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This study describes budget trends at Harvard University, Stanford University, Montana State University at Bozeman and New Mexico State University at Las Cruces. These financial trends are connected to the Shanghai Jiao Tong Academic Ranking of World Universities' rankings from 2004-2008. The connected data indicates that effective budget patterns include keeping collection and materials budgets as large as possible without sacrificing from a human resources perspective. The data also suggests that universities should aim to allocate at least three percent of the total organization's budget to the library system. After establishing the connection between healthy libraries and parent organizations, it is also recommended that libraries treat employees more like business people who are responsible for the well-being of the organization than like librarians whose primary concern is short-term.

Headings:

      Academic libraries--Administration.

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      Universities and colleges--Costs.

      Universities and colleges--Ratings and rankings.

INSTITUTIONAL RANK AND BUDGET EFFICIENCY IN ACADEMIC LIBRARIES

by
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INTRODUCTION

This study focuses on academic library budgets, emphasizing the value of efficiency in the library environment. I propose that specific spending practices in libraries are directly related to overall university rank. The budget breakdown of the top two institutions (as determined by a university ranking system) will be closely examined and data from two bottom-ranked institutions will be included for comparison. With that evidence, it is clear that a library budget that is balanced and emphasizes certain services can directly influence the perceived and real value of the institution as a whole.

Some similar studies do exist, but this study takes a more detailed look at a few institutions as opposed to the data analysis on which most studies focus. This is a problem that deserves reexamination and should be brought to the attention of our professional community. The efficiency of library spending should be increased wherever possible. In addition to that basic idea, it is important to point out what is working for libraries. Not all efficiency means cutting costs, and areas that are the most valuable for university success should be noted while keeping in mind that balance is also necessary. It is the goal of this study to refocus librarians and others connected to the world of academia on the value of certain library services. By refocusing these groups, students will have access to better collections and services. The strengthening of libraries will positively impact parent institutions, and there will also be a greater understanding between the libraries and the parent organizations about the impact that libraries can have outside of their more traditionally understood role.

LITERATURE REVIEW

When looking at any research findings, it is wise to first frame the results within their proper context. In this case, the context to keep in mind for an institution's library budget is the connection between the parent institution and its library system. More specifically, it is important to note the connection between the details of the library budget and the overall institutional rank.

Academic institutions often place great value on their rankings, despite the fact that people often argue about whether a numbers system can truly capture the differences among university experiences. Institutions know that many students who are unsure where they would like to go to school do rely on the ordinal guidelines set out for them by various ranking organizations. Professors also use the measures to determine what kind of setting they could expect from each potential work environment. As with any quantitative measure of qualitative results, there are a lot of differing opinions about rankings and their value in the academic market. A few of those opposing views are represented by Collins (2007), Shakir (2008), and Hermes (2008).

There are weaknesses to any ranking system. They can sometimes favor certain types of schools (research universities over liberal arts institutions, for example), or they could fail to look at intangible elements of an academic experience. Even though they have such weaknesses, that does not take away the need for institutional ranking systems. Rank is one tool that people can use to measure the quality of competing educational institutions, and those institutions should not refuse to be measured against one another. If students are forced to compete with one another in school and in their future careers, it

is only fair that institutions also submit themselves to some sort of competitive measurement (Collins, 2007).

Most discussions of rankings focus on the *U.S. News and World Report* and are not perfect comparisons to the Shanghai Jiao Tong Academic Ranking of World Universities, which is the measure used in this study. The goals of both ranking systems are similar, however, and criticisms of using a number to judge an entire institution are applicable for any quantitative measure of quality. One major concern is that the numbers do not reflect the true "heart and soul" of institutions (Shakir, 2008). Shakir argues that at least one key feature of a university is missing from current rating systems. He thinks that it is the transformative power of a university experience that holds most of its value. If the mission of a university is to transform lives and encourage students to achieve great things, how can that type of inspiration be measured? To what degree does a student enter with one set of hopes and dreams and leave with a different set of aspirations? And how much does their educational institution have to do with that transformation (Shakir, 2008)?

