Kentucky's Affordable Prepaid Tuition

Actuarial Valuation Report
as of June 30, 2019

GRS Retirement Consulting

800.521.0498 | P: 248.799.9000 | F: 248.799.9020 | www.grsconsulting.com

September 9, 2019

Board of Directors
Kentucky's Affordable Prepaid Tuition
100 Airport Road
Frankfort, KY 40601

Attention: David Lawhorn, 529 Program Manager

Re: Kentucky's Affordable Prepaid Tuition Actuarial Valuation as of June 30, 2019

Dear Directors:

Gabriel, Roeder, Smith & Company ("GRS") has performed an actuarial valuation of Kentucky's Affordable Prepaid Tuition program ("KAPT" or "the program") as of June 30, 2019. The purpose of this actuarial valuation is to evaluate the financial status of the program as of June 30, 2019.

This report presents the principal results of the actuarial valuation of KAPT including the following:

a) A comparison of the actuarial present value of the obligations for prepaid tuition contracts purchased through December 13, 2004 (the most recent ending date for contract sales), with the value of the assets associated with the program as of June 30, 2019;
b) An analysis of the factors which caused the deficit/margin to change since the prior actuarial valuation; and
c) A summary of the member data, financial data, program provisions, and actuarial assumptions and methods utilized in the actuarial calculations.

The main conclusion of the valuation is that the fund is expected to become depleted in 3-4 years. We understand that the liabilities of the fund are backed by the full faith and credit of the Commonwealth of Kentucky, who will be responsible for satisfying the liabilities not covered by the assets of the fund.

Our valuation results show estimates of the depletion date and present value of the unfunded liabilities under the glide path adopted by the Board (and resulting expected rates of return provided by Graystone Consulting) in Appendix A. In addition, we show the sensitivity of the depletion date and unfunded liabilities to changes in certain assumptions about future activity affecting KAPT in Section G.

This valuation reflects two program changes. The first is the legislated changes in program provisions. This change affected valuation results. The second is an administrative change that resulted in the data being provided by Staff this year instead of the third party administrator. This second change is not believed to have had a direct effect on valuation results. However, it may have had an indirect effect on liabilities, to the extent that this year's data differs from last year's data. Both changes are discussed on page 6 of the report.

This report was prepared at the request of the program and is intended for use by the Board of Directors ("the Board") and those designated or approved by the Board. This report may be provided to parties other than the Board only in its entirety. This report should not be relied on for any purpose other than the purpose described above. GRS is not responsible for unauthorized use of this report.

The valuation results set forth in this report are based upon data and information, furnished by KAPT, concerning program benefits, financial transactions, and beneficiaries of KAPT. We reviewed this information for internal and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the information provided by KAPT. Further, the data and information provided is through June 30, 2019, and does not reflect subsequent market or membership experience.

There are currently no Actuarial Standards of Practice that specifically refer to prepaid tuition plans. We have followed the guidance from the Actuarial Standards of Practice on pensions due to their similar nature.

The valuation results summarized in this report involve actuarial calculations that require assumptions about future events. The major actuarial assumptions used in this analysis were adopted by, and are the responsibility of the program and the program's Board. We have not performed an experience study, but have reviewed the assumptions. Based on our limited review, we believe these assumptions are within a reasonable range and are in compliance with actuarial standards regarding pension calculations.

We have prepared this valuation with the understanding the program is closed to new participants.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: Program experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; and changes in program provisions or applicable law. We have performed an analysis of the sensitivity of certain changes in future assumptions. See Section G of this report for additional details. In addition, because it is not possible or practical to consider every possible contingency, we may use estimates or simplifications of calculations to facilitate the modeling of future events. We may also exclude factors or data that are deemed to be immaterial.

GRS makes no representations or warranties to any person participating in or considering participation in the program.

To the best of our knowledge, the information contained in this report is accurate and fairly presents the actuarial position of Kentucky's Affordable Prepaid Tuition program as of June 30, 2019.

Brian B. Murphy and James R. Sparks are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

The signing individuals are independent of the program sponsor.

Respectfully submitted,

Kenneth G. Alberts

Brian B. Murphy, FSA, EA, FCA, MAAA, PhD

James R. Sparks, ASA, MAAA

KGA/BBM/JRS:bd

Kentucky's Affordable Prepaid Tuition
Table of Contents

SECTION A

EXECUTIVE SUMMARY

Kentucky's Affordable Prepaid Tuition
Summary of Results

	Valuation Results#	
Valuation Date:	**June 30, 2019**	**June 30, 2018**
Membership Summary:		
Accounts		
8 or More Years Beyond Projected College Entrance Year (PCEY)	567	562
1-7 Years Beyond PCEY	2,046	2,247
At or Before PCEY	641	922
Total	3,254	3,731
Average Years until PCEY (Negative if Past PCEY)	(3.2)	(2.6)
Assets		
Market Value of Assets	$ 58,157,726	$ 69,982,608
Present Value of Future Contract Payments	$ 298,780	$ 575,230
Fees Receivable	$ 10,027	$ 195,828
Total	$ 58,466,533	$ 70,753,666
Annual Return on Market Value of Assets*	6.11%	5.81%
Actuarial Liabilities (Present Value of Future Tuition Payments, Refunds, Fees, and Administrative Expenses)	$ 96,203,553	$ 108,131,117
Margin/(Deficit)	$ (37,737,020)	$ (37,377,451)
Funded Ratio (Total Assets ÷ Actuarial Liabilities)	60.8%	65.4%
Estimated Fiscal year Fund Depleted	2023	2023

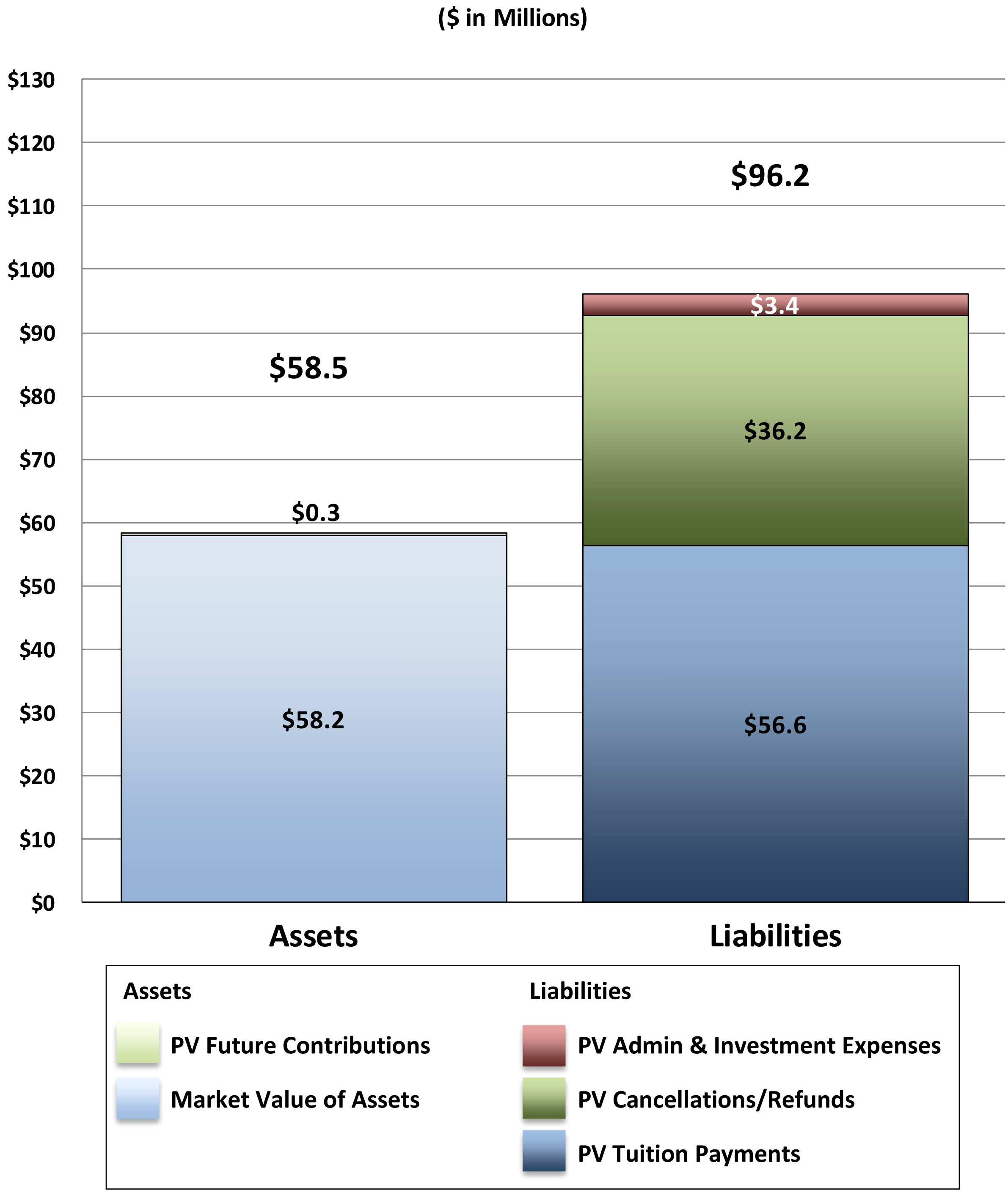
* *Net of fees. Reported to GRS by KAPT's prior investment consultant for 2018.*

\# *Note 2019 results are after program and assumption changes.*

Kentucky's Affordable Prepaid Tuition
Summary of Results

Value as of Valuation Date:	Valuation Results
Invested Assets & Future Contract Receivables	$ 58,456,506
Other Payables & Receivables	10,027
Actuarial Liabilities	96,203,553
Other Liabilities	N/A
Actuarial Deficit	$ (37,737,020)
Deficit as a Percent of Liabilities	39.2%

Kentucky's Affordable Prepaid Tuition
Summary of Assets and Liabilities as of June 30, 2019



PV – Present Value

Numbers may not add due to rounding.

