Long-Term Debt at Public Four-Year Colleges and Universities

Michael Stump

Introduction

Revenues, expenditures, debt, and endowments are the basic components of finance in public, four-year higher education institutions. Revenues and expenditures measure short-term institutional financial health while debt and endowments address the long-term. Most measures and analyses of financial performance involve these components. A brief comment about each follows.

• **Revenues** consist of tuition and fees, appropriations, grants and contracts, gifts, and endowment and investment income; however, tuition and fees and appropriations are the primary revenue sources. Tuition and fees have increased significantly in recent years while appropriations have generally lagged.

• **Expenditures**, which have experienced modest growth, include payroll, benefits, equipment, supplies, maintenance, and debt payments.

• **Debt**, which has grown considerably, consists almost entirely of long-term obligations, such as bonds, notes, and leases.

• **Endowments** are expressed in terms of their market value and are divided into two categories: those restricted to certain uses by donors and those not. Contributions to and investment returns on endowments have been impressive. For example, the fiscal year 2000 investment returns for the University of Michigan and the University of Virginia exceeded 40%.

Some suspect that institutions borrow money instead of spending endowment to take advantage of higher endowment returns and lower interest rates on debt. If so, are tuition, fees, other revenue categories, and expenditures impacted by this practice? Could there be other relationships that are not as intuitive? We should look at the overall finance picture to determine what relationships exist among its basic components. Do revenues, expenditures, debt and endowments impact one another and, if so, to what extent? Such a study could provide information useful to those interested in public higher education finance.

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Why is this study important?

Do some institutions prefer to borrow money at low interest rates while leaving endowment funds intact? Debt involves an ethical dimension, which includes decisions about policy and institutional values. Specific questions must be asked. Are there certain assets for which institutions will borrow money and others for which they will not? What are the consequences of 10, 20 or 30-year institutional debt obligations? Should the decision to borrow be based upon the assumption that endowment earnings will exceed the cost of borrowing? Incurring long-term debt requires assumptions about future endowment returns. This article provides a model for debt analysis by determining what relationships exist among current fund revenues and expenditures, long-term debt, and endowment value.

Literature Review

Long-term Debt

Long-term debt is debt due more than a year from the end of the fiscal year. Shultz (2000) documented large increases in long-term debt. From 1990 to 1998, $90 billion of new higher education debt was sold. Van Der Werf (1999) noted that colleges and universities were more than $100 billion in debt. In 1998, public and private higher education issued $15.5 billion in long-term debt. This was more than double the $7.2 billion issued during 1995, 1996, and 1997 combined. Well before these dramatic increases in debt, scholars such as Johnstone (1993) expressed concern about the rising levels of long-term debt in higher education. It is possible that debt may have been used to avoid difficult decisions concerning allocation of resources. Borrowing money may be easier than languishing over the prioritization of funding, which may result in leaving some desirable items unfunded. In certain cases, borrowing can be justified if problems with revenue flow are considered short-term, and if returns on invested money are greater than the cost of borrowing. Perhaps borrowing is utilized more than it once was with respect to revenues, expenditures, and endowment.

Tuition and Fees

Tuition and fees are the revenues generated by institutions through charges to students. Cooper (2000) noted that tuition increased 4.4% at public four-year colleges and universities and 5.2% for private schools for the academic year 2000-2001. This continued the 1990s trend of significant tuition and fee increases. Institutions are concerned about whether tuition and fees are increasing faster than inflation, parents' ability to pay, and public tolerance in general. With respect to the importance of tuition and fees to revenue flows, institutions fear that the rate of increase may lead to additional pressure to discount tuition and fees.

State Appropriations

For the academic year 2000-2001, state appropriations for higher education totaled $60,568,619,000. This represented a one-year change of 7%, a two-year change of 14.4%, and a five-year average annual change of 6.4% (*Chronicle of Higher Education*, December 15, 2000). In general, state appropriations showed significant increases such that they exceeded the Higher Education Price Index by a significant margin.

