A Case for Multifaceted Reforms in Public Higher Education Using Performance Based Incentives

Vicky C. Langston, Austin Peay State University

Introduction

During the 2001 legislative session most southern states faced significant reductions in projected revenues due to an economic slowdown. Because higher education expenditures are a significant portion of state budgets, there has been a wide spread call to reduce state funding and cutback higher education expenditures. Unfortunately, people living in the south are not in a competitive position to make cuts in higher education. In order to generate higher incomes and world-class economies, southern states need more baccalaureate-educated people.

Quotes from administrators typically express frustration, concern over lack of support for university agendas, and threats of program cutbacks. Quotes from students typically express concern over the increases in their direct costs and possible debt. Yet average student debt remains well below the cost of a new car and earnings paybacks are typically well within five years for most public tuition. However, on average only about 40% of students graduate in a timely manner and tuition at public southern universities has accounted for much less than 40% of the costs spent at these institutions. On average private institutions are much more successful at graduating students. Perhaps private institutions are more focused on the education mission because students realize more of the full costs; but students also may be more focused because more of their own resources are at risk.

While any institution can become more productive by reassessing priorities and eliminating programs and types of activities, the production process of higher education is complicated. To date most of the discussions of higher education reforms have focused on program delivery, more intensive workloads on the part of faculty and administrators, or ways to increase the number of students by focusing on students as customers demanding anytime, anywhere service. The later is not a hallmark characteristic of a public good. Less attention is paid to the fact that students play a role in determining successful outcomes in the human capital formation process of higher education. Because of this precarious customer/input role of the student in higher education, increasing tuition can be a positive incentive. Policy makers, particularly those in the south, need to rethink reform strategies for higher education.

This paper contends that reforms in higher education need to recognize four critical factors: 1) higher education has become the financial responsibility of the people living in a particular state; 2) completion rates at some institutions are appalling low from a taxpayer/donor perspective; 3) multiple student populations have been created because of past performance and labor market conditions, and 4) higher education is a private good, albeit, with significant externalities.

Literature

In 1998, The Journal of Economic Perspectives sponsored a symposium on the economics of higher education. The symposium papers summarize the issues and relevant literature of interest. Winston (1999) identifies four key features of higher education that affect our interpretation of economic factors of supply and demand. These include the role and sources of donations, the student as both customer and input factor, higher education as an investment and process with varying opportunity costs, and branding and segmentation strategies used in the market.

Kane and Rouse (1999) review the history of "community colleges" and outcomes. Community colleges are the most racially and gender balanced institutions. They provide a similar return per year of education compared to baccalaureate programs for technical/science and professional programs usually at significantly less cost. However, there are two significant weaknesses: limited student financing options and poor success rates. The students are primarily part-time and unlikely to complete a baccalaureate degree. Longitudinal studies have all found that students starting at community college are less likely to complete a baccalaureate degree compared to students starting at a baccalaureate granting institution. The 1982 longitudinal study indicates that about 15% of community college students had attained a baccalaureate degree after 10 years compared to almost 60% of 4-year students. [Kane and Rouse 1999] The 1991 longitudinal study indicates that after 6 years less than 6% of community college students had attained a baccalaureate degree. [Horn and Carroll 1998]. The longevity studies at the national level indicate that students who drop out more likely have grade point averages below 2.0, are art-time students trying to work full-time and go to school, delay college enrollment upon finishing high school, and have less parental support in terms of supplemental income or education encouragement.[1]

Several studies of occupational wage data indicate the increased value of higher education attainment, particularly a baccalaureate degree. Census data indicate that 90% of households making over $100,000 in gross income have a head of household with a baccalaureate degree. For Tennessee, particularly, Ukpolo (1998) and Hipple (2001) indicate both positive private and public benefit-cost ratios. Hipple (2001) suggests that private gains may be as high as $1.0 million in current dollars.

Data and Methodology

This research compares aggregate data across nine southern states (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Virginia) collected by the US Census and US Department of Education. In addition, a cross-section sample of 153 institutions out of 298 institutions in these states that focus on baccalaureate education (with some master's level programs) is constructed using data on various quality and performance measures collected by US News and World Reports, faculty salary data collected by American Association of University Professors (AAUP), and institutional descriptions and statistics published in the 1999 College Blue Book.

This sample represents about 20% of all students enrolled in higher education in these states and over 50% of the non- doctoral/specialty 4-year institutions across the states. US News and World Reports describes these institutions as regional colleges and universities or small national liberal arts colleges. By eliminating the "flag-ship"

institutions that include large graduate, research, and athletic programs, the research is able to focus on the funding and institutional practices for baccalaureate education. Institutions are omitted only because of missing data for several key variables. Occasionally, an institution is included in some analysis and not others because of missing data. Unfortunately, the sample under represents students and institutions in two states: Florida and Georgia.

The purpose of considering both state level and institution level data is to be able to consider both state level patterns and institutional practices in the research questions. This cross-section database is constructed using data from a variety of points in time during the mid to late 1990s in order to have the widest possible analysis. Every attempt has been made to collate data for the 1995-96 period and most recently available data. This research is limited to published data and does not include original data collection. The bulk of the data were collected in 2000; however, each of the above sources annually updates and adds to their respective databases.

The data collected for each institution are listed below. The performance indicator of interest is graduation rate because that indicates the successful completion of a baccalaureate degree within a given time frame of no more than six years. Freshmen retention is an intermediate indicator that is currently reported by most institutions. Average incoming test scores or average high school GPA measures student quality. Because some institutions use ACT tests and some use SAT tests, the institutions are grouped and ranked into five groups based on the average scores accepted for the bottom 25% of students. Tuition indicates the student's funding responsibility. Institution practices that are measured include acceptance rate, student faculty ratio, use of full-time faculty, average salaries, extent of student diversity and living arrangements. These indicators are manageable by institutions and measure the quality of academic life available to students.

