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[i] Produced by the Texas Comptroller's staff, 3/15/2010. Source HIS Global Insight, Inc., World Overview: First Quarter 2010.

[ii] Texas Works: Training and Education for All Texans, Chapter 2: Education and the Texas Work Force, Window on Ste Government, http://www.window.state.tx.us/specialrpt/workforce/education.php.

[iii] US Census Bureau, *The 2010 Statistical Abstract*, table 271. Degree-Granting Institutions, Number and Enrollment by State:2006. Current data (2010) from the THECB, reports an increase to 246 institutions.

[iv] NSF, Science and Engineering Indocators, 2008, January 2008, biennial. Reported in US Census Bureau, *The 2010 Statistical Abstract*, table 790. Science and Engineering (S&E) Doctorates by State:2006.

[v] Inflation adjusted using R. Sahr, (2008) Oregon State 2007 CPI Conversion factors, extrapolated to 2010.

[vi] Barr, Nicholas *The benefits of education: What we know and what we don't.* London School of Economics.

[vii] R. Ehrenberg, M. McGraw, J. Mrdjenovic (2005) Why Do Field Differentials In Average Faculty Salaries Vary Across Universities, ILR Collection, Working Papers, Cornell University ILR School.

[viii] Henry, David (1975) Challenges Past, Challenges Present, An Analysis of American Higher Education Since 1930, An Essay For The Carnegie Council on Policy Studies in Higher Education, Jossey-Bass.

Cost Drivers in Higher Education: Texas in the Global Market

Prepared for the Texas Senate Higher Education Committee, September 16, 2010

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Introduction

Texas is one of the largest economies in the world and requires a world class workforce. In 2009 Texas is the 11th largest economy as measured by GDP, larger than Russia and India[i]. Texas is the second largest economy in the United States. Its US state peers are California and New York.

An educated workforce fuels this economy. The research done on *Closing the Gaps* points to a shortage of workers for jobs with a higher education. The Texas Workforce Commission projects an annual need for 68,000 bachelors' degree holders, 9,000 masters' degree holders and 3,000 doctoral degree holders to support the Texas economy[ii]. The latest available data from the US Census Bureau shows that we are falling far short of this need. There are 101 public institutions of higher education in Texas. Of these 35 are comprehensive universities producing graduate degrees in STEM fields.

In 2006 the Census Bureau reported the number of degree granting institutions by state. California has 416, NY 307, Texas 214[iii]. In 2006 the higher education enrollment in California was 2.4m. The enrollment in Texas was 1.2m. In 2006 the State produced 1930 science and engineering doctoral degrees, less than half of the annual production in California[iv].

In the 2010-2011 Biennium that State appropriated $75,450m to all agencies of education, 41% of the State budget. The appropriation to General Academics was $6,357m, more than double what it was five years ago.

The appropriation history confirms that higher education spending has increased. What are the major questions that come to mind?

- What is the effect of inflation
- What are major areas of spending?
- What are the causes in each of these areas?

Review of the past 10 years of UHS and UH spending

The University of Houston System is the state's only metropolitan higher education system, encompassing four universities and two multi-institution teaching centers.

The universities include the University of Houston, a nationally recognized doctoral degree-granting, comprehensive research university; the University of Houston-Downtown, a four-year undergraduate university beginning limited expansion into graduate programs; the University of Houston-Victoria, enrolling a freshman class for the first time this year; and the University of Houston-Clear an upper division and master's-level institution.

The University of Houston is the third largest university in Texas, and the doctoral degree granting, research institution of the UH System. UH is among the most diverse research universities nationally, serving more than 38,000 students with nearly 300 undergraduate and graduate programs. UH aspires to be the state's next nationally recognized Tier One research university, and currently has over $100m in research grants. We have established a goal of increasing research to $150 million by 2015.

Ten years of spending data were extracted from the University of Houston System's data warehouse, which includes total expenditures and expenditures from State funds, consistent with the LAR object of expenditure data, including all funds groups except agency funds.

The data for all institution showed similar patterns. Because UHC, UHD and UHV are smaller institutions and during the last few years have experienced large and irregular enrollment growth in percentage terms, their spending patterns are harder to analyze. The UH campus is larger more mature campus, so that the enrollment growth is at a more consistent rate. I focus on the spending pattern for this campus.

During this time period, the University of Houston has applied any new resources according to the goals of both the institution and the state – in particular, student access and success and research productivity – with very positive results:

- For the third year in a row, UH has posted a record high enrollment – over 2,500 more students than just two years ago.

- Degrees awarded were a record high of 7,181 last year.

- Our six-year graduation rate now stands at 45%. Ten years ago it was 35%.

- Similarly, ten years ago research awards were $50.7 million. Today they are $114 million.

- At UH total spending more than doubled, increased by 128% over the past ten years. During the same period State funded spending has grown by 20%.

