings.

In using the coefficient of variation to evaluate the independent variables with the largest changes over the years studied, many of those areas with the least amount of change, such as Graduation Rate, SAT Scores, and Retention Rate, were the variables with the strongest relationship to the ranking, based on the correlation coefficients. Hence, the very factors that are most impactful seem to be the most difficult to affect!

A regression analysis was performed to allow a further understanding of which attributes had the largest impact in the changes within the rankings over time. As would be expected, Graduation Rate was a consistently highly-correlated variable each year. On the other hand, Admissions Rate was shown in 2011 and 2014 to be negatively correlated with university ranking, meaning that less selectivity resulted in a higher ranking. This finding seems contradictory to what one might expect, as usually the more selective and highly-prestigious universities have higher rankings. Another interesting finding was that both Bachelor's Degrees

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Awarded and Master's Degrees Awarded tended to result in lower rankings, while Doctor's Degrees Awarded resulted in higher rankings. Also, in 2014, as the 12-Month Unduplicated Headcount went up, university ranking went down. One theory about this observation is that a higher enrollment may have resulted in a higher student-to-faculty ratio.

One limitation of this study was the lack of availability of more recent objective data for the analysis. While the 2020 USNWR rankings had already been published at the time of completion of this study, the IPEDS and TARU data was still a few years old. Some universities, such as the state of Florida public universities, had large shifts from their 2017 rankings to their 2020 rankings, so having a better understanding of the data behind those large shifts would be a meaningful area of future research.

Another limitation of the study was in the regression model. While the predictive model developed in this study would theoretically allow one to make changes to one or more attributes to then see whether that change might have a positive or negative impact on the ranking, the model does not take into consideration the changes other universities may be making to their own standings.

An area of future research might be to evaluate how differences within the independent variables affect one another. For example, as Pell Grant numbers change, how does that change impact the Graduation Rate? Also, does a change in the Admissions Rate affect Retention Rate or SAT Scores? Perhaps by understanding how the objective data is intertwined, universities can have a better understanding of how each area of the university truly is operating as a system in which shifts in one area can impact another area.

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Conclusion

The USNWR continues to garner much attention from universities, legislative bodies, parents, and students, so having a better understanding of the data behind these rankings can be of value. Using objective sources of data, such as IPEDS and TARU data can provide insight into how shifts within this objective data may impact shifts in rankings. Of course, universities should be seeking ways to continuously improve while centered on their missions, rather than seeking to simply rise in a list of ranked universities. However, given that university rankings will likely continue to be held in somewhat high regard, it is important that the university have a good understanding of how it can impact that ranking, particularly if those actions are within the realm of the university mission.

This study found that more highly-ranked universities will tend to have a more difficult time changing their ranking, while the lesser-ranked universities may be able to have more of an impact. Even so, the top tier of universities is a difficult one to break into, so seeking to go from a lower quartile to the highest quartile is likely not an attainable goal. Given these findings, steady growth is more likely the best approach for the university to take, rather than expecting exponential growth.

When considering areas to best influence rankings, Graduation Rate and Doctorates Awarded were found to have the strongest relationship to changes in the rankings, so those would be areas of focus. While peer evaluation scores can have a large impact on university rankings, these peer scores are not likely to see a large increase and would, therefore, be less of an area of focus. However, if the university can find ways to tout those areas that have been shown to best influence rankings, peer score changes will likely follow, as that name recognition attached to meaningful measures of quality continues to grow.

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CHAPTER V

CONCLUSION

What does it mean to be "excellent", particularly for the higher education institution (HEI)? In the absence of a definitive answer to that question, university rankings have become the proxy for quality and excellence. As such, HEIs are continually seeking ways to improve their rankings, with the implication being that these rankings measure which universities are the most excellent.

While a high ranking may be a noteworthy accomplishment, it is important to understand that a ranking in and of itself is not what makes the HEI excellent. As lawmakers, HEI administrators, students and parents continue to put such emphasis on these rankings, they lose sight of the complete package that the individual HEI has to offer that is like no other HEI. Trying to place a standardized number on an enterprise with such rich complexity is like expecting a photograph to adequately describe the experience of being in a certain destination. The photograph itself, while it can be an amazing display of art, still cannot provide the sounds, smells, warmth, and other feelings evoked by actually being in the place captured by that photograph. The HEI has so much more to offer than a ranking can express, and users of those rankings would be prudent to consider this fact. Likewise, HEIs would be wise to communicate those things about the HEI that rankings cannot capture.

As the balanced scorecard (BSC) has served as a holistic approach to measuring quality and continuous improvement, the first study of this dissertation explored the adaptation and

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implementation of the BSC in the HEI. Unlike university rankings, the BSC measures the organization against itself and not against other organizations. The BSC allows the HEI to consider its strengths and to develop strategic objectives and measures that will further enhance these strengths. This study illustrated the formation of this BSC using a case study in the Financial Aid department at a public HEI. As every college and university presumably has a financial aid functional area, this adapted BSC can easily be tailored to a similar area at many different types of HEIs. Of course, since the BSC is unique to the organization, using the exact representation of the BSC developed in this study would not be appropriate. When considering the BSC in the HEI, the main alteration to the traditional BSC implementation is that the HEI mission must be first, and Customer Perspective on top of the BSC, rather than the Financial Perspective. Each of the strategic objectives are then developed with mission in mind.

The second study considered perspectives of upper administrators regarding perceived quality in the HEI. Through the survey results, the top five perceived quality factors identified were: Graduation and Retention, Proportion of Full-time Faculty with Terminal Degrees in Their Field, Employer Reputation, Faculty/Student Ratio, and Research Expenditures. Further, the study calculated weights for the top 15 identified quality factors from the survey results to determine whether these weights were in alignment with the methodology of three of the common rankings systems: U.S. News and World Report (USNWR), the Times Higher Education (THE) World University Rankings, and the QS World University Rankings. Interestingly, the study found that the rankings methodologies were not in alignment with the weights from the survey results, indicating that the rankings differ from the perspectives of upper administrators into what factors contribute most to quality in the HEI. So, the very individuals being asked to provide peer evaluation data in these rankings do not even perceive HEI quality in

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the same way as the rankings. Again, this finding causes the researcher to question the adequacy of rankings in measuring the quality and excellence of the HEI.

The third study considered objective data (e.g., enrollment, SAT/ACT scores, revenue) and whether shifts in that data contributed to shifts in USNWR rankings. Graduation Rate and Doctorates Awarded were found to have the strongest relationship to USNWR ranking. In analyzing USNWR rankings and peer score changes over time, the upper tiers of universities had less movement in them, and peer scores, while found to be highly variable, did not have a large point value change. Thus, peer score itself may be difficult to change drastically, even though it contributes a large amount to university rankings. In this case, how can the university ever rise significantly in the USNWR rankings without a substantial overhaul of its priorities and resource allocations? Given earlier discussion regarding the appropriateness of allowing rankings to define quality in the HEI, is this rise in rankings really the most appropriate goal for the HEI?

The wise HEI will find a way to balance university rankings with mission. Since Graduation and Retention were found to contribute greatly to the USNWR ranking, while also being overwhelmingly considered the top perceived quality factor by upper administrators, this area would be a measure of importance. Likewise, it would be difficult to argue that Graduation and Retention are not within the mission of the HEI, so a focus on this factor would still be in line with the HEI mission. Regardless, the HEI needs to center all of its activities around its mission to be sure it does not stray too far away in its quest for quality and excellence.

The future of rankings is unclear. Some method will likely always exist that attempts to measure the quality and excellence of HEIs. However, as studies such as those in this dissertation continue to shed light on the inadequacy of using rankings as a proxy for excellence, dependence on these rankings may wane. To remain competitive, the companies or organizations

providing these rankings will need to look at ways to improve the HEI community's trust in, or perceived validity of, the rankings methodology. By having a better understanding from the HEI community of what factors best contribute to perceived quality in the HEI, the methodologies behind the rankings can more adequately attempt to measure those factors. Subjective areas, such as peer evaluations, should be further studied to see how to best address the limitations of peer evaluations; otherwise, the HEI community will continue to grow weary of the appropriateness of using these measures to rank the HEI.

Regardless of university rankings, HEIs should be promoting their strengths. HEIs are cultivating future generations through educational and life experiences, whether those experiences be on-campus or via distance education. Each HEI has something special that makes it unique, many being hidden jewels to those outside of the HEI. If they are not telling their stories, someone else will do it for them. And who best to tell the story of the HEI than the HEI itself?

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APPENDIX A

SURVEY METHODS

Informed Consent

Informed Consent Form for Participation in Research for Exempt Research*

Title of Research Study: Perceived Quality Factors in Higher Education

Researcher(s): Jennifer Easley, Dr. Lesley Strawderman, Dr. Kari Babski-Reeves, Dr. Stanley Bullington, and Dr. Brian Smith, Department of Industrial and Systems Engineering, Mississippi State University.

Procedures: If you agree to participate, your participation will be for approximately 10 minutes. You will be given a survey that will ask you to rate 25 factors as to how important you believe they are in considering the quality of a college or university. You will then be asked to identify the top 5 of those factors as the most important. The remaining 10 questions will ask about your current and previous roles in higher education, as well as characteristics of your current college or university.

Questions: If you have any questions about this research project, please feel free to contact Jennifer Easley at jbe2@msstate.edu or Dr. Lesley Strawderman at strawderman@ise.msstate.edu.

Voluntary Participation: Please understand that your participation is voluntary, and your responses will be anonymous. Your refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may discontinue your participation at any time without penalty or loss of benefits.

Please take all the time you need to read through this document and decide whether you would like to participate in this research study.

Thank you for agreeing to participate in our research. This research is for residents of the United States over the age of 18; if you are not a resident of the United States and/or under the age of 18, please do not complete this survey.

If you decide to participate, your completion of the research procedures indicates your consent. Please keep this form for your records.

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*The MSU HRPP has granted an exemption for this research. Therefore, a formal review of this consent document was not required.

Research Participant Satisfaction Survey

In an effort to ensure ongoing protections of human subjects participating in research, the MSU HRPP would like for research participants to complete this anonymous survey to let us know about your experience. Your opinion is important, and your responses will help us evaluate the process for participation in research studies.
https://www.surveymonkey.com/r/M5M95YF

Recruitment Emails

Initial Email

Greetings:

My name is Jennifer Easley, and I am an Industrial and Systems Engineering doctoral student at Mississippi State University (MSU). I am conducting an academic survey to collect data from participants regarding perceived factors of quality in higher education.

Participants must be in the role, or role-equivalent of President, Chancellor, Vice President, Vice Chancellor, or Provost, at a public four-year college or university. Please consider forwarding my email to others that might fit this role too.

If you agree to participate, the survey should take approximately 5-10 minutes to complete. Participation is completely voluntary, and your answers will be anonymous. A copy of the survey is attached for your reference. After completing the survey, you will have the option of entering your email address on a separate webform if you would like to receive a copy of the study results. This webform is not tied to your survey response in any way.

This research is supervised by Dr. Lesley Strawderman and has been approved by MSU's Institutional Review Board (Protocol # IRB-19-488).

Please select the link below to complete the survey. Thank you so much for your time!

https://msstateengineering.qualtrics.com/jfe/form/SV_1NBHvfkajQxBNc1

Best Regards,
Jennifer Easley
Bagley College of Engineering
Mississippi State University

Follow-Up Email

Good evening,

This survey has generated a great response, and I'm thankful to all of you who have participated! If you'd like to complete the survey and haven't had a chance to do so just yet, you still have a few more days, as the survey will be closing next week. The average time to complete has been a little over 5 minutes.

Here is the survey link: https://msstateengineering.qualtrics.com/jfe/form/SV_1NBHvfkajQxBNc1

At the end of the survey, you'll have a chance to provide your contact information if you'd like to receive the results of this study. Thanks so much for your time!

Best Regards,
Jennifer

Survey Questions

1. In your opinion, how important are the following characteristics when considering the quality of a college or university? (Likert Scale of 1-7 with 1 = Not important at all, 4 = Neutral, 7 = Critically important)

    1. Class Size

    2. Doctorate/Bachelor Ratio

    3. Doctorates-Awarded/Faculty Ratio

    4. Faculty/Student Ratio

    5. Graduation and Retention (first-time, full-time, degree-seeking undergraduate)

    6. Pell Grant Graduation Rate

    7. SAT/ACT Scores

    8. Prestigious Faculty Awards

    9. Faculty Salary

    10. National Academy Membership

    11. Proportion of Full-time Faculty with Terminal Degrees in Their Field

    12. Employer Reputation

    13. Peer Evaluation

    14. Citations

    15. Publications

    16. Research Expenditures

    17. Alumni Giving

    18. Endowment Assets

    19. Total Income from All Sources

    20. Total Research Income

21. Research Income from Industry

22. International Research Collaborations

23. International Faculty Ratio

24. International Student Ratio

25. Other (please list)

2. Which do you consider to be the 5 most important? (select five)

    1. Class Size

    2. Doctorate/Bachelor Ratio

    3. Doctorates-Awarded/Faculty Ratio

    4. Faculty/Student Ratio

    5. Graduation and Retention (first-time, full-time, degree-seeking undergraduate)

    6. Pell Grant Graduation Rate

    7. SAT/ACT Scores

    8. Prestigious Faculty Awards

    9. Faculty Salary

    10. National Academy Membership

    11. Proportion of Full-time Faculty with Terminal Degrees in Their Field

    12. Employer Reputation

    13. Peer Evaluation

    14. Citations

    15. Publications

    16. Research Expenditures

    17. Alumni Giving

    18. Endowment Assets

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19.   Total Income from All Sources

20.   Total Research Income

21.   Research Income from Industry

22.   International Research Collaborations

23.   International Faculty Ratio

24.   International Student Ratio

25.   Other (please list)

3. Which of the following most closely describes your current position? (select one)

1.   President/Chancellor

2.   Vice President/Vice Chancellor for Research

3.   Provost/Vice President for Academic Affairs

4.   Vice President/Vice Chancellor for Student Affairs

5.   Vice President/Vice Chancellor for Finance

6.   Vice President for Advancement

7.   Dean/Director/Department Head

8.   Other

4. How many years have you been in your current role? (enter value)

5. Which of the following most closely describe previous positions you have held in higher ed?

(select all that apply)

1.   Staff

2.   Academic Faculty

3.   Research Faculty

4.   Department Head

5.   Dean/Director

6.   Vice President/Vice Chancellor

7.   President/Chancellor

8.   Other Administrative Appointment

6. Including your current position, what is the total number of years you have served in an administrator role in higher ed? (enter value)

7. Have you ever served in a Vice President/Vice Chancellor or President/Chancellor role at a college or university other than your current institution? (select one) Yes or No

8. What is the academic discipline of your highest degree? (select all that apply)

1.   Agriculture, Agriculture Operations, and Related Sciences

2.   Architecture and Related Services

3.   Area, Ethnic, Cultural, Gender, and Group Studies

4.   Basic Skills and Developmental/Remedial Education

5.   Biological and Biomedical Sciences

6.   Business, Management, Marketing, and Related Support Services

7.   Citizenship Activities

8.   Communication, Journalism, and Related Programs

9.   Communications Technologies/Technicians and Support Services

10.   Computer and Information Sciences and Support Services

11.   Construction Trades

12.   Education

13.   Engineering

14.   Engineering Technologies and Engineering-Related Fields

15.   English Language and Literature/Letters

16.   Family and Consumer Sciences/Human Sciences

17. Foreign Languages, Literatures, And Linguistics

18. Health Professions and Related Programs

19. Health-Related Knowledge and Skills

20. High School/Secondary Diplomas and Certificates

21. History

22. Homeland Security, Law Enforcement, Firefighting and Related Protective Services

23. Interpersonal and Social Skills

24. Legal Professions and Studies

25. Leisure and Recreational Activities

26. Liberal Arts and Sciences, General Studies and Humanities

27. Library Science

28. Mathematics and Statistics

29. Mechanic and Repair Technologies/Technicians

30. Military Science, Leadership and Operational Art

31. Military Technologies and Applied Sciences

32. Multi/Interdisciplinary Studies

33. Natural Resources and Conservation

34. Parks, Recreation, Leisure, And Fitness Studies

35. Personal and Culinary Services

36. Personal Awareness and Self-Improvement

37. Philosophy and Religious Studies

38. Physical Sciences

39. Precision Production

40. Psychology

41.   Public Administration and Social Service Professions

42.   Residency Programs

43.   Science Technologies/Technicians

44.   Social Sciences

45.   Theology and Religious Vocations

46.   Transportation and Materials Moving

47.   Visual and Performing Arts

9. Which type of institution best describes your college or university? (select one)

1.   Public, 4-year or above

2.   Private not-for-profit, 4-year or above

3.   Private for-profit, 4-year or above

4.   Public, 2-year

5.   Private not-for-profit, 2-year

6.   Private for-profit, 2-year

7.   Public, less-than 2-year

8.   Private not-for-profit, less-than 2-year

9.   Private for-profit, less-than 2-year

10. Which other characteristics describe your university? (select all that apply)

1.   Land-Grant Institution

2.   Historically Black College or University

3.   Predominately Undergraduate Institution

11. How many students are enrolled at your university? (select one)

1.   Under 1,000

2.   1,000 – 4,999

3.   5,000 – 9,999

4. 10,000 – 19,999

5. 20,000 – 29,999

6. 30,000 – 49,999

7. 50,000 or Above

12. Which range best describes the amount of your university's annual research expenditures? (select one)

1. Under $40 Million

2. $40 Million - $75 Million

3. $75 Million - $125 Million

4. $125 Million - $200 Million

5. $200 Million - $250 Million

6. $250 Million - $300 Million

7. $300 Million - $400 Million

8. Greater than $400 Million

Upon completion of the survey, respondents were provided a link to a separate webform that was not connected to their survey response, and this link allowed them to provide an email address if they wanted to receive a copy of the study results/report.