Unfortunately, none of these questions can be quantitatively measured, so there is no real way to add them to the current means of comparison. You can certainly gather student testimonials and compare entrance scores and exit success; such factors are already considered in many rating systems. The truth is that people want something from rankings that is just not possible. They want intangible factors to be included in an utterly quantitative tool. They want social benefit to be measured alongside student to faculty ratios and library funding. In the end, universities that truly feel called to help inspire the disenfranchised students may have to just accept that their ranking does not

reflect their major strength. No comparison factors in every element of every institution, and some lose because of the choices that are made. It is an unfortunate but true fact in every area of comparison.

In addition to questions about the validity of ranking, there are also concerns about the possibility of significantly changing the rankings in a few years (Hermes, 2008). An institution will surely want to improve their ranking to attract the best and the brightest students, faculty, and administrators to join their organization. They will spend vast amounts of money to improve their programs and thereby improve their ranking. But while they are making changes, so are their competitors. Everyone is working towards the same goal, and everyone is working at the speed most feasible for their institution. That translates to the top schools improving more quickly than those below them, and the rankings thus tend to stay the same from year to year (Hermes, 2008). In a way, this could be a positive situation for those who are pro-rankings, not a negative. If Hermes is correct, only schools that make breakthroughs of some sort will be able to significantly improve their ranking, and that rank change will clearly reflect their hard work and innovation.

Taylor and Braddock (2007) take a constructive leap from the realm of opinion to examine the methodology behind some popular ranking systems. They are joined in their empirical approach by Calero-Medina, López-Illescas, Moed, and Visser (2008), who use the field of oncology to look at university rankings from a different perspective. Celaro-Medina, et al. look particularly at ranking systems that use bibliometric information as a main criterion, and they compare general rankings with field-specific rankings, using oncology as the sample field. Of all bibliometric-centered ranking systems, the Shanghai

Jiao Tong University and the *Times Higher Education Supplement* are most closely

considered by Calero-Medina et al. (2008).

When creating their own bibliometric ranking system, Calero-Medina et al. do the

following to compare institutions: "[measure] article production, disciplinary

specialisation, and citation impact, respectively" (2008). They also consider the

differences between European and American models for research institutions. Among

those differences is the emphasis on specialization or generalization within universities.

Not many ranking systems measure the distribution of publications among departments in

a university, so it is difficult to tell whether an institution is above average across the

board or superb in one or two areas. The tendency in the United States is for universities

to be strong in several areas, whereas European institutions tend towards specialization in

one area. Knowing which universities fall into each category would not impact overall

rank, but that difference could be extremely significant for a professor or student who

needs to know which schools are strongest in his or her field (Calero-Medina, 2008).

For this study, I chose to use the Shanghai Jiao Tong Academic Ranking of World

Universities (ARWU) as the means of measure for academic institutions. The

methodology behind this particular ranking system is explained in detail in Liu and

Cheng's article (2005), which provides an extensive case for choosing their tool for a

study like this one. The most important criteria for a ranking system in this study is that

it does not directly include any measure of the libraries associated with academic

institutions. If the ARWU included that type of measurement, it would automatically

link library holdings or budgets to rank. A connection at that level would make further

study of the correlation irrelevant. The ARWU does rely heavily on publications of faculty and staff, but it does not value specific library-related factors.

The ARWU was first published in 2003, and has since been reported by multiple international news sources (Liu & Cheng, 2005). It was originally intended to provide a measure of the gap between Chinese universities and highly valued world institutions, but has grown in popularity because of its different approach to ranking. Like some others, it has a bibliometric focus, looking most seriously at productivity of an institution's faculty as a measurement of the institution's overall success. The number and quality of awards given to faculty and alumni of an institution are also considered. Table 1 from Liu and Cheng (2005) gives a specific look at weighted factors.

Table 1. Criteria and weights for the 2004 ARWU

Criterion	Indicator	Code	Weight (percentage)
Quality of education	Alumni of an institution winning Nobel Prizes and Fields Medals Staff of an institution winning Nobel Prizes and Fields Medals	Alumni Award	10 20
Quality of faculty	Highly cited researchers in 21 broad subject categories	*HiCi*	20
Research output	Articles published in *Nature* and *Science* Articles indexed in SCIE and/or SSCI	*N&S* *SCI*	20 20
Size of Institution	Academic performance relative to institutional size	*Size*	10
Total			100

*For institutions specialized in the Humanities and Social Sciences, such as the London School of Economics, *N&S* is not considered, and the weighting redistributed to other indicators (Liu & Cheng, 2005, p. 128).