Kentucky's Affordable Prepaid Tuition
Funded Status

	June 30, 2019	June 30, 2018
Actuarial Present Value of Future Tuition Payments, Fees and Expenses	$ 96,203,553	$ 108,131,117
Market Value of Assets (Including the Present Value of Installment Contract Receivables)	$ 58,466,533	$ 70,753,666
Margin/(Deficit)	$ (37,737,020)	$ (37,377,451)

Change in Margin/(Deficit)

		Margin/(Deficit)
(1.)	Values as of June 30, 2018	$ (37,377,451)
(2.)	Interest on Margin/(Deficit) at assumed rate (4.40%)	$ (1,644,608)
(3.)	**Projected margin/(deficit) as of June 30, 2019 [(1) + (2)]**	**$ (39,022,059)**
(4.)	Change Due to:	
	a. Legislation	(5,310,361)
	b. Investment experience above/(below) assumed	1,262,810
	c. Change in program assumptions*	(475,023)
	d. Tuition/fee inflation below/(above) assumed	4,694,117
	e. Other program experience during fiscal year 2019	1,113,496
	Total	$ 1,285,039
(5.)	**Actual values as of June 30, 2019 [(3) + (4)]**	**$ (37,737,020)**

** Includes changes in liability as a result of changes to the assumed annual increases in future tuition and assumed future rates of investment return.*

Kentucky's Affordable Prepaid Tuition Discussion

Financial Status of Program

Program Status

As of June 30, 2019, the present value of all future tuition obligations under contracts outstanding (and including estimated future administrative and investment expenses) is $96.2 million. Program assets as of June 30, 2019, including the Market Value of Assets and the present value of installment contract receivables, are $58.5 million.

The difference between the assets of $58.5 million and future obligations of $96.2 million represents a program deficit of $37.7 million. The program is 60.8% funded. This compares to 65.4% as of the prior actuarial valuation. The funded status is not appropriate for measuring the settlement cost of the program. A funded status less than 100% is an indication that additional contributions (in other words, contributions from sources other than contract payments) will be needed in the program to satisfy all the program liabilities.

We understand that the program is backed by the full faith and credit of the Commonwealth of Kentucky. The deficit of $37.7 million is one estimate of the present value of the contributions the Commonwealth will need to make in order to satisfy its obligation under the program, if future activity is exactly as assumed.

Other Measurements to Consider

This report is intended to measure the obligations of the Program. Since the Program obligations will become Commonwealth obligations upon asset depletion, the unfunded obligation of the Program of $37.7 million is one measure of the obligation of the Commonwealth. However, there are other measures. For example, if the expected payment obligations were summed from the date of depletion, to the date of termination, the sum would total approximately $44.7 million in tuition, refund payments and expenses.

Fiscal Year	Projected Tuition Payments*	Projected Refunds	Projected Admin Expenses	Total Obligations
2023	$ 1,506,687	$ -	$ -	$ 1,506,687
2024	6,890,557	5,486,713	295,000	12,672,270
2025	4,185,643	5,065,458	262,500	9,513,601
2026	1,867,504	5,289,388	230,000	7,386,892
2027	621,836	1,358,861	197,500	2,178,197
2028	69,466	1,389,435	165,000	1,623,901
2029	17,978	1,174,750	132,500	1,325,228
2030	-	8,386,891	100,000	8,486,891
TOTAL	$ 15,159,671	$ 28,151,497	$ 1,382,500	$ 44,693,667

** Net of remaining program assets in Fiscal Year 2023.*

Management's Discussion and Analysis Language Describing Financial Status for Financial Statements

The following language was specifically requested by Fund Management:

As of June 30, 2019, the Program had a deficit of $37.7 million. This represents a $0.3 million increase over the previous year's deficit. Based on actuarial estimates, the Program's assets will be exhausted in fiscal year 2023, at which time the liability of the Program becomes a General Obligation of the Commonwealth of Kentucky. Per KRS 164A.708, once a real liability is expected to accrue, the General Assembly shall appropriate the necessary funds to meet the liability. Over the remaining estimated life of the program, through fiscal year 2030, actuarial estimates show the Commonwealth of Kentucky will need to transfer approximately $44.7 million, as shown above.

Kentucky's Affordable Prepaid Tuition
Discussion (Continued)

Program Experience During the Year

Program experience during the year was mostly favorable, resulting in the liabilities increasing less than assumed; the deficit increasing less than assumed, or the solvency of the program extending. We observed the following experience:

1) The market rate of return on fund assets was 6.1%. This compares to an assumed rate of return of 4.4%. This experience does not affect liabilities, but does result in a decrease in the deficit compared to assumptions (since the market contribution to the assets is greater than assumed);
2) The actual rate of tuition increases for UK and KCTCS were (0.5%) and 2.8%, respectively, compared to an assumed increase of 6.0%. This results in a lower liability compared to assumed;
3) Tuition payments and expenses were approximately $16.2 million compared with projected payments of $19.1 million. Since payments were made at a rate slower than assumed (in last year's valuation) liabilities and assets are now higher than projected and insolvency may be affected.

Overall, when experience is combined with the assumption changes and program changes (discussed below), the funded status of the program declined from 65.4% to 60.8%; the deficit increased from $37.4 million to $37.7 million and the insolvency date moved closer to the end of the 2023 fiscal year.

Data

During the year the program administration changed from a third party data manager to an in-house data manager. As a result, the source of the data that was provided for the annual valuation changed. Data was reviewed for general consistency but was not further analyzed or audited. However, one benefit of this change was that the number of remaining hours for each contract was directly provided on the data (for the prior valuation, this had to be computed based on the historical usage related to each contract).

Benefit Provision Changes

Legislation changes during the year include the following changes:

1) Extending the end date of the program until 2030; and
2) Establishing new eight (8) year account full growth value beyond the Projected College Entrance Year (PCEY).

These changes resulted in an increase in liabilities of $5.3 million.

Valuation and Actuarial Methods

Valuation and Actuarial methods were unchanged during the year.

Kentucky's Affordable Prepaid Tuition
Discussion (Continued)

Valuation Assumptions

<u>Changes from Prior Valuation</u>

Tuition Increase Assumption

The assumed rate of future tuition increases was lowered from 6.00% to 5.75% for this valuation. This resulted in a decrease in liabilities of approximately $1.4 million (measured after all other changes).

Asset Allocation Glide Path and Assumed Rate of Investment Return

At the May 2019 Board meeting the following target asset allocation was adopted:

Asset Classes	Proposed Target	Proposed Range
US Large Cap Equities	24%	21% to 27%
US Mid Cap Equities	3%	1% to 5%
US Small Cap Equities	3%	1% to 5%
Non-US Equities	6%	4% to 8%
Inflation Indexed Bonds (TIPS)	6%	4% to 8%
US Fixed-Income	33%	30% to 36%
Short Duration US Fixed Income	15%	12% to 18%
Cash Equivalents	10%	8 to 12%

In addition, the Board adopted the following Glide Path asset allocation:

Asset Classes	2019	2020	2021	2022	2023*
Large Cap US Equity	30%	24%	12%	0%	0%
Small/Mid Cap US Equity	9%	6%	4%	0%	0%
International Equity	9%	6%	3%	0%	0%
US Fixed Income	44%	33%	11%	0%	0%
TIPS	7%	6%	0%	0%	0%
Short Duration US Fixed Income	0%	15%	40%	50%	0%
Cash Equivalents	1%	10%	30%	50%	100%
Totals	100%	100%	100%	100%	100%

* *Not expected to have significant assets to invest. Any remaining assets will be in cash equivalents until depletion.*

Kentucky's Affordable Prepaid Tuition
Discussion (Continued)

Graystone Consulting reviewed the Board's adopted Glide Path and then projected expected rates of return until assets were presumed to be 100% in cash or depleted (in 2022). We used the Graystone projected rates in the valuation through 2022 and continued the final expected rate of return through the end of the program. The final rate of return is akin to an inflationary adjustment.

	Assumed Investment Return							
Fiscal Year Ending:	2019	2020	2021	2022	2023	2024	2025	2026+
Prior Actuarial Valuation (6/30/18)	4.40%	4.40%	3.80%	3.40%	3.10%	2.50%	2.40%	2.40%
Current Assumption (6/30/19)	N/A	4.10%	3.30%	2.50%	2.50%	2.50%	2.50%	2.50%

The change in the assumed rate of investment return resulted in an increase in the liability of approximately $1.1 million (measured after all other changes).