Performance Indicators
Graduation Rate
- *Intermediate Indicator* Freshman Retention Rate
Student Quality
Average GPA Incoming Freshmen- only public institutions
Rank 1-5 lowest-highest Test Scores of Bottom 25% of Students
Student Funding Responsibility
Tuition
% Receiving 100% of Financial Assistance
% Receiving Performance-based Assistance
Institution Practices
Acceptance Rate
Student Faculty Ratio
Percent of Full-time Faculty
Average Salary- Full Professor
Diversity Indicator 0,1
% of Students Living Off Campus

Findings

Current Financial Responsibility and Incentives

As indicated in Table 1, during the academic year 1995-96, over $25 billion was spent on higher education on almost two million students in the nine states. Public sector institutions accounted for about 73% of the expenditures and 76% of the students. Across the states, public institution average per student expenditures ranged between $10,000-$12,500 compared to private institution expenditures ranging between $11,000 and $26,000. National data indicate that the significant differences in public and private expenditures are among research and doctoral institutions, not institutions focusing primarily on baccalaureate education. [2]

Table 1

Higher Education Educational and General Expenditures 1995-1996

	($1,000s) Public E&G	($1,000s) Private E&G	Public Students	Private Students	Per Student Costs Public	Private
Alabama	$1,880,788	$287,587	158,753	19,983	$11,847	$14,392
Florida	$3,390,561	$1,320,668	336,863	85,424	$10,065	$15,460
Georgia	$2,366,561	$1,205,439	188,954	59,311	$12,525	$20,324
Kentucky	$1,419,040	$287,055	115,001	25,326	$12,339	$11,334
Mississippi	$1,111,120	$122,699	92,945	10,122	$11,955	$12,122
North Carolina	$2,881,827	$1,592,275	224,055	61,653	$12,862	$25,826
South Carolina	$1,369,352	$294,984	109,459	22,894	$12,510	$12,885
Tennessee	$1,627,212	$1,017,011	142,785	47,921	$11,396	$21,223
Virginia	$2,282,078	$756,700	204,704	51,008	$11,148	$14,835
	$18,328,539	$6,884,418	1,573,519	383,642	$11,648	$17,945

SOURCE: U.S. Department of Education, National Center for Education Statistics, Higher Education General Information Survey (HEGIS), "Financial Statistics of Institutions of Higher Education" surveys; and Integrated Postsecondary Education Data System (I

Although the numbers differ slightly between Tables 1 and 2 because of accounting years and funding sources for technical schools and community colleges, the consolidated state government financial reports in Table 2 allow us to compare higher education financing compared to other state obligations. Higher education is the most significant component of state budgets other than the management of federally funded welfare programs and highway construction. With the exception of Florida, which uses local funding for community college systems, higher education expenditures account for 10-15% of state budgets.

Table 2

State Level Financing of Higher Education - 1996

	US AVG	AL	FL	GA	KY	MS	NC	SC	TN	VA
Total State Expenditures	$859.6	$12.1	$36.5	$20.0	$11.8	$8.2	$21.2	$12.4	$13.7	$17.8
Higher Education	$85.3	$1.9	$2.4	$2.4	$1.4	$0.8	$2.7	$1.5	$1.9	$2.6
Fees& Revenues: Hi Ed	$37.1	$0.8	$0.8	$0.7	$0.7	$0.3	$1.1	$0.6	$0.6	$1.3
Fees/Revenues as a % of Hi Ed Expenditures	43%	41%	33%	31%	47%	41%	41%	41%	32%	51%
Hi Ed Expenditures % of All State Expenditures	10%	15%	7%	12%	12%	10%	13%	12%	14%	15%
State Income Tax as % of Total State Taxes	32%	30%	0%	41%	32%	19%	41%	35%	2%	48%

Source: US Census

The states vary in who is financially responsible. However, the burden generally falls to taxpayers and institutions. Currently private tuition covers between 50-75% of costs. Public tuition represents between 15-35% of costs. Georgia, Tennessee, and Florida place most of the financial responsibility on taxpayers. Virginia places much more financial responsibility on students and other institution generated revenues, a funding model that more closely matches private sector practices. Combining the information from Tables 1, 2, and 3 suggests that North Carolina with the lowest average public tuition (Table 3) and highest average costs per student (Table 1) has a fairly unique system that shifts financial responsibility to other university revenues and taxpayer income. The result is that 89% of incoming freshmen students stay in-state (Table 4) compared to a national average of 74%. Institution specific data (Figure 4) indicate that North Carolina public universities graduation rates are second behind Virginia; but over all baccalaureate attainment and high school graduate conversion rates are below Tennessee (Table 6)

Table 3 indicates the extent of the private tuition- public tuition gap by state and recent tuition increases. Public tuition averages only 15-35% of private tuition. Private sector increases across the states are slightly more consistent. At the national level, private sector tuition rose slightly more than public sector tuition. The southern states were split. Tennessee and Mississippi experienced significant increases in public sector tuition compared to the private sector. Over the last two years, Tennessee has experienced significant state budget problems requiring additional tuition increases, and has announced a 15% increase in tuition for academic year 2001-2002 in response to a no new taxes state budget. The Hebel (2001) reported in the Chronicle of Higher Education that Alabama has raised tuition up to 16.8% and Mississippi has raised tuition 15% at public institutions. With these increases current average tuitions remain at or below the US average in 1998-99.