APPENDIX B

SURVEY PARTICIPANTS

Table B.1   Number of Respondents by Academic Discipline

Academic Discipline	n
Agriculture, Agriculture Operations, and Related Sciences	9
Area, Ethnic, Cultural, Gender, and Group Studies	1
Biological and Biomedical Sciences	5
Business, Management, Marketing, and Related Support Services	18
Communication, Journalism, and Related Programs	4
Computer and Information Sciences and Support Services	2
Construction Trades	2
Education	31
Education, Public Administration and Social Service Professions	1
Engineering	7
English Language and Literature/Letters	2
Family and Consumer Sciences/Human Sciences	1
Foreign Languages, Literatures, And Linguistics	2
Health Professions and Related Programs, Health-Related Knowledge and Skills	1
History	1
Legal Professions and Studies	2
Leisure and Recreational Activities	1
Mathematics and Statistics	1
Philosophy and Religious Studies	1
Physical Sciences	7
Psychology	4
Public Administration and Social Service Professions	3
Science Technologies/Technicians	1
Social Sciences	3
Visual and Performing Arts	1
(blank)	2
Total	113

Table B.2   Number of Respondents by Current Role

Current Role	n
President/Chancellor	15
Provost/VP for Academic Affairs	23
VP for Advancement	19
VP/VC for Finance	14
VP/VC for Research	13
VP/VC for Student Affairs	22
Other	7
Total	113

Table B.3   Number of Respondents by Years in Current Role

Years in Current Role	n
0 - 2 years	37
3 - 6 years	44
7 - 10 years	16
11 - 15 years	10
16 - 20 years	1
21 - 40 years	4
(blank)	1
Total	113

Table B.4   Number of Respondents by HEI Enrollment

HEI Enrollment	n
1,000 - 4,999	11
5,000 - 9,999	7
10,000 - 19,999	35
20,000 - 29,999	25
30,000 - 49,999	27
50,000 or Above	7
(blank)	1
Total	113

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Table B.5   Number of Respondents by HEI Research Expenditures

HEI Research Expenditures	n
Under $40 Million	24
$40 Million - $75 Million	17
$75 Million - $125 Million	14
$125 Million - $200 Million	20
$200 Million - $250 Million	10
$250 Million - $300 Million	6
$300 Million - $400 Million	7
Greater than $400 Million	13
(blank)	2
Total	113

APPENDIX C

SURVEY RESULTS: FREQUENCY OF RESPONSE TABLES

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Table C.1   Quality Factor Ratings by All Respondents

Quality Factor	1	2	3	4	5	6	7	n	mean	std dev
Graduation and Retention	0.00%	0.88%	0.88%	2.65%	13.27%	38.94%	43.36%	113	6.19	0.93
Full-time Faculty w/ Term Degrees	0.89%	0.00%	0.89%	4.46%	32.14%	41.07%	20.54%	112	5.72	0.97
Employer Reputation	0.00%	0.00%	0.00%	11.50%	29.20%	38.05%	21.24%	113	5.69	0.94
Faculty/Student Ratio	0.00%	0.00%	2.68%	7.14%	37.50%	39.29%	13.39%	112	5.54	0.91
Research Expenditures	0.00%	1.77%	1.77%	7.96%	34.51%	38.05%	15.93%	113	5.53	1.03
Pell Grant Graduation Rate	0.88%	0.00%	3.54%	8.85%	35.40%	36.28%	15.04%	113	5.47	1.06
Total Research Income	0.00%	0.88%	2.65%	10.62%	40.71%	36.28%	8.85%	113	5.35	0.94
Total Income from All Sources	0.00%	1.77%	6.19%	16.81%	29.20%	30.97%	15.04%	113	5.27	1.20
Publications	0.00%	2.65%	0.88%	14.16%	42.48%	30.97%	8.85%	113	5.25	1.01
Citations	0.00%	1.77%	0.88%	17.70%	41.59%	30.97%	7.08%	113	5.20	0.97
Endowment Assets	0.00%	5.31%	6.19%	13.27%	40.71%	23.89%	10.62%	113	5.04	1.24
Alumni Giving	0.88%	5.31%	7.96%	16.81%	30.09%	24.78%	14.16%	113	5.01	1.39
Peer Evaluation	0.88%	5.31%	8.85%	15.93%	30.97%	30.97%	7.08%	113	4.92	1.32
Class Size	1.79%	5.36%	4.46%	16.96%	41.07%	25.00%	5.36%	112	4.87	1.26
Research Income from Industry	0.88%	0.88%	7.08%	26.55%	36.28%	24.78%	3.54%	113	4.85	1.07
National Academy Membership	1.77%	2.65%	6.19%	23.01%	40.71%	18.58%	7.08%	113	4.82	1.20
Prestigious Faculty Awards	1.77%	4.42%	4.42%	23.01%	39.82%	21.24%	5.31%	113	4.80	1.22
Doctorates-Awarded/Faculty Ratio	3.60%	6.31%	4.50%	17.12%	39.64%	22.52%	6.31%	111	4.76	1.39
International Research Collab	0.00%	3.54%	8.85%	29.20%	30.09%	24.78%	3.54%	113	4.74	1.14
Faculty Salary	1.77%	3.54%	7.96%	23.89%	39.82%	20.35%	2.65%	113	4.68	1.17
International Student Ratio	2.65%	6.19%	9.73%	30.97%	39.82%	7.96%	2.65%	113	4.34	1.20
Doctorate/Bachelor Ratio	4.42%	12.39%	4.42%	32.74%	29.20%	15.04%	1.77%	113	4.22	1.40
International Faculty Ratio	2.65%	5.31%	9.73%	47.79%	25.66%	7.08%	1.77%	113	4.17	1.11
SAT/ACT Scores	7.08%	15.04%	13.27%	22.12%	23.01%	15.04%	4.42%	113	4.02	1.62

Note: 1 = Not important at all, 4 = Neutral, 7 = Critically important

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Table C.2   Quality Factor Ratings by Years as HEI Administrator

Low: 0 - 10 Years

Quality Factor	1	2	3	4	5	6	7	n	mean	std dev
Graduation and Retention	0.00%	0.00%	0.00%	0.00%	5.26%	52.63%	42.11%	19	6.37	0.60
Employer Reputation	0.00%	0.00%	0.00%	10.53%	21.05%	36.84%	31.58%	19	5.89	0.99
Full-time Faculty w/ Term Degrees	5.26%	0.00%	5.26%	0.00%	15.79%	36.84%	36.84%	19	5.79	1.55
Total Income from All Sources	0.00%	0.00%	5.26%	5.26%	36.84%	26.32%	26.32%	19	5.63	1.12
Citations	0.00%	0.00%	0.00%	10.53%	42.11%	31.58%	15.79%	19	5.53	0.90
Pell Grant Graduation Rate	0.00%	0.00%	5.26%	10.53%	36.84%	26.32%	21.05%	19	5.47	1.12
Publications	0.00%	0.00%	0.00%	10.53%	47.37%	26.32%	15.79%	19	5.47	0.90
Faculty/Student Ratio	0.00%	0.00%	5.56%	5.56%	38.89%	38.89%	11.11%	18	5.44	0.98
Research Expenditures	0.00%	0.00%	10.53%	0.00%	42.11%	36.84%	10.53%	19	5.37	1.07
Total Research Income	0.00%	0.00%	5.26%	5.26%	52.63%	26.32%	10.53%	19	5.32	0.95
Endowment Assets	0.00%	5.26%	10.53%	5.26%	47.37%	15.79%	15.79%	19	5.05	1.35
Class Size	5.26%	5.26%	0.00%	21.05%	26.32%	26.32%	15.79%	19	5.00	1.60
Peer Evaluation	0.00%	10.53%	5.26%	10.53%	31.58%	31.58%	10.53%	19	5.00	1.45
Faculty Salary	5.26%	5.26%	5.26%	10.53%	36.84%	26.32%	10.53%	19	4.89	1.56
Alumni Giving	0.00%	5.26%	10.53%	15.79%	36.84%	21.05%	10.53%	19	4.89	1.33
Research Income from Industry	0.00%	0.00%	15.79%	21.05%	31.58%	21.05%	10.53%	19	4.89	1.24
National Academy Membership	0.00%	5.26%	10.53%	15.79%	36.84%	26.32%	5.26%	19	4.84	1.26
Prestigious Faculty Awards	5.26%	5.26%	0.00%	15.79%	57.89%	5.26%	10.53%	19	4.74	1.41
International Research Collab	0.00%	5.26%	10.53%	21.05%	36.84%	21.05%	5.26%	19	4.74	1.24
International Student Ratio	0.00%	5.26%	10.53%	15.79%	52.63%	5.26%	10.53%	19	4.74	1.24
International Faculty Ratio	5.26%	0.00%	5.26%	31.58%	36.84%	10.53%	10.53%	19	4.68	1.38
SAT/ACT Scores	5.26%	0.00%	21.05%	10.53%	42.11%	10.53%	10.53%	19	4.58	1.50
Doctorates-Awarded/Faculty Ratio	15.79%	5.26%	5.26%	10.53%	21.05%	31.58%	10.53%	19	4.53	2.01
Doctorate/Bachelor Ratio	10.53%	10.53%	10.53%	10.53%	15.79%	36.84%	5.26%	19	4.42	1.89

Note: 1 = Not important at all, 4 = Neutral, 7 = Critically important

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Table C.2 (continued)

Mid: 10 - 25 Years

Quality Factor	1	2	3	4	5	6	7	n	mean	std dev
Graduation and Retention	0.00%	1.69%	1.69%	5.08%	16.95%	30.51%	44.07%	59	6.05	1.12
Full-time Faculty w/ Term Degrees	0.00%	0.00%	0.00%	3.39%	32.20%	45.76%	18.64%	59	5.80	0.78
Employer Reputation	0.00%	0.00%	0.00%	11.86%	30.51%	33.90%	23.73%	59	5.69	0.97
Research Expenditures	0.00%	3.39%	0.00%	8.47%	32.20%	37.29%	18.64%	59	5.56	1.10
Pell Grant Graduation Rate	1.69%	0.00%	5.08%	6.78%	27.12%	42.37%	16.95%	59	5.53	1.18
Faculty/Student Ratio	0.00%	0.00%	3.39%	6.78%	40.68%	33.90%	15.25%	59	5.51	0.95
Total Research Income	0.00%	1.69%	3.39%	10.17%	37.29%	37.29%	10.17%	59	5.36	1.03
Alumni Giving	0.00%	3.39%	8.47%	16.95%	30.51%	23.73%	16.95%	59	5.14	1.32
Total Income from All Sources	0.00%	1.69%	8.47%	16.95%	32.20%	28.81%	11.86%	59	5.14	1.20
Publications	0.00%	5.08%	1.69%	11.86%	44.07%	32.20%	5.08%	59	5.12	1.08
Citations	0.00%	3.39%	1.69%	15.25%	44.07%	33.90%	1.69%	59	5.08	0.97
Endowment Assets	0.00%	5.08%	6.78%	16.95%	35.59%	25.42%	10.17%	59	5.00	1.26
Prestigious Faculty Awards	1.69%	5.08%	6.78%	18.64%	32.20%	32.20%	3.39%	59	4.85	1.28
Class Size	1.72%	6.90%	5.17%	12.07%	44.83%	25.86%	3.45%	58	4.83	1.27
Doctorates-Awarded/Faculty Ratio	0.00%	10.17%	0.00%	22.03%	40.68%	22.03%	5.08%	59	4.80	1.24
National Academy Membership	3.39%	3.39%	8.47%	13.56%	45.76%	18.64%	6.78%	59	4.78	1.33
Peer Evaluation	0.00%	6.78%	10.17%	18.64%	33.90%	27.12%	3.39%	59	4.75	1.25
Research Income from Industry	1.69%	1.69%	3.39%	32.20%	37.29%	22.03%	1.69%	59	4.75	1.06
International Research Collab	0.00%	5.08%	6.78%	27.12%	37.29%	22.03%	1.69%	59	4.69	1.10
Faculty Salary	1.69%	5.08%	10.17%	22.03%	44.07%	16.95%	0.00%	59	4.53	1.15
International Student Ratio	1.69%	8.47%	8.47%	33.90%	35.59%	10.17%	1.69%	59	4.31	1.19
International Faculty Ratio	1.69%	6.78%	11.86%	44.07%	27.12%	8.47%	0.00%	59	4.14	1.07
Doctorate/Bachelor Ratio	3.39%	15.25%	3.39%	38.98%	28.81%	8.47%	1.69%	59	4.07	1.32
SAT/ACT Scores	8.47%	25.42%	10.17%	25.42%	13.56%	11.86%	5.08%	59	3.66	1.70

Note: 1 = Not important at all, 4 = Neutral, 7 = Critically important

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Table C.2 (continued)

High: Greater than 25 Years

Quality Factor	1	2	3	4	5	6	7	n	mean	std dev
Graduation and Retention	0.00%	0.00%	0.00%	0.00%	11.76%	44.12%	44.12%	34	6.32	0.68
Faculty/Student Ratio	0.00%	0.00%	0.00%	8.82%	32.35%	47.06%	11.76%	34	5.62	0.82
Full-time Faculty w/ Term Degrees	0.00%	0.00%	0.00%	8.82%	41.18%	35.29%	14.71%	34	5.56	0.86
Employer Reputation	0.00%	0.00%	0.00%	11.76%	32.35%	44.12%	11.76%	34	5.56	0.86
Research Expenditures	0.00%	0.00%	0.00%	11.76%	35.29%	38.24%	14.71%	34	5.56	0.89
Pell Grant Graduation Rate	0.00%	0.00%	0.00%	11.76%	47.06%	32.35%	8.82%	34	5.38	0.82
Publications	0.00%	0.00%	0.00%	17.65%	38.24%	32.35%	11.76%	34	5.38	0.92
Total Research Income	0.00%	0.00%	0.00%	14.71%	38.24%	41.18%	5.88%	34	5.38	0.82
Total Income from All Sources	0.00%	2.94%	2.94%	20.59%	20.59%	38.24%	14.71%	34	5.32	1.22
Citations	0.00%	0.00%	0.00%	23.53%	38.24%	26.47%	11.76%	34	5.26	0.96
Peer Evaluation	2.94%	0.00%	8.82%	14.71%	26.47%	35.29%	11.76%	34	5.15	1.35
Endowment Assets	0.00%	5.88%	2.94%	8.82%	47.06%	26.47%	8.82%	34	5.12	1.17
Research Income from Industry	0.00%	0.00%	8.82%	20.59%	38.24%	29.41%	2.94%	34	4.97	1.00
National Academy Membership	0.00%	0.00%	0.00%	41.18%	35.29%	14.71%	8.82%	34	4.91	0.97
Alumni Giving	2.94%	8.82%	5.88%	14.71%	26.47%	29.41%	11.76%	34	4.88	1.57
Faculty Salary	0.00%	0.00%	5.88%	32.35%	35.29%	23.53%	2.94%	34	4.85	0.96
Doctorates-Awarded/Faculty Ratio	3.13%	0.00%	12.50%	9.38%	50.00%	18.75%	6.25%	32	4.84	1.25
Class Size	0.00%	2.94%	5.88%	23.53%	44.12%	20.59%	2.94%	34	4.82	1.03
International Research Collab	0.00%	0.00%	11.76%	38.24%	14.71%	29.41%	5.88%	34	4.79	1.17
Prestigious Faculty Awards	0.00%	2.94%	2.94%	32.35%	44.12%	11.76%	5.88%	34	4.76	1.02
Doctorate/Bachelor Ratio	2.94%	8.82%	2.94%	35.29%	35.29%	14.71%	0.00%	34	4.35	1.23
SAT/ACT Scores	5.88%	5.88%	14.71%	23.53%	26.47%	23.53%	0.00%	34	4.29	1.45
International Student Ratio	5.88%	2.94%	11.76%	32.35%	41.18%	5.88%	0.00%	34	4.18	1.19
International Faculty Ratio	2.94%	5.88%	8.82%	61.76%	17.65%	2.94%	0.00%	34	3.94	0.95

