



**ALABAMA'S
PREPAID AFFORDABLE COLLEGE TUITION
PROGRAM**

**ANNUAL ACTUARIAL VALUATION
SEPTEMBER 30, 2006**

Prepared by
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January 30, 2007

Board of Trustees
Alabama's Prepaid Affordable College Tuition Trust Fund
State Treasurer's Office
600 Dexter Avenue, Suite S-106
Montgomery, Alabama 36104

Ladies and Gentlemen:

We have completed our actuarial analysis of Alabama's Prepaid Affordable College Tuition Trust Fund ("the Fund") as of September 30, 2006. This report presents our findings with respect to the Fund's expected cash flows and the status of the Fund.

This analysis of the funding of the Fund was prepared for the Board in accordance with generally accepted actuarial principles and practices commonly applicable to similar types of arrangements.

The purpose of our actuarial analysis is to provide a long-term view of the Fund's assets and liabilities. Because the Fund undertakes liabilities that in some cases will not be paid out until over 20 years in the future, such a long-term analysis is critical to the proper management of the Fund.

As of September 30, 2006, the expected value of all liabilities is \$887,701,087 and the market value of assets is \$827,165,075, resulting in an actuarial deficit of \$60,536,012. Liabilities are 92.7% funded.

We caution you in interpreting these results to keep in mind that this deficit is an actuarial deficit. Our projections are based on a number of uncertain assumptions, including the future course of tuition increases in Alabama and returns on the Fund's assets. Actual events may vary significantly from our projections - either better or

worse than our projections. These variances may result in material changes to future actuarial analyses.

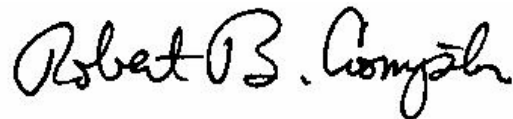
The actuarial status will change from year to year due to positive and negative cash flows and due to the change in the present value of future contract usage caused by the passage of time. The actuarial status will also change due to the variance of experience from the assumptions. These variances include tuition increases, investment income, and timing of benefit payments.

A more complete understanding of this "point-in-time" approach can be gained by reviewing prior years' actuarial reports and analyzing how the surplus and deficit amounts have changed over time. In addition, this report should be read in its entirety so that our projections can be properly interpreted.

* * * * *

We appreciate the opportunity to serve the State of Alabama. Any questions about the report should be directed to me at (770) 752-5656.

Very truly yours,

A handwritten signature in black ink that reads "Robert B. Crompton". The signature is written in a cursive style with a large, prominent "R" and "C".

Robert B. Crompton, FSA, MAAA

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I. EXECUTIVE SUMMARY

The following are the key findings of our analysis.

Status of the Fund

As of September 30, 2006, the Fund's liabilities exceed its assets by \$60,536,012.

Item	Value as of September 30, 2006
Total Assets	\$827,165,075
Total Liabilities	\$887,701,087
Actuarial Deficit	(\$60,536,012)
Funding Ratio	92.7%

Key economic assumptions are listed below.

Key Assumptions		
Yield on Investments		
2006/07 – 2010/11	(5 years)	7.92%
2011/12 & later		8.50%
Tuition Inflation		
2-Year colleges		7.25%
4-Year colleges & universities		7.25%

The assumption for investment returns is composed of two pieces. The assumption for the first five years was based on the recommendation of the Fund's investment consultant, Callan Associates, Inc. The assumption for later years was based on historical norms for the target asset mix combined with the Fund's actual historical returns.

The tuition inflation assumptions are based on a combination of statistical models of tuition increases and on actuarial judgment. Our statistical models also use information from the past 25 years. The rates shown in the table above represent our long-term average estimate of tuition inflation

Please see the *Actuarial Methods and Assumptions* section on page 6 for a more detailed discussion of these items.

A summary balance sheet as of September 30, 2006 is shown in the table below.

Value as of September 30, 2006	Assets and Liabilities
Assets	
Short term assets	\$ 43,100,230
Fixed Income Securities	
Domestic	\$208,620,317
International	<u>4,510,806</u>
Total Fixed Income	213,131,123
Equities	
Domestic	\$355,499,067
International	<u>158,382,948</u>
Total Equities	513,882,015
Accrued Interest	1,966,481
Recoverable Taxes	681,092
Receivables	- 0 -
Equipment	<u>- 0 -</u>
Total Short-term & Invested Assets	772,760,941
Actuarial Value of Future Contract Revenue	
Gross	55,500,146
Less Administrative Fees	<u>1,096,012</u>
Net Contract Revenues	<u>54,404,134</u>
Total Assets	<u>\$827,165,075</u>
Liabilities and Deficit	
Actuarial Value of Future Benefits	\$829,196,136
Other Liabilities	<u>58,504,951</u>
Total Liabilities	887,701,087
Actuarial Deficit	<u>(60,536,012)</u>
Total Liabilities and Deficit	<u>\$827,165,075</u>
Net Assets Available for Benefits	\$714,225,990
Funded Ratio	92.7%
Funded ratio = (net assets available + net contract revenues) ÷ actuarial liabilities	

II. RELIANCES & COMPLIANCE WITH ACTUARIAL STANDARDS OF PRACTICE

In making the projections on which this report is based, we relied on the following information as indicated below.

- Weighted Average Tuition at Alabama colleges and universities, including headcounts as of September 30, 2006, supplied by the Alabama Commission on Higher Education.
- Market value of assets of the Trust Fund, reported by Jackson Thornton and Company.
- Actual inventory of contracts by category, enrollment period, payment method and anticipated matriculation year, supplied by the PACT records administrator, HealthData, Inc.
- Information regarding likely future investment returns on the Trust Fund, supplied by the Fund's investment consultant, Callan Associates, Inc.
- Assumptions regarding the Fund's anticipated asset allocation are derived from the Fund's Investment Policy Statement.

There are no actuarial standards of practice that apply specifically to prepaid tuition plans. However, there are two general standards that we believe apply:

- Actuarial Standard of Practice #3 "Actuarial Communications". This standard sets general guidelines for actuarial communications. This report is in compliance with this standard.
- Actuarial Standard of Practice #23 "Data Quality". This standard sets guidelines on review of data supplied by a third-party. We have performed reasonableness and consistency checks on the data supplied to us by the records administrator, and are in compliance with this standard. Our review of the data was not an audit of the data.

III. SUMMARY OF PARTICIPANT DATA AND INVESTED ASSETS

Contract Data

Data on the number of outstanding contracts and payments was provided by the Fund's records administrator, HealthData, Inc. The tables below summarize the data provided concerning this.

Distribution of Active Contracts by Projected First Year in College			
Projected Year of College Enrollment	Number of Contracts	Projected Year of College Enrollment	Number of Contracts
Prior to 2000	1,333	2012	2,763
2000	825	2013	2,551
2001	1,189	2014	2,224
2002	1,784	2015	2,074
2003	2,585	2016	1,861
2004	2,671	2017	1,698
2005	3,025	2018	1,560
2006	3,079	2019	1,394
2007	3,154	2020	1,072
2008	3,325	2021	878
2009	3,259	2022	514
2010	3,053	2023	297
2011	2,877	2024	32
Total Contracts			51,077

Distribution of Contracts by Year of Purchase			
Year of Purchase	Number of Contracts	Year of Purchase	Number of Contracts
1990	14,582	1998	3,419
1991	7,084	1999	2,531
1992	6,485	2000	2,979
1993	5,228	2001	3,792
1994	4,807	2002	3,730
1995	4,772	2003	2,258
1998	4,332	2004	1,605
1997	3,597	2005	1,192
Total Contracts			72,393

Invested Assets

Fund Investments

The total market value of invested assets held (exclusive of contract receivables) as of September 30, 2006 is \$770,760,941. The allocation of these assets is shown in the table below.