Table 3

Average Tuition at 4-year Public or Private Institutions

State	Public 1997-98 In-state	1998-99 In-state	Increase	Private 1997-98 Tuition	1998-99 Tuition	Increase
United States ..	$3,110	$3,226	4%	$13,344	$14,003	5%
Alabama	2,488	2,621	5%	8,241	8,487	3%
Florida	1,911	2,022	6%	11,525	12,210	6%
Georgia	2,356	2,442	4%	11,241	11,861	6%
Kentucky	2,327	2,516	8%	8,600	9,082	6%
Mississippi	2,571	2,859	11%	7,784	8,303	7%
North Carolina	1,895	1,958	3%	12,307	12,927	5%
South Carolina	3,414	3,520	3%	10,660	11,237	5%
Tennessee	2,296	2,495	9%	11,090	11,604	5%
Virginia	4,052	4,160	3%	11,811	12,281	4%

NOTE.--Data are for the entire academic year and are average charges. Tuition and fees were weighted by the number of full-time-equivalent undergraduates in 1997, but are not adjusted to reflect student residency. Room and board are not included.
SOURCE: U.S. Department of Education, National Center for Education Statistics "Fall Enrollment" and "Institutional Characteristics" surveys. September 1999

In addition to the direct financial responsibility associated with user fees, Virginia also collects the highest percentage of total state taxes from personal state income taxes. As indicated in the literature review, studies directly link higher income and education. Therefore the use of income taxes is a benefit related funding mechanism, much like an implied mortgage. On the other hand, Tennessee and Florida rely on sales taxes. In addition to an income tax, Georgia now relies on a lottery. These sales tax and lottery systems are all notably regressive systems. That is lower income people pay relatively more of their income than higher income taxpayers. Consequently, state funding of higher education based on sales taxes and lotteries is using neither the beneficiary nor the ability to pay principles common in public finance literature for determining financial responsibility.

The data in Table 4 confirm why higher education is a state level responsibility. Seventy five to eighty-nine percent of incoming freshmen remain in-state. With few exceptions, southerners are more likely to stay in their home state for a college education than students in other states. . At the national level 4- year institutions, traditional students (under age 24) represent 60-65% of the population at non-doctoral granting institutions and 70-75% at doctoral granting institutions.[3]

If incoming freshmen are more likely state residents, it is even truer for working adults returning to complete degrees. At baccalaureate-focused institutions 35-40% of students are likely to be working adults living in the area and attending the institution whether public or private. Therefore these institutions are often serving a bimodal student population requiring more flexibility.

Table 4

Freshmen Selection of 4-Yr Higher Education In-State or Out-of- State- 1996

State	Total Enrollment in the state	Student Residents of a state: Attending college in any state	Attending college in home state	In-state Share
United States	1,015,534	996,330	737,654	0.74
Alabama	16,164	13,174	10,960	0.83
Florida	29,148	28,947	20,721	0.72
Georgia	26,849	26,094	20,329	0.78
Kentucky	16,085	15,127	12,619	0.83
Mississippi	8,452	6,979	5,632	0.81
North Carolina	32,526	25,111	22,309	0.89
South Carolina	16,152	13,732	11,185	0.81
Tennessee	21,110	18,475	14,414	0.78
Virginia	30,941	26,928	20,002	0.74

NOTE.--Data are for 4-year and 2-year degree-granting higher education institutions that were eligible to

participate in Title IV federal financial aid programs in the 1996-97 academic year.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary

Education Data System (IPEDS), "Residence of First-Time Students" survey, 1996. January 1998.

The data in Table 5, although based on the old 1990 census, illustrate the magnitude of the value of higher education in the south over a working lifetime even before the information age and service economy shift of the 1990s. The cross section data for Tennessee and Virginia indicate that males between age 25 and 65 would likely earn in 1989 dollars over $450-475,000 more with a baccalaureate degree than a high school degree and over $300,000 more than dropping out of college or only completing an associate degree. While the results are less for women, the data indicate a greater variance, which speaks more about the capacities of local economies to utilize educated women. The data also indicate that it may be even more economically valuable for women to pursue higher education immediately after high school rather than wait.

Table 5

Earnings Differences Based on Education and Sex- 1990 Census

	Tennessee		Virginia	
	Male	**Female**	**Male**	**Female**
25 to 29 years:.....				
Bachelor's degree-High School Diff	$41,280	$39,475	$45,850	$48,490
Bachelor's degree-Some College Diff	$28,270	$26,305	$31,570	$33,430
30 to 34 years:.....				
Bachelor's degree-High School Diff	$71,410	$50,980	$66,675	$62,970
Bachelor's degree-Some College Diff	$48,250	$33,050	$44,985	$40,145
35 to 44 years:.....				
Bachelor's degree-High School Diff	$99,605	$55,510	$95,375	$65,680
Bachelor's degree-Some College Diff	$70,325	$33,435	$66,180	$41,440
45 to 54 years:.....				
Bachelor's degree-High School Diff	$139,845	$45,925	$130,070	$67,540
Bachelor's degree-Some College Diff	$96,820	$26,755	$91,285	$40,775
55 to 64 years:.....				
Bachelor's degree-High School Diff	$117,500	$45,275	$136,415	$55,115
Bachelor's degree-Some College Diff	$68,910	$25,880	$93,175	$30,175
Cumulative Working Age Difference				
Bachelor's degree-High School Diff	$469,640	$237,165	$474,385	$299,795
Bachelor's degree-Some College Diff	$312,575	$145,425	$327,195	$185,965