Endowment Value and Income

Endowment value is the market value of endowed assets at the end of the fiscal year. Duke University and the University of Notre Dame reported investment returns of almost 60% for the fiscal year ended June 30, 2000 (Lively & Street, 2000). Yale University, Dartmouth College, the University of Michigan, the University of Chicago, and the University of Virginia all exceeded 40% for the same period (Lively & Street, 2000). Yale's endowment exceeded $10 billion, and Harvard's was $19.2 billion for the year ended June 30, 2000. Harvard's endowment increased $5 billion from the previous year (Lively & Street, 2000).

Endowment income is the amount of endowment transferred each year to the institutions' current funds, which are those funds allocated for the current fiscal year. Current funds may be restricted by donors for specific purposes or unrestricted and available for current operations at the discretion of the institutions. Basch (1999) studied a sample of 669 private colleges and universities and found that the median payout rate fell from 6.59% for the 1988-89 fiscal year to 5.06% for 1995-96. Altschuler (2000) found that private schools tend to spend a greater percentage of their endowments than publics.

Arbitrage

Arbitrage is defined as the substitution of funds borrowed at lower interest rates for assets that are expected to earn higher returns if left intact. Winston (1992) observed that institutions generate income by arbitrage and believed this was immoral and eroded public trust in higher education. Bradburd and Mann (1993) noted that many institutions borrow money to arbitrage the difference between endowment return and interest on debt. This type of debt is typically not taxed; so the holder of the debt does not have to pay income taxes on interest earned (Bradburd & Mann, 1993).

Many institutions have difficulty deciding whether endowment resources, debt, or a combination of the two be used to meet the current operating budget. Should institutions incur the risks associated with long-term debt to meet short-term budget needs? Stated another way, should institutions obligate future budgets to meet the needs of the current one? Should debt be analyzed with respect to assets and distinct from income, or as a component of income?

Current Fund Expenditures

According to the U. S. Department of Education's National Center for Education Statistics [NCES] (USDE, 1999), trend data reveal increases in expenditures per student through the late 1980s and smaller increases thereafter through 1996. Expenditures increased 16% between 1983 and 1989 (USDE, 1999). Between 1990 and 1996, however, expenditures increased only 7% (USDE, 2000). These figures were adjusted for inflation using the Higher Education Price Index [HEPI]. Over the long-term, from 1960 through 1996, total expenditures for private higher education increased from $20 billion to $90 billion. These amounts are approximations adjusted to 1999 dollars using HEPI (USDE, 2000). For public institutions, expenditures were $25 billion in 1960 and $145 billion in 1996. These amounts are also approximations adjusted to 1999 dollars using HEPI (USDE, 2000).

Higher Education Price Index [HEPI]

McPherson, Shapiro, and Winston (1989) define HEPI as a base-weighted index of the costs of inputs colleges and universities purchase. HEPI was established in 1972 based on data collected by the NCES (Chatman, 1999). Overall there are two broad cost components to

HEPI, personnel and services, which is 79% of the index, and supplies and equipment, the remaining 21% (Chatman, 1999). Navin and Magura (1977) described inflation as a harsh reality that affects all of higher education operations and a persistent economic reality. From 1978 through 1998, HEPI increased 180% (Chatman, 1999).

Research Methods

This study used cluster and ratio analyses to examine the relationships among current fund revenues and expenditures, long-term debt, and endowment value, for public four-year institutions, for fiscal years 1992 through 1997. The following questions help explain the relationships among the variables.

1. What trends exist for current fund expenditures and revenues, long-term debt, and endowment value, and what is the relationship of changes in these variables?

2. Is long-term debt displacing one or more components of current fund revenue, and does endowment value influence this relationship?

3. Why have institutions incurred more debt when their revenues and endowment values have been increasing?

4. Have revenue sources failed to keep pace with the Higher Education Price Index?

Data was gathered from the Integrated Postsecondary Education Data System [IPEDS], developed and maintained by the United States Department of Education's National Center for Education Data Statistics [NCES]. The data are self-reported, and, as such, may contain unintentional or deliberate errors. Data were collected by downloading the annual IPEDS data files from the NCES Website <http://nces.ed.gov/ipeds>.