Market value of assets held as of September 30, 2006		
	<u>Amount</u>	<u>% Of Total</u>
Short-term Assets	\$43,100,230	5.6%
Fixed Income	213,131,123	27.6%
Equities	513,882,015	66.5%
All Other Assets Held in Funds	<u>2,647,573</u>	<u>0.3%</u>
TOTAL	<u>\$772,760,941</u>	<u>100.0%</u>

Investment Strategy

The Fund's Investment Policy states, "A strategic asset allocation has been established based on the principle that individual asset classes can be combined to optimize the objectives of the Fund. The goal of this strategic asset allocation is a Fund that is efficient, well diversified, and manageable over the long term. The benefits of this diversification are reduced risk and improved investment return." The Fund's asset allocation has a target allocation by asset category as follows:

- U.S. Stocks 51%
- Non-U.S. Stocks 21%
- Fixed Income 28%

IV. ACTUARIAL METHODS AND ASSUMPTIONS

Methods

The actuarial method for the determination of the status of the Fund consists of projecting future tuition rates and future utilization of these contracts. The value of future benefits and revenues are determined using the time value of money.

For the projection of future benefits, the analysis proceeds as follows:

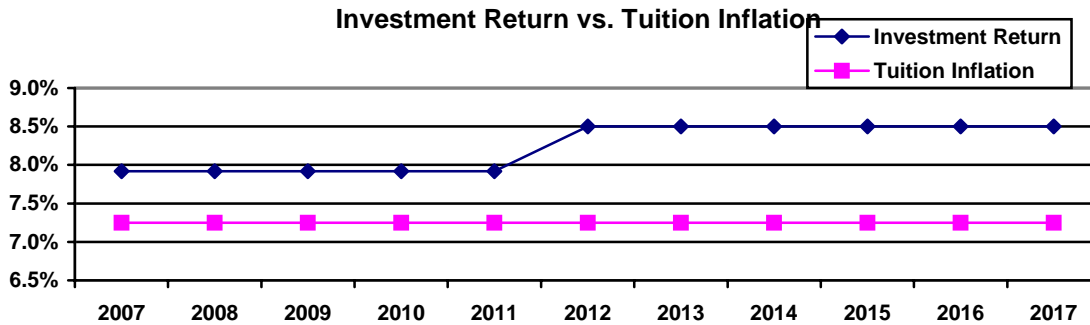
- Project future tuition rates for all years under consideration. Future tuition is based on the assumptions for tuition inflation.
- Determine the nominal cost of future use of contract benefits based on the assumptions regarding utilization of contracts and the length of time the average beneficiary will take to complete his college education.
- Determine the present value of future contract usage based on the investment yield assumptions.
- Perform projections for all of the Fund's beneficiaries to determine the status of the Fund.

Assumptions

Actuarial assumptions used to determine financial status of the Fund are of two general types: economic and demographic. Demographic assumptions determine the expected exposure to financial claims and generally answer the question “How and when will people use their contract?” Economic assumptions are concerned with the expected level of contract usage and answer the question “What is the expected value of contract usage?” The assumptions that we used were those that were approved by the PACT Board in consultation with Actuarial Resources Corporation.

Economic Assumptions

Economic assumptions are used to estimate the annual tuition rates at two and four-year colleges and Fund earnings on assets invested. The single most important indicator of the financial viability of the Fund is the relationship between projected investment returns and the projected tuition increases. The chart below shows the relationship over time of the investment return rates versus the tuition rates.



The following paragraphs describe the economic assumptions used in this study.

Annual Tuition Rates

Our assumptions for tuition were guided by our observations of historic increases, trends in appropriations for higher education and by statistical modeling. Our assumptions are shown below.

Tuition Inflation	
2-Year colleges	7.25%
4-Year colleges & universities	7.25%

We note that for 2-Year Colleges, tuition and fees are set by the Alabama State Board of Education, acting as the trustee for Alabama’s 2-year colleges. For 4-Year Colleges & Universities, tuition and fees are determined independently by each institution’s Board of Trustees.

Tuition Bias Toward Higher Cost Institutions

The Weighted Average Tuition (“WAT”) is used to determine projected tuition payouts. Because purchasers have the opportunity to use the benefits at a school with tuition higher than the WAT, we have included an adjustment factor in our projections to account for this.

Bias Toward Higher Cost Institutions Factors	
Four-year universities	8.0%
Two-year colleges	3.0%

Fund Earnings Rate

Our assumption for investment returns is based on information supplied to us by the Fund’s investment consultant, Callan Associates, Inc. Callan has informed us that their best estimate of likely returns over the next five years is 7.92%. Beyond five years, the assumption is based on historical norms and the Fund’s historical results.

Investment Returns		
2006/07 - 2010/11	(5 years)	7.92%
2011/12 & later		8.50%

These returns are net after investment expenses.

Annual Expenses

As in prior years, we assume that all of the Fund’s expenses are paid from the administrative fees assessed on contracts. Beginning in 2006, investment income is transferred to the Administrative Account for current liquidity needs including tuition benefits and expenses.

Demographic Assumptions

The demographic assumptions used in this report are based on our experience with similar types of liabilities. Our choice of assumptions is based on recent experience, historical data of the Fund and our best estimates as to future events. These assumptions are as follows:

Contract Terminations Due To Mortality and Disability

We assumed no contract terminations due to death or disability.

Other Contract Cancellations

We assumed that contracts would cancel according to the table below.

Contract Cancellation Table			
Type of Payment=>	Lump Sum	60 Monthly Payments	Extended Monthly Payments
Year of purchase	0.50%	5.00%	6.00%
Year of purchase+1	0.50%	2.00%	5.00%
Year of purchase+2	0.50%	1.00%	4.00%
Year of purchase+3	0.50%	1.00%	4.00%
Year of purchase+4	0.50%	1.00%	3.00%
Thereafter	0.50%	1.00%	2.00%

Utilization of Benefits

We assume that beneficiaries will enroll in college at the date indicated as their anticipated college entrance date.

We assume that the average beneficiary will use 128 credit hours and 8 semester fee payments according to the following table. This assumption is based on the Fund's experience to date for beneficiaries who have completed their contract usage either through graduation, depletion or expiration.

Timing	Credit Hours	Fee Usage
Year 1	30	2 semesters
Year 2	30	2 semesters
Year 3	30	2 semesters
Year 4	30	2 semesters
Year 5	8	

For contracts that are past the projected completion date, we assumed that their remaining benefits would be paid according to the schedule above beginning in the current academic year. For contracts that are past their anticipated entrance date, but not yet past their projected completion date, we assumed that their remaining benefits would be paid over the remaining period until their projected completion date.

Within an academic year, contract usage is assumed to be 45% for the fall semester, 45% for the spring semester and 10% for the summer semester. Payment dates are assumed to be November 1 for fall semester, March 1 for spring semester and August 1 for summer semester.

Two-Year College Participation

We assumed that during the first two years of benefit usage, 17.5% of beneficiaries would attend two-year colleges. Projected benefit payments during these first two years reflect the mix of two-year and four-year tuition costs.

V. CHANGES IN ACTUARIAL ASSUMPTIONS FOR 2006

We made two changes to the assumptions used in projecting the status of the Fund. These changes are conservative when considered in aggregate. That is, they cause the actuarial deficit to be larger than it would have been without these changes. These changes are discussed below. These assumption changes that we made were those that were approved by the PACT Board in consultation with Actuarial Resources Corporation.

Changes in Investment Returns

We updated the assumption for investment returns based on the recommendation of the Fund's asset consultant. Current and prior assumptions are shown below.

