Original Article

Private giving versus state funding: Perspectives on funding of Maryland 4-year public institutions

Received (in revised form): 1st July 2011

John L. Cox

is Vice President for Finance, Operations and Government Relations at Harford Community College, Maryland (USA). He is a faculty member in Higher Education Administration at Kent State University and in the Doctor of Management in Community College Policy and Administration program at the University of Maryland. Dr Cox was the 2010 recipient of the John Grenzebach Award for Outstanding Research in Philanthropy from the Council for Advancement and Support of Education.

ABSTRACT This study examined the relationship between and among the changes in the level of institutional fundraising and changes in state funding at Maryland public 4-year institutions. As institutions have become more engaged in fundraising, the impact of private giving success on changes in state funding becomes more apparent in the context of increased fiscal constraint, and as a mechanism to help ensure institutional competitiveness. Anecdotal theory and attitudinal surveys indicated that public funding reductions were considered when private giving increased. Using 13 cases based on 10 years of data from 13 institutions, descriptive statistics, correlation and regression testing results were analyzed using data from several state and national databases. Private giving, state funding, wealth indicators (including the endowment expenditure ratio (EER) and the state pseudo endowment) and ranking indicators, comprised the types of variables tested. Several statistically significant correlations were found, including a moderate, positive correlation between Total Private Giving and State Funding per full-time equivalent (FTE) Student. Simple regression testing indicated a portion of State Funding per FTE Student could be explained by Total Private Giving. This research interpolated that virtually no change was predicted in State Funding per FTE Student per dollar Change in Total Private Giving. Other correlations included statistical significance between private giving variables and several ranking indicators. Many of these indicators were also correlated with state funding. The findings revealed no statistically significant evidence that private giving was used to supplant state funds. Hidden reductions in state funding increases may have occurred, although this research

Correspondence: John L. Cox
Harford Community College, 401 Thomas Run Road, Bel Air,
MD 21015, USA
E-mail: J.Cox@Harford.edu

was unable to extract such findings from the analysis. There was an indication that state funding did not keep pace with inflation. On the basis of the findings, an operational model was developed to assist institutional advancement and government relations efforts to maximize funding. The model introduced the pseudo endowment, a fiscal resource variable enabling comparisons between public and private institutions and their assets supporting operations. Discussion of supplanting theory was also raised as an outcome of this model and the underlying research.

International Journal of Educational Advancement (2011) 10, 181–210.

doi:10.1057/ijea.2011.6

Keywords: state appropriations; private giving; fund raising

INTRODUCTION

College leaders and policymakers benefit by understanding the relationship between increases in private giving, changes in state appropriations and how to position the institution to maximize both sources of revenue (Birnbaum, 1988; Light, 2005). Anecdotal and attitudinal studies suggested that fundraising success may affect state funding of higher education institutions (Johnstone, 1993; Ruppert, 1996). My quantitative study of data from Maryland's 4-year public institutions was undertaken to compare fundraising activity and state operating funding support during the period FY1997 – FY2006. This research was inspired from an understanding of public choice theory, the correlation of endowment size and institutional quality rankings, and a cost of excellence study (Ostrom and Ostrom, 1971; Swensen, 2000; Michael, 2005).

The purpose of this study was to examine the relationship between the change in the level of institutional fundraising and changes in state funding at Maryland public 4-year institutions. As state institutions have been increasingly more engaged in fundraising, the question of the

impact of private giving success on changes in state funding became more apparent in the context of increased fiscal constraint and as a mechanism to help ensure institutional competitiveness.

State funding of higher education has become increasingly more restrained, requiring tuition and other funding sources to provide a proportionately greater percentage of public institutions' overall financing (Mumper, 2001). State and local appropriations per student have declined by 4 percent in current dollars over the past two decades (College Board, 2007). As fundraising in the public institutions expanded significantly in the latter part of the twentieth century, Johnstone (1993) indicated that fundraising may actually end up substituting for state funding of higher education. Ruppert's (1996, 2001) surveys of higher education issues among legislative leaders produced a purposeful sample that indicated an overwhelming awareness among legislators that fundraising dollars can substitute for state funding. There is primary evidence to demonstrate that such a phenomenon has occurred in primary and secondary

education (Office of Management and Budget [OMB], 2006).

In this research there is some complication brought about by the creation of private donation incentive programs (PDIPs) by the states. States provide a match of funds for those public institutions that increase private giving, and the state guarantees not to allow the match to substitute for operating funding (AGB, 2008). The analysis accounted for PDIPs and other specific restricted operating grants that may have increased operating funding.

RESEARCH QUESTIONS

I examined the relationship between the change in private giving and changes in state funding at Maryland public 4-year institutions through six research questions (RQ).

RQ1: What are the funding trends by institution of the past 10 years in terms of private giving, total state funding (operating and capital funding), endowment and the state pseudo endowment level?

RQ2: What are the enrollment trends by institution of the past 10 years relative to the funding trends in RQ1 (private giving, total state funding, endowment and the state pseudo endowment level)?

RQ3: Are there statistically significant relationships among total private giving, per capita state personal income and institutional enrollment, and the total state general operating funding per FTE student?

RQ4: Are changes in total private giving significant predictors

of changes in state capital and operating funding to the Maryland public 4-year institution?

RQ5: Are total private giving, institutional wealth and SAT scores statistically significant predictors of state funding?

RQ6: Are previous year state funding, the number of private gifts and research expenditures statistically significant predictors of the pseudo endowment necessary to support state funding?

RESEARCH DESIGN

Financial and fundraising data were extracted retrospectively from existing databases and standardized financial reports from Fiscal Year 1997 through Fiscal Year 2006. Legislative activities were researched using the Maryland Department of Legislative Services, Office of Information Systems database. Ten years of retrospective data were collected from each institution using Maryland Higher Education Commission (MHEC) (2007) standardized annual financial reports by institution, the Council for Aid to Education (CAE) database, the National Association of College and University Business Officers' (NACUBO) endowment study database, and the Grapevine Survey of Higher Education Appropriations. The opportunity to search audited financial statements of institutions and IRS Form 990s, the basis for much of MHEC, CAE and NACUBO data, was beneficial to complete the dataset for this study.

I applied Light's (2005) *Four Pillars of High Performance* as the theoretical framework used to develop the research questions, acknowledging an

institutional interest to increase both state funding and private giving. Alertness, agility, adaptability and alignment were used as a context for analyzing the policies-in-use, the operationalization of state and institutional actions as demonstrated by the relationship between private giving, state funding and the need for institutions to remain competitive (Light). This required acknowledging the codified state policies that directly determine higher education funding, the policies-in-use. In addition, financial and operational data from several databases was extracted and analyzed in terms of comparative units of measure for each public, 4-year institution in Maryland and aggregate data for all the institutions studied. The change was measured in two ways. First, the change between two consecutive fiscal years, and second, as the change in data between a given year and two fiscal years, prior or future. Standardized units of measure included use of full-time equivalent (FTE) student and per capita divisors. The unit of analysis was the institution.

Variables were tested to demonstrate a relationship between enrollment, private giving, state funding and other variables within specified levels of probability (Stage and Manning, 2003). The research controlled for legislative initiatives that directly affect fundraising, such as the Maryland PDIP that leveraged private donations with state incentive funding (Education Article, § 17, 2008c). The annual reporting and funding required of the program presumably raised the awareness level among institutional leaders and state policymakers. Such incentive programs may work to

institutionalize development within the administrative infrastructure, which may generate sustained and substantial private giving over time.

I used 13 cases based on 10 years of data from 13 Maryland 4-year, public institutions in this study producing a dataset of up to $N=130$ elements. This included the 11 institutions within the University System of Maryland, Morgan State University, and St Mary's College (SMC) (see Appendix for institution list). This entire population was included in the data analysis, and the limits in generalizability to other institutions were recognized.

Inferential statistics require independence of observations. The value of any case that was included should not be predictable from the value of any other case.