Source: based on data from the US Census 1990

From the student's perspective the out-of-pocket education costs are paid back in less than five years. The issue then is the opportunity costs of not working immediately after high school and having the resources to pay living expenses. The 1990 Census data indicated that high school graduates age 18-24 earned about $10,000.[4] A current minimum wage job would earn about the same. This would suggest a cumulative opportunity cost of around $40,000-50,000 for the four-five years as full-time student. In inflated dollars, this would be roughly comparable to the total direct costs (student and taxpayer portions) of a baccalaureate degree. US News and World Reports indicates that room and board costs at the public institutions are between $2000 and $5500 per year. These costs are very likely cheaper than "living on the economy" considering a $500/month apartment would be $6000 except perhaps remaining with parents.[5]

These rough estimates indicate that students could realize a payback period for all costs, direct and indirect, somewhere around 10 years. This suggests an investment and funding horizon suitable for 10-15 year loan programs. Based on the wage differentials above taxpayers and students lose 33-40% of their potential return when the baccalaureate degree is not completed. However because the payback period for direct student expenditures is about the same, it is the taxpayer portion of the investment that is most at risk.

Based on recent tax collection estimates that compare Tennessee and Virginia, it is not clear that a student in either state ever pays back the entire taxpayer portion of the cost of higher education as a future taxpayer. Only the very highest income groups are likely to pay enough differential taxes to cover the taxpayer portion. For example, a Tennessee taxpayer in the $100-200,000 income group pays about $5300 in state and

local taxes compared to $2500 for the taxpayer in the $30-50,000 income group, the income group including the average manufacturing worker in the state. Even in Virginia where the tax range is $10,900 to $3200.

Regardless of the subsidy implied in the data, the 2000 Census data in Table 6 indicate that only Virginia has a truly world class educated workforce among southern states with almost 38% of young adults having a baccalaureate degree or higher- almost 10 percentage points higher than the next states, Tennessee and North Carolina. Another difference is evident in the 1990 Census data in Table 5. Virginia employers have valued college educated women in the workforce.

Table 6

Education Attainment Estimates in 2000

			Degree Completed		
	Population Characteristics		HS	BA or more	BA Conversion
State			Percent	Percent	Rate
Alabama	25 to 44 years	1,243	83.4	21	25.2%
Florida	25 to 44 years	4,353	88.1	24.2	27.5%
Georgia	25 to 44 years	2,664	89.7	25.3	28.2%
Kentucky	25 to 44 years	1,098	89.1	24.3	27.3%
North Carolina	25 to 44 years	2,325	87.2	27.9	32.0%
Tennessee	25 to 44 years	1,659	87.1	28.1	32.3%
Virginia	25 to 44 years	2,115	92.3	37.6	40.7%

Source: US Census 2000- 25 largest states only

Institutional Practices and Student Responsibility

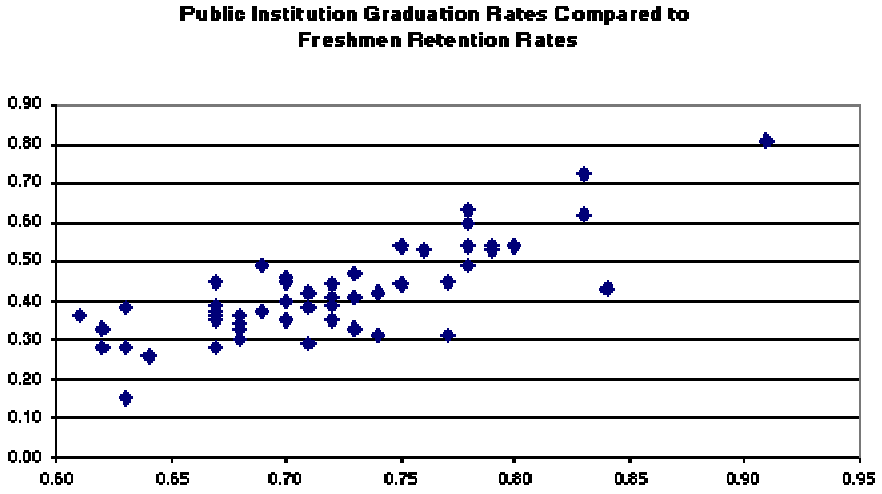
If baccalaureate education is a primary means to achieve higher incomes, then private sector institutions and those students have better achieved their mission. At the national level about two-thirds of private students achieve a baccalaureate degree compared to 47% of public students.[6] Using the sample of southern institutions, students at private institutions are also more likely to graduate, albeit, lower than national estimates.[7] For the 101 private institutions, the mean graduation rate is 50% and the median is 49%. For the sample of 52 public institutions, the mean is 42% and the median is 40%. Only 20% of the sample public institutions achieve the 50% average graduation rate of the private sample.

Completion rates are appalling low from a taxpayer/donor perspective. Among the target age group (age 25-44) for higher education over the last ten years, southern education institutions, state legislatures, taxpayers, and students have left a difficult economic and education gap to bridge despite low tuition and monetary incentives. The current subsidy system is not working. Consequently, reforms need to consider increasing incentives both for students and institutions.

Why are public institution students more likely to drop out? With low tuition relative to cost and financial incentives why is education attainment in the south so low? Clearly reforms are needed to secure the return on the taxpayer's investment and begin to make up for past performance. The first research question examines significant factors in determining graduation rates. The second question examines whether public institutions should continue as the dominant higher education resource.

There are exemplary institutions among the sample of public institutions. Figure 1 suggests that freshman retention is a key determinant in higher graduation rates. However on average, based on the samples, both public and private institutions retain on average 72% of freshmen. Consequently, while freshmen retention is an important factor, accounting for a loss of over 25% of potential graduates, it is does not seem to define the difference between overall private and public success rates. Possibly, sophomore retention is a more defining measure, but that information is not reported.