Current Assumption	Prior Assumption
7.92% through 2010/11	7.88% through 2009/10
8.50% thereafter	8.50% thereafter

Change in Bias To Higher-Cost Institutions

We revised the assumptions to better reflect actual experience of the Fund.

Current Assumption	Prior Assumption
8.0% for 4-year schools	5.0% for 4-year schools
3.0% for 2-year schools	0.0% for 2-year schools

Dollar Effect of Change in Assumptions

The effect of these changes is as follows:

- Investment returns: \$ 1,570,865 increase to deficit
- Bias to Higher-Cost Institutions: \$22,607,706 increase to deficit
- Aggregate change: \$24,178,571 increase to deficit

If assumptions had been the same as last year, the Program's deficit would have been:

(\$36,357,440)

VI. STATUS OF THE FUND AS OF SEPTEMBER 30, 2006

In determining the status of the Fund, we estimated the future disbursements for higher education expenses of beneficiaries and refunds for terminated contracts. We also projected the future assets based on current assets and expected earnings on assets. We believe these estimates are reasonable based on the information available and our past experience and judgment.

The estimates of the prospective assets and liabilities of the Fund are summarized in the table on the following page and demonstrate the financial position of the Fund. The value of all assets including future contract payments is \$827,165,075 while the expected value of all liabilities is \$887,701,087. The resulting actuarial deficit is \$60,536,012.

The actuarial status will change from year to year due to positive and negative cash flows and due to the change in the present value of future contract usage and expense payments because of the passage of time. The actuarial status will change due to the variance of experience from the assumptions. These variances include tuition increases, investment income, and expenses.

The status will change due to the growth of the program and due to updates to assumptions reflecting the Fund's emerging experience. The changes for the year ending September 30, 2006 are summarized in the table below.

Annual Change of Status	
Status at September 30, 2005	(\$70,029,603)
Projected Change to September 30, 2006	(5,518,333)
Effect of New Contracts	N/A
Gain from Favorable Tuition Inflation	25,083,063
Gain due to Favorable Investment Experience	13,442,344
Change in Assumptions	(24,178,571)
Other	<u>665,088</u>
Actuarial deficit at September 30, 2006 ¹	<u><u>(\$60,536,012)</u></u>

¹ Based on assumptions described above. Assumptions will change over time as experience becomes more credible.

The table below presents the Fund’s projected assets, projected cash flows, projected investment income and projected funded status. These projections are as-of September 30, 2006, and are based on the contracts in place at that time. The effects of future contract sales are not included.

Fiscal Year Ending	Payments Into Trust Fund	Payments Out of Trust Fund	Investment Income	End of Year Assets Held	Assets Held Plus Contract Revenue	End Of Year Liabilities	Funded Ratio
2006				772,760,941	827,165,075	887,701,087	92.7%
2007<1>	19,805,561	122,930,677	53,924,685	722,200,265	760,148,940	825,479,404	92.1%
2008	10,880,527	70,752,329	53,842,103	716,170,566	745,765,843	816,270,479	91.4%
2009	8,421,501	92,825,873	52,072,697	683,838,892	706,987,506	783,076,110	90.3%
2010	6,285,374	103,155,653	48,794,583	635,763,196	654,182,166	736,296,987	88.8%
2011	4,515,608	93,760,975	45,306,898	591,824,727	606,989,506	695,607,821	87.3%
2012	3,915,974	92,047,502	45,055,022	548,748,221	561,103,604	657,254,475	85.4%
2013	3,370,600	93,837,740	41,246,489	499,527,571	509,404,807	613,728,503	83.0%
2014	2,839,468	93,871,237	37,026,046	445,521,848	453,266,258	566,457,468	80.0%
2015	2,371,484	92,294,015	32,501,656	388,100,973	394,020,731	516,833,194	76.2%
2016	1,967,543	90,482,982	27,703,670	327,289,204	331,651,926	464,903,448	71.3%
2017	1,581,786	87,222,537	22,700,478	264,348,931	267,425,608	412,003,509	64.9%
2018	1,222,281	83,419,822	17,553,582	199,704,972	201,762,752	358,629,775	56.3%
2019	919,558	80,483,122	12,222,262	132,363,670	133,632,476	303,833,196	44.0%
2020	665,181	77,241,392	6,672,206	62,459,664	63,139,095	247,806,876	25.5%
2021	438,350	72,195,677	1,017,795	(8,279,869)	(8,003,156)	192,361,386	- 4.2%
2022	219,255	65,955,512	(4,641,237)	(78,657,362)	(78,587,860)	138,807,668	- 56.6%
2023	67,189	55,926,195	(10,045,543)	(144,561,911)	(144,557,719)	91,316,429	- 158.3%
2024	4,288	43,627,581	(14,930,578)	(203,115,782)	(203,115,782)	52,807,668	- 384.6%
2025	- 0 -	29,798,352	(19,084,133)	(251,998,268)	(251,998,268)	25,678,676	- 981.4%
2026	- 0 -	17,113,882	(22,488,201)	(291,600,352)	(291,600,352)	9,679,133	-3,012.7%
2027	- 0 -	7,885,532	(25,289,617)	(324,775,501)	(324,775,501)	2,112,740	-15,372.2%
2028	- 0 -	1,987,716	(27,748,859)	(354,512,076)	(354,512,076)	161,665	-219,288.1%
2029	- 0 -	162,768	(30,146,165)	(384,821,009)	(384,821,009)	- 0 -	

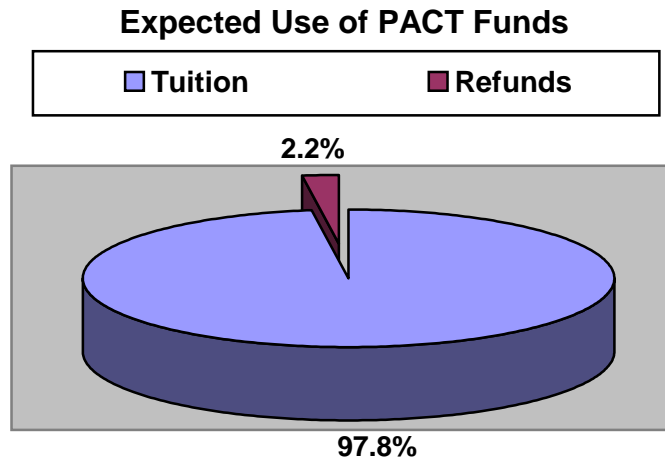
<1> Payments out of Fund include the reversal of liability for “Unsettled Purchases of Securities” as well as other accruals.

VII. EXPECTED USE OF FUNDS

The Fund, which is comprised of contributions, fees and all investment earnings, is expected to pay benefits in the following proportions:

- Tuition payments - 97.8%
- Payments of refunds to contract owners - 2.2%

These results are shown graphically below.



VIII. SENSITIVITY TESTING

We believe that when there is a significant amount of uncertainty about conditions prevailing in the future it is important to test the status of the Fund under other possible assumptions. In particular, we note that our assumptions are not certain due to the volatility of historic results and anticipated future results. Our assumptions were selected to represent our best judgment regarding the future, combined with some conservatism.

The tests given below are not intended to be representative of likely differences between actual events and assumptions; rather they are intended to demonstrate the extent of changes in the Fund's status for a given difference between actual and projected events.

We investigated the effect of variances in inflation, variances in investment yield, variance in bias toward higher-cost institutions and variance in expenses from those anticipated by the reported assumptions. For these projections, we assumed no future contract sales. These scenarios are described below.