Despite the careful analysis that Liu and Cheng provide about the methodology of the ARWU, even they offer a warning against relying on one quantitative measure when

deciding about an institution's quality. No student experience or faculty opportunity can be fully measured with quantitative data, and other factors should be weighed when making choices among institutions (Liu & Cheng, 2005, p. 132). That said, the ARWU does provide a unique view of international institutions because it approaches the comparison through data that tends to be applicable and available across countries and cultures (Liu & Cheng, 2005, p. 133).

The best efforts of the ARWU creators could not safeguard against some bias. Their tool of measurement could never quite balance out the differences caused by publication trends across specializations. Publication of articles from science-oriented departments tends to be higher than publication in humanities-oriented departments, and although the ARWU development team attempted to correct for that, they could not find a way to even out the discrepancies. As a result, the ranking is skewed to place a higher value on scientific, mathematical and technical-oriented institutions (Liu & Cheng, 2005, p. 133).

After the value of institutional rankings has been fully fleshed out by the literature mentioned and by other works, a closer look should be given to library budgets as a whole. Many authors discuss creating and implementing ideal library budgets. Facione (2002) covers the psychological aspects of financial planning in organizations, and Baker (1992) looks at the division of funds within a library system. Some authors such as Cantor and Courant (2003) take the discussion further by considering the real world budget constraints and challenges that seem to always appear in conversations about libraries. They specifically flesh out the problems that an interest in efficiency might

cause in an academic environment. In their discussion of a potential budgeting system at

the University of Michigan, Cantor and Courant come to the following conclusion:

> This system [of responsibility-centered management] threatened what is at
> the heart of our institutional identity, precisely because building the
> collective good is slow, expensive, shared, and not profitable in the
> marketplace of student credit hours or sponsored research--that is,
> interdisciplinary or collaborative work is expensive, service learning and
> community-based research are rarely profitable, Webbased course tools
> are expensive to reproduce for each unit, a school of art will never make
> money, and digital libraries cannot replace the papyrus in our collections
> (2003, p. 6).

With that in mind, it is essential to look at the budget of these economically difficult

pieces of the system with as much care as possible. A center for higher education should

not become an academic retail center, but there is no point in being wasteful because one

cannot be perfect.

As a start of the focus on library budgets and efficiency, Allen and Dickie (2007)

present a longitudinal study that also concentrates on the connection between library

funding and the well-being of parent institutions. Instead of looking at how the money is

spent once it belongs to the library, they focus on the way in which library funding is

approached by the parent institution. Does funding fluctuate in an unpredictable fashion

or is it tied to the overall economic health of the institution as with most academic

departments (Allen & Dickie, 2007). Allen and Dickie define library success by

measuring demand for library services, while this study chooses to measure success by

independently judged rank. Although they use a very different measure of library success

than that used in this study, Allen and Dickie do provide a useful look at the impact of

library funding in a university setting (2007). The unpredictability of library funding in

many institutions is clearly something that should be addressed at those afflicted organizations before they can efficiently assign funds for a long-term plan.

In research that is concerned with the same issues that are at the heart of this study, Liu (2003) looks at library collection development as it relates to university prosperity. He examines the interaction of academic libraries with their universities through the use of a log-linear formula that includes library collection size as the independent variable and university rank as the dependent variable. In Liu's analysis, the library collection size explains 40 percent of the variance in university rank, while serials alone explain 26 percent of the variance (2003). These numbers and other studies reviewed in Liu's article provide strong evidence for the correlation of collection development budget and academic rank. The article does not address the rest of the library's budget, however, or make recommendations about overall financial balance within the organization. There are a myriad of other articles that discuss best practice and methodology for forming collection development and overall library budgets, but Liu's work is far and away the single most useful resource in designing this study. For another strong resource, consider the work of Arora, Anish and Klabjan (2002).

METHODOLOGY

In order to witness the correlation of institutional rank and library efficiency first-hand, this study will examine detailed budget information from the top two institutions as ranked by the Shanghai Jiao Tong Academic Ranking of World Universities: Harvard University and Stanford University. Less detailed information from two institutions in the bottom group of the ARWU rankings is also used for comparison.