Note: 1 = Not important at all, 4 = Neutral, 7 = Critically important

Table C.3   Quality Factor Ratings by Administrator Experience at Another HEI

Some Previous Experience

Quality Factor	1	2	3	4	5	6	7	n	mean	std dev
Graduation and Retention	0.00%	0.00%	2.38%	0.00%	23.81%	21.43%	52.38%	42	6.21	0.98
Employer Reputation	0.00%	0.00%	0.00%	9.52%	38.10%	38.10%	14.29%	42	5.57	0.86
Research Expenditures	0.00%	0.00%	2.38%	11.90%	28.57%	40.48%	16.67%	42	5.57	0.99
Faculty/Student Ratio	0.00%	0.00%	4.76%	9.52%	35.71%	28.57%	21.43%	42	5.52	1.09
Full-time Faculty w/ Term Degrees	2.38%	0.00%	2.38%	7.14%	38.10%	30.95%	19.05%	42	5.48	1.19
Total Income from All Sources	0.00%	2.38%	0.00%	14.29%	33.33%	30.95%	19.05%	42	5.48	1.11
Total Research Income	0.00%	0.00%	0.00%	11.90%	42.86%	33.33%	11.90%	42	5.45	0.86
Pell Grant Graduation Rate	2.38%	0.00%	4.76%	9.52%	38.10%	28.57%	16.67%	42	5.33	1.24
Publications	0.00%	2.38%	0.00%	11.90%	45.24%	30.95%	9.52%	42	5.31	0.98
Citations	0.00%	0.00%	0.00%	19.05%	45.24%	26.19%	9.52%	42	5.26	0.89
Alumni Giving	0.00%	9.52%	2.38%	14.29%	28.57%	30.95%	14.29%	42	5.12	1.42
Endowment Assets	0.00%	4.76%	2.38%	9.52%	50.00%	26.19%	7.14%	42	5.12	1.09
Peer Evaluation	0.00%	0.00%	9.52%	19.05%	35.71%	30.95%	4.76%	42	5.02	1.05
National Academy Membership	2.38%	0.00%	4.76%	19.05%	52.38%	14.29%	7.14%	42	4.90	1.10
Research Income from Industry	0.00%	0.00%	2.38%	30.95%	42.86%	21.43%	2.38%	42	4.90	0.85
Prestigious Faculty Awards	4.76%	2.38%	4.76%	14.29%	42.86%	23.81%	7.14%	42	4.88	1.37
International Research Collab	0.00%	2.38%	7.14%	26.19%	40.48%	21.43%	2.38%	42	4.79	1.02
Doctorates-Awarded/Faculty Ratio	4.88%	2.44%	9.76%	17.07%	31.71%	26.83%	7.32%	41	4.78	1.46
Class Size	4.76%	2.38%	4.76%	23.81%	42.86%	14.29%	7.14%	42	4.69	1.33
Faculty Salary	4.76%	0.00%	11.90%	14.29%	50.00%	16.67%	2.38%	42	4.64	1.25
International Student Ratio	2.38%	0.00%	14.29%	30.95%	42.86%	9.52%	0.00%	42	4.40	1.01
Doctorate/Bachelor Ratio	7.14%	11.90%	2.38%	30.95%	28.57%	16.67%	2.38%	42	4.21	1.52
International Faculty Ratio	2.38%	2.38%	9.52%	50.00%	30.95%	4.76%	0.00%	42	4.19	0.94
SAT/ACT Scores	7.14%	16.67%	16.67%	21.43%	21.43%	9.52%	7.14%	42	3.90	1.66

Note: 1 = Not important at all, 4 = Neutral, 7 = Critically important

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Table C.3 (continued)

No Previous Experience

Quality Factor	1	2	3	4	5	6	7	n	mean	std dev
Graduation and Retention	0.00%	1.41%	0.00%	4.23%	7.04%	49.30%	38.03%	71	6.17	0.91
Full-time Faculty w/ Term Degrees	0.00%	0.00%	0.00%	2.86%	28.57%	47.14%	21.43%	70	5.87	0.78
Employer Reputation	0.00%	0.00%	0.00%	12.68%	23.94%	38.03%	25.35%	71	5.76	0.98
Pell Grant Graduation Rate	0.00%	0.00%	2.82%	8.45%	33.80%	40.85%	14.08%	71	5.55	0.94
Faculty/Student Ratio	0.00%	0.00%	1.43%	5.71%	38.57%	45.71%	8.57%	70	5.54	0.79
Research Expenditures	0.00%	2.82%	1.41%	5.63%	38.03%	36.62%	15.49%	71	5.51	1.05
Total Research Income	0.00%	1.41%	4.23%	9.86%	39.44%	38.03%	7.04%	71	5.30	0.99
Publications	0.00%	2.82%	1.41%	15.49%	40.85%	30.99%	8.45%	71	5.21	1.04
Citations	0.00%	2.82%	1.41%	16.90%	39.44%	33.80%	5.63%	71	5.17	1.01
Total Income from All Sources	0.00%	1.41%	9.86%	18.31%	26.76%	30.99%	12.68%	71	5.14	1.23
Endowment Assets	0.00%	5.63%	8.45%	15.49%	35.21%	22.54%	12.68%	71	4.99	1.33
Class Size	0.00%	7.14%	4.29%	12.86%	40.00%	31.43%	4.29%	70	4.97	1.20
Alumni Giving	1.41%	2.82%	11.27%	18.31%	30.99%	21.13%	14.08%	71	4.94	1.38
Peer Evaluation	1.41%	8.45%	8.45%	14.08%	28.17%	30.99%	8.45%	71	4.86	1.46
Research Income from Industry	1.41%	1.41%	9.86%	23.94%	32.39%	26.76%	4.23%	71	4.82	1.19
National Academy Membership	1.41%	4.23%	7.04%	25.35%	33.80%	21.13%	7.04%	71	4.77	1.27
Prestigious Faculty Awards	0.00%	5.63%	4.23%	28.17%	38.03%	19.72%	4.23%	71	4.75	1.13
Doctorates-Awarded/Faculty Ratio	2.86%	8.57%	1.43%	17.14%	44.29%	20.00%	5.71%	70	4.74	1.36
International Research Collab	0.00%	4.23%	9.86%	30.99%	23.94%	26.76%	4.23%	71	4.72	1.21
Faculty Salary	0.00%	5.63%	5.63%	29.58%	33.80%	22.54%	2.82%	71	4.70	1.14
International Student Ratio	2.82%	9.86%	7.04%	30.99%	38.03%	7.04%	4.23%	71	4.30	1.30
Doctorate/Bachelor Ratio	2.82%	12.68%	5.63%	33.80%	29.58%	14.08%	1.41%	71	4.23	1.33
International Faculty Ratio	2.82%	7.04%	9.86%	46.48%	22.54%	8.45%	2.82%	71	4.15	1.20
SAT/ACT Scores	7.04%	14.08%	11.27%	22.54%	23.94%	18.31%	2.82%	71	4.08	1.60

Note: 1 = Not important at all, 4 = Neutral, 7 = Critically important

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Table C.4   Quality Factor Ratings by HEI Other Characteristic

Historically Black College or University

Quality Factor	1	2	3	4	5	6	7	n	mean	std dev
Graduation and Retention	0.00%	0.00%	0.00%	0.00%	11.11%	33.33%	55.56%	9	6.44	0.73
Employer Reputation	0.00%	0.00%	0.00%	0.00%	33.33%	0.00%	66.67%	9	6.33	1.00
Total Income from All Sources	0.00%	0.00%	0.00%	0.00%	22.22%	33.33%	44.44%	9	6.22	0.83
Faculty/Student Ratio	0.00%	0.00%	0.00%	0.00%	22.22%	44.44%	33.33%	9	6.11	0.78
Alumni Giving	0.00%	0.00%	0.00%	0.00%	33.33%	22.22%	44.44%	9	6.11	0.93
Endowment Assets	0.00%	0.00%	0.00%	0.00%	33.33%	44.44%	22.22%	9	5.89	0.78
Class Size	0.00%	0.00%	0.00%	0.00%	33.33%	55.56%	11.11%	9	5.78	0.67
Full-time Faculty w/ Term Degrees	0.00%	0.00%	0.00%	11.11%	22.22%	44.44%	22.22%	9	5.78	0.97
Pell Grant Graduation Rate	0.00%	0.00%	0.00%	0.00%	44.44%	44.44%	11.11%	9	5.67	0.71
Total Research Income	0.00%	0.00%	11.11%	0.00%	22.22%	66.67%	0.00%	9	5.44	1.01
Peer Evaluation	0.00%	0.00%	11.11%	11.11%	22.22%	44.44%	11.11%	9	5.33	1.22
Publications	0.00%	0.00%	0.00%	11.11%	44.44%	44.44%	0.00%	9	5.33	0.71
Research Expenditures	0.00%	0.00%	11.11%	0.00%	33.33%	55.56%	0.00%	9	5.33	1.00
International Research Collab	0.00%	0.00%	11.11%	11.11%	22.22%	55.56%	0.00%	9	5.22	1.09
Citations	0.00%	0.00%	0.00%	11.11%	66.67%	22.22%	0.00%	9	5.11	0.60
Faculty Salary	0.00%	0.00%	11.11%	22.22%	33.33%	22.22%	11.11%	9	5.00	1.22
National Academy Membership	0.00%	0.00%	0.00%	33.33%	33.33%	33.33%	0.00%	9	5.00	0.87
International Faculty Ratio	0.00%	0.00%	0.00%	44.44%	22.22%	22.22%	11.11%	9	5.00	1.12
Research Income from Industry	0.00%	0.00%	22.22%	11.11%	22.22%	44.44%	0.00%	9	4.89	1.27
Doctorates-Awarded/Faculty Ratio	11.11%	11.11%	0.00%	11.11%	22.22%	33.33%	11.11%	9	4.67	2.00
SAT/ACT Scores	11.11%	11.11%	0.00%	0.00%	44.44%	22.22%	11.11%	9	4.67	1.94
International Student Ratio	0.00%	11.11%	11.11%	33.33%	22.22%	11.11%	11.11%	9	4.44	1.51
Doctorate/Bachelor Ratio	11.11%	11.11%	0.00%	22.22%	22.22%	33.33%	0.00%	9	4.33	1.80
Prestigious Faculty Awards	0.00%	22.22%	0.00%	22.22%	33.33%	22.22%	0.00%	9	4.33	1.50

Note: 1 = Not important at all, 4 = Neutral, 7 = Critically important

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Table C.4 (continued)

Land-Grant Institution

Quality Factor	1	2	3	4	5	6	7	n	mean	std dev
Graduation and Retention	0.00%	2.08%	0.00%	0.00%	14.58%	41.67%	41.67%	48	6.19	0.94
Research Expenditures	0.00%	0.00%	2.08%	2.08%	29.17%	47.92%	18.75%	48	5.79	0.85
Full-time Faculty w/ Term Degrees	0.00%	0.00%	2.08%	2.08%	33.33%	43.75%	18.75%	48	5.75	0.86
Employer Reputation	0.00%	0.00%	0.00%	12.50%	29.17%	33.33%	25.00%	48	5.71	0.99
Faculty/Student Ratio	0.00%	0.00%	2.13%	8.51%	38.30%	40.43%	10.64%	47	5.49	0.88
Total Research Income	0.00%	0.00%	4.17%	10.42%	39.58%	35.42%	10.42%	48	5.38	0.96
Pell Grant Graduation Rate	0.00%	0.00%	6.25%	8.33%	39.58%	35.42%	10.42%	48	5.35	1.00
Citations	0.00%	2.08%	2.08%	14.58%	47.92%	29.17%	4.17%	48	5.13	0.94
Publications	0.00%	4.17%	2.08%	10.42%	52.08%	27.08%	4.17%	48	5.08	1.01
Total Income from All Sources	0.00%	4.17%	8.33%	16.67%	35.42%	22.92%	12.50%	48	5.02	1.28
Alumni Giving	2.08%	6.25%	8.33%	12.50%	31.25%	25.00%	14.58%	48	4.98	1.49
Endowment Assets	0.00%	10.42%	2.08%	10.42%	43.75%	25.00%	8.33%	48	4.96	1.32
Research Income from Industry	0.00%	0.00%	8.33%	29.17%	33.33%	25.00%	4.17%	48	4.88	1.02
National Academy Membership	0.00%	4.17%	8.33%	18.75%	43.75%	16.67%	8.33%	48	4.85	1.18
Faculty Salary	0.00%	2.08%	6.25%	22.92%	47.92%	16.67%	4.17%	48	4.83	1.00
Prestigious Faculty Awards	0.00%	6.25%	6.25%	22.92%	37.50%	18.75%	8.33%	48	4.81	1.25
Peer Evaluation	2.08%	8.33%	6.25%	14.58%	35.42%	27.08%	6.25%	48	4.79	1.41
Class Size	0.00%	10.64%	8.51%	10.64%	40.43%	25.53%	4.26%	47	4.74	1.34
Doctorates-Awarded/Faculty Ratio	6.25%	12.50%	2.08%	10.42%	33.33%	31.25%	4.17%	48	4.63	1.65
International Research Collab	0.00%	6.25%	8.33%	29.17%	31.25%	22.92%	2.08%	48	4.63	1.18
International Student Ratio	4.17%	10.42%	6.25%	31.25%	41.67%	6.25%	0.00%	48	4.15	1.24
SAT/ACT Scores	2.08%	20.83%	16.67%	20.83%	18.75%	10.42%	10.42%	48	4.06	1.67
Doctorate/Bachelor Ratio	4.17%	20.83%	4.17%	29.17%	27.08%	12.50%	2.08%	48	4.00	1.50
International Faculty Ratio	4.17%	12.50%	4.17%	47.92%	25.00%	6.25%	0.00%	48	3.96	1.20

Note: 1 = Not important at all, 4 = Neutral, 7 = Critically important

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Table C.4 (continued)

Predominately Undergraduate
Institution

Quality Factor	1	2	3	4	5	6	7	n	mean	std dev
Graduation and Retention	0.00%	2.63%	0.00%	5.26%	10.53%	36.84%	44.74%	38	6.13	1.09
Employer Reputation	0.00%	0.00%	0.00%	13.16%	21.05%	42.11%	23.68%	38	5.76	0.97
Full-time Faculty w/ Term Degrees	2.70%	0.00%	0.00%	5.41%	27.03%	43.24%	21.62%	37	5.70	1.15
Faculty/Student Ratio	0.00%	0.00%	5.26%	2.63%	28.95%	44.74%	18.42%	38	5.68	0.99
Total Income from All Sources	0.00%	0.00%	5.26%	21.05%	21.05%	31.58%	21.05%	38	5.42	1.20
Pell Grant Graduation Rate	2.63%	0.00%	2.63%	13.16%	28.95%	42.11%	10.53%	38	5.34	1.19
Total Research Income	0.00%	2.63%	5.26%	13.16%	34.21%	34.21%	10.53%	38	5.24	1.15
Research Expenditures	0.00%	5.26%	5.26%	15.79%	28.95%	28.95%	15.79%	38	5.18	1.33
Alumni Giving	0.00%	2.63%	7.89%	18.42%	26.32%	31.58%	13.16%	38	5.16	1.26
Peer Evaluation	0.00%	2.63%	7.89%	18.42%	23.68%	39.47%	7.89%	38	5.13	1.21
Endowment Assets	0.00%	0.00%	7.89%	15.79%	42.11%	23.68%	10.53%	38	5.13	1.07
Publications	0.00%	2.63%	2.63%	28.95%	31.58%	23.68%	10.53%	38	5.03	1.15
Class Size	5.26%	5.26%	2.63%	10.53%	39.47%	26.32%	10.53%	38	4.95	1.51
Citations	0.00%	2.63%	2.63%	28.95%	39.47%	18.42%	7.89%	38	4.92	1.08
National Academy Membership	2.63%	2.63%	2.63%	34.21%	31.58%	15.79%	10.53%	38	4.79	1.30
International Research Collab	0.00%	2.63%	5.26%	36.84%	31.58%	18.42%	5.26%	38	4.74	1.08
Research Income from Industry	2.63%	2.63%	5.26%	28.95%	34.21%	23.68%	2.63%	38	4.71	1.21
Doctorates-Awarded/Faculty Ratio	5.56%	11.11%	5.56%	25.00%	22.22%	22.22%	8.33%	36	4.47	1.65
Faculty Salary	5.26%	5.26%	13.16%	26.32%	23.68%	23.68%	2.63%	38	4.39	1.46
Prestigious Faculty Awards	5.26%	13.16%	2.63%	28.95%	23.68%	23.68%	2.63%	38	4.34	1.55
SAT/ACT Scores	10.53%	10.53%	5.26%	18.42%	26.32%	26.32%	2.63%	38	4.29	1.72
International Faculty Ratio	0.00%	5.26%	10.53%	52.63%	23.68%	5.26%	2.63%	38	4.21	0.99
International Student Ratio	0.00%	13.16%	15.79%	28.95%	31.58%	5.26%	5.26%	38	4.16	1.31
Doctorate/Bachelor Ratio	10.53%	10.53%	5.26%	34.21%	23.68%	15.79%	0.00%	38	3.97	1.53