- 1) Tuition inflation lower than baseline assumptions by 0.25% every year.
- 2) Tuition inflation higher than baseline assumptions by 0.25% every year.
- 3) Investment yields higher than baseline assumptions by 0.25% every year.
- 4) Investment yields lower than baseline assumptions by 0.25% every year.
- 5) Tuition inflation higher and investment yields lower than baseline assumptions by 0.25% every year.
- 6) Explicit provision for variable expenses combined with gross revenue rather than net revenue.
- 7) Investment return of 8.50% for all years.
- 8) Bias toward higher-cost institutions increased to 10% for four-year schools and decreased to 1% for two-year schools.

The deficit for each of these scenarios is shown below.

Sensitivity Testing Results		
<u>Scenario</u>	<u>Actuarial Deficit</u>	<u>Change From Reported</u>
1	(48,494,213)	\$12,041,799
2	(72,830,763)	(\$12,294,751)
3	(48,262,317)	\$12,273,695
4	(73,129,254)	(\$12,593,242)
5	(85,718,945)	(\$25,182,933)
6	(62,669,757)	(\$2,133,745)
7	(44,165,511)	\$16,370,501
8	(73,410,213)	(\$12,874,201)

IX. BREAK-EVEN RATES

Another way to characterize the existing deficit is to quantify the rate of investment income or the rate of tuition inflation that would produce break-even (that is, zero-deficit, zero-surplus). The investment break-even rate assumes that inflation remains at 7.25% in all years, while the tuition inflation break-even rate assumes that investment returns will be 7.92% for five years, then 8.50% thereafter.

Investment return break-even rate: 9.46%

Tuition inflation break-even rate: 5.93%

X. STOCHASTIC ANALYSIS

We have improved the stochastic analysis of the Program in the following important areas:

- Incorporation of serial correlation,
- Incorporation of heteroscedasticity,
- Asset class returns treated as the risk-free return plus a spread and
- Incorporation of Bayesian techniques to better reflect experience.

Serial Correlation

Serial correlation is the statistical connection of returns and inflation rates with prior returns and inflation rates. Many financial statistics show a strong relationship with their preceding values. For example, returns on Treasury Bills show a strong connection with returns for up to three years previously. Likewise, inflation at some of the State-related campuses shows a connection with inflation for up to eight years previously. We have constructed our stochastic analysis model to reflect these serial correlations.

Heteroscedasticity

Heteroscedasticity is a technical term that means the volatility of a statistic changes over time. For those items in our projection that appear to have changing volatility, we have incorporated stochastic shifts in the volatility.

Asset Class Returns Based on Risk-Free Return plus a Spread

Modern financial theory considers the *risk-free return* to be the fundamental component of the capital markets. Further, any investment can be considered as the sum of the risk-free return plus a spread reflective of the volatility of that investment's returns.

We have constructed our asset returns by modeling the 90-day Treasury Bill return as the risk-free return, then constructing separate models for equity spreads and fixed-income spreads.

Bayesian Approach to Setting Parameters

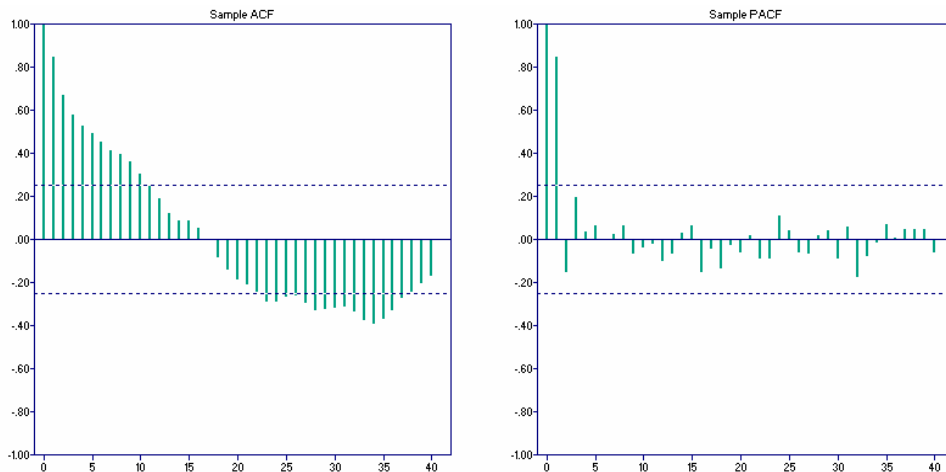
We used a statistical technique known as "Bayesian statistics" to set the stochastic parameters in our model. Given prior beliefs regarding the stochastic elements in the projection, the Bayesian approach constructs the *most-likely* parameters for these stochastic elements based on historical information.

Not only does this improve the stochastic model, it also allows the results of the stochastic model to be used as a “yardstick” with which to judge the assumptions on which our actuarial reserve is based.

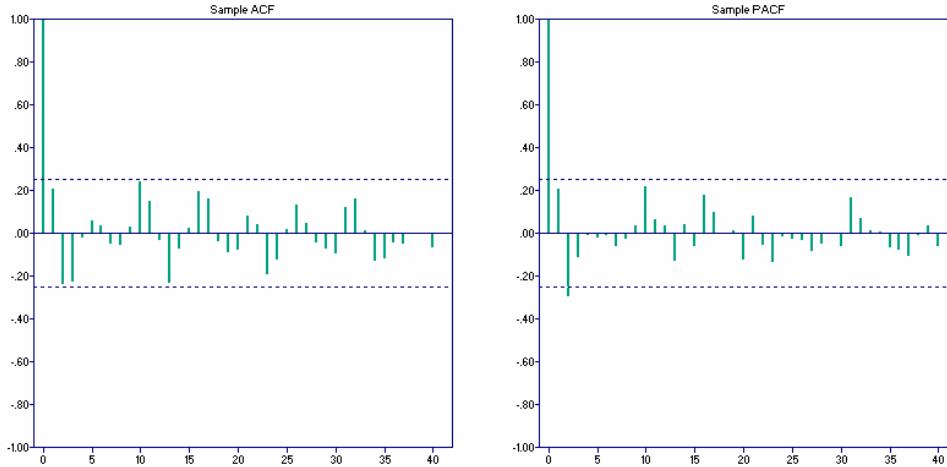
Risk-Free Return Model

We modeled risk-free returns according to a lognormal distribution. Technically, we modeled the natural logarithm of the change in the risk free returns as a normal distribution. Modeling the natural logarithm as a normal distribution is exactly equivalent to modeling the underlying value as a lognormal distribution. The reason for using the change in returns rather than the returns is discussed below.

The autocorrelation (ACF) and partial autocorrelation (PACF) values of the natural log of the risk free returns are shown below. The dashed horizontal lines indicate the approximate 95% confidence interval for these values. The horizontal scale is the time lag. These values indicate that risk-free returns are highly autocorrelated and nonstationary. The standard approach for creating a stationary series is to take differences (that is, the value of the change rather than the underlying value).



We transformed the data into the changes and obtained the ACF and PACF shown below. From inspection, it is apparent that the changes are, if not stationary, at least close to stationary. It is also apparent that an autoregressive model with 2 or 3 factors would be appropriate in modeling the change in the natural log of the risk-free returns.