Each institutions' rank was determined by looking at five years of ARWU rankings, not by selecting one year's rank in particular. The five years in question are 2004-2008. Harvard was ranked at the top for all five years, and Stanford was ranked second for four of the five years. In 2006, Cambridge University was ranked second and Stanford fell into third. Because Stanford was most consistently in the number two spot, their rank is considered second for the purpose of this study (Graduate School of Education [GSE], 2004, 2005, 2006, 2007, 2008). Other institutional ranks were determined by the author in the same way, looking at the data from 2004-2008 to determine an overall ARWU rank. This method was chosen in order to avoid regression towards the mean. If Harvard achieved the number one rank as a fluke in 2004, their rank over five years would be likely to reflect their true quality more accurately. Likewise, if a top institution had one bad year, they would likely recover their proper rank over the course of five years. Their average rank would be a better judge of quality than their rank at one point in time.

If a measurement tool is highly accurate, there is less regression towards the mean than there is with a very faulty tool. Looking at only the five years in question, it could be assumed that the ARWU ranking tool is a strong one because of the little change seen among the top institutions. While the tool's strength does seem to hold true, it is also valuable to note that the institutions listed in groups at the bottom of the five hundred ranked organizations are far more variable. It is perhaps more accurate to sum up the situation by saying that there is a greater distance between the quality of top institutions than there is between the quality of lesser institutions (Liu & Cheng, 2005). Because there is not a vast difference in quality among the lower ranked institutions, their ranks

change more from year to year. Using rankings over five years adds some stability to the fluctuating rankings of lesser institutions. It takes out some of the error of the ARWU's measurement, and gives us better comparison data for our analysis of top institutions. Using rankings from multiple years essentially keeps us from studying an inaccurate set of findings. More will be said later about the difference between top and bottom institutions on the ARWU lists.

When comparing the budget data between the top institutions, Harvard and Stanford, or among those institutions and others, department funding within the library is considered as a percentage instead of as a raw number. The balance of the budget is the key to the success of the library and the institution. The use of a percentage serves as an attempt to study the most efficient way to use money--to take the discussion beyond the matter of who has the most money and into a conversation that will be helpful to libraries with different amounts of funding at their disposal.

Another distinction is made in the case of human resources funding. Human resources money is considered apart from the departments in which staff work. One example of this budget division can be seen by describing collection development funding in this study. The collection development budget is considered to be the percentage of the total library budget that is spent on increasing or maintaining the collection, usually referred to as department funds for collection development. The percentage excludes any money that is designated for staff or administration in that department, which is routed instead to the staffing budget. Numbers gathered for this portion of the study come directly from the institutions in the form of annual reports and

financial statements. Division of budgets varies from one institution to another, and divisions will be reconfigured to create parallel data when necessary.

The data used for analysis was found on university websites by searching for financial files, annual reports, and budget office data. It might not be surprising that detailed information is not available for institutions other than the top two. After gathering detailed data from Harvard and Stanford, other pieces of supporting data were gathered from institutions in the top ten and bottom hundred of the Shanghai Jiao Tong Academic Ranking of World Universities. The "bottom hundred" is a less specific group because it does not typically contain the same number of institutions from year to year. In addition to that issue, the group is not subdivided at all. The rank of institutions becomes more difficult to differentiate as you go down the list, so institutions are grouped first in fifties and then in groups near a hundred as pointed out by Liu and Cheng (2005).

> There is a rapid decrease in the total score relative to rank for the top 100 institutions, and particularly for the top 50. The change of total score is relatively small in the range of the rankings from 100 to 500. This is also why the ranking results are published in groups of 50 institutions in the range of rankings 100 to 200, but in groups of 100 institutions in the range of rankings 200 to 500 (p. 130).

To establish which institutions to include in that group, the lists from 2004-2008 were again consulted. Each institution that was included on the list for all five years was considered in the data gathering process. Only a few of the organizations had useful data available, which is cited as necessary throughout the analysis. After gathering data from the Academic Ranking of World Universities and from institutional websites, budget analysis was performed.

LIMITATIONS

There are several practical limitations of this study. The first that was encountered chronologically is a part of the data-gathering process. Self-reported budget numbers provided on institutional websites might pose a problem in some cases. They are assumed to be accurate, but there is no guarantee that that is the case. Some financial reports were independently audited, such as Montana State's institutional report. Their library budget numbers were not audited, however.