<u>Other Assumptions to Consider Monitoring</u>

Tuition Increase Assumption

At 5.75%, this assumption is higher than many of our other prepaid tuition plans assume. In addition, KAPT's own recent experience has been below this assumption. The 5-year average annual rate of tuition increase was 2.8% for the University of Kentucky and the Kentucky Community and 4.4% for Kentucky Community Technical College (the 10-year average was 4.1% and 3.8%, respectively).

Refunds

With the value of contracts growing at full value for up to eight years beyond the Projected College Entrance Year (PCEY), it would seem likely that participants who have not utilized all of their contracts for schooling would hold their contracts until the date the contract reaches its maximum value. The results shown in this report are based on the following assumptions:

1) Participants who reach 8 years beyond their PCEY in the future are assumed to refund at that point in time (assumed to be 8% of participants); and
2) Participants who already have maximized their contract value and not yet refunded (more than 8 years beyond their PCEY) are expected to hold their contracts until the end of the program (June 30, 2030).

This assumption is similar to the refund assumption used in the prior valuation. It has been adjusted to coordinate with the program change affecting when contracts reach their maximum value.

Kentucky's Affordable Prepaid Tuition
Discussion (Concluded)

Program Status

The program has a closure date of June 30, 2030, at which point any remaining contract values will be refunded or rolled over to individual 529 College Savings Plans. The Board could elect to start selling contracts again and is charged with annually making that decision. However, if new contracts were to be sold, they would be part of a different plan and would not be backed by the full faith and credit of the Commonwealth. See page 29 for a discussion regarding the sales of new contracts.

Future Outlook

The program is expected to become insolvent in 3-4 years.

SECTION B

PROGRAM DESCRIPTION

Kentucky’s Affordable Prepaid Tuition
Summary of Program Description Evaluated June 30, 2019

Purchasing Contracts – KAPT is currently closed to new participants. Current members purchased from three types of contracts with the following benefits:

- **Value Plan** – Provides in-state tuition and mandatory fees at Kentucky Community and Technical College System (KCTCS). KCTCS tuition price for full-time enrollment will be guaranteed. Depending on tuition rates; any money left over can cover qualified educational expenses.

- **Standard Plan** – Provides in-state undergraduate tuition and mandatory fees at Kentucky’s eight public universities. Guarantees tuition price for full-time enrollment at the Commonwealth’s most expensive public university (currently University of Kentucky). Depending on tuition rates, any money left over can cover qualified educational expenses such as books, room, and board.

- **Premium Plan** – Provides tuition at Kentucky’s private colleges and universities. While no particular school’s tuition is guaranteed, your value of the plan grows at the same rate as the University of Kentucky’s tuition. Depending on tuition rates, any money left over can cover qualified educational expenses such as books, room, and board.

Contract Payments – Contract holders may agree to pay-off their contracts in a variety of ways:

- Lump-Sum Payment (Full Contract paid-in-full at time of enrollment to the program)
- 3-Year Monthly Payments (36 monthly payments after purchase of contract)
- 5-Year Monthly Payments (60 monthly payments after purchase of contract)
- 7-Year Monthly Payments (96 monthly payments after purchase of contract)
- Extended Monthly Payments (Monthly payments after purchase of contract for defined period up to and including the year of high school matriculation)
- Custom Monthly Payments (Monthly payments based upon a custom determined schedule)

Refunds

If a contract holder elects to close account prior to July 1 of their Projected College Entrance Year (PCEY), the amount refunded will include payments made towards the contract minus administrative and cancellation fees.

If a contract holder elects to close account beyond July 1 of their PCEY and before the end of their contract's utilization period, the contract holder receives the tuition payout value of the account at that time minus administrative and cancellation fees and any benefits already used.

If a contract holder elects to close account beyond the end of their contract's utilization period, the contracts receive the following:

If refunds occur prior to June 30, 2019:

- Accounts with utilization period end dates prior to 2012 – The value of the remaining prepaid tuition account for the 2014-2015 academic year.
- Accounts with utilization period end dates on or after 2012 – The value of the remaining prepaid tuition account at the end of the utilization period plus any applicable tuition plan value increases in each of the next two years (capped at 3% per annum).

If refunds occur on or after June 30, 2019:

- The value of the remaining prepaid tuition account at the end of the utilization period plus any applicable tuition plan value increases through the first 8 years beyond the contract holder's original Projected College Entrance Year (PCEY).

Accounts have until June 30, 2030 to utilize benefits. Any remaining contract value will be rolled over into a 529 College Savings program or refunded.

Change in Beneficiary

Contract holders can change the beneficiary as long as the new beneficiary is an eligible member of the family of the current beneficiary.

For purposes of this valuation, it is assumed that no contracts will change beneficiaries.

This is a summary of the contract provisions as they pertain to this valuation. This should not be construed as actual contract terms.

SECTION C

DETAILED CHANGE IN MARGIN/(DEFICIT)

Kentucky's Affordable Prepaid Tuition
Detailed Change in Margin/(Deficit)

		Present Value of Benefits	PV Future Contract Payments	Market Value of Assets	Margin/(Deficit)
(1.)	Values as of June 30, 2018	$ 108,131,117	$ 575,230	$ 70,178,436	$ (37,377,451)
(2.)	Expected Contract Payments	$ -	$ (271,587)	$ 271,587	$ -
(3.)	Expected Tuition Payments, Refunds, and Administrative Fees	$ (19,054,078)	$ -	$ (19,054,078)	$ -
(4.)	Interest on Margin/(Deficit) at assumed rate (4.40%)	$ 3,919,390	$ 13,360	$ 2,261,422	$ (1,644,608)
(5.)	Projected Margin/(Deficit) as of June 30, 2019 [(1) + (2) + (3) + (4)]	**$ 92,996,429**	**$ 317,003**	**$ 53,657,367**	**$ (39,022,059)**
(6.)	Change Due to:				
	a. Legislation	5,310,361	-	-	(5,310,361)
	b. Investment experience above/(below) assumed	-	-	1,262,810	1,262,810
	c. Change in program assumptions*	476,174	1,151	-	(475,023)
	d. Tuition/fee inflation below/(above) assumed	(4,694,117)	-	-	4,694,117
	e. Other program experience during fiscal year 2019	2,114,706	(19,374)	3,247,576	1,113,496
	Total	$ 3,207,124	$ (18,223)	$ 4,510,386	$ 1,285,039
(7.)	**Actual values [(5) + (6)]**	**$ 96,203,553**	**$ 298,780**	**$ 58,167,753**	**$ (37,737,020)**

* *Includes changes in liability as a result of changes to the assumed annual increases in future tuition and assumed future rates of investment return.*

SECTION D

PROGRAM ASSETS

Kentucky's Affordable Prepaid Tuition
Statement of Total Assets (at Market Value)

Market Value of Cash & Investment Assets Held				
	as of June 30, 2019		as of June 30, 2018	
	Amount	% of Total	Amount	% of Total
Cash	$ 926,072	1.58%	$ 1,463,457	2.09%
Corporate Bonds	$ 24,481,107	41.87%	$ 28,544,289	40.67%
U.S. Treasury and Government Agency Securities	$ 3,979,545	6.80%	$ 4,921,560	7.01%
Corporate Stock	$ 28,757,000	49.17%	$ 34,884,148	49.71%
Money Market	$ 13,979	0.02%	$ 21,133	0.03%
Assumed Net Receivables	$ 326,692	0.56%	$ 343,849	0.49%
Total	**$ 58,484,395**	**100.00%**	**$ 70,178,436**	**100.00%**

Kentucky's Affordable Prepaid Tuition
Reconciliation of Total Assets (at Market Value)

	FY 2019		FY 2018	
Total Market Value of Assets at the beginning of the Fiscal Year	**$**	**70,178,436**	**$**	**81,997,536**
Additions:				
Contract Payments	**$**	**202,217**	**$**	**163,440**
Investment Revenues:				
a. Net unrealized gain on investments	$	(1,687,283)	$	(1,553,769)
b. Interest and investment income	$	5,503,155	$	6,182,090
Total Investment Revenues	**$**	**3,815,872**	**$**	**4,628,321**
Deductions:				
a. Administrative expenses	$	41,028	$	40,548
b. Personnel and professional expenses	$	381,401	$	334,678
c. Refunds	$	2,452,259	$	2,638,957
d. Trustee fee expense	$	133,662	$	56,159
e. Tuition benefits expense, net	$	13,203,867	$	13,813,548
Total Deductions	**$**	**16,212,217**	**$**	**16,883,890**
Change in Net Position	**$**	**(12,194,128)**	**$**	**(12,092,129)**
Change in Net Receivables	**$**	**500,087**	**$**	**273,029**
Total Market Value of Assets at the end of the Fiscal Year	**$**	**58,484,395**	**$**	**70,178,436**

Total asset value shown above excludes any receivables for future contract payments.