The research design was limited in hypothesis testing of the relationship between private giving and state funding using 13 cases. The 13 cases were the mean calculation of each variable for 10 years within an institution. Therefore, the institutional means became the cases analyzed. The intent was to test cases, one for each institution, that would support the notion of inferential statistics and preserve the assumption of independence using 13 cases. There was recognition that the use of an average may mask relationships among the data during the time period, and evidence of that was found in the descriptive statistics in RQ1 and RQ2.

I examined fundraising patterns of Maryland's public 4-year institutions and how this related to changes in state funding of operations and capital projects, revenue sources, expenditures and fund reserves in the succeeding

year. Use of a single state with state higher education policy coordinated through a single commission controlled for policy variation that may have occurred among different states. My intent was to understand the total private giving, a combination of restricted and unrestricted giving in support of capital and operating functions of the institution, along with total institutional endowments.

I structured a research design requiring a basic understanding of institutional fundraising. Specifically, the seven terms below are important in understanding this work.

Endowment expenditure ratio (EER) is the measure of the endowment size divided by the total institutional expenditures (Schneider, 2006). The ratio can be used as a performance indicator for comparison of the wealth capacity and private giving productivity. The EER is presented as the percentage of endowment market value (MV) to institutional operating funds. The EER never exceeded 100 percent for any institution during this period, meaning the endowment was less than the total operating budget.

Expenditures generally refer to the costs incurred for instruction, research, public service, academic support, student services, institutional support, scholarships and fellowships, and operations and maintenance of facilities (Council for Aid to Education [CAE], 2007). Auxiliary enterprises, hospital services and other independent operations were not included in this research's use of the term expenditure.

Foundation is a private tax-exempt entity that has been created for charitable purposes. A foundation related to a university or college may

be considered a component unit of that institution (CAE, 2007).

Fundraising and private giving, considered synonymous, involve the efforts and outcomes of soliciting gifts for the institution (Worth, 2002).

Indicators represent ratio measures, percentages or other quantitative values that allow an institution to measure and compare its position in key strategic areas to peers, past performance or previously established goals (Taylor and Massy, 1996). For example, the EER is a broad-based measure designed to demonstrate the ability of an endowment to support and sustain the operations of an institution, accounting for private giving that is permanently endowed (Schneider, 2006).

Pseudo endowment, or state pseudo endowment, is a ratio that simulates an unrestricted endowment necessary to support an equivalent spending level equal to state funding. Using an assumed average endowment spending rate of 5 percent, if the institution receives US\$25 million in state funding, the pseudo endowment ratio would be calculated by dividing the \$25 million by the 5 percent spending level. The quotient, or endowment size, would equal \$500 million. The pseudo endowment, in this example \$500 million, would be necessary to produce the equivalent level of funding that the state provides. The pseudo endowment ratio represents a wealth measure of the institution encapsulating the state assets necessary to produce the state operating funding. The pseudo endowment recognizes the on-going presence of state funding, although subject to annual funding gyrations and, in many states, an overall reduction over time. This variable may prove

helpful with future comparisons between other institutions, both public and private, when endowment and state assets necessary to produce operating funding are discussed.

Restricted gift is an asset with a use limited by donor stipulations that neither expire nor can be changed to unrestricted by the institution (NACUBO, 2008).

The RQ1 and RQ2 reported descriptive statistics (Tables 1 and 2). The analysis included changes in both total private giving and state funding in total and per FTE student. The EER and state pseudo endowment were also included. Measures of central tendency and measures of variability were provided when applicable. Scatterplots, histograms, and descriptive graphs and tables were generated to provide a visual representation of the relationship among variables.

Following initial testing, extensive consideration was given to the concept of independence, specifically the treatment of the 10 years of data for each institution. A determination was made that the data were not sufficiently independent of each other within an institution. The research design focused on a descriptive analysis of each institution and the testing of institutional averages for the 10 years of data of each institution. This provided 13 cases representing each public 4-year institution in Maryland.

An analysis of correlation was undertaken in RQ3 – RQ6 to determine the strength of the relationship, or association, between variables being tested. RQ3 – RQ6 design utilized independent variables selected for testing of predictability using regression models based on practical, theoretical and logical considerations.

A block of IVs, as used in hierarchical multiple regression, can make a unique contribution in predicting state funding. Further, it was necessary to acknowledge that a different order of the independent variables results in different increments, which would sum to the same R^2 , which represents the proportion of the variation in the dependent variable, Y , associated with, or predictable by, the regression model.

RQ4 design analysis called for a multiple regression model treating the change in private giving as the collective sum of the predictor or independent variables, Restricted and Capital Giving, and Unrestricted Giving. This research question analyzed the relationship using Total Private Giving and the Changes in State Capital and Operating Funding. This question intended to analyze variables using multiple regression. State funding and private giving was reduced by any PDIP-related funded included in the reported financials.

The hierarchical multiple regression could approach the change in private giving in a 2-year increment, testing to see if private giving affected state funding 2 years after it was raised. There may be delayed effects between when a change in private giving occurs and if, and when, it is factored into state budget decisions. The analysis with a 2-year delay ($X+2$) was intended to control for this potential effect. This research recognized that capital funding tends to be highly variable, based on a capital improvement program that features substantial funding in disjointed intervals.

As the entire population of Maryland 4-year public institutions

Table 1: Research questions: Data analysis procedures

<i>Research questions</i>	<i>Sources of data</i>	<i>Variables</i>	<i>Data analysis</i>
1. What are the funding trends by institution of the past 10 years in terms of private giving, total state funding (operating and capital funding), endowment, and the state pseudo endowment level?	Maryland Higher Education Commission Data Book; MHEC Peer Performance Analysis Voluntary Support of Education Survey; NACUBO Endowment Study;	Total Private Givings; Total Private Giving w/o Private Donation Incentive Program (PDIP); Change in State Funding w/o PDIP; Endowment Expenditure Ratio; State Funding w/o PDIP; Endowment Market Value; State Pseudo Endowment.	Descriptive statistics; Trends among ratios – endowment expenditure ratio, pseudo endowment state funding ratio, Scatterplots. Measures of central tendency, including mean and median by institution, Carnegie Classification, and fiscal year total composite among all institutions. Measures of variability including the range, minimum and maximum, variance, and standard deviation.
2. What are the enrollment trends by institution of the past 10 years relative to the funding trends in RQ1 (private giving, total state funding, endowment and the state pseudo endowment level)?	Maryland Higher Education Commission Data Book; Voluntary Support of Education Survey; NACUBO Endowment Study;	Full Time Equivalent (FTE) Student Enrollment; Total Private Giving without PDIP per FTE student; State Funding w/o PDIP per FTE Student; Endowment per FTE Student; State Pseudo Endowment per FTE Student; Change in Total Private Giving per FTE Student; Change in State Funding per FTE Student; Change in State Funding w/o PDIP FTE Student; Change in State Funding w/o PDIP per FTE Student in 2 Fiscal Years; Budgeted Expenditures per FTE student; Capital Budget per FTE student.	Descriptive statistics; Trends among ratios – endowment expenditure ratio, and pseudo endowment state funding ratio, in terms of per FTE student; Scatterplots. Measures of central tendency, including mean and median per FTE student by institution, Carnegie Classification, and year; Measures of variability including the range, minimum and maximum, variance, and standard deviation of the change in private giving, change in state funding per FTE student.
3. Are there statistically significant relationships among total private giving, per capita state personal income, and institutional enrollment, and the total state general operating funding per FTE student?	MHEC Data Book; Maryland Legislative Services; Maryland State Office on Planning; Voluntary Support of Education Survey; NACUBO Endowment Study.	Total Private Giving; Per Capita State Personal Income; State Funding per FTE student; Institutional Enrollment, (FTE) Student; Change in Per Capita State Personal Income.	Descriptive statistics; Analysis of correlation; Simple linear regression; Initial significance of $\alpha=0.05$ for institutional and state analysis. Will report detail for relationships that exceed $\alpha=0.05$.