The Statistical Package for the Social Sciences [SPSS] version 10.0 was used to explore relationships among revenues, expenditures, long-term debt and endowment value, and determined how these variables vary together or independently of each other. The first step involved computing the mean, standard deviation, and population size for each variable, for each year. Next, a hierarchical cluster analysis was performed to statistically group institutions based on the four variables studied for each school, for each year. SPSS allows users to select a mathematical method to perform the cluster analysis. Euclidean geometry, the default, was used. It computed the square root of the sum of the squared differences, or distances, among the variables, for each school, for each year. Dendograms, one produced for each year, revealed the number of clusters within the various levels of the selected standard error. A higher standard error produces fewer clusters with more schools resulting in greater dissimilarities among the members of each cluster and reduced confidence in the clustering process. Researcher judgment is very important at this point. A 5% standard error was chosen and is consistent with most research in which a 95% confidence level is the norm. This yielded five clusters for fiscal years 1992 through 1996 and six clusters for 1997. Each cluster of schools was considered as a unit and compared to the other clusters.

Results

Table 1 presents the means for current fund revenues, current fund expenditures, long-term debt, and endowment value for all institutions prior to clustering. Table 2 presents the standard deviations prior to clustering. These tables were not adjusted for inflation.

The analysis produced five clusters of schools for each of the years 1992 through 1996 and six clusters for 1997. The number of schools ranged from a low of 294 in 1992 to a high of 348 in 1997. The number of schools in cluster 1 ranged from a low of 17 to a high of 28 for the six years studied. The number of schools in cluster 2 ranged from a low of 268 to a high of 321. The cluster analysis isolated the University of Michigan–Ann Arbor [cluster 3] for each year. Cluster 4 consisted of the University of Minnesota–Twin Cities, Ohio State University, University of Washington, and University of Wisconsin– Madison for fiscal years 1992 through 1996. For 1997, the cluster analysis removed the University of Wisconsin–Madison from cluster 4 and placed it in cluster 1 and isolated the University of Virginia [UVa] from cluster 1 and created cluster 6. The cluster analysis also isolated the University of Texas–Austin [UTA] for each of the six years [cluster 5]. The analysis focused on clusters 1 through 5 since these were present for each of the six years studied, cluster 6 was present in 1997 only.

Table 3 includes the cluster means for fiscal year 1992 data. Table 4 includes the 1997 data adjusted to 1992 dollars using HEPI, and Table 5 is the difference of the two years, also adjusted using HEPI. Table 4 includes cluster 6, the University of Virginia, which was within cluster 1 for fiscal year 1992; therefore, the trend analysis does not include cluster 6. Table 6 documents the percentage of change in each variable, adjusted for HEPI using 1992 dollars, for fiscal years 1992 through 1997.

The research questions and results follow.

1. What trends exist for current fund expenditures and revenues, long-term debt, and endowment value, and what is the relationship of changes in these variables? Adjusting for HEPI, current fund revenues and expenditures were approximately equal for fiscal years 1992 through 1997; revenues and expenses increased modestly. Long-term debt decreased for clusters 1, 4, and 5 between 11.14% and 13.49% and increased 14.64% for cluster 2 and 30.34% for cluster 3. Endowment values increases ranged from 32.37% to 177.95%. (See table 6.)

2. Is long-term debt displacing one or more components of current fund revenue, and does endowment value influence this relationship? Adjusting for HEPI, the data suggest not. Long-term debt decreased for three of the five clusters. The ratio of

debt and expenditures changes revealed little, except for cluster 5, the University of Texas–Austin, in which debt decreased from 130% of expenditures to 109%. Debt decreased as a percentage of endowment value for all clusters; the change ranged from 10% to 77%. (See table 5.) It does not appear that long-term debt is displacing any portion of current fund revenues. Generally, long-term debt decreased in terms of 1992 dollars and as a percentage of endowment value.

3. Why have institutions incurred more debt when their revenues and endowment values have been increasing? Adjusting for HEPI, debt decreased relative to revenues, expenditures, and endowment value. Endowment value increased as a percentage of expenditures for all clusters: 6% for cluster 2; 12% for cluster 1; 21% for cluster 4; 47% for cluster 3; and 107% for cluster 5. This indicates that endowment value grew faster than expenditures for all clusters, after accounting for inflation, with significant increases for clusters, 1, 3, and 5. (See table 5.)