SECTION E

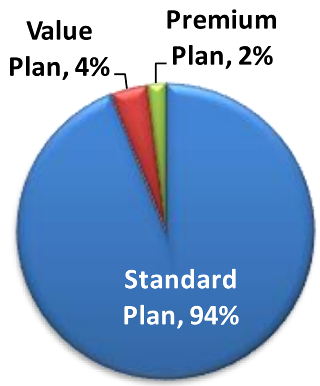
CONTRACT DATA

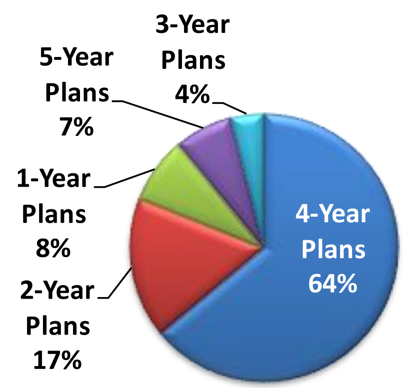
Kentucky's Affordable Prepaid Tuition
Member Matriculation Summary as of June 30, 2019

Projected Matriculation Year	Type of Contract												Total	
	Value Plan 1 Year	Value Plan 2 Years	Standard Plan 1 Year	Standard Plan 2 Years	Standard Plan 3 Years	Standard Plan 4 Years	Standard Plan 5 Years	Premium Plan 1 Year	Premium Plan 2 Years	Premium Plan 3 Years	Premium Plan 4 Years	Premium Plan 5 Years		
2004	-	2	3	3	1	7	1	-	-	-	1	-	**18**	0.6%
2005	-	2	2	3	3	15	1	-	-	-	2	-	**28**	0.9%
2006	-	2	2	5	5	28	4	-	-	-	1	-	**47**	1.4%
2007	2	1	5	16	3	30	3	-	-	-	1	-	**61**	1.9%
2008	1	2	4	11	-	45	4	-	1	-	4	2	**74**	2.3%
2009	2	5	9	17	3	62	9	-	-	-	1	1	**109**	3.3%
2010	1	1	7	15	7	63	11	1	-	-	2	-	**108**	3.3%
2011	2	4	10	12	5	80	7	-	-	-	1	1	**122**	3.8%
2012	1	3	6	18	5	73	8	-	-	-	3	-	**117**	3.6%
2013	2	3	10	18	4	108	11	-	-	-	-	3	**159**	4.9%
2014	-	6	13	34	6	137	8	-	1	1	5	2	**213**	6.6%
2015	2	5	13	25	7	151	17	-	-	-	3	2	**225**	6.9%
2016	2	11	14	43	16	207	26	-	-	-	6	-	**325**	10.0%
2017	4	6	19	37	8	222	32	-	2	1	2	2	**335**	10.3%
2018	4	21	26	49	15	253	22	1	2	-	2	-	**395**	12.1%
2019	2	12	25	45	7	169	12	-	1	1	2	1	**277**	8.5%
2020	4	9	28	40	9	166	16	-	1	-	1	-	**274**	8.4%
2021	2	8	27	29	5	127	16	-	1	-	2	-	**217**	6.7%
2022	3	4	11	12	5	64	9	1	1	1	1	-	**112**	3.4%
2023	-	-	4	6	-	21	3	-	-	-	1	-	**35**	1.1%
2024	-	-	-	-	-	1	-	-	-	-	-	-	**1**	0.0%
2025	-	-	-	1	-	-	-	-	-	-	-	-	**1**	0.0%
2026	-	-	-	-	-	-	-	-	-	-	-	-	**-**	0.0%
2027	-	-	-	-	-	-	-	-	-	-	-	-	**-**	0.0%
2028	-	-	1	-	-	-	-	-	-	-	-	-	**1**	0.0%
Total	**34**	**107**	**239**	**439**	**114**	**2,029**	**220**	**3**	**10**	**4**	**41**	**14**	**3,254**	100.0%
	1.0%	3.3%	7.3%	13.5%	3.5%	62.4%	6.8%	0.1%	0.3%	0.1%	1.3%	0.4%	100.0%	

Kentucky's Affordable Prepaid Tuition
Member Payment Option Summary as of June 30, 2019

Contract Payment Type	Type of Contract												Total	
	Value Plan 1 Year	Value Plan 2 Years	Standard Plan 1 Year	Standard Plan 2 Years	Standard Plan 3 Years	Standard Plan 4 Years	Standard Plan 5 Years	Premium Plan 1 Year	Premium Plan 2 Years	Premium Plan 3 Years	Premium Plan 4 Years	Premium Plan 5 Years		
Lump Sum	10	26	134	174	36	863	98	1	5	4	21	7	**1,379**	42.4%
3-Year Monthly	2	14	18	24	6	111	15	-	-	-	3	-	**193**	5.9%
5-Year Monthly	2	6	16	36	7	175	22	1	2	-	4	5	**276**	8.5%
7-Year Monthly	4	19	27	88	29	375	38	-	-	-	9	1	**590**	18.1%
Monthly Extended	16	42	44	114	36	443	33	1	3	-	3	1	**736**	22.6%
Custom Monthly	-	-	-	3	-	62	14	-	-	-	1	-	**80**	2.5%
Total	**34**	**107**	**239**	**439**	**114**	**2,029**	**220**	**3**	**10**	**4**	**41**	**14**	**3,254**	100.0%
	1.0%	3.3%	7.3%	13.5%	3.5%	62.4%	6.8%	0.1%	0.3%	0.1%	1.3%	0.4%	100.0%	





SECTION F

METHODS AND ASSUMPTIONS

Kentucky's Affordable Prepaid Tuition
Valuation Methods and Assumptions

Assumed Rate of Investment Return – These rates were provided by Graystone Consulting and based upon the Board adopted Glide Path (see Appendix A for more details). The assumed rate of investment return is gross of investment and administrative expenses.

	Assumed Investment Return			
Fiscal Year Ending:	2019	2020	2021	2022
Assumed Rates of Return	N/A	4.10%	3.30%	2.50%

The assumed rate of investment return in 2023 and thereafter was 2.50% (this is akin to price inflation).

Assumed Rate of Tuition Increases:

4-Year Universities – 5.75%
2-Year Community Colleges – 5.75%

Assumed Utilization Hours#: It is assumed 92% of contracts who reach projected contract enrollment year (PCEY) on or after the valuation date will utilize 32 KAPT hours per year until they have exhausted all value or reached the end of their utilization period. Contracts with remaining value beyond the utilization period are assumed to refund eight years after their PCEY (maximum refundable value).

Liabilities are modeled assuming two payments per year for Tuition payouts (one at beginning of September and one at beginning of January).

Refunds: It is assumed 8% of contracts with PCEY on or after the valuation date will not utilize any additional KAPT hours in the future and will continue holding their contract until eight years after PCEY, at which time they will be issued a refund.

Past Due Refunds: Those who are already eight years past their PCEY and have not already refunded are assumed to continue holding their contracts until the program closure in 2030 and then will be issued a refund.

Election of Program Changes: None.

Election of Change of Beneficiary: None.

Liability Adjustments for Investment and Administrative Expenses: There is a 0.2% expense based upon the Market Value of Assets for Investment Expenses. Administrative expenses are assumed to be $425,000 in the next year and steadily decrease to $100,000 in 2030 (the final year of the Program).

Contract Terms: No changes in contract terms are assumed once initiated.

Annual Payout Values for the 2019/2020 Academic Year (based on usage of 32 KAPT hours):

Value Plan – $5,824
Standard Plan – $12,360
Premium Plan:
  2001-2002 KAPT Enrollment – $39,122
  2002-2003 KAPT Enrollment – $42,784
  2004-2005 KAPT Enrollment – $36,100

Kentucky's Affordable Prepaid Tuition
Valuation Methods and Assumptions

Cancellations: It is assumed contracts which have not yet reached their PCEY will cancel and refund based upon the rates below. It is assumed the amount refunded equals the amount of money the contract has paid into the program towards their contract.

	Contract Payment Plan					
Years Since Purchase	**Lump-Sum**	**36 Monthly Payments**	**60 Monthly Payments**	**84 Monthly Payments**	**Extended Payments**	**Custom Payments**
0	1.50%	3.00%	5.00%	6.00%	8.00%	8.00%
1	1.00%	2.00%	4.00%	4.00%	7.00%	7.00%
2	0.75%	1.00%	3.00%	3.00%	5.00%	5.00%
3	0.75%	1.00%	2.00%	2.00%	4.00%	4.00%
4	0.50%	0.75%	1.00%	1.00%	3.00%	3.00%
5	0.50%	0.75%	0.75%	1.00%	2.00%	2.00%
6	0.50%	0.75%	0.75%	1.00%	1.00%	1.00%
7+	0.50%	0.75%	0.75%	0.75%	0.75%	0.75%

The assumptions were adopted by and provided by the Board either through Staff or through the prior Actuary's valuation report. Where the application of certain assumptions in the prior valuation was not completely clear (such as timing of refunds for participants more than 2 years past the expected utilization period), we worked with Staff to determine a clear application and/or showed a range of results.

We have reviewed the assumptions for reasonableness and believe the rationale for the assumptions is based on past program experience (for demographic assumptions) or future expectations (for economic assumptions). We believe the assumptions are reasonable.