Table 1 continued

<i>Research questions</i>	<i>Sources of data</i>	<i>Variables</i>	<i>Data analysis</i>
4. Are changes in total private giving significant predictors of changes in state capital and operating funding to the Maryland public 4-year institution?	Voluntary Support of Education Survey (VSE); Voluntary Support of Education Survey; MHEC Data Book and Peer Performance Analysis; Grapevine Survey of Higher Education Appropriations. Maryland Legislative Services	Total Private Giving; State Funding; Capital Fundings; Change in State Operating Funding and Capital Funding.	Descriptive statistics; Analysis of correlation; Initial significance of $\alpha=0.05$ for institutional and state analysis. May include additional testing at $\alpha=0.1$, if initial testing is not significant; Hierarchical multiple regression (unable to perform)
5. Are private giving, institutional wealth and SAT scores statistically significant predictors of state funding?	Voluntary Support of Education Survey (VSE); Maryland Higher Education Commission Data Book; Grapevine Survey of Higher Education Appropriations.	Total Private Giving; Institutional Wealth; SAT scores; State Funding; Average FT Faculty Salary; Change in State Funding to next Fiscal Year.	Analysis of correlation; Initial significance of $\alpha=0.05$ for institutional and state analysis. May include additional testing at $\alpha=0.10$, if initial testing is not significant. Hierarchical multiple regression (unable to perform).
6. Are previous year state funding, the number of private gifts, and research expenditures statistically significant predictors of the pseudo endowment necessary to support state funding?	MHEC Data Book and Peer Performance Analysis; Voluntary Support of Education Survey (VSE); NACUBO Endowment Study.	Previous Year State Funding; Alumni Donors; Research Expenditures; State Pseudo Endowment; Research Expenditures per FTE Student; Total Private Giving per FTE Student.	Analysis of correlation; Initial significance of $\alpha=0.05$ for institutional and state analysis. May include additional testing at $\alpha=0.10$, if initial testing is not significant; Hierarchical multiple regression (unable to perform).

Table 2: Variables schematic by research question

<i>Research Question 1</i>	
Total Private Giving	= Unrestricted + Restricted + Capital
Total Private Giving w/o PDIP (Private Donation Incentive Program eligible contributions)	= Total Private Giving – PDIP eligible contributions
Total Private Giving minus PDIP	= Total Private Giving w/o PDIP
Change in State Funding w/o PDIP Next FY	= State Funding w/o PDIP FY + 1 – Total State Funding w/o PDIP
State Funding w/o PDIP	= State Unrestricted Operating Revenues FY + 1
State Funding w/o PDIP funds Next FY	= State Funding w/o PDIP
Endowment Market Value (MV)	—
Endowment Expenditure Ratio	= Endowment MV ÷ Budgeted Operating Expenditures
State Pseudo Endowment	= State Funding ÷ 5%
<i>Research Question 2</i>	
Total Private Giving w/o PDIP per Full Time Equivalent (FTE) Student	= Total Private Giving w/o PDIP ÷ FTE Student
State Funding w/o PDIP per FTE Student	= State Funding w/o PDIP ÷ FTE Student
Endowment per FTE Student	= Endowment MV ÷ FTE Student
State Pseudo Endowment per FTE Student	= State Pseudo Endowment ÷ FTE Student
Change in Total Private Giving per FTE Student	= (Total Private Giving FY + 1 – Total Private Giving FY) ÷ FTE Student
Change in State Funding per FTE Student	= (State Funding FY + 1 – State Funding FY) ÷ FTE Student
Change in State Funding w/o PDIP per FTE Student	= State Funding w/o PDIP per FTE Student FY + 1 – State Funding w/o PDIP per FTE Student FY
Change in State Funding w/o PDIP per FTE Student in 2 FYs	= State Funding w/o PDIP per FTE Student FY + 2 – State Funding w/o PDIP per FTE Student FY
Budgeted Expenditure per FTE Student	= Budgeted Expenditure ÷ FTE Student
Capital Budget per FTE Student	= Capital Budget ÷ FTE Student
<i>Research Question 3</i>	
Total Private Giving	= Total Private Giving w/o PDIP
Per Capita State Personal Income	—
Institutional enrollment	= FTE Student
State Funding per FTE Student	= State Funding w/o PDIP per FTE Student
Change in Per Capita State Personal Income	= Per Capital State Personal Income FY – Per Capital State Personal Income FY-1
<i>Research Question 4</i>	
Total Private Giving	= Total Private Giving w/o PDIP
Changes in State Capital and Operating Funding	= (Capital Funding FY + 1 + State Funding w/o PDIP FY + 1) – (Capital Funding FY + State Funding w/o PDIP FY)
<i>Research Question 5</i>	
Total Private Giving	= Total Private Giving w/o PDIP
Institutional Wealth	= Endowment MV + State Pseudo Endowment
SAT score	= Institutional Mean SAT Score of entering freshmen
State Funding	= State Funding w/o PDIP
Change in State Funding	= State Funding w/o PDIP FY + 1 – Total State Funding w/o PDIP
Average FT Faculty Salary	= Institution Average Full Time Faculty Salary

Table 2 continued

Research Question 6	
Previous Year State Funding	= State Funding w/o PDIP FY-1
Number of Private Gifts	= Alumni Donors
Research Expenditures	= Budgeted Operating Expenditures for Research
State Pseudo Endowment	= State Funding ÷ 5%
Alumni Donors	= Annual level of alumni participation in giving
Research Expenditures per FTE Student	= Research Expenditures ÷ FTE Student
Total Private Giving per FTE Student	= Total Private Giving w/o PDIP ÷ FTE Student

Figure 1: Total private giving and state funding institutional averages.

was being tested, the homogeneity of the group was not a likely consideration. The F test of the R^2 change indicated statistical significance with a level of significance of $\alpha=0.05$, a reasonable level given the analysis among 13 institutions. As the analyses consider statistical significance it is also important to draw attention to meaningful relationships between

variables that may not be significant yet should be noted.

FINDINGS

The data visually provided evidence (Figure 1) of a decline corresponding to the downturn in the regional economy beginning in FY2001. Figure 1 demonstrated a consistent pattern among institutions that state funding

Figure 2: Total private giving and state funding (UMCP, Research, Flagship).

returned, or exceeded, its previous highest levels within 5 years of the start of the decline. Upward movements, with some moderating declines, occurred among the institutions with private giving during the 10 years with the giving more than doubling during this period. The state funding average among the institutions did not experience a similar growth rate, although both variables gained in six of the 10 years reported. Recall that the graph of State Funding w/o PDIP (funds Next FY) represented the funding in the next fiscal year. This related to the perceived lag in funding decisions that were thought to occur that would have considered the implications of fundraising outcomes by institutions.

Figure 2, University of Maryland College Park, featured the largest changes in terms of absolute dollars in State Funding. The largest decrease was exhibited in FY2002 with a reduction of \$28.8 million. The largest increase was in FY2006, at \$41.8 million. Although these were the greatest total changes in terms of dollars, the State Funding trendline was very similar to the same trendline among the institutional averages (Figure 1), indicating a level of proportionality among the institutions during this period of study. Total Private Giving followed a pattern to more than double annual contributions in 10 years with a pattern that reflected the economic pressure of the time as demonstrated in state funding.

Figure 3: Rate of change in total private giving and change in state funding (Institution Average).

Examining the rates of change in both variables revealed a more sporadic change in private giving. As Figure 3 is examined, the graph demonstrates the rates of change for each variable. In this analysis, the change in a variable may be increasing, but the analysis was focused on the rate at which the change occurred. Therefore, while the change in funding may increase, the rate of change may decrease. The rates of Change in State Funding tended to be less variable, not as subjected to the number and intensity of annual fluctuations as the Change in Total Private Giving, although there was a substantial decline.

Figure 4, the Institutional Average, indicated that the change in endowment MV was parallel to the change in the EER for much of the decade. During the last year of the period the endowment MV flattened, growing

at 0.5 percent, while the budgeted expenditures for the institutions contracted during FY2005 with some large increases in endowment MVs occurring in FY2006 and expenditures began to increase. The pseudo endowment based on state funding, while not graphed, followed a similar pattern as the EER in most years shown below.