Figure 1



What do private institutions possibly do differently after freshmen year? Three things are readily apparent. Private institutions charge students more, are significantly smaller and segment the student market at least for the best-qualified students. Figure 2 indicates that among private institutions in the sample there is a positive relationship between graduation rates and the tuition level that students pay. Figure 3 indicates that there is some relationship between student quality based on test score rankings of the bottom 25% of students at the institution and tuition. However, there is at least one "high-priced" institution that accepts lower quality students. But as Figure 2 indicates that institution has difficulty in graduating students. Consequently, both student quality and tuition incentives are a part of the graduation success formula.

Figure 2

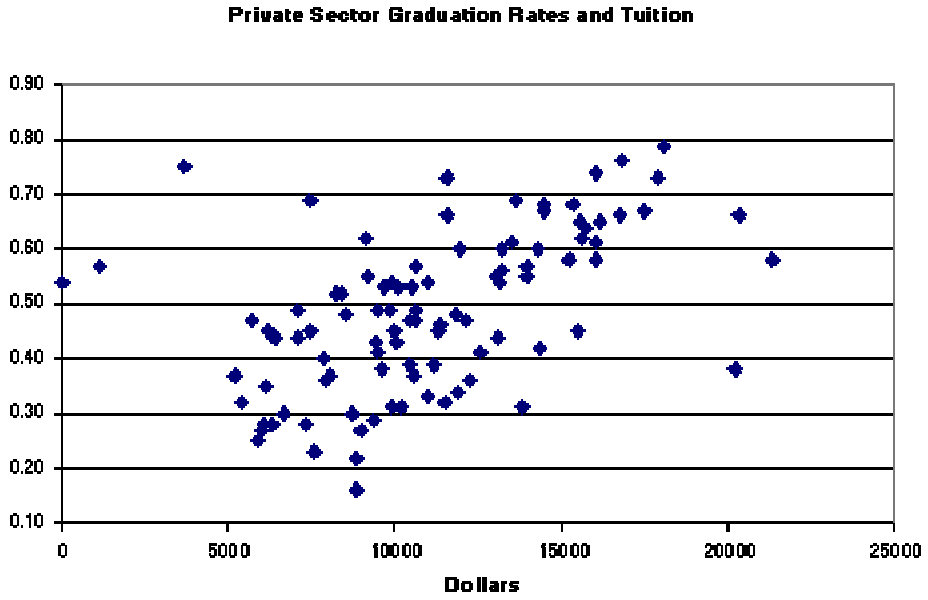
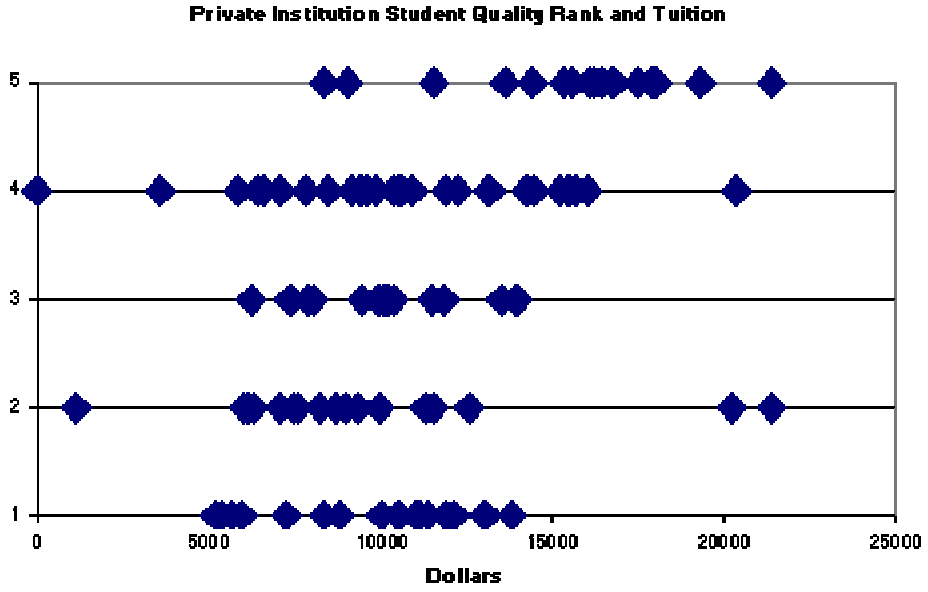
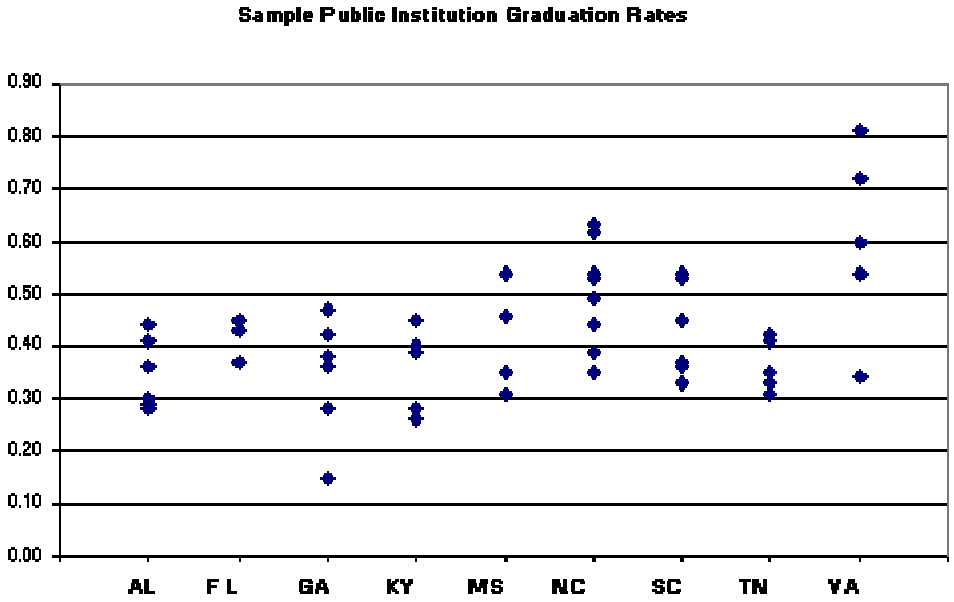