Note: 1 = Not important at all, 4 = Neutral, 7 = Critically important

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Table C.5   Quality Factor Ratings by Current Role

President/Chancellor/Provost

Quality Factor	1	2	3	4	5	6	7	n	mean	std dev
Full-time Faculty w/ Term Degrees	0.00%	0.00%	0.00%	0.00%	13.16%	52.63%	34.21%	38	6.21	0.66
Graduation and Retention	0.00%	0.00%	0.00%	5.26%	10.53%	47.37%	36.84%	38	6.16	0.82
Research Expenditures	0.00%	5.26%	0.00%	2.63%	18.42%	65.79%	7.89%	38	5.63	1.05
Pell Grant Graduation Rate	0.00%	0.00%	0.00%	7.89%	34.21%	47.37%	10.53%	38	5.61	0.79
Employer Reputation	0.00%	0.00%	0.00%	21.05%	23.68%	36.84%	18.42%	38	5.53	1.03
Faculty/Student Ratio	0.00%	0.00%	0.00%	10.53%	47.37%	34.21%	7.89%	38	5.39	0.79
Total Research Income	0.00%	2.63%	2.63%	5.26%	42.11%	47.37%	0.00%	38	5.29	0.90
Citations	0.00%	2.63%	0.00%	5.26%	55.26%	34.21%	2.63%	38	5.26	0.83
Publications	0.00%	5.26%	0.00%	2.63%	52.63%	34.21%	5.26%	38	5.26	1.00
Prestigious Faculty Awards	0.00%	5.26%	0.00%	15.79%	44.74%	26.32%	7.89%	38	5.11	1.11
Faculty Salary	0.00%	2.63%	0.00%	21.05%	44.74%	26.32%	5.26%	38	5.08	0.97
Total Income from All Sources	0.00%	5.26%	7.89%	18.42%	28.95%	31.58%	7.89%	38	4.97	1.28
Doctorates-Awarded/Faculty Ratio	5.26%	2.63%	2.63%	13.16%	47.37%	23.68%	5.26%	38	4.87	1.34
National Academy Membership	2.63%	2.63%	5.26%	21.05%	42.11%	21.05%	5.26%	38	4.82	1.23
Research Income from Industry	2.63%	2.63%	5.26%	28.95%	31.58%	26.32%	2.63%	38	4.74	1.22
Alumni Giving	0.00%	7.89%	10.53%	21.05%	34.21%	15.79%	10.53%	38	4.71	1.37
Endowment Assets	0.00%	10.53%	7.89%	15.79%	36.84%	23.68%	5.26%	38	4.71	1.35
Class Size	0.00%	5.41%	10.81%	27.03%	32.43%	24.32%	0.00%	37	4.59	1.14
Peer Evaluation	0.00%	13.16%	7.89%	15.79%	39.47%	23.68%	0.00%	38	4.53	1.31
International Research Collab	0.00%	7.89%	7.89%	31.58%	34.21%	18.42%	0.00%	38	4.47	1.13
Doctorate/Bachelor Ratio	7.89%	10.53%	2.63%	36.84%	28.95%	10.53%	2.63%	38	4.11	1.47
International Student Ratio	5.26%	7.89%	5.26%	44.74%	28.95%	5.26%	2.63%	38	4.11	1.27
International Faculty Ratio	7.89%	5.26%	10.53%	55.26%	15.79%	2.63%	2.63%	38	3.84	1.24
SAT/ACT Scores	2.63%	18.42%	26.32%	23.68%	13.16%	15.79%	0.00%	38	3.74	1.41

Note: 1 = Not important at all, 4 = Neutral, 7 = Critically important

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Table C.5 (continued)

Other Vice President/Vice Chancellor

Quality Factor	1	2	3	4	5	6	7	n	mean	std dev
Graduation and Retention	0.00%	1.33%	1.33%	1.33%	14.67%	34.67%	46.67%	75	6.20	0.99
Employer Reputation	0.00%	0.00%	0.00%	6.67%	32.00%	38.67%	22.67%	75	5.77	0.88
Faculty/Student Ratio	0.00%	0.00%	4.05%	5.41%	32.43%	41.89%	16.22%	74	5.61	0.96
Research Expenditures	0.00%	0.00%	2.67%	10.67%	42.67%	24.00%	20.00%	75	5.48	1.02
Full-time Faculty w/ Term Degrees	1.35%	0.00%	1.35%	6.76%	41.89%	35.14%	13.51%	74	5.47	1.01
Total Income from All Sources	0.00%	0.00%	5.33%	16.00%	29.33%	30.67%	18.67%	75	5.41	1.13
Pell Grant Graduation Rate	1.33%	0.00%	5.33%	9.33%	36.00%	30.67%	17.33%	75	5.40	1.17
Total Research Income	0.00%	0.00%	2.67%	13.33%	40.00%	30.67%	13.33%	75	5.39	0.97
Publications	0.00%	1.33%	1.33%	20.00%	37.33%	29.33%	10.67%	75	5.24	1.02
Endowment Assets	0.00%	2.67%	5.33%	12.00%	42.67%	24.00%	13.33%	75	5.20	1.15
Citations	0.00%	1.33%	1.33%	24.00%	34.67%	29.33%	9.33%	75	5.17	1.03
Alumni Giving	1.33%	4.00%	6.67%	14.67%	28.00%	29.33%	16.00%	75	5.16	1.39
Peer Evaluation	1.33%	1.33%	9.33%	16.00%	26.67%	34.67%	10.67%	75	5.12	1.28
Class Size	2.67%	5.33%	1.33%	12.00%	45.33%	25.33%	8.00%	75	5.00	1.29
Research Income from Industry	0.00%	0.00%	8.00%	25.33%	38.67%	24.00%	4.00%	75	4.91	0.99
International Research Collab	0.00%	1.33%	9.33%	28.00%	28.00%	28.00%	5.33%	75	4.88	1.13
National Academy Membership	1.33%	2.67%	6.67%	24.00%	40.00%	17.33%	8.00%	75	4.83	1.20
Doctorates-Awarded/Faculty Ratio	2.74%	8.22%	5.48%	19.18%	35.62%	21.92%	6.85%	73	4.70	1.42
Prestigious Faculty Awards	2.67%	4.00%	6.67%	26.67%	37.33%	18.67%	4.00%	75	4.64	1.25
Faculty Salary	2.67%	4.00%	12.00%	25.33%	37.33%	17.33%	1.33%	75	4.48	1.22
International Student Ratio	1.33%	5.33%	12.00%	24.00%	45.33%	9.33%	2.67%	75	4.45	1.15
International Faculty Ratio	0.00%	5.33%	9.33%	44.00%	30.67%	9.33%	1.33%	75	4.33	1.00
Doctorate/Bachelor Ratio	2.67%	13.33%	5.33%	30.67%	29.33%	17.33%	1.33%	75	4.28	1.37
SAT/ACT Scores	9.33%	13.33%	6.67%	21.33%	28.00%	14.67%	6.67%	75	4.16	1.71

Note: 1 = Not important at all, 4 = Neutral, 7 = Critically important

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Table C.6   Quality Factor Ratings by HEI Enrollment

Enrollment: 1,000 - 9,999

Quality Factor	1	2	3	4	5	6	7	n	mean	std dev
Graduation and Retention	0.00%	0.00%	0.00%	0.00%	16.67%	44.44%	38.89%	18	6.22	0.73
Faculty/Student Ratio	0.00%	0.00%	0.00%	0.00%	16.67%	61.11%	22.22%	18	6.06	0.64
Employer Reputation	0.00%	0.00%	0.00%	5.56%	27.78%	27.78%	38.89%	18	6.00	0.97
Full-time Faculty w/ Term Degrees	0.00%	0.00%	0.00%	5.56%	27.78%	50.00%	16.67%	18	5.78	0.81
Total Income from All Sources	0.00%	0.00%	0.00%	27.78%	16.67%	27.78%	27.78%	18	5.56	1.20
Class Size	5.56%	0.00%	0.00%	0.00%	38.89%	44.44%	11.11%	18	5.44	1.29
Alumni Giving	0.00%	0.00%	5.56%	16.67%	33.33%	16.67%	27.78%	18	5.44	1.25
Endowment Assets	0.00%	0.00%	0.00%	16.67%	38.89%	27.78%	16.67%	18	5.44	0.98
Pell Grant Graduation Rate	5.56%	0.00%	0.00%	11.11%	50.00%	27.78%	5.56%	18	5.06	1.26
Peer Evaluation	0.00%	0.00%	5.56%	27.78%	33.33%	22.22%	11.11%	18	5.06	1.11
Citations	0.00%	0.00%	0.00%	22.22%	55.56%	16.67%	5.56%	18	5.06	0.80
Publications	0.00%	0.00%	0.00%	27.78%	44.44%	27.78%	0.00%	18	5.00	0.77
Doctorates-Awarded/Faculty Ratio	5.56%	11.11%	0.00%	11.11%	22.22%	44.44%	5.56%	18	4.89	1.68
International Research Collab	0.00%	0.00%	5.56%	38.89%	22.22%	27.78%	5.56%	18	4.89	1.08
Total Research Income	0.00%	5.56%	5.56%	27.78%	27.78%	33.33%	0.00%	18	4.78	1.17
SAT/ACT Scores	11.11%	11.11%	0.00%	0.00%	33.33%	38.89%	5.56%	18	4.72	1.87
Faculty Salary	5.56%	5.56%	5.56%	16.67%	33.33%	27.78%	5.56%	18	4.72	1.53
Research Expenditures	0.00%	5.56%	5.56%	27.78%	33.33%	27.78%	0.00%	18	4.72	1.13
International Faculty Ratio	0.00%	0.00%	5.56%	44.44%	27.78%	16.67%	5.56%	18	4.72	1.02
National Academy Membership	5.56%	0.00%	5.56%	33.33%	38.89%	16.67%	0.00%	18	4.50	1.20
Research Income from Industry	5.56%	0.00%	16.67%	27.78%	27.78%	22.22%	0.00%	18	4.39	1.33
International Student Ratio	0.00%	11.11%	11.11%	27.78%	33.33%	11.11%	5.56%	18	4.39	1.33
Doctorate/Bachelor Ratio	11.11%	11.11%	0.00%	27.78%	11.11%	38.89%	0.00%	18	4.33	1.78
Prestigious Faculty Awards	5.56%	11.11%	5.56%	16.67%	50.00%	11.11%	0.00%	18	4.28	1.41

Note: 1 = Not important at all, 4 = Neutral, 7 = Critically important

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Table C.6 (continued)

Enrollment: 10,000 - 19,999

Quality Factor	1	2	3	4	5	6	7	n	mean	std dev
Graduation and Retention	0.00%	0.00%	0.00%	8.57%	11.43%	31.43%	48.57%	35	6.20	0.96
Full-time Faculty w/ Term Degrees	2.94%	0.00%	0.00%	2.94%	17.65%	47.06%	29.41%	34	5.91	1.16
Employer Reputation	0.00%	0.00%	0.00%	17.14%	22.86%	40.00%	20.00%	35	5.63	1.00
Research Expenditures	0.00%	2.86%	2.86%	2.86%	28.57%	45.71%	17.14%	35	5.63	1.09
Pell Grant Graduation Rate	0.00%	0.00%	2.86%	11.43%	28.57%	40.00%	17.14%	35	5.57	1.01
Total Research Income	0.00%	0.00%	2.86%	0.00%	42.86%	48.57%	5.71%	35	5.54	0.74
Total Income from All Sources	0.00%	0.00%	2.86%	14.29%	25.71%	48.57%	8.57%	35	5.46	0.95
Faculty/Student Ratio	0.00%	0.00%	2.86%	8.57%	48.57%	28.57%	11.43%	35	5.37	0.91
Publications	0.00%	5.71%	0.00%	8.57%	34.29%	42.86%	8.57%	35	5.34	1.14
Citations	0.00%	2.86%	0.00%	14.29%	34.29%	42.86%	5.71%	35	5.31	0.99
Endowment Assets	0.00%	2.86%	8.57%	5.71%	40.00%	37.14%	5.71%	35	5.17	1.12
Research Income from Industry	0.00%	2.86%	0.00%	17.14%	40.00%	37.14%	2.86%	35	5.17	0.95
Alumni Giving	0.00%	5.71%	5.71%	17.14%	31.43%	28.57%	11.43%	35	5.06	1.30
Doctorates-Awarded/Faculty Ratio	6.06%	3.03%	6.06%	12.12%	36.36%	27.27%	9.09%	33	4.88	1.52
Prestigious Faculty Awards	2.86%	5.71%	0.00%	25.71%	31.43%	28.57%	5.71%	35	4.86	1.33
International Research Collab	0.00%	8.57%	2.86%	17.14%	40.00%	28.57%	2.86%	35	4.86	1.22
Peer Evaluation	0.00%	8.57%	11.43%	11.43%	28.57%	37.14%	2.86%	35	4.83	1.36
Class Size	2.94%	0.00%	5.88%	20.59%	52.94%	17.65%	0.00%	34	4.74	1.02
National Academy Membership	2.86%	5.71%	2.86%	25.71%	37.14%	20.00%	5.71%	35	4.71	1.32
Faculty Salary	2.86%	2.86%	8.57%	17.14%	45.71%	22.86%	0.00%	35	4.69	1.18
Doctorate/Bachelor Ratio	5.71%	2.86%	5.71%	25.71%	42.86%	14.29%	2.86%	35	4.51	1.31
International Student Ratio	2.86%	0.00%	14.29%	34.29%	42.86%	5.71%	0.00%	35	4.31	0.99
International Faculty Ratio	2.86%	0.00%	11.43%	51.43%	31.43%	2.86%	0.00%	35	4.17	0.89
SAT/ACT Scores	8.57%	11.43%	20.00%	22.86%	22.86%	11.43%	2.86%	35	3.86	1.56

Note: 1 = Not important at all, 4 = Neutral, 7 = Critically important

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Table C.6 (continued)

Enrollment: 20,000 - 29,999

Quality Factor	1	2	3	4	5	6	7	n	mean	std dev
Graduation and Retention	0.00%	4.00%	4.00%	0.00%	24.00%	28.00%	40.00%	25	5.88	1.30
Research Expenditures	0.00%	0.00%	0.00%	8.00%	28.00%	40.00%	24.00%	25	5.80	0.91
Faculty/Student Ratio	0.00%	0.00%	4.00%	12.00%	24.00%	48.00%	12.00%	25	5.52	1.00
Full-time Faculty w/ Term Degrees	0.00%	0.00%	4.00%	0.00%	52.00%	32.00%	12.00%	25	5.48	0.87
Employer Reputation	0.00%	0.00%	0.00%	12.00%	40.00%	40.00%	8.00%	25	5.44	0.82
Total Research Income	0.00%	0.00%	0.00%	20.00%	32.00%	36.00%	12.00%	25	5.40	0.96
Pell Grant Graduation Rate	0.00%	0.00%	8.00%	8.00%	48.00%	28.00%	8.00%	25	5.20	1.00
Publications	0.00%	4.00%	0.00%	20.00%	44.00%	20.00%	12.00%	25	5.12	1.13
Alumni Giving	4.00%	4.00%	4.00%	12.00%	28.00%	36.00%	12.00%	25	5.12	1.48
Total Income from All Sources	0.00%	4.00%	8.00%	16.00%	36.00%	24.00%	12.00%	25	5.04	1.27
Citations	0.00%	4.00%	0.00%	24.00%	48.00%	16.00%	8.00%	25	4.96	1.06
Prestigious Faculty Awards	0.00%	0.00%	8.00%	32.00%	32.00%	20.00%	8.00%	25	4.88	1.09
National Academy Membership	0.00%	0.00%	12.00%	16.00%	52.00%	12.00%	8.00%	25	4.88	1.05
Peer Evaluation	4.00%	4.00%	4.00%	16.00%	40.00%	24.00%	8.00%	25	4.88	1.39
International Research Collab	0.00%	0.00%	8.00%	32.00%	28.00%	28.00%	4.00%	25	4.88	1.05
Endowment Assets	0.00%	12.00%	0.00%	16.00%	48.00%	12.00%	12.00%	25	4.84	1.37
Research Income from Industry	0.00%	0.00%	8.00%	32.00%	40.00%	20.00%	0.00%	25	4.72	0.89
Class Size	0.00%	16.00%	4.00%	16.00%	36.00%	20.00%	8.00%	25	4.64	1.50
Faculty Salary	0.00%	4.00%	12.00%	28.00%	32.00%	24.00%	0.00%	25	4.60	1.12
Doctorates-Awarded/Faculty Ratio	4.00%	4.00%	8.00%	20.00%	52.00%	8.00%	4.00%	25	4.52	1.26
International Student Ratio	4.00%	8.00%	4.00%	32.00%	44.00%	8.00%	0.00%	25	4.28	1.21
Doctorate/Bachelor Ratio	4.00%	8.00%	4.00%	44.00%	32.00%	8.00%	0.00%	25	4.16	1.18
International Faculty Ratio	0.00%	8.00%	12.00%	56.00%	20.00%	4.00%	0.00%	25	4.00	0.91
SAT/ACT Scores	4.00%	20.00%	20.00%	24.00%	20.00%	8.00%	4.00%	25	3.76	1.51