SECTION G

PROJECTION RESULTS

Kentucky's Affordable Prepaid Tuition
Sensitivity Testing Results

The actuarial assumptions regarding future increases in tuition costs and fees and the future rate of investment return were adopted by KAPT. In our opinion, the adopted assumptions are reasonable for the purpose of the measurement. However, no one knows with certainty what the future holds with respect to economic and other contingencies. For example, while it is assumed that the assets of the Program will earn 4.40% gross of investment expenses during the 2019 Fiscal Year; actual return is expected to vary from year to year. Therefore, we have projected the program's results under alternative assumptions for future investment income and tuition increases, as follows:

Pg.	Description
21	Current valuation assumptions – Projection based upon the valuation assumptions and the current program assets plus the deficit of $37.7 as a lump-sum contribution to the program as of the valuation date to display solvency for the remainder of the program.
22	Current valuation assumptions – Projection based upon the valuation assumptions and current program assets for computation of the depletion date.
23	The investment return assumption is 200 basis points higher than assumed in each of the next 4 years.
24	Tuition increases are 100 basis points higher in each future year than assumed.
25	Tuition increases are 100 basis points lower in each future year than assumed.
26	Contracts which, as of the valuation date, are more than 8 years past their Projected College Entrance Year (PCEY) but have not refunded yet are assumed to refund immediately in the next fiscal year.
27	Contracts once beyond the Projected College Entrance Year (PCEY) are assumed to not refund their contracts until program closure in 2030.

The summary of the impact of each of these scenarios on the principal valuation results is presented on the following page. See pages 21 through 27 for detailed projection results of each scenario.

Kentucky's Affordable Prepaid Tuition
Sensitivity Testing Results

	Valuation Results Pages 21 & 22	Plus 200 Basis Points for next 4 years Page 23	Assumed Tuition Increases +100 Basis Points Page 24	Assumed Tuition Increases -100 Basis Points Page 25	Assuming All Maximized Refunds Paid Next Fiscal Year Page 26	Assuming All Maximized Refunds Paid Upon Program Closure Page 27
Assumed Investment Return in Fiscal Year Ending						
2020	4.10%	6.10%	4.10%	4.10%	4.10%	4.10%
2021	3.30%	5.30%	3.30%	3.30%	3.30%	3.30%
2022	2.50%	4.50%	2.50%	2.50%	2.50%	2.50%
2023	2.50%	4.50%	2.50%	2.50%	2.50%	2.50%
2024	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
2025	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
2026+	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Assumed Tuition Increases	5.75%/5.75%	5.75%/5.75%	6.75%/6.75%	4.75%/4.75%	5.75%/5.75%	5.75%/5.75%
Year Insolvent	2023	2024	2023	2023	2023	2026
(Increase)/Decrease in Deficit ($ in Millions)		$5.2	($1.8)	$2.7	($1.1)	$4.6

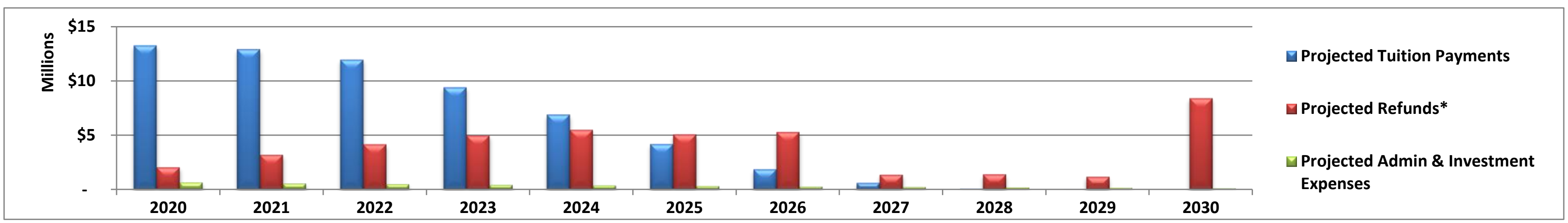
Kentucky's Affordable Prepaid Tuition
June 30, 2019 Projection Based on Valuation Results
Projection of Lump-Sum Contribution for Program Solvency

Inputs		
	% of BOY Assets:	
Investment Expenses:	0.20%	
Admin Expenses:	2019: $425,000	2030: $100,000
Closure of Program:	2030	

Valuation Results	
Present Value of Future Tuition and Fees	$ 96,203,553
Present Value of Future Contract Payments	$ 298,780
June 30, 2019 Assets	$ 58,167,753
(Margin)/Deficit	$ 37,737,020
Funded Status	60.8%

Fiscal Year	Assumed Investment Return During Year	Assumed Tuition Increase for UK	Assumed Tuition Increase for KCTCS	Solvent Market Value of Assets Beginning of Fiscal Year	Projected Tuition Payments	Projected Refunds*	Projected Admin & Investment Expenses	Projected Contract Payments	Solvent Market Value of Assets End of Fiscal Year	Lump-Sum Contribution
2019									$ 58,167,753	$ 37,737,020
2020	4.10%	N/A	N/A	$ 95,904,773	$ 13,250,540	$ 2,050,363	$ 646,739	$ 181,607	83,659,555	
2021	3.30%	5.75%	5.75%	83,659,555	12,910,773	3,197,010	559,819	92,050	69,501,936	
2022	2.50%	5.75%	5.75%	69,501,936	11,943,034	4,152,024	499,004	31,577	54,421,161	
2023	2.50%	5.75%	5.75%	54,421,161	9,392,642	4,966,488	436,342	5,316	40,768,363	
2024	2.50%	5.75%	5.75%	40,768,363	6,890,557	5,486,713	376,537	-	28,846,348	
2025	2.50%	5.75%	5.75%	28,846,348	4,185,643	5,065,458	320,193	-	19,859,659	
2026	2.50%	5.75%	5.75%	19,859,659	1,867,504	5,289,388	269,719	-	12,829,324	
2027	2.50%	5.75%	5.75%	12,829,324	621,836	1,358,861	223,159	-	10,916,181	
2028	2.50%	5.75%	5.75%	10,916,181	69,466	1,389,435	186,832	-	9,522,576	
2029	2.50%	5.75%	5.75%	9,522,576	17,978	1,174,750	151,545	-	8,399,558	
2030	2.50%	5.75%	5.75%	8,399,558	-	8,386,891	116,799	-	0	

** Assumed all maximized refunds as of 6/30/2019 are paid upon termination of the Program (2030). All other contracts are assumed to refund 8 years after Projected College Entrance Year (time at which contract value is maximized).*



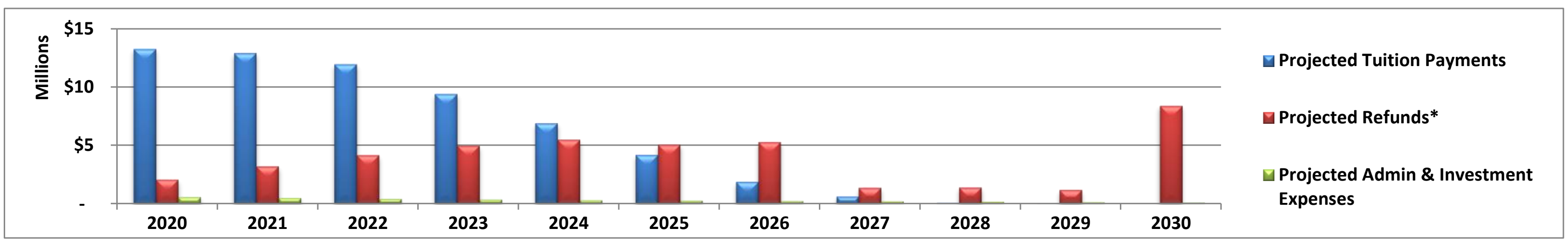
Kentucky's Affordable Prepaid Tuition
June 30, 2019 Projection Based on Valuation Results
Projection of Program Depletion

Inputs		
	% of BOY Assets:	
Investment Expenses:	0.20%	
Admin Expenses:	2019: $425,000	2030: $100,000
Closure of Program:	2030	

Solvency Results	
Year Insolvent	2023

Fiscal Year	Assumed Investment Return During Year	Assumed Tuition Increase for UK	Assumed Tuition Increase for KCTCS	Market Value of Assets Beginning of Fiscal Year	Projected Tuition Payments	Projected Refunds*	Projected Admin & Investment Expenses	Projected Contract Payments	Market Value of Assets End of Fiscal Year
2019									$ 58,167,753
2020	4.10%	N/A	N/A	$ 58,167,753	$ 13,250,540	$ 2,050,363	$ 571,265	$ 181,607	44,452,328
2021	3.30%	5.75%	5.75%	44,452,328	12,910,773	3,197,010	481,405	92,050	29,080,572
2022	2.50%	5.75%	5.75%	29,080,572	11,943,034	4,152,024	418,161	31,577	13,071,112
2023	2.50%	5.75%	5.75%	13,071,112	9,392,642	4,966,488	353,642	5,316	(1,531,707)
2024	2.50%	5.75%	5.75%	(1,531,707)	6,890,557	5,486,713	295,000	-	(14,428,673)
2025	2.50%	5.75%	5.75%	(14,428,673)	4,185,643	5,065,458	262,500	-	(24,438,826)
2026	2.50%	5.75%	5.75%	(24,438,826)	1,867,504	5,289,388	230,000	-	(32,536,409)
2027	2.50%	5.75%	5.75%	(32,536,409)	621,836	1,358,861	197,500	-	(35,557,718)
2028	2.50%	5.75%	5.75%	(35,557,718)	69,466	1,389,435	165,000	-	(38,091,066)
2029	2.50%	5.75%	5.75%	(38,091,066)	17,978	1,174,750	132,500	-	(40,385,143)
2030	2.50%	5.75%	5.75%	(40,385,143)	-	8,386,891	100,000	-	(49,987,312)

** Assumed all maximized refunds as of 6/30/2019 are paid upon termination of the Program (2030). All other contracts are assumed to refund 8 years after Projected College Enrollment Year (time at which contract value is maximized).*