There are public policies that may help explain some of the funding differences among the institutions. SMC, the baccalaureate college identified as Maryland's honor college, is autonomous from the University System of Maryland (USM), with a board granted authority to prepare and implement its own operating and capital budget (Education Article, 2008). State law recognized the need for SMC to support its operations from other revenue sources; hence the

Figure 4: Endowment market value and endowment expenditure ratio (Institutional Average).

institution demonstrated a rather low pseudo endowment among Maryland institutions and a high EER.

The state espoused a funding goal that all 4-year public institutions will be funded at 100 percent of MHEC's funding guidelines (Education Article §11–105, 2008b). Before this, the state legislature approved a policy of funding higher education at 15.5 percent of the state's General Fund revenues (Education Article). The guidelines, which would apply to USM and Morgan State University (MSU), based funding on 75th percentile of revenues per FTE student of peer and aspirational institutions. After subtracting tuition and fee revenues, the state appropriation was intended to bring the institution to the 75th percentile of the comparator institutions. The state had difficulty meeting this

goal, particularly with the economic conditions existing during a portion of this period studied. A review of the descriptive statistics and charts does not provide apparent evidence of changes in state funding patterns, particularly as it relates to changes in the funding guidelines.

Further review of Morgan, an HBI doctoral institution that is also an independent state institution, indicated a level of state support below the average of all institutions in FY2006 with a state pseudo endowment of \$1.04 billion. The EER, also 17.5 percent, lagged the institutions' average of 27.9 percent. Conversely, the flagship, University of Maryland College Park (UMCP), had an EER almost double MSU's at 34.89 percent and a state pseudo endowment of \$6.58 billion. Theoretically, state assets of

Figure 5: Mean of total private giving by fiscal year (FY1997 – FY2006) among all Maryland 4-year public institutions; Education Article (2008c).

five times the level of the average of all institutions support UMCP.

Figure 5 provided a representation of the annual mean over the 10-year period and demonstrating increased private giving over time. This analytical approach looked at the institutions collectively in terms of an annual mean for comparison of state funding and private giving. The concept of this approach was based on comparing the aggregate mean among all institutions for each fiscal year for Maryland's 4-year public institutions along with a comparison of the aggregate means of change in state funding for each year. This provided a macro view of the institutional trends in both private giving and state funding changes.

Private giving tended to plateau during the period FY2001 –FY2004, which corresponded to an economic slowdown when Maryland's revenues were constrained and tuitions were increased at Maryland's public universities. The line labeled as Total Giving Ops + Capital is the same as Total Private Giving. The Total Giving Ops + Capital without PDIP contributions reflects Total Private Giving w/o PDIP. The gap between the lines began with the renewal of the

PDIP legislation for FY1999, with most institutions reaching their qualified limits by FY2004.

Interestingly, the state's commitment to fund the PDIP during this period lagged by as much as 4 years from the time the eligible private giving was received. This suggested a relationship to state revenue constraints that occurred between FY2001 and FY2004. Given the time value of money, this actually made the PDIP program less costly to the state in terms of the constant value of dollars.

Descriptive statistics demonstrated that the EER averaged 0.217 among $N=130$, representing the endowment MV to operating budget expenditures in the next fiscal year across all institutions. This translated into the endowment MV equaling 21.7 percent of the operating budget. The range was from 0.03, or an endowment of 3 percent of total operating budget, to 0.60, or 60 percent of the total operating budget.

Similarly, if the total state operating support were looked upon as an endowment necessary to support the current level of state funding with a 5 percent spending level, then during this 10-year period (Table 3) the mean state pseudo endowment would have

Table 3: Endowment expenditure ratios and state pseudo endowment by fiscal year

<i>Fiscal year</i>	<i>EER plus 1 FY</i>	<i>EER plus 2 FY</i>	<i>State pseudo endowment</i>
<i>FY2006</i>			
N	10	1	13
Mean	0.2340	0.0000	\$1281453012
SD	0.13353	—	\$1746583470
Median	0.2340	0.0000	\$528689080
Minimum	0.06	0.00	\$291858200
Maximum	0.48	0.00	\$6576190460
<i>Total</i>			
N	102	93	130
Mean	0.2166	0.2107	\$1158445345
SD	0.14761	0.14536	\$1573527090
Median	0.1660	0.1620	\$478698230
Minimum	0.03	0.00	\$77300000
Maximum	0.60	0.60	\$7186779540

been \$1.16 billion, ranging from a low of \$77.3 million to a high of \$7.19 billion, with $N=130$ cases. To put this in context, if the focus were on FY2006 data, for example, the mean state pseudo endowment was \$1.28 billion. This equated to a similar endowment size during the same fiscal year as that of Indiana University and Swarthmore College, and the figure is approximately \$1.1 billion below the endowment of Johns Hopkins University (NACUBO, 2006).

RQ1 analysis indicated private giving's growth ceased during the period FY2001 – FY2004. Private giving increased in FY2005, with large donations to the professional graduate schools and the flagship institution. The descriptive statistics also demonstrated substantial gifts that were received in two instances that had no recognizable affect on state funding. Further, the changes in funding policy during this period appeared to have little affect on

funding trends, particularly with the reductions in state funding.

State funding was subject to less variability. Within 5 years of the initial decline in state funding during the period studied, state funding returned to, or exceeded, the previous high. The initial implication was that the regional economic circumstances that affect state revenues may have related to the actual changes in state funding during the period studied. Budget reductions for higher education appeared to be related to reduced state revenues not necessarily associated with personal income.

RQ2 was distinguished from RQ1 by incorporating the effects of enrollment on the variables in RQ1. An FTE student divisor for each institution was used to calculate the trends among each variable in RQ2. The comparative analysis (Figure 6) of State Funding w/o PDIP per FTE Student and Total Private Giving w/o PDIP per FTE Student displayed similar trendlines to the total comparisons found in the previous RQ in Figure 1. The reduction associated with the economic downturn from FY2002 through FY2005 was present. Private giving followed a relatively steady slope until FY2004 when private giving plummeted on a per FTE Student basis.

Several institutions generated rather random slopes in their trendlines that represented increases and decreases during the period. In these cases, it was difficult to distinguish any potential relationship between private giving and state funding based on FTE student.

The examination of the rate of change in both variables per FTE student (Figure 7) demonstrated a trendline that was more sporadic for

Figure 6: Total private giving per FTE student and total state funding per FTE student.

private giving. The rate of Change in State Funding per FTE student was smoother, tending to be more incremental in fluctuation even with the analysis in terms of the standard measure of FTE student.

The descriptive statistics contained in Table 4 show the outcome of private giving and state support, examining the endowment and the level of state funding in terms of an equivalent pseudo endowment, the total amount of assets necessary to generate the level of state funding for institutional operations. The mean endowment per FTE student was \$4977, with a median of \$2282 and a range from \$581 to \$24028. Examining each year individually rather than using an institutional average found a range of \$403 to \$31906. The standard deviation was large, reflective of the

broad spectrum of institution types and the levels of operational resources and fundraising infrastructure.

Applying a similar rationale to the state funding of institutional operations from Table 4, the state pseudo endowment had a mean of \$152933 per FTE student, a median of \$134119 and a range of \$20547 to \$497853. The actual range based on individual institutional experience ranged from \$11048 to \$583389. The pseudo endowment represented the state wealth necessary to produce the state operating funding for an institution. This was based on an equivalent private endowment spending rate of 5 percent of assets. Again, there was a large standard deviation that related to converting the state operating funding for the different

Figure 7: Rate of change in total private giving per FTE student and change in total state funding per FTE student.

Table 4: Descriptive statistics – Endowment per FTE student and state pseudo endowment per FTE student (FY1997 – FY2006); Education Article (2008c)

	Mean	Median	SD	Minimum	Maximum
Endowment per FTE Student (\$)	4977	2282	6425	581	24 028
State Pseudo Endowment per FTE Student (\$)	152 933	134 119	113 846	20 547	497 853

N=13.

institutions to an equivalent endowment.

The graph of State Pseudo Endowment per FTE Student (Figure 8) appeared to be inverse of the similar graph of Total State Funding in Figure 1. This was partially reflective of the increase in enrollment during the period studied. The State Pseudo Endowment per FTE featured one of the lowest growth rates, 22.2 percent, among the financial variables analyzed.