Note: 1 = Not important at all, 4 = Neutral, 7 = Critically important

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Table C.6 (continued)

Enrollment: 30,000 or Above

Quality Factor	1	2	3	4	5	6	7	n	mean	std dev
Graduation and Retention	0.00%	0.00%	0.00%	0.00%	5.88%	52.94%	41.18%	34	6.35	0.60
Pell Grant Graduation Rate	0.00%	0.00%	2.94%	5.88%	26.47%	44.12%	20.59%	34	5.74	0.96
Employer Reputation	0.00%	0.00%	0.00%	8.82%	29.41%	41.18%	20.59%	34	5.74	0.90
Full-time Faculty w/ Term Degrees	0.00%	0.00%	0.00%	8.82%	32.35%	38.24%	20.59%	34	5.71	0.91
Research Expenditures	0.00%	0.00%	0.00%	2.94%	47.06%	32.35%	17.65%	34	5.65	0.81
Faculty/Student Ratio	0.00%	0.00%	3.03%	6.06%	45.45%	33.33%	12.12%	33	5.45	0.90
Total Research Income	0.00%	0.00%	2.94%	5.88%	52.94%	23.53%	14.71%	34	5.41	0.92
Publications	0.00%	0.00%	2.94%	8.82%	50.00%	26.47%	11.76%	34	5.35	0.92
Citations	0.00%	0.00%	2.94%	14.71%	38.24%	35.29%	8.82%	34	5.32	0.94
Total Income from All Sources	0.00%	2.94%	11.76%	14.71%	35.29%	17.65%	17.65%	34	5.06	1.35
National Academy Membership	0.00%	2.94%	5.88%	20.59%	38.24%	20.59%	11.76%	34	5.03	1.19
Prestigious Faculty Awards	0.00%	2.94%	5.88%	17.65%	47.06%	20.59%	5.88%	34	4.94	1.07
Peer Evaluation	0.00%	5.88%	11.76%	14.71%	26.47%	32.35%	8.82%	34	4.94	1.37
Class Size	0.00%	5.88%	5.88%	23.53%	32.35%	26.47%	5.88%	34	4.85	1.23
Research Income from Industry	0.00%	0.00%	8.82%	32.35%	32.35%	17.65%	8.82%	34	4.85	1.10
Endowment Assets	0.00%	5.88%	11.76%	17.65%	38.24%	14.71%	11.76%	34	4.79	1.34
Doctorates-Awarded/Faculty Ratio	0.00%	8.82%	2.94%	23.53%	44.12%	17.65%	2.94%	34	4.68	1.17
Faculty Salary	0.00%	2.94%	5.88%	32.35%	44.12%	8.82%	5.88%	34	4.68	1.04
Alumni Giving	0.00%	8.82%	14.71%	20.59%	29.41%	14.71%	11.76%	34	4.62	1.46
International Research Collab	0.00%	2.94%	17.65%	35.29%	26.47%	14.71%	2.94%	34	4.41	1.13
International Student Ratio	2.94%	8.82%	8.82%	26.47%	38.24%	8.82%	5.88%	34	4.38	1.37
SAT/ACT Scores	5.88%	17.65%	8.82%	29.41%	20.59%	11.76%	5.88%	34	4.00	1.61
International Faculty Ratio	5.88%	11.76%	8.82%	38.24%	23.53%	8.82%	2.94%	34	4.00	1.41
Doctorate/Bachelor Ratio	0.00%	26.47%	5.88%	35.29%	23.53%	5.88%	2.94%	34	3.85	1.37

Note: 1 = Not important at all, 4 = Neutral, 7 = Critically important

Table C.7   Quality Factor Ratings by HEI Research Expenditures

Under $40M

Quality Factor	1	2	3	4	5	6	7	n	mean	std dev
Graduation and Retention	0.00%	0.00%	0.00%	0.00%	16.67%	41.67%	41.67%	24	6.25	0.74
Employer Reputation	0.00%	0.00%	0.00%	8.33%	20.83%	29.17%	41.67%	24	6.04	1.00
Faculty/Student Ratio	0.00%	0.00%	4.17%	0.00%	33.33%	45.83%	16.67%	24	5.71	0.91
Full-time Faculty w/ Term Degrees	4.17%	0.00%	0.00%	4.17%	29.17%	33.33%	29.17%	24	5.71	1.33
Total Income from All Sources	0.00%	0.00%	0.00%	16.67%	25.00%	29.17%	29.17%	24	5.71	1.08
Pell Grant Graduation Rate	4.17%	0.00%	0.00%	4.17%	41.67%	41.67%	8.33%	24	5.38	1.17
Alumni Giving	0.00%	0.00%	8.33%	12.50%	37.50%	20.83%	20.83%	24	5.33	1.20
Endowment Assets	0.00%	0.00%	4.17%	8.33%	54.17%	20.83%	12.50%	24	5.29	0.95
Peer Evaluation	0.00%	0.00%	4.17%	16.67%	37.50%	33.33%	8.33%	24	5.25	0.99
Publications	0.00%	0.00%	0.00%	16.67%	45.83%	33.33%	4.17%	24	5.25	0.79
Citations	0.00%	0.00%	0.00%	16.67%	50.00%	29.17%	4.17%	24	5.21	0.78
Total Research Income	0.00%	4.17%	4.17%	12.50%	37.50%	41.67%	0.00%	24	5.08	1.06
Research Expenditures	0.00%	4.17%	8.33%	12.50%	37.50%	33.33%	4.17%	24	5.00	1.18
International Research Collab	0.00%	0.00%	8.33%	20.83%	41.67%	25.00%	4.17%	24	4.96	1.00
Class Size	8.33%	4.17%	0.00%	12.50%	29.17%	41.67%	4.17%	24	4.92	1.59
National Academy Membership	4.17%	0.00%	0.00%	29.17%	37.50%	25.00%	4.17%	24	4.88	1.19
Doctorates-Awarded/Faculty Ratio	8.70%	4.35%	4.35%	13.04%	30.43%	30.43%	8.70%	23	4.78	1.68
Research Income from Industry	4.17%	0.00%	12.50%	20.83%	33.33%	29.17%	0.00%	24	4.67	1.27
Faculty Salary	8.33%	0.00%	16.67%	16.67%	29.17%	25.00%	4.17%	24	4.50	1.56
International Faculty Ratio	0.00%	0.00%	12.50%	45.83%	29.17%	8.33%	4.17%	24	4.46	0.98
SAT/ACT Scores	12.50%	8.33%	4.17%	12.50%	33.33%	25.00%	4.17%	24	4.38	1.79
Doctorate/Bachelor Ratio	12.50%	4.17%	0.00%	33.33%	20.83%	29.17%	0.00%	24	4.33	1.63
Prestigious Faculty Awards	8.33%	12.50%	0.00%	20.83%	41.67%	16.67%	0.00%	24	4.25	1.54
International Student Ratio	0.00%	8.33%	20.83%	25.00%	37.50%	4.17%	4.17%	24	4.21	1.22

Note: 1 = Not important at all, 4 = Neutral, 7 = Critically important

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Table C.7 (continued)

$40 Million - $125 Million

Quality Factor	1	2	3	4	5	6	7	n	mean	std dev
Graduation and Retention	0.00%	0.00%	0.00%	6.45%	19.35%	29.03%	45.16%	31	6.13	0.96
Full-time Faculty w/ Term Degrees	0.00%	0.00%	0.00%	3.33%	33.33%	50.00%	13.33%	30	5.73	0.74
Employer Reputation	0.00%	0.00%	0.00%	9.68%	32.26%	45.16%	12.90%	31	5.61	0.84
Pell Grant Graduation Rate	0.00%	0.00%	3.23%	12.90%	32.26%	32.26%	19.35%	31	5.52	1.06
Research Expenditures	0.00%	0.00%	0.00%	16.13%	29.03%	41.94%	12.90%	31	5.52	0.93
Total Research Income	0.00%	0.00%	0.00%	16.13%	35.48%	35.48%	12.90%	31	5.45	0.93
Faculty/Student Ratio	0.00%	0.00%	0.00%	16.13%	45.16%	25.81%	12.90%	31	5.35	0.91
Total Income from All Sources	0.00%	3.23%	0.00%	19.35%	29.03%	38.71%	9.68%	31	5.29	1.10
Citations	0.00%	0.00%	0.00%	19.35%	41.94%	32.26%	6.45%	31	5.26	0.86
Publications	0.00%	3.23%	0.00%	12.90%	41.94%	35.48%	6.45%	31	5.26	1.00
Class Size	0.00%	0.00%	3.33%	13.33%	63.33%	13.33%	6.67%	30	5.07	0.83
Prestigious Faculty Awards	0.00%	0.00%	3.23%	25.81%	41.94%	22.58%	6.45%	31	5.03	0.95
Endowment Assets	0.00%	6.45%	3.23%	19.35%	32.26%	29.03%	9.68%	31	5.03	1.28
Alumni Giving	0.00%	6.45%	3.23%	19.35%	35.48%	25.81%	9.68%	31	5.00	1.26
Faculty Salary	0.00%	3.23%	6.45%	22.58%	38.71%	29.03%	0.00%	31	4.84	1.04
Doctorates-Awarded/Faculty Ratio	6.67%	3.33%	3.33%	20.00%	30.00%	26.67%	10.00%	30	4.83	1.56
Peer Evaluation	0.00%	6.45%	9.68%	22.58%	25.81%	32.26%	3.23%	31	4.77	1.28
Research Income from Industry	0.00%	0.00%	3.23%	35.48%	45.16%	16.13%	0.00%	31	4.74	0.77
Doctorate/Bachelor Ratio	3.23%	3.23%	3.23%	32.26%	35.48%	19.35%	3.23%	31	4.65	1.23
National Academy Membership	3.23%	3.23%	12.90%	19.35%	38.71%	16.13%	6.45%	31	4.61	1.36
International Research Collab	0.00%	6.45%	9.68%	32.26%	25.81%	22.58%	3.23%	31	4.58	1.23
International Student Ratio	3.23%	3.23%	12.90%	41.94%	29.03%	9.68%	0.00%	31	4.19	1.11
International Faculty Ratio	3.23%	0.00%	16.13%	54.84%	19.35%	6.45%	0.00%	31	4.06	0.96
SAT/ACT Scores	6.45%	9.68%	19.35%	25.81%	22.58%	12.90%	3.23%	31	4.00	1.51

Note: 1 = Not important at all, 4 = Neutral, 7 = Critically important

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Table C.7 (continued)

$125 Million - $250 Million

Quality Factor	1	2	3	4	5	6	7	n	mean	std dev
Graduation and Retention	0.00%	0.00%	0.00%	3.33%	10.00%	53.33%	33.33%	30	6.17	0.75
Full-time Faculty w/ Term Degrees	0.00%	0.00%	3.33%	3.33%	30.00%	36.67%	26.67%	30	5.80	1.00
Research Expenditures	0.00%	3.33%	0.00%	0.00%	36.67%	40.00%	20.00%	30	5.70	1.02
Employer Reputation	0.00%	0.00%	0.00%	13.33%	26.67%	46.67%	13.33%	30	5.60	0.89
Pell Grant Graduation Rate	0.00%	0.00%	3.33%	10.00%	30.00%	43.33%	13.33%	30	5.53	0.97
Faculty/Student Ratio	0.00%	0.00%	6.67%	6.67%	40.00%	40.00%	6.67%	30	5.33	0.96
Total Research Income	0.00%	0.00%	6.67%	10.00%	46.67%	30.00%	6.67%	30	5.20	0.96
Publications	0.00%	6.67%	3.33%	10.00%	40.00%	26.67%	13.33%	30	5.17	1.29
Total Income from All Sources	0.00%	0.00%	10.00%	16.67%	30.00%	33.33%	10.00%	30	5.17	1.15
Citations	0.00%	6.67%	3.33%	13.33%	36.67%	33.33%	6.67%	30	5.07	1.23
Endowment Assets	0.00%	10.00%	3.33%	13.33%	36.67%	26.67%	10.00%	30	4.97	1.38
Research Income from Industry	0.00%	3.33%	6.67%	23.33%	30.00%	33.33%	3.33%	30	4.93	1.14
Prestigious Faculty Awards	0.00%	6.67%	6.67%	20.00%	33.33%	26.67%	6.67%	30	4.87	1.28
Alumni Giving	3.33%	10.00%	3.33%	20.00%	23.33%	26.67%	13.33%	30	4.83	1.62
International Research Collab	0.00%	3.33%	6.67%	26.67%	33.33%	26.67%	3.33%	30	4.83	1.12
Faculty Salary	0.00%	6.67%	10.00%	10.00%	50.00%	20.00%	3.33%	30	4.77	1.19
National Academy Membership	0.00%	3.33%	10.00%	20.00%	50.00%	10.00%	6.67%	30	4.73	1.11
Class Size	0.00%	6.67%	6.67%	23.33%	43.33%	20.00%	0.00%	30	4.63	1.10
Peer Evaluation	3.33%	10.00%	10.00%	10.00%	40.00%	20.00%	6.67%	30	4.60	1.52
International Student Ratio	3.33%	3.33%	6.67%	23.33%	46.67%	13.33%	3.33%	30	4.60	1.22
Doctorates-Awarded/Faculty Ratio	0.00%	13.33%	6.67%	16.67%	46.67%	13.33%	3.33%	30	4.50	1.31
International Faculty Ratio	3.33%	10.00%	6.67%	43.33%	26.67%	6.67%	3.33%	30	4.13	1.28
SAT/ACT Scores	0.00%	16.67%	23.33%	23.33%	23.33%	13.33%	0.00%	30	3.93	1.31
Doctorate/Bachelor Ratio	3.33%	20.00%	10.00%	30.00%	30.00%	6.67%	0.00%	30	3.83	1.34

Note: 1 = Not important at all, 4 = Neutral, 7 = Critically important

Table C.7 (continued)