- Adjusted for inflation, total growth is about 75%, State funded spending decreased about (8%).[v]

Total Spending by Major Administrative Units

- Academic Affairs was 58% of all spending in 2000, 65% in 2010. It grew by 155%, inflation adjusted 96%.

- Administration and Finance was 11% of all spending in 2000, 17% in 2010. It grew by 239%, inflation adjusted 160%.

- Research Administration was 5% of all spending in 2000, 4% in 2010. It grew by 63%, inflation adjusted 25%.

- Student Affairs was 6% of all spending in 2000, but only 4% in 2010. It grew by 36%, inflation adjusted 4%.

Causes of the growth of spending

- Academic Affairs state funded expenditures grew by 31%. Salaries and wages grew by 36%.
- Administration and Finance state funded expenditures grew by 1%.
- Research state funded expenditures grew by (3%).
- Student Affairs expenditures are less than 1% of state funded expenditures.

How is this possible? Cost shifting to non-state funds explains these trends. The result is that expenditures funded from non-state sources grew the most.

- Overall non-state funded expenditures grew by 236%.
- Academic Affairs non-state funded expenditures grew by 283%.
- A&F non-state funded expenditures grew by 1021.
- Research non-state funded expenditures grew by 122%.

What accounts for this growth?

Growth in enrollment.

In ten years UH enrollment grew by 13%, with more student demand for majors in STEM and professional fields. This can be attributed to both the State of Texas's plan to develop a workforce in global industries and the realization by individuals of the Private Rate of Return from an investment in higher education.

How should these costs be shared between the taxpayer and the individual? The theoretical argument is that the student should pay for their private benefit, while the taxpayer contributes a subsidy equal to the external benefit[vi]. I could find no recent studies calculating the Private Rate of Return compared to the Social Rate of Return to a university degree, but American higher education has long accepted that high-quality public education produces real benefits for the individual and tuition rates should at least reflect this.

At UH, Academic Affairs was 58% of all spending in 2000 and 65% in 2010. The faculty grew by 25% during this time, but the growth was disproportionately in the STEM and professional fields. This drives spending in disciplines with higher costs.

Studies of faculty salary differentials show that we have to paying well over the average to recruit faculty in the STEM and professional fields. Also market demand for faculty who can work in other industries drives up the salary of our entry level faculty[vii] .

Growth in support services.

During the past ten years we have spent millions on electronic and physical infrastructure. Administration and Finance non-state funded expenditures grew by 1021%. Almost all of it, nearly $100m, was due to construction funded by gift and auxiliary income.

Other costly infrastructure we provide includes, modern Enterprise Resources Planning systems and educational learning systems, parking and food services.

Growth in residential students.

The growing emphasis on the success of freshman students has resulted in the growth of on-campus residential facilities and support services.

Growth in research grants.

Research non-state funded expenditures grew by 122%. Salaries and wages grew by 200%. Much of this can be attributed to the hiring of research faculty. Many of this faculty works in other industries, driving up the salary of our entry level faculty

We spend significant amounts on research and research equipment. From the 2007 DOE Reports; UH reported $77m in research expenditures, $5.9m on research equipment, 90% for graduate programs and 44% on STEM colleges. As our research activity grows we can expect to spend even more. As a comparison, UT reported $406m in research expenditures, $31.9m on research equipment, 90% for graduate programs and 64% on STEM colleges.

Growth in STEM fields.

"An explosion of knowledge and population, a burst of technological and economic advance, the outbreak of ideological conflict... and an unparalleled demand by Americans for more and better education...The gap between this Nation's educational needs and its educational effort is widening enormously."` President Johnson, 1968.

The benefits of higher education are both public and private. The origins of higher education in this country were largely about public benefits.

In recent history this was illustrated by the GI Bill and the "space race experience." Both created a need that lead to increased federal funding. But following the veteran bulge and the GI Bill, enrollment dropped. Prior to the GI Bill the pattern had been that only 20% of HS graduates enrolled in higher education. At the time public universities received 30.9% of their income from tuition and fees[viii]. The National Defense Education Act (1958) again brought federal funds to higher education to support a national challenge. This federal funding slowed and declined in the 1980's.

Our current demand/growth in STEM fields mirrors the "space race" experience, but without the federal funding for expansion.

Conclusions

While costs have clearly increased the reason are complicated. Texas competes in a global economy and recognizes the need for a workforce that is highly educated in STEM fields; yet challenging economic times prevent the State from fully investing to achieve this purpose. Nationwide universities have been meeting the demand for globally competitive education by cost shifting. Students once paid about a third of the price of their education as compensation for the private benefit they received. In today's labor market the value of the private benefit for a higher education is closer to two-thirds of the cost. Research universities have further shifted costs to grants to fund research and graduate education.