Total State Pseudo Endowment growth was 40.2 percent. The implication of this was that over the 10 years studied, the theoretical assets of the state necessary to produce the funding levels that occurred grew slower than the growth in Total State Funding at 56.3 percent, State Funding per FTE Student at 38 percent, Total Private Giving at 118 percent, and Endowment at 94.5 percent. In fact, the assets necessary to support public higher

Figure 8: Pseudo state endowment per FTE student and endowment per FTE student.

education funding of 4-year institutions grew at a rate below the 28 percent consumer price index increase during the same period (Bureau of Labor Statistics, 2009). The implication of this analysis indicated additional fiscal capacity theoretically existed in the state tax revenue generating base that could support higher education. The overall growth rate during this period was small if the effects of inflation were factored into the analysis. The per FTE Student figures suggested that the state assets committed to funding these institutions, while increasing over time, increased at a smaller rate than state funding.

An initial analysis of correlation (Table 5) was completed using Total

Table 5: Correlations^a of total private giving, FTE student, and state funding per FTE student among all Maryland 4-year public institutions (FY1997 – FY2006); Education Article (2008c)

	Total private giving	FTE student
FTE Student	0.772**	—
State Funding per FTE Student	0.627*	0.064

^aListwise N=13

**significant at the 0.01 level (2-tailed);

*significant at 0.05 level.

Private Giving, Per Capita State Personal Income, FTE Students and State Funding per FTE Student. As the analysis used averages of 10 years of data, the average for Per Capita State

Personal Income was a constant. FTE Student was not significant with State Funding w/o PDIP per FTE ($r=0.064$, $P>0.1$).

The research question was non-directional, using a two-tailed test. This analysis identified a heavy, positive statistically significant correlation between Total Private Giving w/o PDIP and FTE Student ($r=0.772$, $P<0.01$) and a moderate positive statistically significant correlation between Total Private Giving and State Funding per FTE Student ($r=0.627$, $P<0.05$). As FTE Student was contained in the calculation of State Funding per FTE, the focus was on testing the predictivity with a simple linear regression model using Total Private Giving and State Funding per FTE Student.

Before performing regression testing, the assumptions of linear regression were reviewed. This included linearity, homoscedasticity, normal distribution and independence. The use of theory and previous research contained in the literature review was a basis for the current analyses and suggested linear

relationships (Johnstone, 1993; Ruppert, 2001). The examination of residual plots (Figure 9) did contain outliers. One was associated with the flagship university's substantially higher private giving mean for the period studied (see triangle marker in Figure 9). With a mean of \$64.3 million per year, this was well beyond the more typical institutional means of \$1 million – \$4 million per year. Further, the Special Focus institution was an outlier with State Funding per FTE Student. UMB with medical, dental, pharmacy, law and other graduate programs received mean state funding of \$25 500 per FTE student per year while other institutions had more typical means of \$5000 to \$8000 per FTE student over the 10-year period (see box marker in Figure 9). The figure suggested the residuals were somewhat scattered with little evidence of a fanning effect. Slight heteroscedasticity appeared having little effect on significance tests (Cohen *et al*, 2003).

The independence assumption of residual scores was checked using the

Figure 9: Scatterplot of total private giving w/o PDIP and state funding w/o PDIP per FTE student next fiscal year.

Table 6: RQ3 – Coefficients using total private giving w/o PDIP and state operating funding w/o PDIP per FTE student next FY (FY1997 – FY2006); Education Article (2008c)

<i>Model</i>	<i>Unstandardized coefficients</i>		<i>Standardized coefficients</i>	<i>t</i>	<i>Sig.</i>
	<i>B</i>	<i>SE</i>	<i>Beta</i>		
1 (Intercept)	5957.34	1498.54	—	3.975	0.002
Total private giving	0.00	0.00	0.627	2.667	0.022

Note: Adjusted $R^2=0.338$; $F(1,11)=7.11$, $P<0.05$; Durbin–Watson=2.09; Dependent Variable: State Operating Funding w/o PDIP per FTE next FY.

Durbin–Watson test. When there is no correlation between successive residual scores, the Durbin–Watson statistic will be close to 2. The result generated (Table 6) was 2.09 indicating that the independence assumption was not severely violated. Generally, Durbin–Watson results should be between 1.5 and 2.5 to indicate independence of observations.

Focusing exclusively on the relationship between private giving and state funding per student, the simple regression analysis was performed using Total Private Giving (IV) and State Funding per FTE Student (DV). Table 6 indicates the F test of R^2 Change, the proportional reduction in prediction errors due to the added IV relative to the predictor errors in the baseline model. Results were statistically significant, $F(1, 11)=7.11$, $P<0.05$.

The predictive utility was 0.338 of the Total Private Giving without controlling for other IVs. This meant 33.8 percent of variance in the State Operating Funding per FTE Student based on the 13 cases could be explained by Total Private Giving.

The simple regression model was $Y=5957.34+(0.00)X_1$, where Total Private Giving w/o PDIP was X_1 .

The t test was statistically significant, $t(11)=2.67$, $P<0.05$. The null hypothesis $H_0: \mu_{\text{Total Private Giving}} = \mu_{\text{State Operating Funding per FTE Student Next FY}}$ was not retained. Results supported the predictive utility of the IV for the DV in the population. Interpolation within the range of values of the dataset indicated that this model predicted no change in State Operating Funding per FTE Student Next per dollar Change in Total Private Giving from the Previous FY.

RQ4 asked if changes in Total Private Giving are statistically significant predictors of changes in state Capital and Operating Funding to the Maryland public 4-year institutions. There was no indication that changes in Total Private Giving were statistically significant predictors of changes in Capital and Operating Funding (Table 7). As there was a heavy, positive statistically significant correlation ($r=0.877$, $P<0.01$) between Change in Total Private Giving and Change in State Operating and Capital Funding in 2 FYs, the variables were not used for further testing of predictability.

RQ5 asked if Total Private Giving, Institutional Wealth, and SAT scores are statistically significant predictors of State Funding. Using Swensen's (2000)

Table 7: Correlation^a of change in total private giving from previous FY without PDIP and change in state operating (w/o PDIP) and capital funding in 2 FYs (FY1997 – FY2006); Education Article (2008c)

	<i>Change in total private giving from previous FY without PDIP</i>
Change in State Operating (w/o PDIP) and Capital Funding in 2 FYs	0.877**

^aListwise N=13.

**Pearson Correlation is significant at the 0.01 level (2-tailed).

research as a basis to support testing the relationship between funding and ranking indicators, these independent variables were unable to be used as predictors of state funding. Heavy, positive statistically significant correlation existed between Total Private Giving without PDIP, Institutional Wealth, and State Operating and Capital Funding in Next FY (Table 8). The remaining relationships involving SAT score and the financial variables mentioned above were not statistically significant. The findings did not support further testing for predictability.

RQ6 asked if Previous Year State Funding, the Number of Private Gifts and Research Expenditures were statistically significant predictors of the pseudo endowment necessary to support state funding. The short answer is 'no'. The heavy, positive statistically significant correlations between the variables do not enable further testing for predictability.

Previous Year State Funding was replaced with Total Private Giving per FTE Student. Also, Research Expenditures was adjusted to Research

Table 8: Research question 5 – Correlations^a of institutional wealth, SAT score, total private giving without PDIP, and state operating and capital funding in next FY (FY1997 – FY2006); Education Article (2008c)

	<i>Total private giving without PDIP</i>	<i>Institutional wealth</i>	<i>SAT score</i>
Institution Wealth	0.992**	—	—
SAT Score	0.515	0.492	—
State Operating and Capital Funding in Next FY	0.824**	0.857**	0.392

^aListwise N=10 (Special focus institution, Masters Upper Division institution, and Open Admission on-line Masters institution did not report SAT Scores).