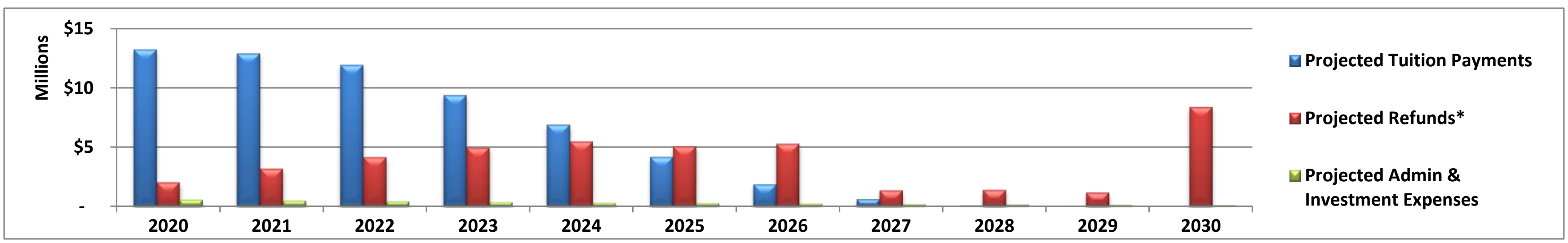
Kentucky's Affordable Prepaid Tuition
June 30, 2019 Projection Based on Investment Return +200 Basis Points for 4 Years

Inputs		
	% of BOY Assets:	
Investment Expenses:	0.20%	
Admin Expenses:	2019: $425,000	2030: $100,000
Closure of Program:	2030	

Solvency Results	
Year Insolvent	2024

Fiscal Year	Assumed Investment Return During Year	Assumed Tuition Increase for UK	Assumed Tuition Increase for KCTCS	Solvent Market Value of Assets Beginning of Fiscal Year	Projected Tuition Payments	Projected Refunds*	Projected Admin & Investment Expenses	Projected Contract Payments	Market Value of Assets End of Fiscal Year
2019									$ 58,167,753
2020	6.10%	N/A	N/A	$ 58,167,753	$ 13,250,540	$ 2,050,363	$ 571,550	$ 181,607	45,417,254
2021	5.30%	5.75%	5.75%	45,417,254	12,910,773	3,197,010	483,335	92,050	30,778,291
2022	4.50%	5.75%	5.75%	30,778,291	11,943,034	4,152,024	421,557	31,577	15,220,844
2023	4.50%	5.75%	5.75%	15,220,844	9,392,642	4,966,488	357,942	5,316	795,257
2024	2.50%	5.75%	5.75%	795,257	6,890,557	5,486,713	296,591	-	(12,045,145)
2025	2.50%	5.75%	5.75%	(12,045,145)	4,185,643	5,065,458	262,500	-	(21,995,709)
2026	2.50%	5.75%	5.75%	(21,995,709)	1,867,504	5,289,388	230,000	-	(30,032,215)
2027	2.50%	5.75%	5.75%	(30,032,215)	621,836	1,358,861	197,500	-	(32,990,918)
2028	2.50%	5.75%	5.75%	(32,990,918)	69,466	1,389,435	165,000	-	(35,460,096)
2029	2.50%	5.75%	5.75%	(35,460,096)	17,978	1,174,750	132,500	-	(37,688,399)
2030	2.50%	5.75%	5.75%	(37,688,399)	-	8,386,891	100,000	-	(47,223,149)

** Assumed all maximized refunds as of 6/30/2019 are paid upon termination of the Program (2030). All other contracts are assumed to refund 8 years after Projected College Entrance Year (time at which contract value is maximized).*



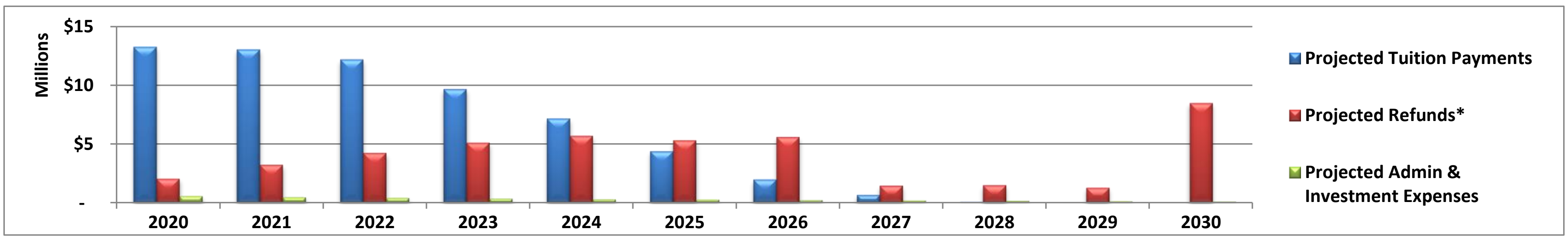
Kentucky's Affordable Prepaid Tuition
June 30, 2019 Projection Based on Tuition Increases +100 Basis Points

Inputs		
	% of BOY Assets:	
Investment Expenses:	0.20%	
Admin Expenses:	2019: $425,000	2030: $100,000
Closure of Program:	2030	

Solvency Results	
Year Insolvent	2023

Fiscal Year	Assumed Investment Return During Year	Assumed Tuition Increase for UK	Assumed Tuition Increase for KCTCS	Solvent Market Value of Assets Beginning of Fiscal Year	Projected Tuition Payments	Projected Refunds*	Projected Admin & Investment Expenses	Projected Contract Payments	Market Value of Assets End of Fiscal Year
2019									$ 58,167,753
2020	4.10%	N/A	N/A	$ 58,167,753	$ 13,250,540	$ 2,050,363	$ 571,265	$ 181,607	44,452,328
2021	3.30%	6.75%	6.75%	44,452,328	13,032,860	3,226,737	481,405	92,050	28,925,597
2022	2.50%	6.75%	6.75%	28,925,597	12,169,974	4,230,487	417,851	31,577	12,602,428
2023	2.50%	6.75%	6.75%	12,602,428	9,661,628	5,108,548	352,705	5,316	(2,428,441)
2024	2.50%	6.75%	6.75%	(2,428,441)	7,154,913	5,697,205	295,000	-	(15,829,683)
2025	2.50%	6.75%	6.75%	(15,829,683)	4,387,324	5,309,528	262,500	-	(26,326,999)
2026	2.50%	6.75%	6.75%	(26,326,999)	1,975,998	5,596,678	230,000	-	(34,893,199)
2027	2.50%	6.75%	6.75%	(34,893,199)	664,184	1,451,400	197,500	-	(38,110,169)
2028	2.50%	6.75%	6.75%	(38,110,169)	74,898	1,498,089	165,000	-	(40,822,857)
2029	2.50%	6.75%	6.75%	(40,822,857)	19,568	1,278,596	132,500	-	(43,291,983)
2030	2.50%	6.75%	6.75%	(43,291,983)	-	8,473,431	100,000	-	(53,054,441)

** Assumed all maximized refunds as of 6/30/2019 are paid upon termination of the Program (2030). All other contracts are assumed to refund 8 years after Projected College Entrance Year (time at which contract value is maximized).*



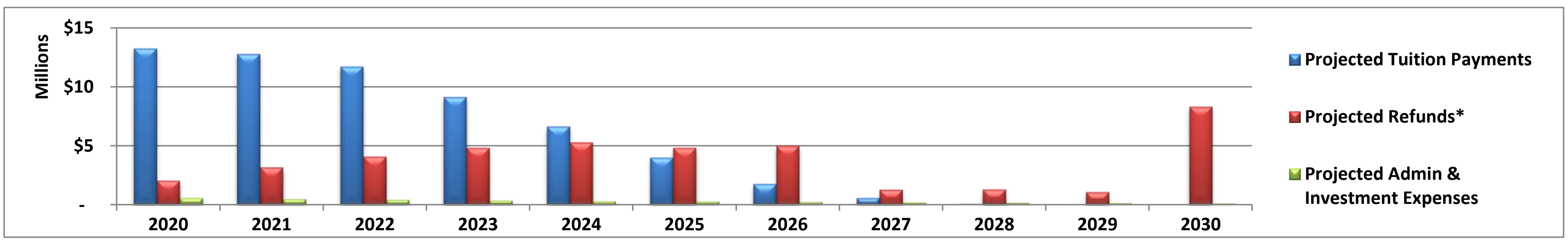
Kentucky's Affordable Prepaid Tuition
June 30, 2019 Projection Based on Tuition Increases -100 Basis Points

Inputs		
	% of BOY Assets:	
Investment Expenses:	0.20%	
Admin Expenses:	2019: $425,000	2030: $100,000
Closure of Program:	2030	