Our model for the change in the natural log of the risk free returns is:

$$Y_t = \text{Normal}(\mu_t, \sigma_t)$$

Where:

Y_t is the change for year t

$$\mu_t = 0.03602 + 0.2129 (\mu_{t-1} - .03602) - 0.3049 (\mu_{t-2} - .03602) - 0.1437 (\mu_{t-3} - .03602) + \text{Bernoulli}(.03819) * \text{Normal}(0, .063)$$

$\text{Bernoulli}(.03819)$ is a Bernoulli distribution with a “p” of .03819

$\text{Normal}(0, .063)$ is a Normal distribution with mean zero and standard deviation of .063

$\sigma_t = \sigma_{t-1} * \text{Bernoulli}(.08446) * \text{Exponential}(1)$ is the variance for year t

$\text{Bernoulli}(.08446)$ is a Bernoulli distribution with a “p” of .08446

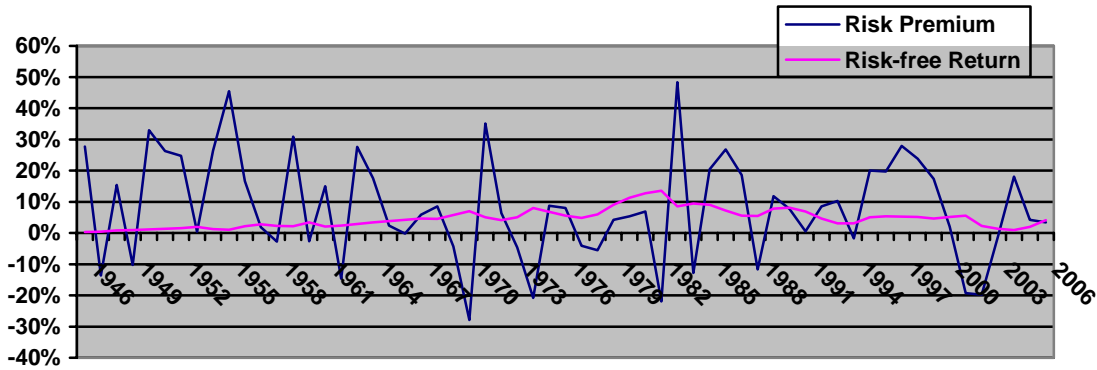
$\text{Exponential}(1)$ is an Exponential distribution with mean = 1.

$\sigma_t = \sigma_{t-1}$ if the Bernoulli distribution yields zero

In words, the mean is the sum of an autoregressive process plus an additive random shock. The standard deviation is subject to a random multiplicative shock. The Bernoulli factor for the mean results in a 3.8% likelihood of a shock in any year while the Bernoulli factor for the standard deviation gives a 8.4% likelihood of a change in the volatility in any year. The amount of the volatility change is proportional and varies from 1/5 to 5.

Equity Risk Premium

The chart below shows historic equity risk premiums for the post-WWII era plotted against risk-free returns.



Equity premiums are stationary or close to stationary (in the statistical sense – that is, the average value doesn't move very much over time), so no differencing was applied to these rates. We modeled the geometric (as opposed to arithmetic) equity risk premium as follows:

$$Z_t = \text{Normal}(\mu_t, \sigma)$$

Where:

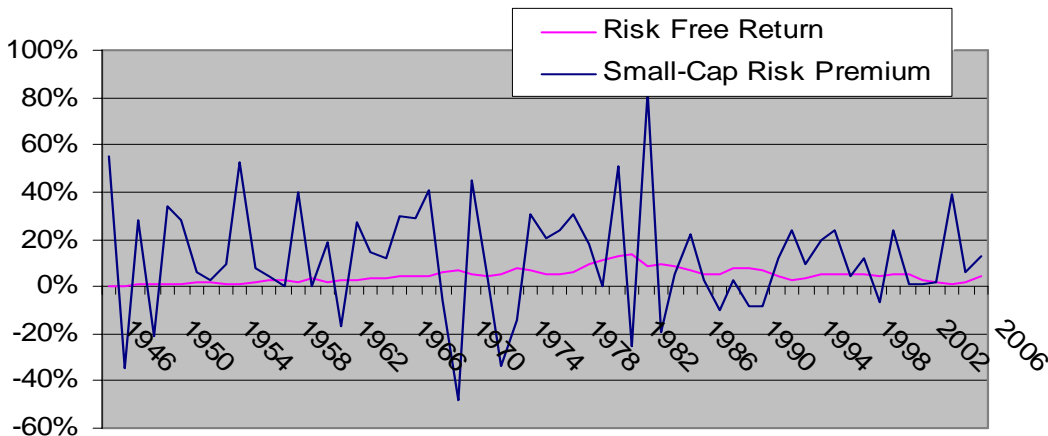
Z_t is the risk-premium for year t

$$\mu_t = 0.0631 - 1.988 (Y_t - Y_{t-1}) - 0.04906 (\mu_{t-3} - .0631) + 0.2596 (\mu_{t-4} - .0631) - 0.1215 * (\mu_{t-6} - .0631)$$

$$\sigma = .158$$

Small Cap Equity Risk Premium

The chart below shows historic equity risk premiums for the small cap for the post-WWII era plotted against risk-free returns.



We have treated Small Cap equity risk premiums in a manner consistent with Large Cap equity risk premiums according to the following model

$$X_t = \text{Normal}(\mu_t, \sigma)$$

Where:

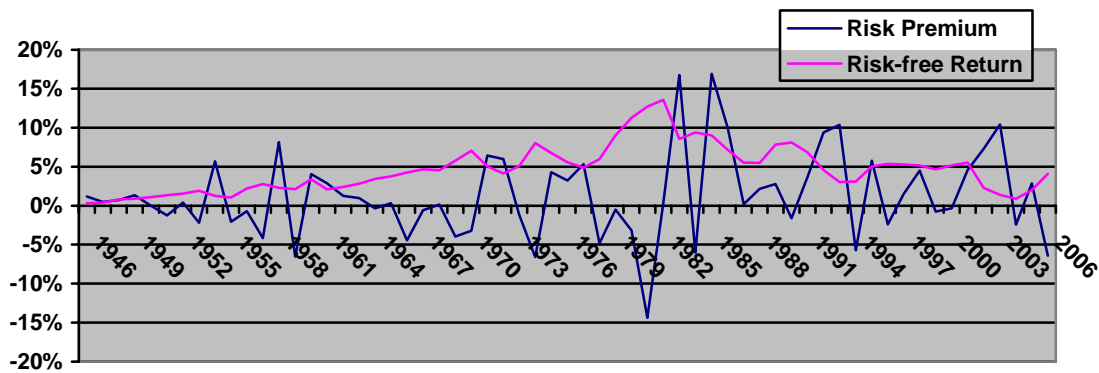
X_t is the risk-premium for year t

$$\mu_t = 0.08368 - 2.819 (Y_t - Y_{t-1}) - 0.2045 (\mu_{t-1} - .08368) - 0.1872 (\mu_{t-6} - .08368) - 0.2045 (\mu_{t-7} - .08368)$$

$$\sigma = .168$$

Fixed-Income Risk Premium

The chart below shows historic fixed-income risk premiums for the post-WWII era plotted against risk-free returns.



We have treated fixed-income risk premiums in a manner consistent with equity risk premiums according to the following model

$$W_t = \text{Normal}(\mu_t, \sigma)$$

Where:

W_t is the risk-premium for year t

$$\mu_t = 0.01431 - 2.335 (Y_t - Y_{t-1}) - 0.09233 (\mu_{t-4} - .01431) - 0.1805 (\mu_{t-5} - .01431) + 0.124 * (\mu_{t-6} - .01431)$$

$$\sigma = .158$$

Final Fixed Income Returns

The fixed income risk premiums described above are based on Ibbotson's medium-term Treasury bond return data. We used the Lehman Brothers Government/Credit Index as being more representative of the Program's fixed income returns. We performed regression analysis of the Index returns against Ibbotson's Treasury returns in order to convert the Risk Free + Spread return to the benchmark return.