**Correlation is significant at the 0.01 level (2-tailed).

Expenditures per FTE Student. The analysis of correlation of the modified variables (Table 9) indicated a heavy positive statistically significant correlation between Alumni Donors and State Pseudo Endowment and between Research Budget per FTE Student and Total Private Giving per FTE Student. There was no statistically significant correlation between Alumni Donors and Total Private Giving per FTE Student and between State Pseudo Endowment and Total Private Giving per FTE Student. There was moderate, positive statistically significant correlation between Research Expenditures per FTE Student and Alumni Donors and State Pseudo Endowment and Research Expenditures per FTE Student. The implication of this result suggested the level of research activity as demonstrated through budgeted funding may relate to the level of donor activity. Further, as the research budget was tied to state funding, a

Table 9: Research question 6 – Correlations of state pseudo endowment, total private giving per FTE student, research expenditures per FTE student, and alumni donors (FY1997 – FY2006); Education Article (2008c)

	<i>Alumni donors</i>	<i>State pseudo endowment</i>	<i>Research expenditures per FTE student</i>
State Pseudo Endowment	0.960**	—	—
Research Expenditures per FTE Student	0.648*	0.704*	—
Total Private Giving per FTE Student	0.502	0.538	0.968**

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

N=11

correlation to State Pseudo Endowment, which was based on state funding, appears logical. Once again, given the results of this analysis, further testing for predictability was not possible.

CONCLUSION

This study examined the relationship between and among the changes in the level of institutional fundraising and changes in state funding at Maryland public 4-year institutions retrospectively over a 10-year period. As more state institutions have become increasingly engaged in fundraising, the question of the impact of private giving success on changes in state funding became more apparent in the context of increased fiscal constraint and as a mechanism to help ensure institutional competitiveness. Anecdotal theory and attitudinal surveys indicated that public funding was reduced when private giving increased (Johnstone,

1993; Ruppert, 2001). This study did not confirm such theory and survey findings, although a predictive relationship was found between Total Private Giving and State Funding per FTE Student. RQ3 found a moderate, positive statistically significant correlation between Total Private Giving and State Funding per FTE Student. Simple regression testing indicated 33.8 percent of the variance in State Funding per FTE Student could be explained by Total Private Giving. However, the regression model demonstrated virtually no change predicted in State Funding per FTE Student per dollar Change in Total Private Giving. There was also no indication through the predictive model that Total Private Giving leveraged additional State Funding per FTE Student when controlling for the PDIP. This finding appears to substantiate Maryland's espoused policy that private giving 'may not be used as a substitute for State General Fund appropriations' (Education Article, Annotated Code of Maryland, 2008, §15–104).

The data, extracted from state and national databases for 13 public institutions in the State of Maryland, found several statistically significant relationships and trends among the descriptive statistics (Table 10). Following the interpretation of the findings, an operational model comprised of five recommendations was presented. The interpretation and recommendations support the high performance institutional assessment operation.

The State Pseudo Endowment per FTE growth in comparison to Total State Funding, State Funding per FTE and the Consumer Price Index (CPI)

Table 10: Outline of findings by research question

	Range (in \$1000s)	
	Minimum	Maximum
<i>RQ1. What are the funding trends by institution of the past 10 years in terms of private giving, total state funding, endowment, and the state pseudo endowment level? (see accompanying figures in Chapter 4)</i>		
Total Private Giving		
Institution range for 10 years (N=130)	215.1	84 044.5
Range of institutional means (N=13)	338.7	64 706.1
Range of means for all institutions by FY (N=13)	6581.6	14 368.1
Range of change mean of all institutions by FY (N=13)	-516.0	2327.0
Total State Funding		
Institution range for 10 years (N=130)	4300.1	370 688.8
Range of institutional means (N=13)	13 139.3	319 022.6
Range of means for all institutions by FY (N=13)	47 363.8	74 023.6
Range of change mean of all institutions by FY (N=13)	-5164.5	9828.7
Endowment Market Value		
Institution range for 10 years (N=130)	2400.0	332 483.2
Range of institutional means (N=13)	2941.4	257 769.9
Range of means for all institutions by FY (N=13)	29,121.5	53,852.6
State Pseudo Endowment		
Institution range for 10 years (N=130)	77 300.0	7 186 779.5
Range of institutional means (N=13)	230 377.3	6 127 171.3
Range of means for all institutions by FY (N=13)	914 278.0	1 368 429
<i>RQ2. What are the enrollment trends by institution of the past 10 years relative to the funding trends in RQ1 (private giving, total state funding, endowment, and the state pseudo endowment level)? (see accompanying figures in Chapter 4)</i>		
Total Private Giving per FTE Student		
Institution range for 10 years (N=130)	53	10 671
Range of institutional means (N=13)	77	6709
Range of means for all institutions by FY (N=13)	755	1651
Range of change mean of all institutions by FY (N=13)	-332	120
Total State Funding per FTE Student ^a		
Institution range for 10 years (N=130)	552	29 169
Range of institutional means (N=13)	1180	25 491
Range of means for all institutions by FY (N=13)	6783	9363
Range of change mean of all institutions by FY (N=13)	-618	1347
Endowment Market Value per FTE Student		
Institution range for 10 years (N=130)	403	31 906
Range of institutional means (N=13)	581	24 028
Range of means for all institutions by FY (N=13)	3388	6521
State Pseudo Endowment		
Institution range for 10 years (N=130)	11 048	583 389
Range of institutional means (N=13)	20 547	497 853
Range of means for all institutions by FY (N=13)	130 740	177 740

Table 10 continued

	Range (in \$1000s)	
	Minimum	Maximum
RQ3. Are there statistically significant relationships among total private giving, per capita state personal income, and institutional enrollment, and the total state general operating funding per FTE student?		
Total Private Giving		
Range of institutional means (N=13)	\$339	\$64 706
Per capita state personal income		
Range during period studied (N=13)	\$28 382	\$43 706
Institutional enrollment		
Range of institutional means (N=13)	\$1753	\$27 034
(Total) State (General Operating) Funding per FTE Student ^b		
Range of institutional means (N=13)	\$1180	\$25 491
Analysis of Correlation		
Correlation ^b		
FTE × State Funding per FTE Student	Not significant	
Total Private Giving × FTE Student	Significant, heavy positive	
Total Private Giving × State Funding per FTE Student	Significant, moderate positive	
Simple Linear Regression		
Regression findings		
H ₀ : $\mu_{\text{Total Private Giving}} = \mu_{\text{State Operating Funding per FTE Student Next FY}}$	Significant, H ₀ not retained	
Adjusted R ²	0.338	
B	0.000	
RQ4. Are changes in total private giving significant predictors of changes in state capital and operating funding to the Maryland public four-year institution?		
Total Private Giving		
Range of institutional means (N=13)	− 105.4	4501.4
Range of change mean of all institutions by FY (N=13)	− 516.0	2327.0
Change in state operating and capital funding in two FYs		
Range of institutional means (N=13)	2548.8	53 588.9
Range during period studied (N=13)	6523.9	45 701.2
Analysis of Correlation		
Correlation		
Change in Total Private Giving × Change in State Operating and Capital Funding in 2 FYs	Significant, heavy positive	
RQ5. Are total private giving, institutional wealth, and SAT scores statistically significant predictors of state funding?		
Total Private Giving		
Range of institutional means (N=13)	− 105.4	4501.4
Range of change mean of all institutions by FY (N=13)	− 516.0	2327.0
Institutional wealth		
Range of institutional means (N=13)	236 685.8	6 384 941.8

