

**Does KEES Help Retain High-Performing Students  
In-State for Higher Education?**

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## **Executive Summary**

Kentucky's merit-based program, the Kentucky Educational Excellence Scholarship (KEES), started in 1998 providing financial assistance to students attending higher education in-state based on high school academic achievements. The intended goal of KEES is elusive, however two key objectives are often mentioned with KEES. These are incentivizing and rewarding high school academic achievement and keeping high-performing students in Kentucky for their college education. This study aims to investigate whether Kentucky's merit-based program keeps high-performing students in Kentucky for higher education.

The dataset available for this research was provided by the Kentucky Center for Education and Workforce Statistics from their high school feedback reports. The aggregate data are comprised of the three recent academic school years and all data are at the school level. An ordinal least squares regression was used to determine the relationship between the percent of high-performing Kentucky high school graduates from each public high school attending college out-of-state with other academic and demographic variables from each high school.

Results from this study showed that there is a very weak correlation between KEES and the out-of-state going rate suggesting the KEES program may not have an impact on students going to school out-of-state. However, the study showed that KEES money has more influence for high schools located in non-Appalachia for their out-of-state college going rate compared to high schools located in Appalachia in Kentucky. Lastly, the results also indicated that students from schools with a high percentage of participants in the free and reduced lunch program are less likely to attend higher education either in-state or out-of-state.

## **Introduction**

Higher education is not free but many people agree it should be affordable or accessible to all who want it. Increasing tuition levels has made higher education accessibility a more salient policy issue. The Higher Education Act of 1965 created several financial aid programs for students seeking higher education, helping more people have access to college (2014, FinAid). Financial aid based on need was the norm until the early 1990s when several states implemented policies allowing more students to attend college at a subsidized price. These policy shifts began to offer aid to students based on their academic achievements in high school. Kentucky became one of those states in 1998, when the General Assembly created their own merit-based program, the Kentucky Educational Excellence Scholarship (KEES).

The only stated goal of KEES is to “ensure access of Kentucky citizens to public and private postsecondary education...” (Legislative Research Commission, 2011). The General Assembly may have kept the statement vague to create flexibility for the program in case it needed any refining. Although the program’s goal remains elusive, two key objectives are often mentioned in legislative discussions of KEES. These are, incentivizing and rewarding high school academic achievement and keeping high-performing students in Kentucky for their college education.

Focusing on the second objective, policy makers in Kentucky would like to retain high-performing students in-state for higher education, because it is their hope these students would find a career in the state after graduation, helping to grow a stronger economy (Rogers & Heller, 2003). According to the Kentucky Long-Term Research Center (2001), Kentucky high school students who are pursuing higher education out-of-state are the students with the highest academic achievements.

## **KEES Background**

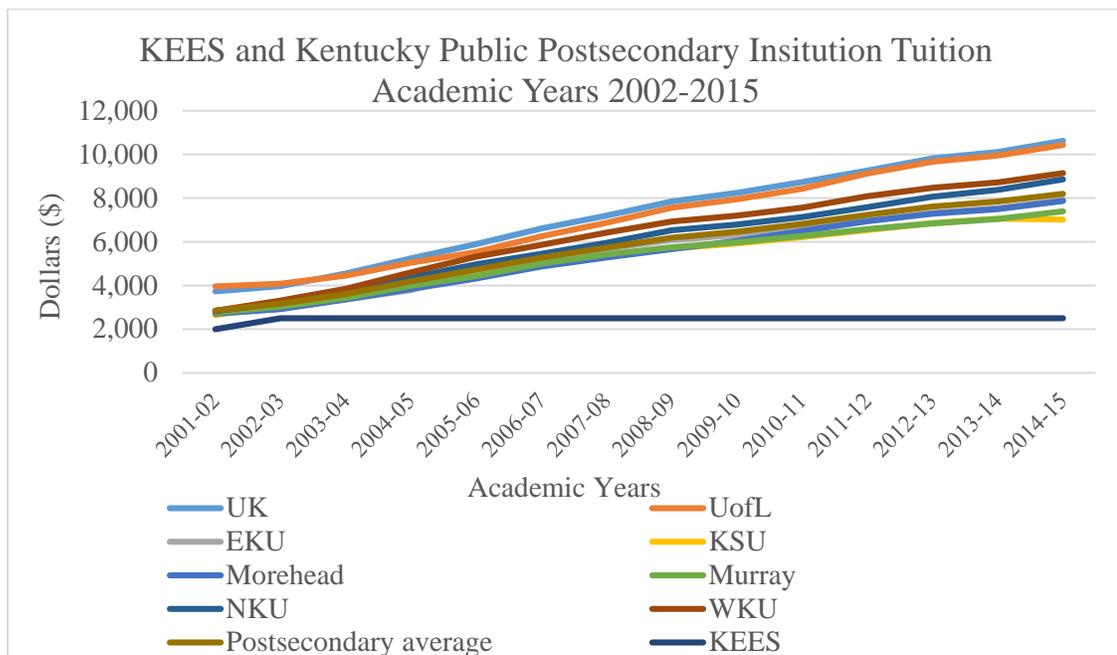
In 1998 the General Assembly passed Senate Bill 21, later known as the Kentucky Educational Excellence Scholarship (Legislative Research Commission, 2011). KEES is funded through the state lottery along with the College Access Program (CAP) and Kentucky Tuition Grant (KTG). Whereas KEES is a merit-based scholarship program accessible to all Kentucky high school students, CAP and KTG scholarships are need-based grants (Legislative Research Commission, 2011). From the latest study available by the Legislative Research Commission (LRC), about 88 percent of Kentucky high school students earn some amount of KEES money (2011).