Figure 3



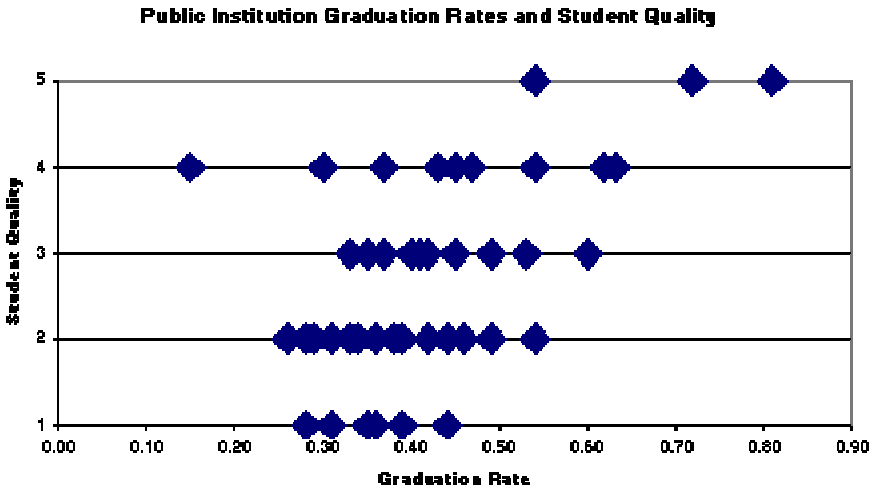
Among the public institutions in Figure 4, Virginia institutions have the highest graduation rates at more public institutions than other southern states. North Carolina, South Carolina and Mississippi all have some institutions achieving the mean private sector graduation rate. Most of the state systems have also developed some segmentation based on student quality. Tennessee, appearing to have one of the more balanced systems, unfortunately has graduation rates well below 50%.

Figure 4



If we look at student quality based on the test score rankings in Figure 5, student quality and graduation rates follow a pattern similar to the private sector. However, the variances across institutions are significant.

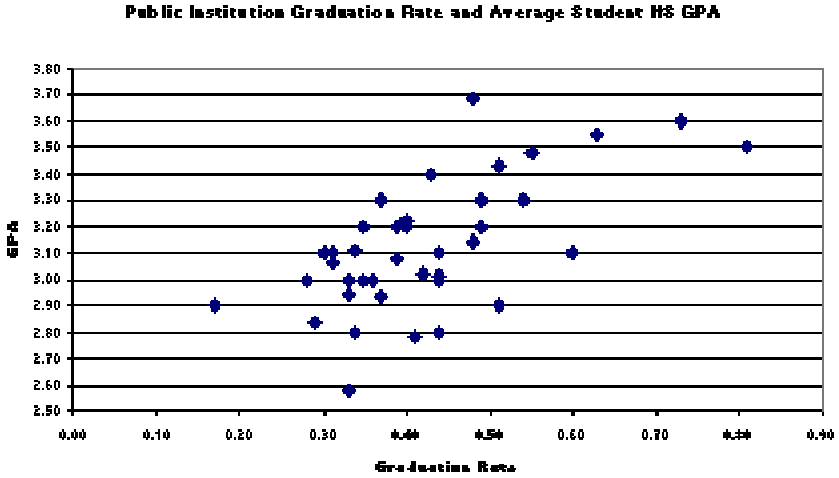
Figure 5



In 2001, US News and World Report began reporting average high school GPA of incoming students at an institution in addition to the average test scores of the top and bottom 25% of students. This sample, however, is smaller than that in Figure 5 because

of missing data. Figure 6 stresses again the significant role of students themselves in the human capital formation process. Using average GPAs rather than grouped rankings gives us a more continuous relationship between student quality and graduation success rates. What we see is that institutions that attract A students graduate 50% or better. Whereas schools that attract B/C+ students are unlikely to achieve 50% graduation rates. Again there is enough variance to indicate institutional or social factors at play. Consequently, student quality is not the sole factor and institutions are in part accountable for successful outcomes.

Figure 6



Therefore, we need to explore some possible factors that may provide incentives or disincentives to improving degree completion rates in a timely manner. One factor to consider is race. Southern states have struggled over the last 10 years to provide equal access to higher education. With large minority populations, it is essential that minorities are successful in higher education for the aggregate population to achieve world-class status. Figures 7 and 8 are somewhat disturbing. Beginning in 2001, US News and World Reports categorizes whether an institution is diverse or not based on the percentage of minority students compared to the national average (17%). The data indicate that institutions that have strived for diversity are likely to have lower graduation rates and on average lower quality students.