Table 10 *continued*

	Range (in \$1000s)	
	Minimum	Maximum
Change in state funding next FY		
Range of institutional means (N=13)	260.2	9168.7
SAT score	Range (mean score)	
Range of institutional means (N=13)	841	1237
<i>Analysis of Correlation</i>	<i>Correlation</i>	
Total Private Giving × Institutional Wealth	Significant, heavy positive	
Total Private Giving × State Operating and Capital Funding	Significant, heavy positive	
Next FY		
Institutional Wealth × State Operating and Capital Funding	Significant, heavy positive	
Next FY		
Total Private Giving × SAT Score	Not Significant	
Institutional Wealth × SAT Score	Not Significant	
State Operating and Capital Funding in Next FY × SAT Score	Not Significant	
Change in State Funding Next FY × SAT Score	Not Significant	
Change in State Funding Next FY × Institutional Wealth	Significant, heavy positive	
Change in State Funding Next FY × Total Private Giving	Significant, heavy positive	
<i>RQ6. Are previous year state funding, the number of private gifts, and research expenditures statistically significant predictors of the pseudo endowment necessary to support state funding?</i>		
Previous Year State Funding		
Range of institutional means (N=13)	\$11 110 836	\$303 864 014
Alumni donors (private gifts)		
Range of institutional means (N=13)	230	18 378
Research expenditure budget		
Range of institutional means (N=13)	\$0	\$62 480 570
State Pseudo Endowment		
Range of institutional means (N=13)	\$230 377 290	\$6 127 171 290
<i>Analysis of Correlation</i>	<i>Correlation</i>	
Previous Year State Funding × Alumni Donors	Significant, heavy positive	
Previous Year State Funding × State Pseudo Endowment	Significant, perfectly correlated	
Previous Year State Funding × Research Expenditure Budget	Significant, heavy positive	
Alumni Donors × State Pseudo Endowment	Significant, heavy positive	
Alumni Donors × Research Expenditures Budget	Significant, heavy positive	
State Pseudo Endowment × Research Expenditure Budget	Significant, heavy positive	
Research Expenditures per FTE Student × Alumni Donors	Significant, moderate positive	
Total Private Giving per FTE Student × Alumni Donors	Not Significant	
State Pseudo Endowment × Research Expenditures per FTE Student	Significant, moderate positive	
State Pseudo Endowment × Total Private Giving per FTE Student	Not Significant	
Research Exp Bud/FTE Student × Total Private Giving per FTE Student	Significant, heavy positive	

^aVariation due in part to UMUC funding versus enrollment compared to UMB.

^bVariables that were statistically significant with heavy correlations approaching 1 were not subjected to predictive testing in regression.

suggests a more subtle constrained view of higher education funding has occurred (Sowell, 1987). If the assets supporting the public funding of higher education are not maintaining equity with the CPI, then a reduction has theoretically occurred, at least in terms of constant dollars. The pseudo endowment is a potential measure to see if policy makers made decisions reducing the level of state funding increases, within the context of inflation and state assets. These findings do raise further questions that private giving may have had a subtle effect on state funding. Further research may provide a quantitative approach to answering such questions.

The use of the EER and the Endowment MV graphed as similar trendlines displaying annual change as parallel (Figure 4) could indicate the operating budget as aligned with the change in Endowment MV. Similarly, if a comparison of trendlines demonstrated the EER slowing below the rate of change of the Endowment, budgeted expenditures rate of change would be slowing or even reduced. This finding implies that while this may occur during a short time frame, it would not be sustainable over the long term. The rate of change would likely slow or decline where the trendlines would not continue in a divergent pattern over time. These trendlines become tools for comparison of two ratios that could be integrated into the alert institution's advancement planning and assessment (Light, 2005).

Given the results of this study, I offer six points as an operational model to assist institutional advancement and government relations efforts to maximize funding. First, institutional fundraising efforts should be continued

and expanded to generate more robust and diverse revenue sources to sustain operations and capital investment in the future. This research indicated that Total Private Giving was a partial predictor of State Funding per FTE Student, although there was no multiplier effect on private giving leveraging increased state funding. Moreover, the statistical analyses and figures reviewed found no indication of the supplanting of state funds with private giving funds. State policy served to encourage private giving and protect the funds from supplanting.

Second, supplanting theory needs to be formalized, building awareness and legitimizing its presence in public budgeting. Rooted in political economy and public choice theory, supplanting theory is more specialized (Buchanan and Tullock, 1967; Ostrom and Ostrom, 1971). Supplanting can affect partial changes in funding, rather than all the change in funding as would occur in zero sum theory (Thurow, 1987). Supplanting theory becomes more evident when a sudden, material increase in restricted funding occurs. If operational plans are not in place, there may be a tendency to shift current unrestricted expenditures to the restricted funds, thereby supplanting funds. A reprioritization and shifting of such finite funding to other organizations serving other needs could occur.

Third, a closer examination of potential supplanting is in order. This research did not find support for supplanting of state funds with private giving. However, in one related action by the state, the shifting of restricted funds to unrestricted operations did raise the potential for supplanting of funds over time.

Table 11: FY 2007 endowment and pseudo endowment assets and endowment expenditure ratio

	Endowment size (\$000)	Endowment per student (\$)	State funding (\$000)	Pseudo endowment (\$000)	Total endowment and pseudo endowment assets (\$000)	Total endowment and pseudo endowment assets per FYE student (\$)	Endowment expenditure ratio
Princeton	15 787 200	2 228 257	—	—	15 787 200	2 228 257	19.49
Yale	22 530 200	1 983 641	—	—	22 530 200	1 983 641	10.69
Harvard	34 634 906	1 774 875	—	—	34 634 906	1 774 875	12.49
Stanford	17 164 836	1 152 776	—	—	17 164 836	1 152 776	7.10
MIT	9 980 410	973 699	—	—	9 980 410	973 699	4.70
Cal Tech	1 860 052	891 684	—	—	1 860 052	891 684	3.70
Howard	523 690	54 654	204 404	4 443 565	4 967 255	518 394	11.24
Duke	5 910 280	475 868	—	—	5 910 280	475 868	3.08
Washington	5 567 843	473 738	—	—	5 567 843	473 738	3.39
Chicago	6 204 189	469 765	—	—	6 204 189	469 765	4.68
UNCH	2 164 444	78 091	488 678	10 623 435	12 787 879	461 373	8.32
Emory	5 561 743	458 511	—	—	5 561 743	458 511	4.94
Northwestern	6 503 292	397 390	—	—	6 503 292	397 390	5.21
Brown	2 780 798	350 226	—	—	2 780 798	350 226	5.69
Virginia	4 370 209	200 019	147 431	3 205 022	7 575 231	346 708	8.10
Columbia	7 149 803	337 398	—	—	7 149 803	337 398	3.27
Pennsylvania	6 635 187	317 336	—	—	6 635 187	317 336	2.83
Vanderbilt	3 487 500	300 647	—	—	3 487 500	300 647	2.82
Michigan	7 089 830	145 573	32 5796	7 082 522	14 172 352	290 995	6.36
Delaware	1 397 492	91 471	113 098	2 458 652	3 856 144	252 398	5.99
Johns Hopkins	2 800 377	195 434	21 009	4 567 17	3 257 094	227 308	1.29
Case Western	1 841 234	215 551	—	—	1 841 234	215 551	2.52
University of Arkansas	876 839	56 327	110 788	2 408 435	3 285 274	211 041	21.23
Yeshiva	1 409 576	189 408	—	—	1 409 576	189 408	2.79
Texas (Austin)	15 613 672	111 775	316 406	6 878 391	22 492 063	161 015	13.85
Tufts	1 452 058	156 861	—	—	1 452 058	156 861	2.77
Texas A&M System	6 590 300	78 258	275 609	5 991 500	12 581 800	149 406	8.68
UMCP	810 374	107 118	400 905	8 715 326	9 525 700	125 990	8.82
Carnegie Mellon	1 115 740	119 933	—	—	1 115 740	119 933	1.54

Table 11 continued

	Endowment size (\$000)	Endowment per student (\$)	State funding (\$000)	Pseudo endowment (\$000)	Total endowment and pseudo endowment assets (\$000)	Total endowment and pseudo endowment assets per FTYE student (\$)	Endowment expense ratio
Southern Cal	3715272	117915	—	—	3715272	117915	2.35
Georgetown	1059343	80614	—	—	1059343	80614	1.36
New York	2161800	62053	—	—	2161800	62053	1.05
Rochester	656218	55168	—	—	656218	55168	2.08
Boston U	1101386	44223	—	—	1101386	44223	0.97
Miami	409271	19705	—	—	409271	19705	1.08

Note: From 2007 NACUBO Endowment Study, National Association of College and University Business Officers, Tables 48 and 54. And from Institutional Reports, Institute of Education Sciences, National Center for Education Statistics.