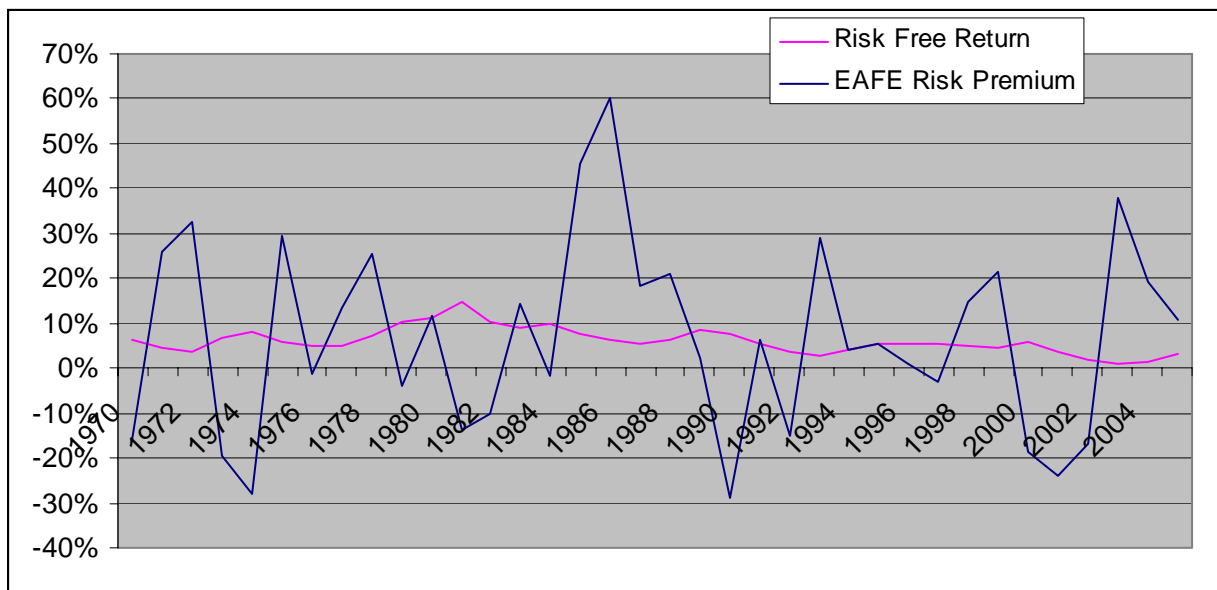
The regression equation is:

Benchmark Fixed Income Return = $.019881 + .684845 * \text{Medium-term Treasury return}$.

The r^2 value from this regression is 94.2%

Non-U.S. Equity Risk Premium

The chart below shows historic fixed-income risk premiums for Morgan Stanley's EAFE returns (after exchange rates) for 1970 - 2005.



We have treated non-U.S. equity risk premiums in a manner consistent with equity risk premiums according to the following model

$$V_t = \text{Normal}(\mu_t, \sigma)$$

Where:

V_t is the risk-premium for year t

$$\mu_t = 0.06923 - 1.567 (Y_{t-1} - Y_{t-2}) + 0.1509 (\mu_{t-1} - .06923) - 0.07435 (\mu_{t-2} - .06923) - 0.2999 (\mu_{t-4} - .01431)$$

$$\sigma = .213$$

Tuition Inflation

We modeled tuition inflation as a Beta distribution with constant variance but with an autoregressive mean. That is,

$$U_t = \text{Beta}(\alpha_t, \beta_t)$$

Where:

U_t is the tuition inflation for year t
 α_t and β_t are the Beta distribution parameters for year t , and are determined in the standard manner from year t 's mean and variance.
 $\text{mean}_t = 0.07314 + 0.3265 * (\text{mean}_{t-1} - .07314) - 0.2574 * (\text{mean}_{t-2} - .07314)$
 $\text{variance}_t = .0008452.$

Correlations

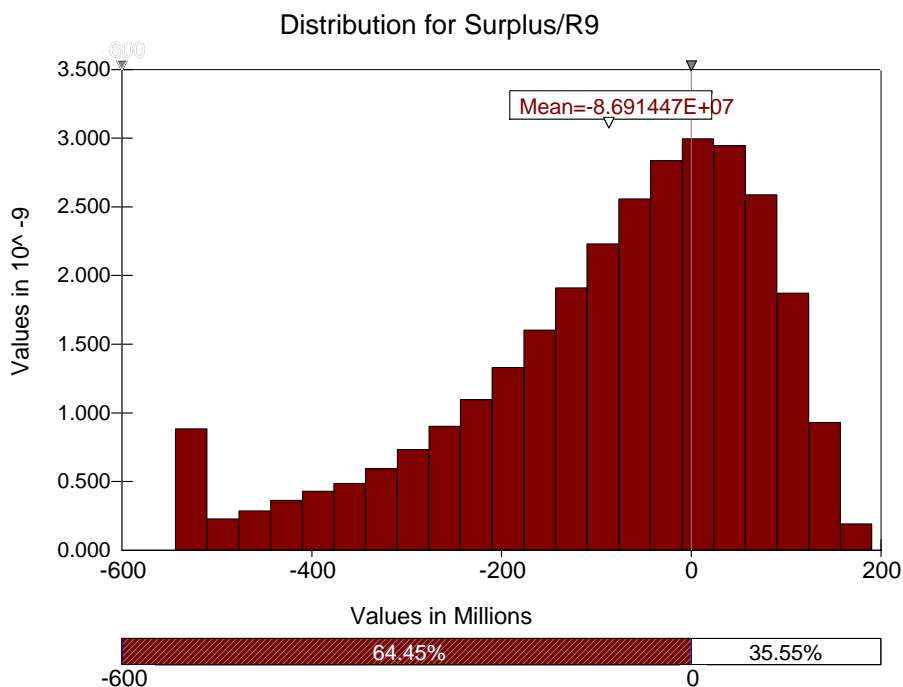
In performing our stochastic projections, we used the following correlations based on historical correlation analysis. Note that we do not include equities or fixed income in this table since both of these items are projected to be a function of the risk-free return. Also note that in the table below, "Risk-free" refers to the change in the natural logarithm of the risk free returns

	<i>WAT Inflation</i>	<i>Risk Free</i>
WAT Inflation	1	
Risk Free	-.65292	1

Results

Based on 10,000 scenarios, the results of our projections are shown below.

Proportion of scenarios with a surplus	35.5%
25% of results are better than:	35,045,160
50% of results are better than:	(50,999,568)
75% of results are better than:	(172,733,376)
Largest Surplus	190,398,464
Largest Actuarial Deficit	(543,434,880)
Mean Result	(86,914,469)



The most important measures from the table immediately above are the Proportion with a surplus and the 50% Results. The Proportion with a surplus probability of 35.5% indicates that there is a slightly better than 1/3 likelihood that the Program will have a surplus.

The 50% Results measure is a “best-estimate” measure of results. If our assumptions are neither conservative (that is they understate results) nor aggressive (that is they overstate results) then the 50% Results measure should be close to our projected result of (60,536,012). The table above indicates that our assumptions are slightly conservative.

The Largest Actuarial Deficit indicates what happens if economic events continue adversely for the lifetime of the current contracts –high tuition increases, coupled with

negative returns in the equity market until the end of the projection horizon. On the other hand, the Largest Surplus indicates what happens if economic conditions are favorable for the remaining lifetime of the current contracts.

Commentary on the Results of the Stochastic Analysis

The most compelling item from the stochastic analysis is how close the 50th percentile result is to the reported result based on deterministic techniques. The reason this is compelling is that the assumptions for both methods were **determined independently**.

The assumptions for the reported result were based on expert opinion, while the stochastic analysis used statistical parameters derived from Bayesian “look-back” methodologies that use historical results as a basis.

Expert opinion, whether consciously or unconsciously, gives more weight to recent experience than to less-recent experience.

Our inflation assumptions are based on the rationale that the recent run-up in tuition will be followed by several years of benign increases – gradually ramping up to our long-term expectation of 7.25%. In the Bayesian model used in stochastic analysis, inflation rates are slightly higher on average than our expert opinion

Likewise, the stochastic model’s investment returns are higher than those based on expert opinion.