Figure 7

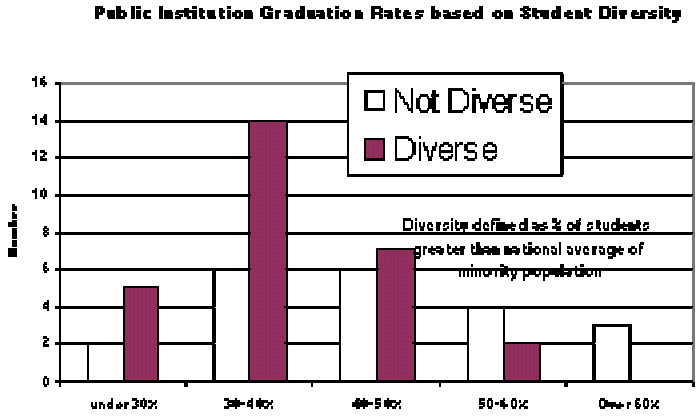
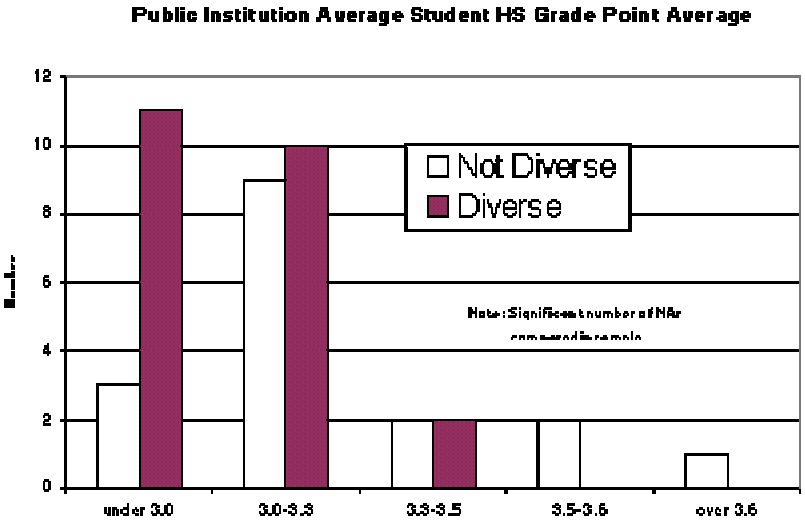
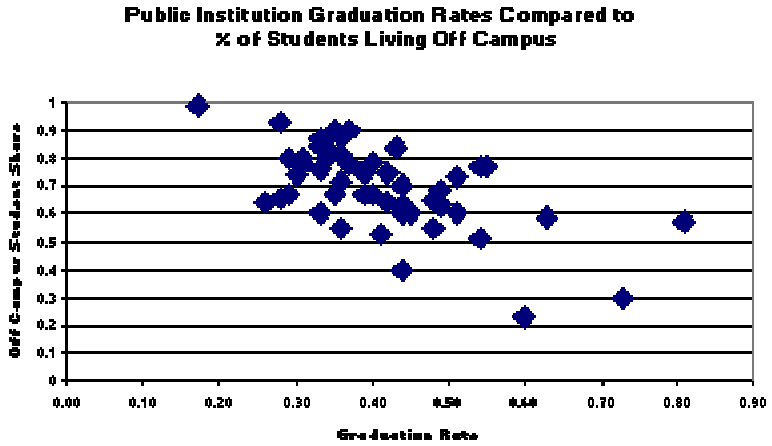


Figure 8



Another factor is the degree to which students live on campus. Figure 9 indicates that graduation rates are negatively associated with the share of students not residing on campus. This suggests that emersion in the campus environment is another significant factor for successful outcomes. How diversity is developed and managed and how a campus environment is fostered are institutional responsibilities.

Figure 9



The Model Results

Using simple multiple linear regression analysis, we test the significance of the relationship between select factors and graduation rates among the public sector institutions. The multiple regression technique allows us to account for interdependencies. We use two samples of the fifty-two public institutions. For the regression analysis only 48 observations have complete enough data and to consider GPA only 38 observations are available. Models 1 and 3 consider student GPA for the student quality factor. This series is a more continuous series than the test score rankings. Results are in Table 7.

In Model 1 the significant variables related to graduation rate are freshmen retention, off-campus living, and tuition. Diversity and student GPA Have the expected signs but are less significant. In Model 2, confirms the orders of magnitude for the other coefficients using the larger dataset by excluding student GPA. Because freshmen retention is an intermediate outcome, Model 3 considers other factors. Student GPA and the percentage of full-time faculty, replace freshmen retention as significant variables and diversity becomes insignificant. Acceptance rate and student faculty ratios were tested in the models and proved to be insignificant in all three models.

Table 7

Regression Models for Graduation Rates

	Model 1		Model 2		Model 3	
R2 adjusted	0.91		0.84		0.72	
F Stat	79.2		41.9		19.89	
Observations	38		48		38	
Intercept	-0.72	*6.07*	-0.47	*-2.22*	-0.99	*-2.66*
Student GPA	0.06	*1.48*			0.33	*5.94*
Tuition	3.00E-05	*3.04*	2.00E-05	*2.13*	3.60E-05	*1.98*
Off Campus	-0.17	*-3.35*	-0.18	*2.98*	-0.26	*-2.8*
Fr. Retention	1.41	*9.38*	1.4	*10.15*		
Diversity	-0.02	*-1.34*	-0.03	*-1.93*	-0.017	*-0.71*
Full-Time Faculty			0.002	*0.01*	0.54	*2.2*

T statistics in italics

The statistical analysis provides an indication that the most significant performance factors to improve graduation rates include increased student financial responsibility, attraction of quality students, and an improved campus lifestyle including additional living quarters and full-time faculty.