Greater than $250 Million

Quality Factor	1	2	3	4	5	6	7	n	mean	std dev
Graduation and Retention	0.00%	3.85%	3.85%	0.00%	7.69%	34.62%	50.00%	26	6.15	1.26
Faculty/Student Ratio	0.00%	0.00%	0.00%	4.00%	28.00%	48.00%	20.00%	25	5.84	0.80
Research Expenditures	0.00%	0.00%	0.00%	3.85%	38.46%	34.62%	23.08%	26	5.77	0.86
Total Research Income	0.00%	0.00%	0.00%	3.85%	42.31%	38.46%	15.38%	26	5.65	0.80
Full-time Faculty w/ Term Degrees	0.00%	0.00%	0.00%	7.69%	38.46%	38.46%	15.38%	26	5.62	0.85
Employer Reputation	0.00%	0.00%	0.00%	15.38%	38.46%	23.08%	23.08%	26	5.54	1.03
Pell Grant Graduation Rate	0.00%	0.00%	7.69%	7.69%	38.46%	30.77%	15.38%	26	5.38	1.10
Publications	0.00%	0.00%	0.00%	15.38%	46.15%	26.92%	11.54%	26	5.35	0.89
Citations	0.00%	0.00%	0.00%	19.23%	42.31%	26.92%	11.54%	26	5.31	0.93
National Academy Membership	0.00%	3.85%	0.00%	23.08%	38.46%	23.08%	11.54%	26	5.12	1.14
Peer Evaluation	0.00%	3.85%	11.54%	15.38%	23.08%	34.62%	11.54%	26	5.08	1.35
Total Income from All Sources	0.00%	3.85%	11.54%	15.38%	34.62%	19.23%	15.38%	26	5.00	1.36
Alumni Giving	0.00%	3.85%	15.38%	15.38%	26.92%	23.08%	15.38%	26	4.96	1.43
Research Income from Industry	0.00%	0.00%	7.69%	26.92%	34.62%	23.08%	7.69%	26	4.96	1.08
Doctorates-Awarded/Faculty Ratio	0.00%	3.85%	3.85%	19.23%	46.15%	23.08%	3.85%	26	4.92	1.06
Prestigious Faculty Awards	0.00%	0.00%	7.69%	26.92%	38.46%	19.23%	7.69%	26	4.92	1.06
Endowment Assets	0.00%	3.85%	11.54%	11.54%	46.15%	15.38%	11.54%	26	4.92	1.26
Class Size	0.00%	11.54%	7.69%	15.38%	23.08%	30.77%	11.54%	26	4.88	1.53
Faculty Salary	0.00%	3.85%	0.00%	46.15%	38.46%	7.69%	3.85%	26	4.58	0.95
International Research Collab	0.00%	3.85%	11.54%	38.46%	19.23%	23.08%	3.85%	26	4.58	1.21
International Student Ratio	3.85%	11.54%	0.00%	34.62%	42.31%	3.85%	3.85%	26	4.27	1.31
Doctorate/Bachelor Ratio	0.00%	23.08%	3.85%	38.46%	23.08%	7.69%	3.85%	26	4.00	1.39
International Faculty Ratio	3.85%	11.54%	3.85%	50.00%	23.08%	7.69%	0.00%	26	4.00	1.20
SAT/ACT Scores	11.54%	26.92%	3.85%	26.92%	11.54%	7.69%	11.54%	26	3.69	1.91

Note: 1 = Not important at all, 4 = Neutral, 7 = Critically important

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APPENDIX D

UNIVERSITY RANKINGS DATA

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Table D.1   University USNWR Rankings by Quartile

University	2017 Quartile	2008	2011	2014	2017	std dev
University of Washington - Seattle	Q1	42	41	52	54	6.7020
Pennsylvania State University - University Park	Q1	48	47	37	50	5.8023
University of Texas - Austin	Q1	44	45	52	56	5.7373
University of Connecticut - Storrs	Q1	64	69	57	60	5.1962
Purdue University - West Lafayette	Q1	64	56	68	60	5.1640
University of California - Irvine	Q1	44	41	49	39	4.3493
University of Illinois - Urbana-Champaign	Q1	38	47	41	44	3.8730
University of Pittsburgh - Pittsburgh	Q1	59	64	62	68	3.7749
University of California - San Diego	Q1	38	35	39	44	3.7417
University of Maryland - College Park	Q1	54	56	62	60	3.6515
University of Wisconsin - Madison	Q1	38	45	41	44	3.1623
University of California - Santa Barbara	Q1	44	39	41	37	2.9861
University of California - Davis	Q1	42	39	39	44	2.4495
Clemson University	Q1	67	64	62	66	2.2174
Ohio State University - Columbus	Q1	57	56	52	54	2.2174
University of Georgia	Q1	59	56	60	56	2.0616
University of Florida	Q1	49	53	49	50	1.8930
University of Michigan - Ann Arbor	Q1	25	29	28	27	1.7078
University of North Carolina - Chapel Hill	Q1	28	30	30	30	1.0000
University of California - Los Angeles	Q1	25	25	23	24	0.9574
University of Virginia	Q1	23	25	23	24	0.9574
University of California - Berkeley	Q1	21	22	20	20	0.9574
Georgia Institute of Technology	Q1	35	35	36	34	0.8165
University of Utah	Q2	159	129	121	111	20.6882
North Carolina State University	Q2	85	111	101	92	11.2657
University of Massachusetts - Amherst	Q2	96	99	91	74	11.1654
Iowa State University	Q2	85	94	101	111	10.9962
Florida State University	Q2	112	104	91	92	10.0789
University at Buffalo	Q2	118	120	109	99	9.6090
University of Missouri - Columbia	Q2	91	94	97	111	8.8459
University of Nebraska - Lincoln	Q2	91	104	101	111	8.3016
Stony Brook University	Q2	96	99	82	96	7.6322
University of Vermont	Q2	96	94	82	92	6.2183
Auburn University	Q2	96	85	91	99	6.1305
University of California - Santa Cruz	Q2	79	72	86	79	5.7155
Texas A&M University - College Station	Q2	62	63	69	74	5.5976
Indiana University - Bloomington	Q2	75	75	75	86	5.5000
University of Colorado - Boulder	Q2	79	86	86	92	5.3151
Michigan State University	Q2	71	79	73	82	5.1235
Rutgers University - New Brunswick	Q2	59	64	69	70	5.0662
University of New Hampshire - Durham	Q2	108	104	97	107	4.9666
University of Oklahoma - Norman	Q2	108	111	101	111	4.7170
University of Oregon	Q2	112	111	109	103	4.0311
University of Tennessee - Knoxville	Q2	96	104	101	103	3.5590
University of Minnesota - Twin Cities	Q2	71	64	69	71	3.3040

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Table D.1 (continued)

University	2017 Quartile	2008	2011	2014	2017	std dev
University of Delaware	Q2	71	75	75	79	3.2660
University of Iowa	Q2	71	75	75	79	3.2660
University of South Carolina - Columbia	Q2	112	111	112	107	2.3805
Virginia Polytechnic Institute and State University	Q2	71	69	69	74	2.3629
San Diego State University	Q3	227	183	152	146	37.0675
Temple University	Q3	159	132	121	118	18.6637
Louisiana State University - Baton Rouge	Q3	159	124	135	135	14.7733
Washington State University - Pullman	Q3	118	111	128	143	13.8804
University of Kansas - Lawrence	Q3	85	104	101	118	13.5401
University of Illinois - Chicago	Q3	159	143	128	152	13.3791
University of Cincinnati - Cincinnati	Q3	159	156	135	135	13.0480
University at Albany	Q3	159	143	128	146	12.7279
University of Arizona	Q3	96	120	119	124	12.6853
University of California - Riverside	Q3	96	94	112	118	11.8322
University of South Florida - Tampa	Q3	159	183	170	159	11.4127
New Jersey Institute of Technology	Q3	124	139	150	135	10.7393
Arizona State University	Q3	124	143	142	129	9.4692
Oregon State University	Q3	159	139	142	143	8.9954
George Mason University	Q3	159	143	141	143	8.3865
University of Kentucky	Q3	122	129	119	133	6.3966
University of Rhode Island	Q3	159	167	152	159	6.1305
Kansas State University	Q3	124	132	135	135	5.1962
University of Alabama - Birmingham	Q3	159	151	152	159	4.3493
Colorado State University - Fort Collins	Q3	124	124	121	129	3.3166
University of Maryland - Baltimore County	Q3	159	159	158	159	0.5000
University of New Mexico - Albuquerque	Q4	159	229	181	176	30.0153
Utah State University	Q4	159	170	190	220	26.7753
Montana State University - Bozeman	Q4	159	183	201	210	22.5000
University of Houston - University Park	Q4	227	229	190	194	20.8646
New Mexico State University - Las Cruces	Q4	227	229	190	220	18.0831
Cleveland State University	Q4	227	229	239	265	17.4738
University of Texas - El Paso	Q4	227	229	239	265	17.4738
Florida International University	Q4	227	229	239	265	17.4738
Wayne State University	Q4	227	229	239	265	17.4738
University of Colorado - Denver/Anschutz Medical	Q4	159	191	190	197	17.1148
University of Alaska - Fairbanks	Q4	227	229	239	202	15.7348
University of Alabama - Huntsville	Q4	159	179	181	197	15.5778
Mississippi State University	Q4	159	151	142	176	14.4453
West Virginia University	Q4	159	176	170	183	10.1653
University of Central Florida	Q4	159	179	170	176	8.8318
University of Louisville	Q4	159	176	161	171	8.0984
University of Nevada - Reno	Q4	UR*	191	181	197	8.0829
University of Wyoming	Q4	159	153	161	171	7.4833
University of Idaho	Q4	159	153	161	171	7.4833
University of Hawaii - Manoa	Q4	159	159	158	169	5.1881
Virginia Commonwealth University	Q4	159	167	167	164	3.7749

*UR = Not ranked

Table D.2   University USNWR Peer Scores by Quartile

University	2017 Quartile	2008	2011	2014	2017	std dev
Clemson University	Q1	3.1	3.5	3.1	3.2	0.1652
Pennsylvania State University - University Park	Q1	3.8	3.9	3.6	3.7	0.1109
Purdue University - West Lafayette	Q1	3.8	3.9	3.6	3.7	0.1109
University of North Carolina - Chapel Hill	Q1	4.2	4.2	4.1	4.0	0.0957
Georgia Institute of Technology	Q1	4.0	4.2	4.1	4.1	0.0816
University of California - Davis	Q1	3.8	4.0	3.8	3.8	0.0750
University of Texas - Austin	Q1	4.1	4.2	4.0	4.0	0.0750
University of California - Irvine	Q1	3.6	3.8	3.6	3.6	0.0750
University of California - Santa Barbara	Q1	3.5	3.7	3.5	3.5	0.0750
University of Connecticut - Storrs	Q1	3.2	3.4	3.2	3.2	0.0750
University of California - Berkeley	Q1	4.8	4.7	4.7	4.7	0.0629
University of Pittsburgh - Pittsburgh	Q1	3.4	3.5	3.4	3.5	0.0577
University of Michigan - Ann Arbor	Q1	4.5	4.4	4.5	4.4	0.0577
University of California - San Diego	Q1	3.8	3.9	3.8	3.8	0.0500
University of Illinois - Urbana-Champaign	Q1	4.0	3.9	3.9	3.9	0.0500
University of Washington - Seattle	Q1	3.9	3.9	3.8	3.9	0.0500
University of Virginia	Q1	4.3	4.3	4.3	4.2	0.0500
University of Wisconsin - Madison	Q1	4.1	4.1	4.1	4.0	0.0479
Ohio State University - Columbus	Q1	3.7	3.8	3.8	3.8	0.0479
University of Georgia	Q1	3.5	3.6	3.5	3.5	0.0250
University of California - Los Angeles	Q1	4.2	4.3	4.2	4.2	0.0250
University of Florida	Q1	3.6	3.7	3.6	3.6	0.0250
University of Maryland - College Park	Q1	3.6	3.7	3.6	3.6	0.0250
University of New Hampshire - Durham	Q2	2.9	3.2	2.9	2.8	0.1493
North Carolina State University	Q2	3.1	3.3	3.0	3.1	0.1258
University of Massachusetts - Amherst	Q2	3.3	3.5	3.2	3.3	0.1258
University of Delaware	Q2	3.1	3.4	3.1	3.1	0.1250
University of California - Santa Cruz	Q2	3.2	3.4	3.1	3.1	0.1181
University of South Carolina - Columbia	Q2	2.9	3.2	2.9	3.0	0.1181
Auburn University	Q2	3.1	3.4	3.2	3.3	0.1109
Rutgers University - New Brunswick	Q2	3.4	3.6	3.3	3.4	0.1031
University of Missouri - Columbia	Q2	3.3	3.5	3.3	3.2	0.1031
Virginia Polytechnic Institute and State University	Q2	3.4	3.7	3.5	3.5	0.1031
University of Tennessee - Knoxville	Q2	3.1	3.3	3.1	3.1	0.1000
Florida State University	Q2	3.0	3.2	3.0	3.1	0.0957
Iowa State University	Q2	3.2	3.4	3.2	3.3	0.0957
University of Iowa	Q2	3.6	3.7	3.5	3.5	0.0750
University of Utah	Q2	3.0	3.2	3.0	3.1	0.0750
Stony Brook University	Q2	3.2	3.4	3.2	3.2	0.0750
University of Vermont	Q2	3.0	3.1	2.9	3.0	0.0629
University of Nebraska - Lincoln	Q2	3.2	3.3	3.1	3.2	0.0629
University of Oklahoma - Norman	Q2	3.0	3.2	3.1	3.1	0.0629
University of Colorado - Boulder	Q2	3.5	3.6	3.6	3.5	0.0577
Michigan State University	Q2	3.5	3.5	3.4	3.5	0.0500
University of Minnesota - Twin Cities	Q2	3.7	3.8	3.7	3.7	0.0500

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Table D.2 (continued)

University	2017 Quartile	2008	2011	2014	2017	std dev
University of Oregon	Q2	3.3	3.4	3.3	3.3	0.0500
University at Buffalo	Q2	3.1	3.1	3.0	3.0	0.0479
Indiana University - Bloomington	Q2	3.7	3.7	3.6	3.6	0.0479
Texas A&M University - College Station	Q2	3.6	3.7	3.6	3.6	0.0250
George Mason University	Q3	2.9	3.3	2.9	3.0	0.1652
University of Illinois - Chicago	Q3	3.1	3.3	3.0	2.9	0.1493
Kansas State University	Q3	2.9	3.2	2.9	3.0	0.1414
Louisiana State University - Baton Rouge	Q3	2.9	3.1	2.8	2.8	0.1414
University of Kentucky	Q3	3.0	3.2	2.9	3.0	0.1258
Washington State University - Pullman	Q3	3.0	3.2	2.9	3.0	0.1258
University of Alabama - Birmingham	Q3	2.8	3.0	2.8	2.7	0.1258
Colorado State University - Fort Collins	Q3	2.9	3.2	2.9	2.9	0.1250
New Jersey Institute of Technology	Q3	2.6	2.9	2.6	2.6	0.1250
University of California - Riverside	Q3	3.1	3.3	3.0	3.0	0.1181
Oregon State University	Q3	2.9	3.2	2.9	3.0	0.1181
Temple University	Q3	2.9	3.2	3.0	2.9	0.1181
University of Maryland - Baltimore County	Q3	2.8	3.0	2.8	2.8	0.1000
University at Albany	Q3	2.9	3.0	2.8	2.8	0.0957
University of South Florida - Tampa	Q3	2.6	2.8	2.6	2.7	0.0957
University of Rhode Island	Q3	2.8	2.9	2.7	2.7	0.0957
San Diego State University	Q3	2.8	3.0	2.8	2.8	0.0750
University of Kansas - Lawrence	Q3	3.4	3.5	3.3	3.3	0.0750
University of Cincinnati - Cincinnati	Q3	2.7	2.9	2.8	2.8	0.0629
Arizona State University	Q3	3.3	3.3	3.2	3.3	0.0500
University of Arizona	Q3	3.6	3.6	3.5	3.5	0.0479
Mississippi State University	Q4	2.4	2.9	2.3	2.5	0.2394
University of Alabama - Huntsville	Q4	2.5	2.9	2.4	2.4	0.2136
Utah State University	Q4	2.6	2.9	2.4	2.5	0.1931
University of Texas - El Paso	Q4	2.3	2.6	2.2	2.3	0.1732
Virginia Commonwealth University	Q4	2.7	3.1	2.8	2.8	0.1732
University of Idaho	Q4	2.7	3.0	2.6	2.7	0.1732
Wayne State University	Q4	2.7	2.9	2.5	2.5	0.1702
Montana State University - Bozeman	Q4	2.6	2.9	2.5	2.5	0.1652
University of Colorado - Denver/Anschutz Medical	Q4	2.8	3.1	2.7	2.7	0.1652
Cleveland State University	Q4	2.1	2.4	2.0	2.1	0.1493
University of Central Florida	Q4	2.4	2.7	2.5	2.6	0.1291
University of Hawaii - Manoa	Q4	2.7	3.0	2.7	2.7	0.1250
University of Wyoming	Q4	2.6	2.9	2.6	2.6	0.1250
New Mexico State University - Las Cruces	Q4	2.5	2.7	2.4	2.4	0.1181
University of Alaska - Fairbanks	Q4	2.5	2.7	2.4	2.4	0.1181
University of Houston - University Park	Q4	2.5	2.8	2.5	2.6	0.1181
Florida International University	Q4	2.2	2.5	2.2	2.3	0.1181
University of Louisville	Q4	2.7	3.0	2.7	2.8	0.1181
University of Nevada - Reno	Q4	2.5	2.5	2.3	2.4	0.0957
University of New Mexico - Albuquerque	Q4	2.8	2.9	2.7	2.7	0.0957
West Virginia University	Q4	2.7	2.8	2.6	2.7	0.0816

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Table D.3   Coefficients of Variation by Attribute by University (IVs #1 – 15)