4. Have revenue sources failed to keep pace with HEPI? Adjusting for HEPI, the data suggest not. Revenues increased from 1.14% to 9.26% for the period, suggesting that revenue sources have kept pace with HEPI. (See table 6.)

Implications and Conclusions

Generally, the literature does not compare debt to revenues, expenditures, and endowment value, but to previous debt levels. It was not clear, with the exception of Shultz's study, whether the debt studies considered HEPI. Once revenues, expenditures, endowment values, and HEPI were considered, public, four-year school debt levels were less concerning for the period 1992 through 1997 than suggested by the literature. This study found that for four-year public institutions, for the period 1992 through 1997, after adjusting for HEPI:

1. Revenues increased approximately 5% or less for each cluster except number 3, the University of Michigan–Ann Arbor, which increased more than 9%. Expenditures increased approximately 6% or less for each cluster except cluster 3, which increased approximately 13.5%.

Table 1. **Means**	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997
Current Fund Revenues	$139,749,862	$146,765,713	$152,474,393	$160,729,170	$164,390,523	$172,422,224
Current Fund Expenditures	$138,723,102	$145,897,658	$151,657,839	$159,241,194	$163,042,679	$170,634,596
Long-term Debt	$36,204,601	$38,242,147	$39,706,932	$41,275,836	$41,988,904	$43,814,562
Endowment Value	$29,928,208	$34,818,305	$33,511,033	$39,084,096	$45,642,143	$55,082,174

Table 2. **Standard Deviations**	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997
Current Fund Revenues	$224,224,759	$234,616,193	$244,772,816	$257,261,033	$265,123,845	$277,872,249
Current Fund Expenditures	$222,248,089	$232,174,787	$242,165,573	$255,057,268	$263,576,595	$274,700,780
Long-term Debt	$82,705,289	$83,878,373	$85,830,759	$90,371,469	$88,007,854	$86,652,909
Endowment Value	$185,650,132	$202,765,540	$194,567,312	$216,566,715	$238,890,401	$287,690,451

Table 3. Cluster Groups' Means Fiscal Year 1992

Cluster	CF Revenues	CF Expenditures	Long-term Debt	Endowment Value	CFR/CFE	LTD/CFE	EV/CFE	LTD/EV	n
1	$732,924,516	$718,356,758	$226,165,791	$140,923,133	102.03%	31.48%	19.62%	160.49%	20
2	$114,343,978	$113,300,875	$21,792,534	$9,599,459	100.92%	19.23%	8.47%	227.02%	268
3	$1,956,609,792	$1,868,539,629	$411,777,213	$611,694,083	104.71%	22.04%	32.74%	67.32%	1
4	$1,288,270,084	$1,316,275,532	$241,283,187	$301,776,818	97.87%	18.33%	22.93%	79.95%	4
5	$780,332,286	$784,635,408	$1,019,613,900	$3,357,886,150	99.45%	129.95%	427.95%	30.36%	1
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Cluster 3: University of Michigan–Ann Arbor
Cluster 4: Minnesota–Twin Cities, Ohio State University, University of Washington, and University of Wisconsin–Madison
Cluster 5: University of Texas–Austin

Table 4. Cluster Groups' Means Fiscal Year 1997 - Adjusted for HEPI

Cluster	CF Revenues	CF Expenditures	Long-term Debt	Endowment Value	CFR/CFE	LTD/CFE	EV/CFE	LTD/EV	n
1	$742,568,357	$735,128,877	$195,645,257	$233,895,674	101.01%	26.61%	31.82%	83.65%	21
2	$115,647,959	$114,826,772	$24,982,602	$16,572,839	100.72%	21.76%	14.43%	150.74%	321
3	$2,137,863,287	$2,124,117,230	$536,705,259	$1,700,229,352	100.65%	25.27%	80.04%	31.57%	1
4	$1,324,522,590	$1,297,459,489	$209,418,267	$567,342,237	102.09%	16.14%	43.73%	36.91%	3
5	$820,014,340	$830,647,044	$906,038,220	$4,444,717,935	98.72%	109.08%	535.09%	20.38%	1
6	$872,718,682	$884,645,770	$208,232,892	$1,007,829,029	98.65%	23.54%	113.92%	20.66%	1
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Cluster 3: University of Michigan–Ann Arbor
Cluster 4: Ohio State University, the University of Minnesota–Twin Cities, and University of Washington
Cluster 5: University of Texas–Austin
Cluster 6: University of Virginia