More importantly, it would be helpful to extend the time span used to perform this study. A longer research period would allow data to be gathered by request from all of the top ten and bottom institutions. With that data, quantitative measures could be used to determine the correspondence between library budget trends and university ranking. With the data available, it is possible to show a likely connection. Numbers were gathered from three years for Harvard University (2003-2006), three years for Stanford University (2005-2008), and one year for New Mexico State University and Montana State University (2007). With more complete data, a tie between financial practice and university rank could be proven instead of merely indicated.

It could also be helpful to extend the scope of this study to become a longitudinal study. Looking at movement of institutional rank in relation to budget changes over time would definitely enrich the findings of this study. Unfortunately, the time constraints involved in this case did not allow such research. While certain parts of the study were extended to take out some of the impact of regression towards the mean, other parts of the study do not look at data over time. Financial reports were not available for the same time period in all cases, and some institutions only make the data available for one year at

a time. If information could be retrieved from 2003-2008 for Harvard and Stanford instead of 2003-2006 for Harvard and 2005-2008 for Stanford, a more thorough comparison would be achieved. Longitudinal information from the bottom institutions would also benefit the analysis. With limited information, it is impossible to determine long-term trends in university funding or library spending.

DATA

The '03-'04 financial record shows that the Harvard library system spent $56,320,559 on salaries and wages, $15,217,440 on health and retirement plans, $27,884,612 on book purchases and other library materials, $1,112,762 on binding, and $27,479,809 on other costs. The total spending for the year is $128,015,182. The data in percentages is as follows: 44% for salaries and wages, 11.9% for health and retirement plans, 21.8% for books and other materials, 0.9% for binding, and 21.4% for other costs (Harvard University Library [HUL], 2004). Some of the libraries spend more money on collection development than others, with the Harvard College Library taking the vast majority of that responsibility and also shouldering a good deal of the staffing costs. We are more concerned with the overall use of finances in the library system than the way in which the many libraries work together, so the aggregate information is most valuable in this case.

The '04-'05 financial record shows that the Harvard library system spent $57,609,065 on salaries and wages, $18,761,158 on health and retirement plans, $27,569,823 on book purchases and other library materials, $1,060,533 on binding, and $29,056,903 on other costs. The total spending for the year is $134,057,481. The data in percentages is as follows: 43% for salaries and wages, 14% for health and retirement

plans, 20.6% for books and other materials, 0.8% for binding, and 21.7% for other costs (HUL, 2005).

According to Harvard University's financial records for the '05-'06 academic year, the library system as a whole spent $58,047,311 on salaries and wages, $20,026,111 on health and retirement plans, $28,138,926 on book purchases and other library materials, $1,017,350 on binding, and $32,576,172 on other costs. In total, their expenditures amount to $139,805,870 for the year. As percentages, that translates to 41.5% for salaries and wages, 14.3% for health and retirement plans, 20.1% for books and other materials, 0.8% for binding, and 23.3% for other costs (HUL, 2006). For a summary of the three years' financial records, refer to Table 2.

Table 2. Harvard University library expenditure (HUL, 2004, 2005, 2006)

	Salaries and wages ($)	Health and retirement ($)	Books and materials ($)	Binding ($)	Other ($)	Total ($)
2003-2004	56,320,559 44%	15,217,440 11.9%	27,884,612 21.8%	1,112,762 0.9%	27,479,809 21.4%	128,015,182 100%
2004-2005	57,609,065 43%	18,761,158 14%	27,569,823 20.6%	1,060,533 0.8%	29,056,903 21.7%	134,057,481 100%
2005-2006	58,047,311 41.5%	20,026,111 14.3%	28,138,926 20.1%	1,017,350 0.8%	32,576,172 23.3%	139,805,870 100%

There was a 4.7% increase in total budget from the '03-'04 academic year to the '04-'05 academic year, and a 4.3% increase from '04-'05 to '05-'06. The data provided by the university as a whole does not always coincide with the timeframe of data presented by the library system. There is some chronologically overlapping data, however, and from that we see that there was a 5.7% increase in total university expenses between the academic years of '05-'06 and '06-'07 (Financial Administration, 2006,

2007). We also see that the library budget in the '04-'05 budget year constituted 4.9% of the university's total expenses, which were $2,757,373,000 (Financial Administration, 2006 and HUL, 2006). In the '05-'06 budget year, library expenses accounted for 4.7% of the university's expenses, which were $2,999,503,000 (Financial Administration, 2006 and HUL, 2006).