Solvency Results	
Year Insolvent	2023

Fiscal Year	Assumed Investment Return During Year	Assumed Tuition Increase for UK	Assumed Tuition Increase for KCTCS	Solvent Market Value of Assets Beginning of Fiscal Year	Projected Tuition Payments	Projected Refunds*	Projected Admin & Investment Expenses	Projected Contract Payments	Market Value of Assets End of Fiscal Year
2019									$ 58,167,753
2020	4.10%	N/A	N/A	$ 58,167,753	$ 13,250,540	$ 2,050,363	$ 571,265	$ 181,607	44,452,328
2021	3.30%	4.75%	4.75%	44,452,328	12,788,685	3,167,284	481,405	92,050	29,235,548
2022	2.50%	4.75%	4.75%	29,235,548	11,718,228	4,074,299	418,471	31,577	13,536,880
2023	2.50%	4.75%	4.75%	13,536,880	9,128,697	4,827,090	354,574	5,316	(645,776)
2024	2.50%	4.75%	4.75%	(645,776)	6,633,595	5,282,109	295,000	-	(13,052,214)
2025	2.50%	4.75%	4.75%	(13,052,214)	3,991,448	4,830,448	262,500	-	(22,592,599)
2026	2.50%	4.75%	4.75%	(22,592,599)	1,764,020	4,996,288	230,000	-	(30,242,076)
2027	2.50%	4.75%	4.75%	(30,242,076)	581,824	1,271,427	197,500	-	(33,076,826)
2028	2.50%	4.75%	4.75%	(33,076,826)	64,382	1,287,740	165,000	-	(35,440,023)
2029	2.50%	4.75%	4.75%	(35,440,023)	16,505	1,078,471	132,500	-	(37,568,849)
2030	2.50%	4.75%	4.75%	(37,568,849)	-	8,307,410	100,000	-	(47,020,140)

** Assumed all maximized refunds as of 6/30/2019 are paid upon termination of the Program (2030). All other contracts are assumed to refund 8 years after Projected College Entrance Year (time at which contract value is maximized).*



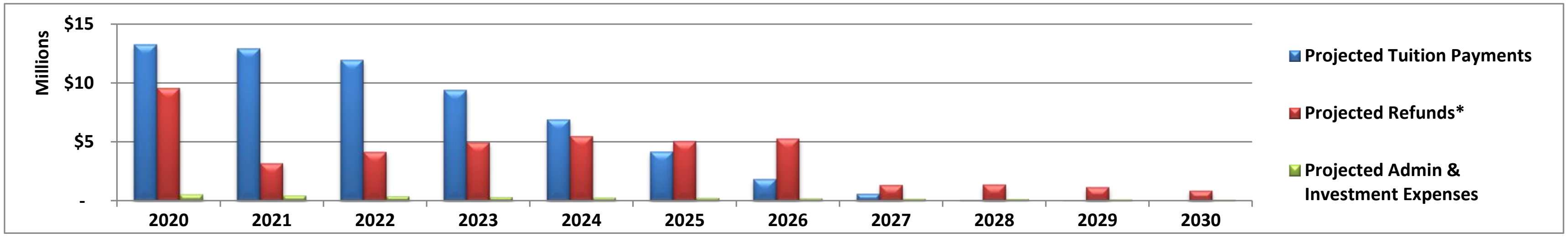
Kentucky's Affordable Prepaid Tuition
June 30, 2019 Projection Based on Maximized Refunds Paid Next Fiscal Year

Inputs		
	% of BOY Assets:	
Investment Expenses:	0.20%	
Admin Expenses:	2019: $425,000	2030: $100,000
Closure of Program:	2030	

Solvency Results	
Year Insolvent	2023

Fiscal Year	Assumed Investment Return During Year	Assumed Tuition Increase for UK	Assumed Tuition Increase for KCTCS	Solvent Market Value of Assets Beginning of Fiscal Year	Projected Tuition Payments	Projected Refunds*	Projected Admin & Investment Expenses	Projected Contract Payments	Market Value of Assets End of Fiscal Year
2019									$ 58,167,753
2020	4.10%	N/A	N/A	$ 58,167,753	$ 13,250,540	$ 9,560,359	$ 571,265	$ 181,607	36,789,408
2021	3.30%	5.75%	5.75%	36,789,408	12,910,773	3,197,010	466,079	92,050	21,180,353
2022	2.50%	5.75%	5.75%	21,180,353	11,943,034	4,152,024	402,361	31,577	4,989,385
2023	2.50%	5.75%	5.75%	4,989,385	9,392,642	4,966,488	337,479	5,316	(9,799,113)
2024	2.50%	5.75%	5.75%	(9,799,113)	6,890,557	5,486,713	295,000	-	(22,902,764)
2025	2.50%	5.75%	5.75%	(22,902,764)	4,185,643	5,065,458	262,500	-	(33,124,769)
2026	2.50%	5.75%	5.75%	(33,124,769)	1,867,504	5,289,388	230,000	-	(41,439,501)
2027	2.50%	5.75%	5.75%	(41,439,501)	621,836	1,358,861	197,500	-	(44,683,387)
2028	2.50%	5.75%	5.75%	(44,683,387)	69,466	1,389,435	165,000	-	(47,444,877)
2029	2.50%	5.75%	5.75%	(47,444,877)	17,978	1,174,750	132,500	-	(49,972,799)
2030	2.50%	5.75%	5.75%	(49,972,799)	-	876,895	100,000	-	(52,211,175)

** Assumed all maximized refunds as of 6/30/2019 are paid immediately in the next Fiscal Year (2020). All other contracts are assumed to refund 8 years after Projected College Entrance Year (time at which contract value is maximized).*



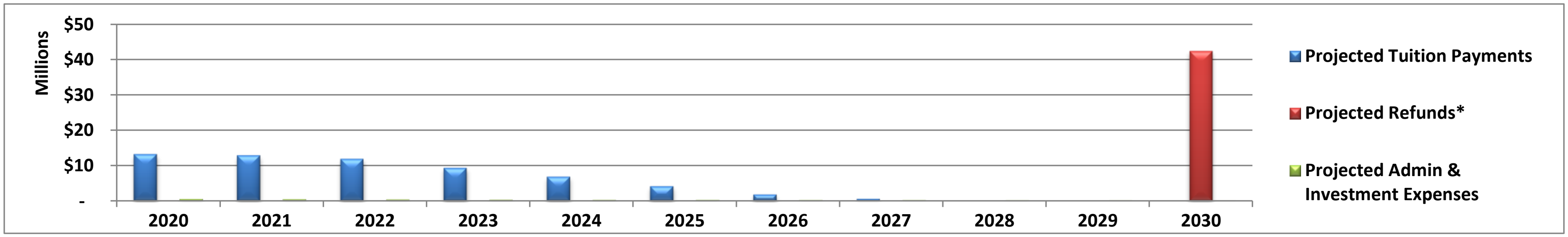
Kentucky's Affordable Prepaid Tuition
June 30, 2019 Projection Based on Maximized Refunds Paid Upon Program Closure

Inputs		
	% of BOY Assets:	
Investment Expenses:	0.20%	
Admin Expenses:	2019: $425,000	2030: $100,000
Closure of Program:	2030	

Solvency Results	
Year Insolvent	2026

Fiscal Year	Assumed Investment Return During Year	Assumed Tuition Increase for UK	Assumed Tuition Increase for KCTCS	Solvent Market Value of Assets Beginning of Fiscal Year	Projected Tuition Payments	Projected Refunds*	Projected Admin & Investment Expenses	Projected Contract Payments	Market Value of Assets End of Fiscal Year
2019									$ 58,167,753
2020	4.10%	N/A	N/A	$ 58,167,753	$ 13,250,540	$ 87,944	$ 571,265	$ 181,607	46,454,708
2021	3.30%	5.75%	5.75%	46,454,708	12,910,773	53,416	485,409	92,050	34,340,142
2022	2.50%	5.75%	5.75%	34,340,142	11,943,034	22,793	428,680	31,577	22,632,155
2023	2.50%	5.75%	5.75%	22,632,155	9,392,642	5,938	372,764	5,316	13,271,303
2024	2.50%	5.75%	5.75%	13,271,303	6,890,557	161	321,543	-	6,272,391
2025	2.50%	5.75%	5.75%	6,272,391	4,185,643	84	275,045	-	1,895,495
2026	2.50%	5.75%	5.75%	1,895,495	1,867,504	28	233,791	-	(192,364)
2027	2.50%	5.75%	5.75%	(192,364)	621,836	28	197,500	-	(1,029,323)
2028	2.50%	5.75%	5.75%	(1,029,323)	69,466	28	165,000	-	(1,292,758)
2029	2.50%	5.75%	5.75%	(1,292,758)	17,978	-	132,500	-	(1,477,502)
2030	2.50%	5.75%	5.75%	(1,477,502)	-	42,346,961	100,000	-	(44,489,805)