Fourth, an understanding of the triad of institutional development variables relationships should be developed. This triad, private giving, institutional wealth and ranking indicators, has been found to be correlated in many cases. Building on Swensen's (2000) correlation of endowment to institutional quality, the triad serves as a framework to approach the three variables and their derivations. The triad implicitly represents a logic supporting the testing of private giving and fundraising.

Fifth, the State Pseudo Endowment and EER should be used routinely to gauge performance among institutions. The pseudo endowment determines the state wealth supporting the institution and may be useful in monitoring funding relative to inflation and the state's fiscal capacity. The EER monitors the relationship between endowment and the operating budget and is useful in benchmarking.

Both indicators also bridge the analytical gap between public and private institutions in terms of their wealth capacity, and relationship of such assets to ranking indicators would be useful for gauging competitiveness (Swensen, 2000; Zumeta, 2001; Michael, 2005).

Table 11 demonstrates how the pseudo endowment enables the comparison of financial strength of public versus private institutions. Applying a 4.6 percent weighted average for endowment spending, as extrapolated from the National Association of College and University Business Officers (2008), state funding was translated to the Pseudo Endowment to reflect the assets supporting the institutions. By adding

Endowment and Pseudo Endowment together and dividing by FTE Student, two comparison indicators are configured to enable public and private institutions to compare their total asset base and assets per student.

In the case of Howard University, federal funding in support of operations is calculated in terms of the pseudo endowment assets necessary to generate such a level of funding, given the spending rates reported in the NACUBO Endowment Study (2008). Howard University's federal support of operations generated a pseudo endowment of \$4.4 billion. This approach repositions HU much higher in terms of the endowment-type assets per FTE Student. Similarly, the University of Arkansas and University of Delaware are present in the table in terms of their endowment assets per FTE Student. Other nuances include state support provided to private institutions, such as Johns Hopkins University's Sellinger Grant for operations received annually from the State of Maryland. This reflects pseudo endowment assets that Swensen's research would not have recognized. Table 11 is based on the premise that public and private institutions can be compared in terms of endowment-type assets supporting increased financial resources improving ranking indicators.

Sixth, the alert and agile institutional leaders should encourage the state to continue a PDIP. This incentive program was directed at diversification of funding sources, sustaining institutional operations, and encouraging high performance (Zumeta, 2001; Light, 2005). Despite a potential lack in state match obligations, such incentives may increase the wealth of the institution

and further professionalize the advancement function, particularly given there was no indication of supplanting of state funds with private giving.

REFERENCES

- Association of Governing Boards of Universities and Colleges. (2008) State matching funds are boosting private giving to public higher education, <http://www.agb.org/wmspage.cfm?parm1=1490>, accessed 1 April 2008.
- Birnbaum, R. (1988) *How Colleges Work: The Cybernetics of Academic Organization and Leadership* San Francisco, CA: Jossey-Bass Publishers.
- Buchanan, J. and Tullock, G. (1967) *The Calculus of Consent*. Ann Arbor, MI: University of Michigan Press.
- Bureau of Labor Statistics. (2009) Consumer price index of all urban areas. Economic Analysis and Information Branch, http://www.bls.gov/ro3/fax_9125.pdf, accessed 7 April 2009.
- Cohen, J., Cohen, P., West, S. and Aiken, L. (2003) *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences*, 3rd edn. Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.
- College Board. (2007) 2007 trends in higher education series: Institutional finance, http://www.collegeboard.com/prod_downloads/about/news_info/trends/institutional_finance.pdf, accessed 21 October 2007.
- Council for Aid to Education. (2007) *2006 Voluntary Support of Education*. New York: Council for Advancement and Support of Education.
- Education Article. (2008a) §11–104, Annotated code of Maryland, <http://www.michie.com/maryland/lpext.dll?f=templates&fn=main-h.htm&cp=mdcode>, accessed 22 February 2008.
- Education Article. (2008b) §11–105, Annotated code of Maryland, <http://www.michie.com/maryland/lpext.dll?f=templates&fn=main-h.htm&cp=mdcode>, accessed 22 February 2008.
- Education Article. (2008c) §17 Subtitle 3, Annotated code of Maryland, <http://www.michie.com/maryland/lpext.dll?f=templates&fn=main-h.htm&cp=mdcode>, accessed 22 February 2008.
- Johnstone, D. (1993) The costs of higher education: Worldwide issues and trends for the 1990s. In: P. Altbach and D. Johnstone (eds.) *The Funding of Higher Education: International Perspectives*. New York: Garland, pp. 3–24.
- Light, P. (2005) *The Four Pillars of High Performance: How Robust Organizations Achieve Extraordinary Results*. New York: McGraw-Hill.

- Maryland Higher Education Commission (2007) Trends in general fund support per FTE, Maryland public four-year institutions FY1996 – FY2005, <http://www.mhec.state.md.us/publications/research/AnnualPublications/2007TrendBook.pdf>, accessed 19 January 2009.
- Michael, S. (2005) The cost of excellence: The financial implications of institutional rankings. *The International Journal of Educational Management* 19(5): 365–382.
- Mumper, M. (2001) State efforts to keep public colleges affordable in the face of fiscal stress. In: M. Paulsen and J. Smart (eds.) *The Finance of Higher Education: Theory, Research, Policy, and Practice*. New York: Agathon Press, pp. 321–354.
- NACUBO. (2006) NACUBO endowment study, <http://www.endowstudy.org/nacubo/survey/report2006.jsp>, accessed 30 December 2008.
- National Association of College and University Business Officers. (2008) 2007 NACUBO Endowment Study, <http://www.nacubo.org/x2376.xml>, accessed 2 February 2008.
- Office of Management and Budget. (2006) Major Savings and Reforms in the President's 2007 Budget, <http://www.whitehouse.gov/omb/budget/fy2007/pdf/savings.pdf>, accessed 4 December 2006.
- Ostrom, V. and Ostrom, E. (1971) Public choice: A different approach to the study of public administration. *Public Administration Review* 31(2): 203–216.
- Ruppert, S. (1996) *The Politics of Remedy: State Legislative Views on Higher Education*. Washington DC: National Education Association.
- Ruppert, S. (2001) *Where Do We Go From Here: State Legislative Views on Higher Education in the New Millennium*. Washington DC: National Education Association.
- Schneider, M. (2006) Endowments can become too much of a good thing. *The Chronicle of Higher Education* 52(39): B18, <http://chronicle.com/weekly/v52/i39/39b01801.htm>, accessed 19 March 2007.
- Sowell, T. (1987) *A conflict of Visions: Ideological Origins of Political Struggles*. New York: William Morrow.
- Stage, F. and Manning, K. (eds.) (2003) What is your research approach? *Research in the College Context*. New York: Brunner-Routledge, pp. 19–31.
- Swensen, D. (2000) *Pioneering Portfolio Management: An Unconventional Approach to Institutional Investment*. New York: The Free Press.
- Taylor, B. and Massy, W. (1996) *Strategic Indicators for Higher Education, 1996*. Princeton, NJ: Peterson's Publishing.
- Thurow, L. (1987) *The Zero-sum Solution: A Radical Blue Print for Economic Growth*. New York: Viking Books.
- Worth, M. (2002) *New Strategies for Educational Fund Raising*. Westport, CT: Praeger Publishers.
- Zumeta, W. (2001) State policy and private higher education. In: M. Paulsen and J. Smart (eds.) *The Finance of Higher Education: Theory, Research, Policy, and Practice*. New York: Agathon Press, pp. 396–416.

APPENDIX

Maryland Public Four Year Colleges and Universities

Maryland Higher Education Commission – Coordinating Board

Morgan State University, a historically black university

St Mary's College of Maryland, a public honors college

University System of Maryland

- Bowie State University, a historically black university
- Coppin State University, a historically black university
- Frostburg State University
- Salisbury University
- Towson University
- University of Baltimore
- University of Maryland Baltimore
- University of Maryland Baltimore County
- University of Maryland College Park, the flagship institution
- University of Maryland Eastern Shore, a historically black university
- University of Maryland University College