Stanford University's total expenses in the '05-'06 academic year were $4,212,523,000, while their total expenses in the '06-'07 academic year rose to $4,520,241,000 (Office of the Controller [OC], 2008, *Annual Report*). That translates to a 7.3% increase, which is 1.6% higher than the increase seen at Harvard over the same two years.   Although expense information from the same years is not available for the Harvard and Stanford library systems, it is still useful to compare the percentage of total university spending between the two institutions. In the '07-'08 academic year, Stanford planned to spend $95,700,000 on library expenses, or 3.6% of total university expense budget. Their actual expenses in the '05-'06 year were $83.5 million, and '06-'07 expenses were estimated to be $91.7 million (OC, 2008, *Budget Plan*). That difference is a 9.8% increase in library expenditure over just one year. The leap from the '06-'07 to '07-'08 budgets is a more typical 4.4% increase.

The spending breakdown for Stanford is more general than that of Harvard, but it does get at the most important piece of information for this study. In '05-'06, 59.3% of the Stanford library system's budget was spent on salaries and benefits. In the '06-'07 academic year, that percentage rose ever so slightly to 59.4 and dropped slightly in '07-'08 to 59.2. On the other side of the coin, 40.7% of the library's funds were used for non-salary expenses in '05-'06, 40.6% in '06-'07, and 40.8% in '07-'08 (OC, 2008,

Budget Plan). The steadiness of that percentage is a strong indication that the Stanford library system feels that they have a good funding balance in their organization. Despite Stanford's budget allocation consistency, Harvard does use a higher percentage of funds on books and other library materials. To compare the breakdown of both institutions, see Table 3.

Table 3. Budget comparison of Harvard and Stanford library systems
(HUL 2004, 2005, 2006, OC, 2008, *Annual Report* and *Budget Plan*)

	Harvard Expenditure		Stanford Expenditure	
	Salaries & benefits	Non-salary	Salaries & benefits	Non-Salary
2003-2004	55.90%	44.10%	-	-
2004-2005	57%	43%	-	-
2005-2006	55.80%	44.20%	59.30%	40.70%
2006-2007	-	-	59.40%	40.60%
2007-2008	-	-	59.20%	40.80%

One of the institutions in the bottom group of the ARWU rankings, New Mexico State University at Las Cruces, had a total expenditure of $485,731,949 for the '07-'08 fiscal year. Their library budget for the same year was $4,270,574 (Santana-Melgoza, 2007), which means that a mere 0.9% of New Mexico State's budget was spent on their library system that year.

Montana State University at Bozeman is also ranked in the bottom hundred of the ARWU rankings and has similar library funding percentages. In the 2007 fiscal year, MSU had $396,308,068 total expenses (Legislative Audit Committee [LAC], 2007) and allocated $6,104,284 of that to the library systems (Montana State University [MSU], 2008). The library budget was a mere 1.5% of the institution's total budget.

CONCLUSIONS

The two top institutions examined in this study, as ranked by the Academic Ranking of World Universities from 2004 to 2008, use between three and five percent of their total university budgets on their respective library systems each year (Financial Administration, 2006, 2007, HUL 2004, 2005, 2006, OC, 2008, *Annual Report* and *Budget Plan*). The libraries and their parent organizations are faring well, and budgeting issues are at least partially responsible. The institutions at the bottom of the sample use around one percent of the overall budget for libraries (Santana-Melgoza, 2007, LAC, 2007 and MSU, 2008). The discrepancy between the institutions at the top and those at the bottom is no accident. Where healthy libraries exist, more research can be done by students and professors associated with that institution. When better resources are available and more research is completed, the institutions gain esteem in academic circles and the institution as a whole goes up in value. This in turn influences the type of students who want to attend a certain school and the type of professors who decide to work there. In other words, the quality of an academic institution is much more closely tied to the quality of its libraries than is often thought.