The 7.92% initial investment return assumption is based on the expert opinion from the Program’s investment advisor, Callan. This expert opinion is consistent with what we have seen for similar programs with similar asset portfolios, and implies an equity risk premium lower than historical averages. The stochastic model is based on historical equity premiums, so will produce results consistent with historical equity premiums.

Many investment experts believe that equity risk premiums in the future will be consistently lower than historical averages – perhaps influenced by equity returns of the early 2000’s. However, such expert opinion regarding equity risk premiums is not unanimous. We offer the following quotes from experts in defense of historically consistent equity premiums:

Brealey and Myers have no official position on the exact market risk premium, but we believe a range of 6 to 8.5% is reasonable for the United
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States. We are most comfortable with figures towards the upper end of the range²

Note that this quote is from what is perhaps the most widely used undergraduate text on finance, written by two respected economists.

The next quote is taken from the actuarial literature

It is dangerous for actuaries to engage in simplistic analyses of historical ERPs to generate *ex ante* forecasts that differ from the realized mean.³

In other words, any projection of equity returns that deviates from historical risk premiums needs to have a compelling reason for such a departure. Without such a compelling reason, historical norms should be used.

We also note that there is consistency between the development of asset returns and inflation rates since both are developed from long-term history. This consistency is important since the spread between investment returns and inflation is more important than the absolute level of either. In this sense, the stochastic projections provide evidence that the spread used in the deterministic projection is reasonable to conservative when considered in the aggregate.

² Brealey & Myers in Principles of Corporate Finance, 6th edition, page 160, McGraw-Hill, 2000

³ Derrig & Moore, "Equity Risk Premium: Expectations Great and Small", North American Actuarial Journal, Volume 8, Number 1, page 60.

Appendix A – Development of Weighted Average Tuition for Four-Year Schools

Weighted Average Tuition 4-Year Schools – Tuition & Fees

	Annual Tuition & Required Fees @ 15 Hours per Semester								
	2002-03	Increase	2003-04	Increase	2004-05	Increase	2005-06	Increase	2006-07
Alabama A&M University	\$3,670	10.6%	\$4,060	-0.2%	\$4,050	0.0%	\$4,050	0.0%	\$4,050
Alabama State University	2,904	24.0%	3,600	11.3%	4,008	0.0%	4,008	0.0%	4,008
Athens State University	3,110	14.8%	3,570	8.4%	3,870	0.0%	3,870	0.0%	3,870
Auburn University	4,024	16.0%	4,666	8.6%	5,068	4.1%	5,278	4.1%	5,496
Auburn University at Montgomery	3,620	14.1%	4,130	7.5%	4,440	4.1%	4,620	2.6%	4,740
Jacksonville State University	3,250	9.2%	3,550	13.8%	4,040	0.0%	4,040	25.5%	5,070
Troy State University<1>	3,532	8.8%	3,842	2.7%	3,946	4.0%	4,104	0.0%	4,104
Troy State University Dothan<1>	3,532	8.8%	3,842	8.3%	4,162	3.8%	4,320		
Troy State University Montgomery<1>	3,290	9.4%	3,600	8.9%	3,920	4.7%	4,104		
University of Alabama	3,556	16.3%	4,134	12.0%	4,630	5.1%	4,864	8.5%	5,278
University of AL at Birmingham	3,880	10.2%	4,274	-1.6%	4,204	2.9%	4,324	0.0%	4,324
University of AL at Huntsville	3,764	9.6%	4,126	9.5%	4,516	3.8%	4,688	3.4%	4,848
University of Montevallo	4,334	10.4%	4,784	12.8%	5,394	3.5%	5,584	0.0%	5,584
University of North Alabama	3,286	11.6%	3,668	3.5%	3,798	7.1%	4,068	6.6%	4,338
University of South Alabama	3,410	10.6%	3,770	7.7%	4,060	3.2%	4,190	0.0%	4,190
University of West Alabama	3,516	6.0%	3,728	3.2%	3,846	2.9%	3,958	0.0%	3,958
Totals:	\$3,612	12.7%	\$4,071	7.3%	\$4,369	3.3%	\$4,514	4.2%	\$4,703

<1> Troy State Dothan and Troy State Montgomery were merged with Troy State University in June 2005.

**Weighted Average Tuition
4-Year Schools - Headcount**

	Resident Enrollment Headcount			Average 03 - 05	Percent Of Total
	Fall '03	Fall '04	Fall '05		
Alabama A&M University	4,473	4,177	3,996	4,215	4.0%
Alabama State University	4,434	4,149	4,029	4,204	4.0%
Athens State University	2,400	2,461	2,488	2,450	2.3%
Auburn University	15,517	15,322	15,435	15,425	14.6%
Auburn University at Montgomery	5,149	4,903	4,909	4,987	4.7%
Jacksonville State University	7,750	7,660	7,600	7,670	7.2%
Troy State University<1>	10,143	11,092	11,153	10,796	10.2%
Troy State University Dothan<1>	0	0	0	0	0.0%
Troy State University Montgomery<1>	0	0	0	0	0.0%
University of Alabama	15,755	16,270	16,943	16,323	15.4%
University of AL at Birmingham	14,235	14,600	14,528	14,454	13.7%
University of AL at Huntsville	5,515	5,661	5,952	5,709	5.4%
University of Montevallo	3,011	2,947	2,883	2,947	2.8%
University of North Alabama	4,264	4,440	4,692	4,465	4.2%
University of South Alabama	9,510	10,936	10,450	10,299	9.7%
University of West Alabama	1,796	1,858	2,105	1,920	1.8%
Totals:	103,952	106,476	107,163	105,864	100.0%

<1> Troy State Dothan and Troy State Montgomery were merged with Troy State University in June 2005. Headcounts for 2003 and 2004 for both merged campuses have been added to those of Troy State University.

Appendix B - Payments by School for Academic Year 2005/06

Alabama Public Four-Year Universities

School	Number of Enrollment s	Semester Hours	% of Total Hours	Fees Paid	Tuition Paid	Total of Tuition and Fees Paid	Average Paid Per Semester Hour	
							Actual	Projected
Alabama A&M University	78	930	0.47%	4,425.00	120,920.80	125,345.80	134.76	150.47
Alabama State University	92	1,107	0.56%	- 0 -	153,807.00	153,807.00	138.94	150.47
Athens State University	110	1,072	0.54%	11,502.00	118,992.00	130,494.00	121.73	150.47
Auburn University	5,152	63,878	32.23%	- 0 -	12,915,857.56	12,915,857.56	202.20	150.47
Auburn at Montgomery	588	5,998	3.03%	13,289.85	910,990.00	924,279.85	154.11	150.47
Jacksonville State University	662	6,618	3.34%	- 0 -	1,000,689.50	1,000,689.50	151.22	150.47
Troy State University	791	8,675	4.38%	34,103.50	1,310,532.95	1,344,636.45	155.00	150.47
Troy State - Montgomery	128	1,033	0.52%	4,349.85	170,710.00	175,059.85	169.47	150.47
University of Alabama	4,818	58,674	29.60%	- 0 -	10,686,725.32	10,686,725.32	182.14	150.47
University of Al. - Birmingham	1,499	17,098	8.63%	178,306.01	2,278,681.69	2,456,987.70	143.70	150.47
University of Al - Huntsville	669	7,373	3.72%	- 0 -	1,211,390.61	1,211,390.61	164.30	150.47
University of Montevallo	629	6,634	3.35%	23,946.00	1,206,542.61	1,230,488.61	185.49	150.47
University of North Alabama	506	6,244	3.15%	75,348.00	799,773.00	875,121.00	140.15	150.47
University of South Alabama	945	11,450	5.78%	130,077.85	1,461,664.50	1,591,742.35	139.02	150.47
University of West Alabama	115	1,411	0.71%	5,520.00	200,217.50	205,737.50	145.78	150.47
Grand Total	16,782	198,193	100.00%	480,868.06	34,547,495.04	35,028,363.10	176.74	150.47
Ratio of Actual to Projected								117.46%