University	Ranking	Res Exp	Fed Res Exp	Endowments	Annual Giving	NAS	Faculty Awds	Doctorates (TARU)	Postdocs	SAT	Natl Merit	12 mth Enrollment	Grad Rate	Admit Rate	Fall Enrollment
Arizona State University	7.04	28.09	24.38	14.68	15.53	10.80	51.93	21.78	36.25	3.57	18.49	16.65	7.83	4.38	18.39
Auburn University	6.61	5.52	8.75	27.58	32.68	81.65	63.43	14.84	44.54	3.57	65.37	6.12	7.50	4.43	6.26
Clemson University	3.42	26.28	10.39	21.69	38.22	38.49	54.01	21.19	29.65	1.21	14.62	11.00	3.91	8.91	11.53
Cleveland State University	7.28	71.17	93.83	32.76	75.74	0.00	141.42	10.97	48.10	5.40	200.00	2.52	15.12	16.66	6.69
Colorado State University - Fort Collins	2.66	11.30	12.05	23.10	70.22	23.57	28.04	9.30	16.33	1.45	60.47	6.93	3.21	7.96	4.96
Florida International University	7.28	28.00	16.06	31.84	44.87	28.57	81.65	21.13	40.46	2.28	127.66	14.47	8.42	17.12	12.76
Florida State University	10.10	10.90	9.18	10.62	15.34	11.66	50.94	5.68	10.62	2.36	17.07	1.95	6.25	5.41	1.29
George Mason University	5.72	22.71	19.73	19.15	47.36	0.00	59.13	32.48	69.31	1.58	115.47	9.31	8.06	12.72	5.36
Georgia Institute of Technology	2.33	22.77	33.60	11.74	10.42	7.45	15.51	10.23	16.73	2.86	41.71	15.37	4.19	29.06	13.97
Indiana University - Bloomington	7.07	66.91	62.72	11.10	8.82	20.11	30.06	11.90	44.74	2.27	10.53	8.92	3.98	3.47	9.91
Iowa State University	11.25	13.79	8.59	17.03	20.66	11.76	30.62	9.53	25.62	0.87	14.52	13.34	4.91	1.98	14.68
Kansas State University	3.95	16.25	14.65	22.43	37.81	115.47	62.93	9.91	18.10	1.29	29.61	4.53	3.71	29.09	2.35
Louisiana State University - Baton Rouge	10.69	5.51	6.19	12.31	30.73	40.82	45.64	9.45	13.20	0.86	23.13	3.77	7.22	4.49	3.93
Michigan State University	6.72	18.10	23.87	33.34	22.58	34.91	12.83	3.49	5.73	1.66	8.78	5.11	2.26	4.41	4.51
Mississippi State University	9.20	6.91	10.74	22.67	23.12	40.00	54.71	14.95	30.88	2.71	22.53	9.16	2.53	8.00	11.09
Montana State University - Bozeman	11.95	6.95	9.37	14.43	91.06	200.00	27.22	9.22	45.19	2.28	27.22	10.12	5.34	15.29	11.36
New Jersey Institute of Technology	7.84	9.22	20.52	19.09	68.65	28.57	66.67	11.61	91.06	3.86	81.65	12.90	7.59	13.99	14.27
New Mexico State University - Las Cruces	8.35	11.60	10.76	14.21	65.67	0.00	69.28	29.58	76.36	1.96	115.47	7.97	2.25	15.39	7.86
North Carolina State University	11.58	13.81	19.47	32.92	27.90	9.36	32.73	11.23	26.50	2.58	27.76	4.12	4.61	13.10	4.44
Ohio State University - Columbus	4.05	5.59	13.38	28.26	28.17	19.47	24.72	8.69	17.53	3.17	82.07	2.29	7.52	12.92	5.16
Oregon State University	6.17	11.57	15.33	13.56	22.65	11.76	15.25	10.42	48.43	0.99	64.90	18.63	2.05	8.51	18.71
Pennsylvania State University - University Park	12.75	9.04	16.54	28.50	12.12	6.28	23.16	2.18	5.18	0.24	5.10	3.00	0.96	9.92	4.02

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Table D.3 (continued)

University	Ranking	Res Exp	Fed Res Exp	Endowments	Annual Giving	NAS	Faculty Awds	Doctorates (TARU)	Postdocs	SAT	Natl Merit	12 mth Enrollment	Grad Rate	Admit Rate	Fall Enrollment
Purdue University - West Lafayette	8.33	14.59	21.68	15.36	22.11	11.78	34.94	8.31	10.67	2.54	85.63	1.96	4.88	17.33	0.72
Rutgers University - New Brunswick	7.73	35.76	44.63	20.53	19.94	2.27	22.82	21.95	25.97	1.44	18.42	15.23	4.28	2.91	16.09
San Diego State University	20.94	2.94	15.42	33.43	25.87	0.00	38.72	26.33	38.36	2.65	200.00	5.80	10.72	16.34	4.43
Stony Brook University	8.18	7.98	5.71	41.68	45.85	8.88	32.26	11.40	39.96	3.17	65.03	3.22	7.49	8.02	4.92
Temple University	14.09	44.09	37.30	37.72	11.86	83.27	39.27	39.70	30.43	0.94	200.00	3.45	6.84	7.45	4.80
Texas A&M University - College Station	8.35	15.55	8.77	28.56	20.98	15.04	31.01	9.51	25.16	0.34	17.11	15.95	1.21	4.38	15.51
University at Albany	8.84	51.25	14.48	37.84	67.10	40.00	63.01	11.98	7.77	0.98	0.00	2.34	1.91	10.81	2.12
University at Buffalo	8.62	8.50	10.12	13.98	16.19	11.66	49.00	13.95	6.20	0.56	0.00	2.75	8.47	5.87	2.80
University of Alabama - Birmingham	2.80	17.18	4.51	18.51	20.61	15.32	80.92	17.33	20.55	2.26	50.89	3.38	17.60	16.64	4.91
University of Alabama - Huntsville	8.70	15.89	22.76	19.52	23.57	115.47	115.47	9.43	58.92	3.93	40.00	3.87	5.69	8.34	4.41
University of Alaska - Fairbanks	7.02	11.14	12.01	20.11	63.93	40.00	70.71	18.21	120.98	1.00	0.00	5.09	12.37	2.05	4.74
University of Arizona	11.05	5.97	8.84	20.10	12.54	4.53	32.92	7.50	20.00	0.79	21.69	7.78	3.74	8.02	6.16
University of California - Berkeley	4.61	13.01	14.63	17.12	15.60	3.14	11.30	20.36	21.95	1.84	39.92	4.12	1.91	18.91	4.86
University of California - Davis	5.97	9.50	14.96	21.91	13.24	14.72	15.36	9.50	8.70	1.47	45.54	6.50	3.06	19.25	7.29
University of California - Irvine	10.06	4.81	8.91	38.32	9.25	8.15	29.50	15.44	16.50	1.61	105.83	7.26	3.76	17.75	8.42
University of California - Los Angeles	3.95	8.97	5.30	25.38	17.30	13.10	22.54	3.06	8.97	1.62	36.97	5.25	0.55	20.11	5.70
University of California - Riverside	11.27	3.68	6.55	25.49	12.97	32.85	20.11	16.89	22.23	1.95	200.00	9.70	4.84	17.57	10.37
University of California - San Diego	9.59	16.90	15.37	45.68	28.15	4.11	18.76	13.20	14.70	3.45	16.24	7.99	1.47	11.16	9.70
University of California - Santa Barbara	7.42	10.57	10.50	19.80	39.17	4.84	29.57	11.85	26.24	1.62	100.66	3.12	1.60	19.13	4.73
University of California - Santa Cruz	7.23	12.00	15.08	20.15	62.12	5.71	43.49	11.41	8.47	1.29	115.47	5.44	5.13	16.59	6.46
University of Central Florida	5.16	25.28	29.33	15.56	35.82	0.00	42.24	15.36	26.53	1.02	24.95	12.60	6.72	5.46	12.92
University of Cincinnati - Cincinnati	8.92	14.79	11.82	12.85	36.16	27.00	35.72	11.91	28.22	2.22	28.52	8.85	20.02	10.29	10.17
University of Colorado - Boulder	6.20	21.78	20.69	19.95	57.61	6.08	12.15	13.19	20.93	2.12	44.41	1.54	2.18	3.89	2.22

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Table D.3 (continued)

University	Ranking	Res Exp	Fed Res Exp	Endowments	Annual Giving	NAS	Faculty Awds	Doctorates (TARU)	Postdocs	SAT	Natl Merit	12 mth Enrollment	Grad Rate	Admit Rate	Fall Enrollment
University of Colorado - Denver/Anschutz Medical	9.29	20.39	13.60	26.37	46.96	6.72	37.06	22.96	19.72	0.95	0.00	4.94	9.11	6.70	7.41
University of Connecticut - Storrs	8.31	19.55	25.27	13.63	38.25	66.67	50.62	14.12	14.19	1.66	45.64	5.39	5.05	6.84	5.68
University of Delaware	4.35	18.53	16.23	14.50	26.54	6.45	47.83	20.61	6.97	1.00	136.63	2.98	3.96	14.31	4.89
University of Florida	3.77	9.58	10.98	12.18	14.16	8.86	24.69	4.14	7.03	0.60	56.65	1.92	3.39	5.75	0.86
University of Georgia	3.57	4.85	16.40	21.53	29.26	11.66	9.07	13.42	4.68	0.85	17.89	1.59	4.19	9.58	2.64
University of Hawaii - Manoa	3.22	10.20	2.18	17.21	25.21	10.94	45.86	17.64	45.11	0.92	200.00	5.90	6.47	9.59	3.85
University of Houston - University Park	9.94	20.39	18.86	22.57	35.89	9.07	35.95	21.51	33.10	3.49	45.12	8.80	7.16	13.44	9.69
University of Idaho	4.65	4.99	10.05	15.04	20.04	0.00	59.48	20.25	12.54	0.70	25.30	9.28	2.37	11.74	3.69
University of Illinois - Chicago	9.20	6.25	11.15	24.46	14.13	20.13	14.14	5.69	6.86	0.00	27.22	5.83	6.78	12.37	6.90
University of Illinois - Urbana-Champaign	9.11	10.31	12.48	20.25	12.49	2.48	11.02	6.42	13.06	0.00	40.25	2.90	1.50	7.90	2.93
University of Iowa	10.12	13.73	9.74	19.04	27.96	4.51	17.55	16.54	4.28	1.00	21.00	0.95	3.62	2.91	3.24
University of Kansas - Lawrence	13.27	15.52	14.61	13.39	27.87	10.50	34.48	10.14	11.76	1.01	27.44	2.70	2.10	10.62	4.03
University of Kentucky	5.09	6.93	3.98	14.56	54.09	23.09	26.97	7.16	18.76	1.67	59.34	4.17	3.34	11.01	5.88
University of Louisville	4.86	8.75	7.60	8.22	33.09	22.22	52.90	8.04	14.94	2.50	21.75	2.38	8.59	5.27	1.10
University of Maryland - Baltimore County	0.31	6.83	9.01	20.43	37.08	200.00	42.55	7.55	21.02	1.54	50.09	9.43	5.82	9.97	7.09
University of Maryland - College Park	6.30	16.41	22.72	11.15	31.46	8.35	31.53	7.51	34.74	1.11	12.84	5.58	3.33	4.68	3.49
University of Massachusetts - Amherst	12.41	16.09	18.98	31.50	37.99	5.71	21.14	2.56	15.70	2.53	66.67	5.59	6.46	8.59	5.76
University of Michigan - Ann Arbor	6.27	21.19	13.79	17.89	23.67	17.30	4.90	5.38	21.24	3.21	8.90	2.94	1.40	27.16	4.02
University of Minnesota - Twin Cities	4.81	14.71	17.33	16.09	19.10	6.02	15.64	6.78	16.18	3.85	20.59	1.69	9.17	9.77	1.40
University of Missouri - Columbia	9.00	5.83	7.37	23.38	15.91	17.21	11.66	17.30	9.74	1.48	36.91	9.20	1.88	3.06	10.33
University of Nebraska - Lincoln	8.16	7.64	11.46	7.23	41.54	22.22	11.61	7.87	24.74	1.00	25.13	4.37	3.16	9.39	5.50
University of Nevada - Reno	4.26	12.48	11.98	16.91	57.11	40.82	77.74	24.41	21.32	1.56	35.36	7.91	6.73	4.43	10.73
University of New Hampshire - Durham	4.78	15.54	15.51	20.75	28.16	0.00	66.67	4.72	23.87	1.57	127.66	1.76	3.87	7.56	1.61

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University	Ranking	Res Exp	Fed Res Exp	Endowments	Annual Giving	NAS	Faculty Awds	Doctorates (TARU)	Postdocs	SAT	Natl Merit	12 mth Enrollment	Grad Rate	Admit Rate	Fall Enrollment
University of New Mexico - Albuquerque	16.12	9.18	10.38	13.02	9.50	20.41	20.20	4.17	99.58	0.00	62.52	4.14	4.44	9.65	4.96
University of North Carolina - Chapel Hill	3.39	30.98	26.23	16.71	9.41	10.20	20.15	2.75	10.57	2.28	75.40	1.53	4.04	7.41	2.45
University of Oklahoma - Norman	4.38	16.21	18.59	16.42	42.15	40.00	42.24	8.43	30.09	1.21	23.06	1.69	3.97	6.07	3.39
University of Oregon	3.71	18.51	17.38	28.41	26.55	17.68	7.70	3.37	16.39	0.64	18.46	6.70	4.33	10.37	8.28
University of Pittsburgh - Pittsburgh	5.97	22.51	17.32	25.33	5.56	13.13	20.89	6.40	10.42	1.54	7.72	3.04	3.37	3.93	3.13
University of Rhode Island	3.85	13.19	21.42	16.54	15.72	0.00	117.80	7.29	25.90	1.05	200.00	2.36	4.05	6.69	4.45
University of South Carolina - Columbia	2.15	8.95	10.51	21.54	33.87	71.90	49.57	16.15	13.99	1.30	25.39	8.90	6.91	6.62	9.45
University of South Florida - Tampa	6.80	18.40	14.20	12.57	22.08	67.70	36.58	15.06	19.17	3.77	24.44	6.09	15.39	8.91	3.67
University of Tennessee - Knoxville	3.52	15.51	19.96	17.19	8.17	59.48	39.28	15.80	7.04	1.77	42.83	3.55	8.72	5.34	3.34
University of Texas - Austin	11.65	11.02	8.64	24.03	19.91	7.53	36.78	5.76	25.98	2.48	91.06	2.08	1.62	9.60	1.99
University of Texas - El Paso	7.28	34.08	30.63	17.35	21.65	0.00	81.65	40.56	106.09	66.69	0.00	8.35	13.31	0.58	7.46
University of Utah	15.91	29.96	22.41	30.73	73.33	10.37	6.96	8.92	16.22	0.90	31.72	4.33	7.21	2.70	4.36
University of Vermont	6.83	3.63	5.24	20.42	40.51	22.22	32.53	15.87	5.41	0.87	36.28	4.91	2.97	6.90	5.15
University of Virginia	4.03	19.98	8.25	19.57	15.69	11.71	38.92	9.86	24.11	1.23	21.70	7.44	0.54	10.25	0.90
University of Washington - Seattle	14.18	18.99	17.80	19.14	33.24	9.18	6.18	9.31	8.51	1.31	35.38	3.53	4.81	9.79	6.67
University of Wisconsin - Madison	7.53	8.71	5.56	18.65	6.60	4.29	16.01	8.16	11.91	1.57	27.90	0.58	3.05	11.44	1.75
University of Wyoming	4.65	21.26	35.99	22.68	21.62	0.00	40.00	21.32	14.93	2.55	68.23	7.01	3.12	0.52	2.61
Utah State University	14.49	10.32	14.97	37.47	43.59	115.47	45.13	9.50	27.37	1.75	200.00	38.35	9.76	1.56	36.18
Virginia Commonwealth University	2.30	13.55	13.93	76.01	11.37	18.24	59.60	21.43	7.68	1.78	140.72	2.75	12.56	9.11	2.69
Virginia Polytechnic Institute and State University	3.34	17.91	20.25	24.76	10.05	5.83	32.71	14.88	9.23	0.72	67.64	4.84	3.70	3.81	5.62
Washington State University - Pullman	11.10	18.41	18.70	15.76	37.02	5.71	25.34	30.64	8.40	2.70	54.01	8.42	3.91	2.45	9.52
Wayne State University	7.28	8.27	6.20	13.79	79.11	27.22	49.07	9.63	11.61	6.00	58.32	7.44	11.04	3.81	7.88
West Virginia University	5.91	12.97	9.74	16.76	16.87	40.00	79.06	19.05	23.38	2.82	18.87	3.16	2.86	3.53	3.80

Table D.4   Coefficients of Variation by Attribute by University (IVs #16 – 30)