These findings are similar to earlier research that included data on private institutions as well. That research found that significant factors in explaining graduation rates were freshmen retention, bottom quartile student quality rank and student-faculty ratios. Freshmen retention significant factors included bottom quartile student quality rank, student faculty ratio, percent of full-time faculty and faculty salaries. The student-faculty ratio was significant in the earlier work because of the differences between private and public institutions.

The second issue is given the performance as measured by graduation rates, should the public sector continue to be the dominant provider of higher education? Because the public sector is the largest provider of higher education, many people consider higher education a public good. However, this is not a correct perception. The definition of a public good accepted by economists is a good or service for which consumers cannot be excluded and additional users do not detract from the benefit of current users. Almost every higher education institution rejects applicants. The average acceptance rate among the sample public institutions is 71-72%. However, rather than performance, most state funding formulas have been based primarily on headcount suggesting that economies of scale are not recognized or realized. In fact, the data indicate that many smaller private institutions spend only slightly more per student than public institutions.

Despite the weaknesses in the public sector and the private sector has a sound record of performance in the south; private institutions have not grown in many states comparable to national performance. Private enrollments have actually declined in Mississippi and South Carolina and have grown at only 58% of the public institution enrollment in Tennessee. Georgia and Florida have experienced the most significant increases in both sectors. The very nature of the private sector allows institutions to pick markets and student populations. While the private sector could be called upon to play a more significant role in higher education, there are potential consequences resulting from the segmentation strategies used including religion, ethnicity and academic background that can result in significant externalities. Therefore reforming the public sector may be the taxpayers' and student's best option.

Table 8

Full-time-equivalent Enrollment in Institutions of Higher Education

	Public			Private		
	1990	1997	%CH	1990	1997	%CH
United States	7,557,982	7,839,374	4%	2,425,454	2,645,352	9%
Alabama	154,343	154,360	0%	20,267	20,913	3%
Florida	302,579	344,129	14%	80,806	92,266	14%
Georgia	149,115	193,499	30%	49,434	61,963	25%
Kentucky	111,858	114,305	2%	25,793	26,197	2%
Mississippi	92,269	98,900	7%	11,688	9,804	-16%
North Carolina	208,321	219,946	6%	60,704	64,588	6%
South Carolina	101,918	110,955	9%	25,307	24,779	-2%
Tennessee	130,184	145,833	12%	45,777	49,021	7%
Virginia	202,285	210,229	4%	49,423	51,441	4%

Note: based on fall data

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), "Fall Enrollment" surveys. July 1999.

Recommendations and Strategies to Improve Graduation Rates

As a private good, it is the value of the private good and associated externalities that should be considered in pricing and subsidy schemes for higher education. Benefits appear to be at least one-third more for degree completion. Without degree completion, income potential with a community college education is virtually the same while state expenditures per student are considerably less.

Therefore public institutions should consider the following three strategies: 1) raise public institution tuition and institute a performance-based financing system for students, 2) design funding formulas that reward institution performance by recognizing the nature of student quality, ethnic diversity and faculty availability as factors important for successful outcomes, and 3) develop new on or near campus housing options for traditional and non-traditional students and other activities that sustain student and faculty connectedness.

Raising public institution tuition to the point that students begin to understand the total cost and financial responsibility is a sound strategy that will likely lead to positive results. To counter the loss of students responding to price increases, a subsidy system could and should be revamped around increased loans, which are a call on almost certain future income increases, or tuition or loan forgiveness programs based on student academic performance. This type of incentive program prevents institutions or students from simply encouraging graduation with very low grades that reduce the earnings potential of a degree. Also expanding financial assistance options will help students, who are focused on their education but have less financial resources, complete a degree. This type of program would require the state to develop a new loan program and finance an initial loan fund. This type of program more closely parallels the private sector model holding students financially accountable for performance and rewarding scholarship not attendance.

Because much of student quality is determined by the K-12 experience as indicated by test scores and incoming student GPA's, part of the reform effort and

incentive programs must be directed to K-12 program student performance. K-12 systems should be rewarded for student higher education performance. Because many public institutions are regional in nature, it will be difficult to implement the kinds of segmentation strategies that private institutions use to augment performance and target donors. Furthermore, higher education incentive systems must recognize student quality as a factor and reward institutions that take below average students and successfully graduate those students. When institutions serve less academically qualified students, they require more not less resources to achieve quality results. If not, the public sector will perpetuate and further exacerbate the externalities created by the student quality segmentation strategies.

Public institutions should also pursue increased on-campus or near campus housing for students. Increased exposure to the campus lifestyle apparently helps students to focus their priorities. In addition, it may help defray living costs and reduce significant opportunity costs. Institutions should explore with local housing authorities and possibly HUD new multifamily housing initiatives. This strategy is similar to the movement after World War II when married student housing was developed for GI Bill veterans. The data strongly suggest that the commuter school model is flawed.

The third set of strategies, however, must recognize two very distinct student groups: the new high school graduate and the backlog of students who did not complete their degree the first time. The data suggest that there is much less value in the baccalaureate degree if completion is prolonged. This has been especially true for women, who make up the majority of the non-traditional aged students. Consequently, developing lifelong learning opportunities for the working public should not be confused with the focused attention needed to generate a sufficient workforce with a timely and high quality baccalaureate education. The south is behind and this should be the paramount economic development strategy for southern states.

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[1] Horn and Carroll 1999. p 25-26.
[2] US Department of Education…
[3] US Department of Education (1998). Profile of Undergraduates in US Post secondary Education Institutions: 1995-96. p 87.
[4] US Census 1990.
[5] US News and World Report College Rankings 2001.
[6] Horn and Carroll 1999. p 16.
[7] In various graphics, observations may be missing due to missing data for a particular variable.

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