After an institution decides the relative needs of its divisions and the return expected from each unit, money is allotted accordingly. Once money arrives in the hands of a library or any organization, it is essential that all available funds be spent in an efficient manner. Although there is less specific data on the matter, the top two institutions do indicate a slight difference in budget patterns. The top institution, Harvard University, spends several percentage points less on the salaries and benefits of their employees, thereby freeing up that money to go into the purchase of serials, books, and

other library materials. As mentioned at the start of this study, a healthy balance should always be maintained. It is not the point of this study to propose that library staff should be substantially cut to allow for greater collection development funding. It is, however the point of this study to show that spending more on collection development and other library materials has stood Harvard University in good stead. The choice to use a greater percentage of library funds on collections and other materials does directly benefit the students and faculty of Harvard University, and this benefit is reflected in the university's success and in their spending choices.

When Harvard's library budget allotted more money for staff health benefits and retirement funds, the salary portion of the budget decreased (Financial Administration, 2006, 2007, and HUL, 2004, 2005, 2006). Care was taken to keep overall staff costs consistent, and this care points to their concern that the materials budget remain as high as possible. Although Stanford's salary to materials ratio is a bit different from Harvard's, they also maintain a very consistent balance over the three years studied. It would be easy to let staffing costs rise to compensate for new challenges in libraries and new developments in the field, but Stanford kept their staffing to materials budget ratio nearly identical from 2005 to 2008. Stanford joined Harvard in speaking through spending trends to indicate a great value on materials.

On the other end of the spectrum sit New Mexico State University at Las Cruces and Montana State University at Bozeman. They are by no means the worst among academic institutions, as evidenced by their inclusion in the ARWU list. The Academic Ranking of World Universities only includes the top five hundred institutions around the world, and there are many academic institutions that did not make the list at all. That

said, their library budgets as a percentage of total budget are by no means exemplary. Both institutional budgets start off much smaller than that of Harvard or Stanford. If the universities were to allocate four or five percent of their total budget to the library system, the libraries would still have to work hard to stretch their funds for the best possible use. But since the libraries only receive about one percent of the overall budget, the growth of their institutional research is inhibited. Without meaning to, the institutions are stunting the growth and improvement of their entire organizations by not providing generously enough for the library systems.

There are many possible reasons for the different funding situations in academic institutions. Perhaps New Mexico State University or Montana State University formerly gave five percent of their budgets to their respective library systems and the libraries did not use the money effectively. Maybe the libraries did use the money well, but the institutions decided that they needed to focus on attracting high quality professors with higher income in the year covered by this study. These are just two of the myriad possibilities. No matter what the reason, New Mexico State, Montana State and other universities with similar funding plans should carefully reconsider their options. Consistent funds need to be given to any institution's library system to ensure the well-being of the university as a whole. Without knowing the history of funding at New Mexico State or Montana State, it is impossible to tell whether the libraries suffer from chronic under-funding or a sudden drop in funding. Either problem should be addressed by the librarians who are a part of each organization. A new understanding of the libraries' value to their parent institutions should be reached among all financial planners, and hopefully the universities will reconsider the value of their libraries.

Once the basics of library funding are under control in an organization, there are other elements of the matter to consider. Institutions such as Harvard and Stanford that are doing well and have been doing well for quite some time have also had the opportunity to look beyond the problems that some other libraries experience. While New Mexico State and Montana State libraries are trying to encourage planners to see their value to the parent organization, Harvard and Stanford can tackle less obvious issues such as educational productivity.

In my limited experience, most librarians do not like to think about their work in terms like "greatest possible output" and "financial efficiency." Libraries are reluctant to press employees to maintain strict efficiency standards because there is so much about teaching that is simply not efficient. To help someone with research takes a lot of time and effort, and sometimes the most rewarding task is the one that provides the least benefit for the academic community. Many community members need help using computers, for example, and their lives can be greatly impacted if a librarian takes the time to truly help them. No great research goals will be reached the moment that someone learns how to double click or send an email, but the future result of time spent on such questions is entirely unknown. Even if the academic result is negligible, there are other benefits that should also be weighed.

Unfortunately, it can be extremely difficult to reconcile the goals of financial planners and librarians. One group is hoping for the most output at the lowest cost, and the other group is not terribly conscious about productivity in terms of time expenditure. As with most things, balance is the key to success for libraries. Librarians should be able to pursue time-consuming activities without worrying about their productivity in that

moment. A patron's information need might not strictly fall within the academic institution's mission, but should be taken seriously nonetheless. With that customer service orientation in mind, librarians should also be able to look at their daily activities, change certain work habits to make them more efficient, and ultimately increase their own productivity for the library. With employees who are conscious of the impact of their choices on the well-being of the institution, library staff productivity would increase without an increase in salary expenditure or other cost to the organization.