Table 5. Cluster Groups' Means Fiscal Year 1997 - 1992 Difference - Adjusted for HEPI

Cluster	CF Revenues	CF Expenditures	Long-term Debt	Endowment Value	CFR/CFE	LTD/CFE	EV/CFE	LTD/EV
1	$9,643,841	$16,772,119	-$30,520,534	$92,972,541	-1.02%	-4.87%	12.20%	-76.84%
2	$1,303,981	$1,525,897	$3,190,068	$6,973,380	-0.21%	2.52%	5.96%	-76.27%
3	$181,253,495	$255,577,601	$124,928,046	$1,088,535,269	-4.07%	3.23%	47.31%	-35.75%
4	$36,252,506	-$18,816,043	-$31,864,920	$265,565,419	4.21%	-2.19%	20.80%	-43.04%
5	$39,682,054	$46,011,636	-$113,575,680	$1,086,831,785	-0.73%	-20.87%	107.14%	-9.98%

Table 6. Cluster Groups' Means FY 1997 - 1992 Trends - HEPI Adjusted

Cluster	CF Revenues	CF Expenditures	Long-term Debt	Endowment Value
1	1.32%	2.33%	-13.49%	65.97%
2	1.14%	1.35%	14.64%	72.64%
3	9.26%	13.68%	30.34%	177.95%
4	2.81%	-1.43%	-13.21%	88.00%
5	5.09%	5.86%	-11.14%	32.37%

2. Debt decreased between 11% and 14% for three of the five clusters, but showed an increase of more than 14.5% for cluster 2 and more than 30% for cluster 5, the University of Texas–Austin.

3. Debt, as a function of expenditures, has remained static, except for cluster 5, the University of Texas–Austin, where it has decreased by more than 20%.

4. Debt, as a function of endowment value, has decreased between 43% and 77% for clusters 1 through 4, and nearly 10% for cluster 5, University of Texas–Austin.

5. Endowment value increased between 32% and 178%.

6. Endowment value, as a function of expenditures, increased anywhere from approximately 6% to more than 107%.

Considerations for Further Research

Returns on endowments were considered good for the years studied. However, a significant decline in earnings or giving would impact endowment values, which may indirectly impact revenues, expenditures, and debt. Therefore, the analyses performed in this study might yield different results if conducted for a period where the economy was less favorable.

The classification and accounting for public higher education debt should be studied to determine the extent to which "authorities" are used to issue and incur debt. Authorities are legal entities created by legislative bodies to perform certain functions, such as public transportation, garbage collection, or, in the case of higher education, providing housing to students. Authorities collect revenues, expend monies, and incur debt. They are distinct legal, public entities that issue separate financial statements. Financial reports of authorities created to administer functions at public colleges are reduced to footnotes within the financial statements of the colleges — detailed financial information is not presented. The use of authorities may be a method for public colleges and universities to avoid recording debt within their financial statements. This practice could impact the results of this and future debt studies.

A study utilizing cluster and ratio analyses should be conducted for private, four-year institutions to compare and contrast with this study and help determine the viability of such analyses. Private institutions may be more attracted to debt for a number of reasons, including the elimination of the $150 million debt ceiling in the Tax Reform Act of 1996 (Hennigan, 1998).

The cluster and ratio analyses performed in this study provide a different model by which to study higher education debt and finance. These analyses were used to determine mathematical relationships among current fund revenues and expenditures, long-term debt, and endowment value. These analyses are objective in nature and can reveal relationships that were not suspected or disprove those that were. More research should be conducted using this model to determine its worth to administrators and higher education finance scholarship.

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