Alabama Public Two-Year Colleges

School	Number of Enrollments	Semester Hours	% of Total Hours	Fees Paid	Tuition Paid	Total of Tuition and Fees Paid	Average Paid Per Semester Hour	
							Actual	Projected
Alabama Southern	34	338	0.80%	6,365.00	24,055.00	30,420.00	90.00	91.43
Bevill State	189	2,019	4.79%	34,518.00	146,592.00	181,110.00	89.70	91.43
Bishop State	58	556	1.32%	8,082.00	41,076.00	49,158.00	88.41	91.43
Calhoun State	627	5,826	13.81%	114,815.81	423,557.79	538,373.60	92.41	91.43
Central Alabama	65	661	1.57%	9,956.00	49,154.00	59,110.00	89.43	91.43
Chattahoochee Valley State	46	409	0.97%	6,821.00	29,685.00	36,506.00	89.26	91.43
Enterprise-Ozark	63	643	1.52%	10,678.00	46,223.00	56,901.00	88.49	91.43
Faulkner State	215	2,222	5.27%	43,406.00	159,940.00	203,346.00	91.51	91.43
Gadsden State	260	2,651	6.29%	48,697.00	188,278.00	236,975.00	89.39	91.43
Jefferson Davis	16	166	0.39%	2,698.00	12,071.00	14,769.00	88.97	91.43
Jefferson State	782	6,997	16.59%	182,024.67	509,593.00	691,617.67	98.84	91.43
Lawson State - Birmingham	79	820	1.94%	12,401.82	59,393.95	71,795.77	87.59	91.43
Lurleen B. Wallace	52	526	1.25%	8,341.00	37,745.00	46,086.00	87.62	91.43
Marion Military Institute	4	66	0.16%	269.08	8,912.12	9,181.20	139.11	91.43
Northeast Alabama	67	678	1.61%	8,588.00	49,126.00	57,714.00	85.12	91.43
Northwest Shoals	108	923	2.19%	18,478.00	66,559.00	85,037.00	92.13	91.43
Shelton State	548	4,770	11.31%	80,333.77	346,601.95	426,935.72	89.51	91.43
Snead State	132	1,343	3.18%	22,198.00	102,699.00	124,897.00	93.00	91.43
Southern Union State	542	6,132	14.54%	103,163.05	442,383.00	545,546.05	88.97	91.43
Wallace State - Dothan	125	1,253	2.97%	20,197.00	91,566.00	111,763.00	89.20	91.43
Wallace State - Hanceville	227	2,395	5.68%	36,726.77	173,484.00	210,210.77	87.77	91.43
Wallace State - Selma	107	783	1.86%	13,749.26	55,593.00	69,342.26	88.56	91.43
Grand Total	4346	42,176	100.00%	792,507.23	3,064,287.81	3,856,795.04	91.44	91.43
Ratio of Actual to Projected								100.01%

Alabama Public Technical Colleges

School	Number of Enrollment s	Semester Hours	% of Total Hours	Fees Paid	Tuition Paid	Total of Tuition and Fees Paid	Average Paid Per Semester Hour	
							Actual	Projected
Drake State Technical College	17	181.00	21.70%	2,736.00	13,364.00	16,100.00	88.95	91.43
Reid State Technical College	7	79.00	9.47%	1,493.00	5,609.00	7,102.00	89.90	91.43
Trenholm State Tech College	55	574.00	68.82%	7,223.83	41,598.00	48,821.83	85.06	91.43
Grand Total	79	834.00	100.00%	11,452.83	60,571.00	72,023.83	86.36	91.43
Ratio of Actual to Projected								94.49%

Summary - All Categories

School	Number of Enrollments	Semester Hours	% of Total Hours	Fees Paid	Tuition Paid	Total of Tuition and Fees Paid	Average Paid Per Semester Hour	
							Actual	Projected
Alabama 4-Year Universities	16,782	198,193	66%	480,868.06	34,547,495.04	35,028,363.10	176.74	150.47
<i>Alabama 2-Year Schools</i>								
Community Colleges	4346	42,176	14%	792,507.23	3,064,287.81	3,856,795.04	91.44	91.43
Technical Schools	79	834	0%	11,452.83	60,571.00	72,023.83	86.36	91.43
Total 2-Year Schools	4,425	43,010	14%	803,960.06	3,124,858.81	3,928,818.87	91.35	91.43
<i>Out of State Schools</i>								
Community Colleges	197	2,076	1%	11,778.18	177,390.17	189,168.35	91.11	91.43
Technical Schools	102	1,310	0%	5,974.05	179,927.18	185,901.23	141.87	91.43
Public Universities	2360	29,852	10%	128,670.72	4,186,259.96	4,314,930.68	144.54	150.47
Private Colleges	412	5,605	2%	23,953.75	798,040.20	821,993.95	146.65	150.47
Total Out of State	3,071	38,844	13%	170,376.70	5,341,617.51	5,511,994.21	141.90	145.32
<i>Alabama Private Schools</i>								
Community Colleges	6	47	0%	144.09	6,809.34	6,953.43	147.95	91.43
Technical Schools	106	847	0%	3,648.53	122,279.92	125,928.45	148.67	91.43
Universities	39	343	0%	1,868.62	49,537.93	51,406.55	149.87	150.47
Colleges	1331	18,330	6%	77,437.08	2,630,372.51	2,707,809.59	147.73	150.47
Total Alabama Private	1,482	19,567	7%	83,098.32	2,808,999.70	2,892,098.02	147.81	147.77
Total 4-Year	20,924	252,323	84%	712,798.23	42,211,705.64	42,924,503.87	170.12	150.47
Total 2-Year	4,836	47,290	16%	825,504.91	3,611,265.42	4,250,971.10	89.89	91.43
Grand Total	25,760	299,613	100%	1,538,303.14	45,822,971.06	47,175,474.97	157.45	141.15

Resume of Robert B. Crompton, FSA, MAAA

Bob is a vice-president and consulting actuary in Atlanta office of Actuarial Resources. He coordinates all the services provided to the Board with respect to PACT.

Bob is a leading consultant in the prepaid tuition area. In addition to working with the PACT program, he also currently provides actuarial analysis for over 30% of the prepaid tuition programs in the United States, including:

- Colorado,
- Kentucky,
- Pennsylvania,
- South Carolina and
- West Virginia.

In addition, Bob has also worked with the prepaid tuition programs in Florida, Mississippi and Texas.

Bob's specific assistance to prepaid tuition plans includes the following:

- assisting with plan design;
- assisting with setting appropriate actuarial assumptions;
- developing systems to perform necessary calculations;
- reviewing cash flows for appropriate investment strategy;
- preparing analyses of potential impact of fluctuations in tuition increase, investment income, and change in tax status; and
- presenting results to the program governing bodies.

Bob has published two articles specifically relating to prepaid tuition contracts, "Actuarial Issues for Prepaid Tuition Contracts," which was co-winner of the 1992 Actuarial Education and Research Fund's Practitioners Award and "Financing the Future Generations, An Examination of Prepaid Tuition Plans," published in the American Academy of Actuaries' magazine *Contingencies*.

Bob has over 25 years of actuarial experience. Prior to working at Actuarial Resources, Bob worked at Ernst & Young for 14 years. Bob is a Fellow of the Society of Actuaries and a Member of the American Academy of Actuaries. He has a Bachelor of Science degree in Economics from Harding University.