In a library where employees are driven to improve for the sake of the institution, the funds available for materials will also be put to the best possible use. Even if materials budgets are not expanded, the more efficient staff will be able to make better informed choices about which materials are most necessary. Employees who are striving to be the best in their field will be far superior to those who are merely doing what they are supposed to do.

The proposed outcome of this study is that institutions take a closer look at how they function and where their money is going. On an organizational level, funds should be balanced carefully between human resources and library materials, putting as much money as possible into library materials without undermining staff support. On an individual level, it is vital for institutions to motivate employees to feel a sense of responsibility for the library's community impact. Libraries are good at talking about taking care of the community, but they should also learn how to act on those ideas in a practical way.

Being fiscally responsible is one of the most tangible ways to serve an organization's community, yet it is something that many librarians are not used to

considering. If library managers treat employees more like business people and less like librarians, it could have a great positive impact on library services. A businessman is concerned about the happiness of customers and the quality of the product that he produces, but a businessman must also understand the realities of funding and the budget allocations necessary to make his project possible.

In a librarian's training, relatively little time is spent considering the business elements of a library. Once out of training, librarians perform tasks and stay busy, but are rarely asked to think critically about their own work. In a business, you change your practices if they are not producing strong results. In a library, it can take years to arrive at that conclusion instead of the weeks or months it might take in a profit-centered environment.

It is my opinion that if you expect librarians to take responsibility for the health of the library, they will do so. If you expect them to increase productivity, they will find a way to make that possible. The problem is that no one expects librarians to take responsibility like that in their daily activities. Analysis should be performed more than annually, and improvements should be made because of individual motivation. Librarians are not intrinsically less business-minded than other professionals; they are merely not asked to exercise that sort of thinking on a regular basis. Combine a greater focus on institutional budget balance and a greater care for individual efficiency and there is no telling how library systems across the world could impact their communities.

RECOMMENDATIONS

The data gathered for this study is illustrative of the proposed ideas, but it cannot prove their truth. It would be highly useful to the academic world to study this matter in

greater depth. A study that gathers detailed data from all of the ARWU top twenty and bottom group institutions could prove that specific patterns of university and library spending do create healthier, more highly esteemed academic institutions. With more hard data on each organization, Pearson's Chi-square Test could be used to determine how observed institutional spending impacts institutional rank. Additional conclusions could be drawn based on statistical significance and percentage of institutional rank that can be explained by institutional spending patterns.

Further analysis could also be performed on each library's statement of values in financial reports and their other written goals. A literary analysis of espoused values versus actual spending could enrich the data analysis proposed above. It is always helpful to see the difference between what an organization claims to value and what they place value on through budgeting.

It is my hope that more research will be done on this topic because it is of such great importance. Financial responsibility is an often overlooked part of library systems, and one that should be on every library employee's mind. Budgets are not in place to restrict expenditures or thwart brilliant plans for change. They are in place to create the best possible balance of spending within an organization. It is my wish that employees and managers could communicate about budget and efficiency more freely and that a stronger professional environment would grow as a result of that interaction.

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Appendix A. Institutions in ARWU "Top Ten" and "Bottom" groups

Top Ten (2004-2008 averaged rank)
1. Harvard University
2. Stanford University
3. University of Cambridge
4. University of California - Berkeley
5. Massachusetts Institute of Technology
6. California Institute of Technology
7. Princeton University
8. Columbia University
9. University of Oxford
10. University of Chicago

Bottom 100 (organizations in category for all years from 2004-2008)
Boston College
Drexel University
Ehime University
Hannover Medical School
Kagoshima University
Montana State University - Bozeman
Nara Institute of Science & Technology
New Mexico State University - Las Cruces
Northeastern University
University of Akron
University of Bremen
University Estadual Paulista
University of Fribourg
University of Granada
University of Idaho
University KwaZulu-Natal
University of Louisville
University of Maine - Orono
University of Maryland - Baltimore County
University of Quebec
University Sevilla
University of Sherbrooke
University Siena
University Tromso
University of Wales - Swansea
University of Zaragoza