University	Bachelors	Masters	Doctors (IPEDS)	Retention	COA	SFA - Fed Grants	State $s per FTE	Faculty/Staff FTE	Faculty Avg Salary	Personnel Cost %	Equity Ratio	Operating Revenue	NonOp Revenue	Other Rev & Add	Total All Revenue
Arizona State University	21.48	24.68	26.48	3.81	18.69	25.34	28.98	9.44	7.66	4.85	13.65	35.35	20.41	48.02	27.90
Auburn University	5.53	14.63	34.76	2.34	25.83	0.00	14.13	4.40	4.19	4.84	14.24	24.60	5.24	50.42	16.13
Clemson University	11.62	20.06	21.19	1.88	15.02	16.58	32.94	3.39	10.06	5.27	30.34	22.63	8.26	49.18	13.49
Cleveland State University	12.27	2.80	45.46	8.24	11.63	10.75	8.39	2.47	7.17	9.50	25.42	15.80	9.09	104.10	10.88
Colorado State University - Fort Collins	7.62	23.64	23.90	2.57	21.80	21.55	62.46	7.45	6.02	2.73	46.30	16.99	41.25	52.21	18.94
Florida International University	22.44	21.52	52.18	5.10	13.69	21.31	18.29	21.04	6.69	1.59	5.08	29.91	19.17	49.67	20.95
Florida State University	6.52	6.56	29.30	2.27	17.97	21.59	31.70	2.08	8.95	1.41	5.61	18.38	8.92	48.84	11.74
George Mason University	13.79	6.52	37.61	0.95	23.85	24.45	12.64	10.93	4.92	5.02	10.57	28.81	11.02	44.16	24.90
Georgia Institute of Technology	11.74	22.15	9.39	2.35	21.06	11.76	18.50	11.01	6.75	2.86	6.51	28.64	9.84	76.23	23.85
Indiana University - Bloomington	6.43	12.61	28.75	0.65	13.57	14.08	8.87	4.17	4.34	2.64	6.03	19.83	6.90	31.15	15.57
Iowa State University	15.11	14.81	20.61	1.76	7.16	10.69	17.21	3.40	10.76	3.31	2.81	21.84	2.95	63.16	15.74
Kansas State University	5.87	16.56	25.62	2.36	15.01	14.83	6.45	4.82	6.53	5.27	11.19	25.42	7.02	66.17	21.36
Louisiana State University - Baton Rouge	3.59	6.90	31.10	1.14	23.83	12.96	18.41	4.71	6.42	5.58	62.36	18.21	18.90	67.59	12.14
Michigan State University	5.47	7.47	31.62	0.90	17.23	14.85	17.72	5.68	7.56	2.66	7.73	20.81	38.71	65.32	20.86
Mississippi State University	10.91	5.41	30.10	0.61	15.10	14.14	8.47	3.24	6.46	4.37	28.60	14.55	11.19	33.07	11.79
Montana State University - Bozeman	9.01	3.86	12.87	3.03	10.51	8.87	9.02	0.71	10.03	1.63	10.06	11.71	11.51	73.23	12.06
New Jersey Institute of Technology	20.84	15.29	11.61	4.09	16.43	6.55	10.04	6.34	3.65	3.02	18.05	23.53	18.19	130.40	23.12
New Mexico State University - Las Cruces	6.31	10.67	21.13	1.38	9.91	9.73	8.90	9.61	7.51	5.50	43.16	7.36	14.03	27.79	3.10
North Carolina State University	6.10	23.85	16.33	2.90	19.52	9.13	3.30	8.66	5.53	3.62	4.39	22.86	10.87	56.03	14.51
Ohio State University - Columbus	7.41	1.97	34.57	1.08	7.71	5.39	6.30	25.82	7.07	1.68	22.74	21.68	51.21	23.14	21.48
Oregon State University	14.25	14.90	26.19	1.97	20.05	10.58	15.39	14.15	9.55	2.69	11.27	26.76	15.95	47.93	23.97
Pennsylvania State University - University Park	8.25	9.97	8.92	0.88	17.02	14.36	0.00	3.69	7.61	0.00	0.00	0.00	0.00	0.00	0.00
Purdue University - West Lafayette	4.66	15.84	18.67	3.97	13.75	8.87	4.32	2.14	15.81	4.06	3.15	18.83	23.51	63.44	16.30

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Table D.4 (continued)

University	Bachelors	Masters	Doctors (IPEDS)	Retention	COA	SFA - Fed Grants	State $s per FTE	Faculty/Staff FTE	Faculty Avg Salary	Personnel Cost %	Equity Ratio	Operating Revenue	NonOp Revenue	Other Rev & Add	Total All Revenue
Rutgers University - New Brunswick	15.61	33.46	48.96	1.79	13.08	10.90	26.33	40.95	4.42	1.48	31.43	36.66	21.13	70.09	32.21
San Diego State University	7.67	2.04	44.70	5.10	17.78	24.68	18.83	6.73	7.07	4.89	48.25	16.60	9.91	147.59	12.41
Stony Brook University	11.95	7.28	21.59	0.65	14.98	2.84	13.13	7.08	5.31	2.73	180.61	20.75	14.36	90.51	17.85
Temple University	10.44	4.83	39.69	1.61	12.66	9.50	0.00	4.57	4.19	0.00	0.00	0.00	0.00	0.00	0.00
Texas A&M University - College Station	11.56	27.06	41.61	1.37	12.56	12.84	11.05	14.23	7.33	9.73	5.82	26.46	21.94	50.10	27.72
University at Albany	4.35	10.44	11.98	1.55	14.11	17.09	6.72	3.85	6.49	18.04	207.28	27.89	16.93	74.79	19.80
University at Buffalo	9.53	9.14	34.65	1.09	18.82	14.63	9.08	1.86	4.75	1.70	0.00	14.02	6.46	48.53	9.28
University of Alabama - Birmingham	8.83	21.69	37.60	3.73	11.07	15.54	12.84	2.53	7.94	6.47	21.17	19.89	23.33	90.31	12.84
University of Alabama - Huntsville	11.67	20.77	22.15	2.34	21.52	12.89	12.96	5.78	8.64	1.18	30.87	21.01	17.17	157.59	8.57
University of Alaska - Fairbanks	9.50	5.51	18.21	3.79	12.88	15.60	8.40	3.65	10.91	3.66	13.39	13.15	29.54	93.26	19.28
University of Arizona	8.83	17.17	26.68	1.21	19.26	22.23	28.72	3.92	5.43	3.07	19.30	23.88	14.88	48.04	20.00
University of California - Berkeley	5.67	13.66	15.36	0.52	17.63	10.90	25.20	1.64	12.14	2.86	45.98	24.35	7.02	51.24	22.16
University of California - Davis	8.80	16.57	28.68	0.89	18.34	13.14	14.90	2.26	10.93	7.91	45.98	25.28	9.77	24.92	22.54
University of California - Irvine	6.77	20.45	30.42	0.54	17.99	34.05	5.21	3.99	12.69	3.17	45.98	24.82	19.34	61.31	19.43
University of California - Los Angeles	6.00	12.02	26.38	0.52	16.70	4.03	21.16	8.30	13.95	2.01	45.98	28.45	6.58	60.97	24.55
University of California - Riverside	16.74	21.48	16.89	2.45	19.61	14.73	15.74	2.70	11.67	2.07	45.98	26.31	29.64	48.84	21.77
University of California - San Diego	9.12	16.64	25.06	0.61	18.30	26.17	7.77	2.96	11.08	0.82	45.98	29.39	17.64	50.04	29.05
University of California - Santa Barbara	3.11	2.44	11.85	1.79	18.52	20.53	16.97	2.24	13.04	1.92	45.98	19.65	12.84	53.21	14.27
University of California - Santa Cruz	7.77	17.91	11.41	1.59	18.68	32.89	15.50	5.35	13.46	4.91	45.98	19.03	26.72	64.07	17.72
University of Central Florida	17.86	9.72	33.18	3.59	12.85	30.05	23.96	9.72	7.15	2.21	5.35	27.60	13.74	99.99	18.30
University of Cincinnati - Cincinnati	22.62	26.51	38.60	4.02	5.35	6.32	10.46	4.98	6.03	3.51	16.42	15.96	64.27	25.17	21.48
University of Colorado - Boulder	2.95	11.38	24.54	1.68	19.99	15.36	0.00	9.17	7.03	2.82	6.43	19.87	26.15	67.86	21.23
University of Colorado - Denver/Anschutz Medical	12.14	10.26	46.97	2.02	15.39	20.85	12.13	25.69	11.55	3.83	1.54	26.54	43.79	57.78	25.01

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Table D.4 (continued)

University	Bachelors	Masters	Doctors (IPEDS)	Retention	COA	SFA - Fed Grants	State $s per FTE	Faculty/Staff FTE	Faculty Avg Salary	Personnel Cost %	Equity Ratio	Operating Revenue	NonOp Revenue	Other Rev & Add	Total All Revenue
University of Connecticut - Storrs	4.69	7.85	30.80	0.62	16.69	11.61	24.21	27.31	7.43	2.37	30.94	41.06	28.30	64.51	38.63
University of Delaware	8.41	12.10	17.53	1.65	18.20	28.12	0.00	4.19	10.32	0.00	0.00	0.00	0.00	0.00	0.00
University of Florida	7.95	10.53	35.98	1.05	17.29	18.32	14.03	2.87	8.50	2.23	8.65	22.66	18.72	49.91	18.77
University of Georgia	2.66	3.49	33.93	0.87	22.34	19.25	10.07	3.28	7.61	3.77	12.84	20.07	4.40	51.77	14.34
University of Hawaii - Manoa	7.32	4.81	37.15	1.05	28.94	19.74	10.14	2.19	11.15	3.26	10.67	14.28	12.27	33.56	9.58
University of Houston - University Park	16.72	16.60	42.33	5.43	14.28	10.78	10.92	7.31	9.43	5.26	11.65	24.81	8.15	31.18	17.27
University of Idaho	6.45	9.07	29.88	2.67	11.48	4.93	14.06	2.03	5.77	4.30	7.88	12.16	6.86	38.52	7.25
University of Illinois - Chicago	8.15	12.28	41.27	1.88	13.41	22.05	48.06	2.06	7.52	3.87	13.52	11.42	36.08	28.48	17.84
University of Illinois - Urbana-Champaign	3.93	10.94	20.32	0.54	14.36	13.32	48.17	3.26	8.22	2.96	12.43	18.48	25.24	95.30	19.79
University of Iowa	4.22	6.77	36.47	1.53	10.38	22.09	16.66	3.16	5.45	2.44	2.70	23.05	8.27	87.84	20.90
University of Kansas - Lawrence	2.78	5.51	36.76	1.21	15.92	29.76	5.52	23.72	4.37	4.46	12.48	23.08	18.06	75.77	23.42
University of Kentucky	10.07	5.62	39.39	2.59	18.53	19.55	13.13	2.09	7.74	1.38	7.73	26.77	28.12	42.06	21.39
University of Louisville	7.17	3.42	45.54	1.22	16.68	21.50	12.07	10.24	5.89	2.32	9.22	15.24	8.52	103.23	16.26
University of Maryland - Baltimore County	12.10	19.96	7.55	2.05	10.67	18.18	14.30	2.78	6.55	3.79	4.64	13.25	21.97	97.55	17.23
University of Maryland - College Park	4.61	15.07	5.65	1.38	8.83	9.56	12.95	6.28	6.83	2.14	7.63	13.91	11.89	5.03	12.97
University of Massachusetts - Amherst	11.47	6.69	9.14	3.79	16.55	7.41	19.29	4.08	9.96	7.45	2.82	20.18	9.09	72.37	17.67
University of Michigan - Ann Arbor	6.38	10.62	28.49	0.60	12.50	13.52	7.28	8.09	2.96	1.56	9.72	19.51	358.54	21.76	31.87
University of Minnesota - Twin Cities	5.91	5.17	31.43	3.27	13.37	4.85	12.83	3.69	3.73	4.26	10.45	15.65	18.79	34.88	14.73
University of Missouri - Columbia	8.74	6.79	34.99	1.66	12.25	20.13	16.75	15.95	7.05	3.92	2.47	17.74	16.87	45.87	15.64
University of Nebraska - Lincoln	5.97	3.04	21.46	0.60	17.00	16.18	3.15	3.17	8.00	2.44	1.37	17.20	14.84	72.37	17.69
University of Nevada - Reno	19.26	12.70	35.53	2.15	8.71	35.95	26.12	13.47	4.27	2.77	12.36	12.97	8.72	104.39	8.90
University of New Hampshire - Durham	8.17	9.89	5.22	0.95	16.22	26.95	27.56	4.23	9.75	2.01	7.52	13.02	35.86	36.55	11.26
University of New Mexico - Albuquerque	10.39	8.23	37.28	3.41	13.65	23.37	8.42	7.57	4.61	3.23	29.75	23.96	11.50	65.90	19.01
University of North Carolina - Chapel Hill	8.69	7.66	33.68	0.52	21.00	17.07	4.06	3.31	5.56	3.93	8.72	21.73	27.44	29.88	19.53

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University	Bachelors	Masters	Doctors (IPEDS)	Retention	COA	SFA - Fed Grants	State $s per FTE	Faculty/Staff FTE	Faculty Avg Salary	Personnel Cost %	Equity Ratio	Operating Revenue	NonOp Revenue	Other Rev & Add	Total All Revenue
University of Oklahoma - Norman	4.10	5.74	31.53	2.03	16.07	29.88	9.23	7.24	5.79	4.81	25.34	22.27	7.68	32.43	14.91
University of Oregon	11.97	2.59	27.55	2.54	17.84	18.18	22.68	13.69	10.68	4.17	14.08	25.85	20.21	27.87	24.15
University of Pittsburgh - Pittsburgh	7.81	4.92	36.47	2.06	12.95	8.53	0.00	5.47	8.68	0.00	0.00	0.00	0.00	0.00	0.00
University of Rhode Island	15.91	5.76	38.25	2.54	17.58	12.80	25.05	5.02	5.52	6.27	8.27	17.87	9.35	34.66	15.15
University of South Carolina - Columbia	15.95	3.29	40.23	0.58	14.40	9.90	34.14	7.12	7.73	2.33	26.95	21.48	11.24	47.40	16.69
University of South Florida - Tampa	7.16	14.43	44.01	4.48	14.29	33.19	16.56	14.00	7.37	4.91	8.69	17.09	5.43	20.17	11.14
University of Tennessee - Knoxville	8.85	8.63	46.78	1.68	22.39	20.63	10.71	17.72	11.04	3.22	8.53	12.99	15.56	26.13	10.97
University of Texas - Austin	5.81	7.30	24.29	1.35	12.46	7.04	9.68	2.79	6.58	6.83	0.55	18.99	69.77	18.62	15.26
University of Texas - El Paso	12.64	17.75	49.87	2.68	22.07	10.33	6.37	4.43	10.22	7.30	0.57	14.73	23.12	64.96	10.79
University of Utah	5.37	13.15	29.45	6.42	15.33	26.91	10.38	13.46	10.56	1.54	3.87	28.54	16.99	86.52	26.08
University of Vermont	11.14	7.00	45.65	0.96	16.55	20.29	7.76	2.68	10.09	2.47	20.24	16.72	76.91	46.69	15.55
University of Virginia	6.94	4.98	35.38	0.51	21.83	26.72	6.23	2.73	8.08	4.00	4.80	19.05	179.08	30.87	33.33
University of Washington - Seattle	4.18	13.78	29.33	0.88	20.68	11.67	24.45	2.38	9.90	3.37	10.69	24.40	77.54	40.88	22.55
University of Wisconsin - Madison	4.53	6.12	25.81	1.37	17.49	13.94	7.10	4.15	7.61	3.33	2.52	12.76	5.19	51.13	11.18
University of Wyoming	9.62	10.00	42.84	2.88	13.01	8.22	12.85	3.92	9.37	4.26	2.08	17.20	23.48	87.44	19.01
Utah State University	10.51	7.60	10.76	1.74	19.02	28.19	15.52	15.00	7.66	2.32	4.62	22.70	25.00	41.95	21.49
Virginia Commonwealth University	16.96	6.75	45.14	2.65	20.06	12.61	13.14	8.40	3.58	3.19	11.52	20.31	10.95	43.61	17.40
Virginia Polytechnic Institute and State University	6.25	6.19	22.08	2.28	21.03	60.08	11.88	4.80	6.72	3.56	8.88	24.34	5.16	22.45	17.54
Washington State University - Pullman	5.97	10.38	41.71	3.09	18.97	31.76	23.65	6.35	8.56	2.53	10.55	23.11	7.99	66.19	14.59
Wayne State University	10.90	5.75	43.89	4.84	17.60	13.94	7.48	1.90	5.89	2.11	16.25	8.68	4.64	59.48	5.92
West Virginia University	7.29	4.61	46.58	2.15	15.75	1.83	5.48	5.04	10.66	3.95	11.06	19.04	13.58	47.91	19.10

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