** Assumed all refunds after Projected Contract Enrollment Year are paid at closure of Program (2030).*



APPENDIX A

GLIDE PATH

Kentucky's Affordable Prepaid Tuition
Glide Path

Graystone Consulting

Allocations and Expected Performance

	Secular Forecasts		Strategic Forecasts	
	Return	Volatility	Return	Volatility
Cash & Bonds				
Ultra-Short Fixed Income	2.9%	0.9%	2.3%	0.9%
Short Term Fixed Income	3.3%	1.4%	2.7%	1.4%
US Fixed Income	3.9%	5.3%	3.4%	5.3%
International Fixed Income	3.6%	4.1%	0.5%	4.1%
Inflation-Linked Securities	4.9%	7.3%	1.7%	7.3%
High Yield	5.8%	8.2%	3.6%	8.2%
Emerging Markets Fixed Income	7.2%	12.1%	7.1%	12.1%
Convertible Bond	7.1%	10.9%	5.5%	10.9%
Equities				
US Large Cap Growth Equity	8.6%	16.8%	5.2%	15.8%
US Large Cap Value Equity	8.9%	14.4%	6.1%	13.7%
US Mid Cap Growth Equity	9.7%	19.8%	4.1%	18.4%
US Mid Cap Value Equity	9.7%	15.5%	7.0%	14.8%
US Small Cap Growth Equity	8.5%	22.3%	7.0%	21.0%
US Small Cap Value Equity	9.7%	17.2%	8.7%	16.7%
Europe Equity	8.2%	17.2%	7.4%	16.5%
Japan Equity	8.1%	20.6%	8.0%	19.0%
Asia Pacific ex Japan Equity	11.0%	22.9%	8.1%	21.3%
Emerging Markets Equity	11.0%	22.5%	9.5%	21.0%
Non-Traditional Asset Classes*				
Real Estate Investment Trusts	8.1%	16.7%	7.7%	16.7%
Commodities	5.0%	15.9%	4.3%	15.9%
Master Limited Partnerships	8.3%	16.6%	8.4%	16.6%
Natural Resources	11.3%	19.9%	7.7%	19.9%
Absolute Return Assets	5.3%	3.9%	3.8%	3.9%
Equity Hedge Assets	5.8%	8.2%	4.5%	8.2%
Equity Return Assets	7.0%	8.1%	5.1%	8.1%
Private Credit	5.9%	6.9%	5.5%	6.9%
Private Equity	13.6%	13.2%	9.7%	13.2%
Private Real Estate Funds	10.0%	16.8%	8.4%	16.8%
Core Private Real Estate Funds	6.8%	9.5%	7.6%	9.5%

Source: Global Investment Committee Feb 28, 2019. Annual return is the forecasted arithmetic average annual return. Annualized volatility, skewness and kurtosis estimates are based on the longest available data through Feb 28, 2019. Strategic Forecasts are calibrated to a 7 year investment horizon. Secular Forecasts are calibrated to a 20+ year horizon.

Forecast estimates are for illustrative purposes only, are based on proprietary models and are not indicative of the future performance of any specific investment, index or asset class. Actual performance may be more or less than the estimates shown in this table. Estimates of future performance are based on assumptions that may not be realized.

* The GIC applies significant statistical adjustments to correct for distortions typically associated with hedge fund, private equity and private real estate index returns. For more information, see the 'Return Series Adjustments' section on Appendix page 18.

Investor Suitability: Morgan Stanley recommends that investors independently evaluate each asset class, investment style, issuer, security, instrument or strategy discussed. Legal, accounting and tax restrictions, transaction costs and changes to any assumptions may significantly affect the economics and results of any investment. Investors should consult their own tax, legal or other advisors to determine suitability for their specific circumstances. Investments in private funds (including hedge funds, managed-futures funds and private-equity funds) are speculative and include a high degree of risk.

All figures annualized. Asset class returns are assumed to be serially independent. In some cases, the asset classes in the forgoing presentation are aggregations of the asset classes listed above, as per the mapping detailed on page 2 of the Appendix. Assumptions for aggregated asset class are simply aggregates of the above assumptions with weights as per the Granular Portfolio Allocations on Page 1 of the Appendix and Model Allocations on page 3 of the Appendix respectively. Please refer to the end of this Appendix for important disclosures about this presentation.

	Recommended Glide Path							
Asset Classes	2018	2019	2020	2021	2022	2023	2024	2025
Large Cap US Equity	30	30	24	12	0	0	0	0
Small/Mid Cap US Equity	9	9	6	4	0	0	0	0
International Equity	9	9	6	3	0	0	0	0
US Fixed Income	44	44	33	11	0	0	0	0
TIPS	7	7	6	0	0	0	0	0
Short Duration US Fixed Income	0	0	15	40	50	0	0	0
Cash Equivalents	1	1	10	30	50	0	0	0
Totals	100	100	100	100	100	0	0	0
2019 Annual Returns (%)		**4.60**	**4.10**	**3.30**	**2.50**	**0.00**	**0.00**	**0.00**
2019 Standard Deviations (%)		**7.20**	**5.50**	**2.80**	**0.09**	**0.00**	**0.00**	**0.00**
Change in Expected Return			**-11%**	**-20%**	**-24%**	**-100%**	**0%**	**0%**
Change in Expected Risk			**-24%**	**-49%**	**-97%**	**-100%**	**0%**	**0%**

The projections and other information generated by the Morgan Stanley Asset Allocation Center regarding likelihood of various investment outcomes are hypothetical in nature, they do not reflect actual investment results and are not a guarantee of future results.

From May 9, 2019 Glide Path Presentation from Graystone Consulting.

APPENDIX B

DISCUSSION OF SELLING NEW CONTRACTS

Kentucky's Affordable Prepaid Tuition
Discussion on Selling New Contracts

Background

The Board must annually consider the selling of new contracts. Contracts were last sold in 2004.

Long Term Growth of Contracts

Under the original program, Participants could leave their contracts in the program (unused) for as long as they desired and the contract value would continue to grow at the rate of the increase in tuition growth (primarily at the University of Kentucky). Since pricing is based on a present value of expected payments, appropriate pricing under a program design, such as this, cannot be determined when the value of the contract can grow forever and the rate of increase in value (assumed tuition increases) exceeds the discount rate (assumed rate of investment return).

However, the legislated program changes in 2014 limited the growth of unused contracts to 6 years beyond the expected utilization period. Legislated changes in 2019 modified that limit to 8 years past the Projected College Entrance year (PCEY). Under either the 2014 limit or the 2019 limit, an appropriate pricing can be determined. If the limit is changed in the future, we would need to assess whether appropriate prices could still be determined.

Separation of Programs

We understand that if the Board were to re-open sales of new contracts, a separate program would be created (such as a KAPT II). We further understand that contracts under the new program would not be backed by the full faith and credit of the Commonwealth and the assets of the new program would not be used to pay the benefits of the old program. We further understand that there would be a time limit on the growth of the contract value (similar or the same as under the current KAPT program).

Development of Pricing

Under these parameters, we believe that appropriate pricing can be developed. The pricing would be dependent on the following:

- The age of the participant at contract purchase;
- Expected matriculation date;
- Assumptions regarding:
    - Rates of utilization
    - Rates of future tuition increases (or growth of contract value)
    - Rates of assumed investment return
    - Timing of expected tuition payments (or refunds)
    - Rates of cancellation
    - Rates of administrative expenses paid by the contract holder
- Risk margin; and
- Board's funding and pricing policy/guidelines.

Kentucky's Affordable Prepaid Tuition
Discussion on Selling New Contracts (Continued)

Important Considerations

Risk Margins

Risk margins are an important aspect of contract pricing. Essentially the contracts are an insurance policy with one-time pricing. Pricing is traditionally built using assumptions developed on average expectations. Meaning that half the time, the contracts are underpriced and that half the time contracts are overpriced. This type of pricing can work when only a short period of time is covered and assumptions can be continually reviewed and contracts can be repriced (such as automobile insurance). In the case of a prepaid tuition plan the time frame between purchase and benefit payment can be as long as 25 years. In addition, short term risks (for participants who are older at contract purchase) may place significant pressure on cash flow for programs that are new or smaller. By recognizing these risks, programs can build a margin into the pricing to manage these risks.

There are two types of Risk Margins that we have seen utilized in contract pricing: implicit risk margin and explicit risk margin. Implicit risk margins are created when pricing assumptions are more conservative than average expectations. For example, a program may believe that the long term average increase in tuition will be 6%, but include pricing based on increases of 10% for the next 6 years, 7% for the following six years and 4% for the remaining six years (assuming 18 years for complete payment of benefits).

Another example of an implicit risk premium would be if the long term investment return expectation is 5%, but pricing assumed 2% for the next 6 years, 4% for the six years after that and 7% for the remaining six years (assuming 18 years for complete payment of benefits).

Explicit risk margins are created when pricing is increased by a specific factor, such as 5%, as the final step.

We have assisted other pre-paid programs in developing funding policies that connect the risk margin in the pricing to the funded status of the program (and the relativity to the Board's funding target). For example, an initial risk premium could be established of 3% explicit and 3% implicit. In addition, a funded status target might be established of 115%. Then, in years when the funded target is exceeded by 200 basis points, the risk margin is reduced. Conversely, if the funded target missed by 200 basis points, the risk margin would be increased.

Program size

There is a common misconception that a prepaid tuition program must have a certain level of participation to be viable. While we do not agree with this sentiment, we do believe that the program size has implications for the Board to consider. One consideration is the funding target (or risk reserve). Because the program is basically insurance, the size of the program is the risk pool. The larger the pool, the more the program is spreading risk and therefore the smaller the risk reserve will need to be (as a percent of liabilities). Conversely, the smaller the risk pool, the larger the risk reserve needs to be in order to keep the program healthy.

Kentucky’s Affordable Prepaid Tuition
Discussion on Selling New Contracts (Concluded)

Program size is also a consideration when determining if the program is an appropriate use of resources. This is a policy decision, not an actuarial decision. However, the issue is essentially, the expected size of the Program (once it matures) sufficient to justify allocating Commonwealth resources to the maintenance of the Program. A side concern is whether or not the Program is being utilized by the intended population.

Final Thoughts

Should the Board wish to explore opening a new program and selling new contracts, we would be happy to work with the Board to develop a funding policy, initial pricing assumptions and contract pricing.