KEES money is awarded to students based on their GPA, ACT score, and AP exam scores. For every year of high school, a student's GPA can earn them money towards college. For example, if a student earns a 3.0 GPA, they receive \$250 in KEES tuition assistance. If a student earns a 3.0 GPA all four years of high school, he or she is awarded \$1000 in KEES tuition assistance for any Kentucky institution. A student's ACT score and AP exam scores also earn them more money towards college. In addition, KEES awards students from a low income family bonuses for their scores on AP tests.

The KEES program has made some adjustments over the years. Until 2010, a student needed to retain a minimum 3.0 GPA in college to renew their KEES assistance for the next year. To help prevent so many students from losing their KEES assistance, the General Assembly passed a bill in 2008 that lowered the minimum GPA to 2.5 as long as the student is on track to graduate. It is reported about 40 percent of students lose their KEES eligibility after their first year of higher education (Legislative Research Commission, 2011).

Tuition in Kentucky has increased two hundred per cent over the last fifteen years (Kentucky Center for Economic Policy, 2014). The largest amount a student could receive from KEES in 2002 could pay 63%-85% of their tuition at a Kentucky institution. In 2009, the largest amount a student could receive from KEES could only pay 37%-51% of in-state tuition. As of 2015, the most money a student can earn in KEES money is \$2,500 and this amount has not increased since 2002 (LRC, 2011). Figure A below shows the rise in tuition of several public Kentucky institutions over the past fourteen years as the highest amount of KEES assistance awarded to students has stayed constant. According to the LRC (2011), the constant increase in tuition has decreased the value of KEES money. The LRC also mentions that higher education institutions outside the state are matching KEES awards to help attract students to their schools. The study for this paper is to examine whether the KEES program increases the percentage of high-performing students remaining in Kentucky for higher education.

**Figure A**



Source: Kentucky Council on Postsecondary education. (2015)

## **Literature Review**

### **Why States Adopt Merit-Based Programs**

As of 2012, thirteen states had merit-based scholarship programs with eight of them located in the south (Wall Street Journal, 2012). Some researchers believe this is due to policy diffusion, but several academics are skeptical about diffusion as the only answer. Researcher William Doyle (2008) studied the states with merit-based programs. Doyle found that states with merit-based programs are the states that have the smallest percentage of high school students attending and completing college. He concluded that a state is more likely to adopt a financial aid program for academic achievement if the state is struggling to get their resident students to attend college. The south has the biggest problem getting students to seek higher education and keeping the brightest students in-state for higher education (Doyle, 2008). Kentucky has been one of the states with the lowest number of college graduates per capita in the country, (Rogers & Heller, 2003). This may have contributed to why the Kentucky legislature may have wanted to implement a merit-based scholarship program in the state of Kentucky.

Another reason states want to retain their high-performing students in-state for higher education is a hope these students would find a career in the state after graduation, providing a better economy (Rogers & Heller, 2003). An educated workforce attracts employers to a state, supporting the economy. Researchers Orsuwan and Heck (2008) noted that around fifty percent of students who attend college out-of-state return to their home state after graduation, whereas eighty percent who attend college in-state, stay in the state after graduation. Kentucky had 25,000 residents leave from 1970-1995, most of them high-performing students (Rogers & Heller, 2003). This diminishes Kentucky's economic potential. The state is struggling to keep its brightest students in Kentucky, but policymakers hope with programs like KEES, they will start to see more of these students deciding to stay in-state. States want to retain as many of their

high-performing high school graduates pursuing higher education in the state as well as appealing to out-of-state students to attend their universities because high-performing students bring academic achievement for the institution and out-of-state residents provide more revenue for the state and institution.

Merit-based scholarships are intended to help high-achieving students, but not all education policy experts are proponents of such programs. Perhaps the biggest argument against merit-based programs is they do not help those who need it most. Several studies have demonstrated that money goes to students who are already planning on attending college and are from higher income families (Monks, 2008). Georgia was the first state to offer a merit-based scholarship program in 1992 with the HOPE scholarship. As the first fully implemented merit-based program in the country, it is extensively researched by economists and education policy analysts. Researcher Susan Dynarski studied Georgia's HOPE program the year after it was implemented to assess its effect on high school students' college decisions (2004). The empirical analysis included data on high school students, GPA, test scores, and family income. Her results shows that white and middle-to-upper middle class students received more merit-based aid than minorities and those from lower-income families. Her results also indicated that, with the HOPE scholarship, a student was more likely to attend a four year college rather than a two year college and more students stayed in-state for college than the previous year. As the first state to implement a merit-based scholarship program, this kind of study showed the promise to other states considering a similar program.

Another study from The National Center for Education Statistics (NCES) showed how merit-based scholarships may not be helping those who need it most. The NCES took data from Georgia and concluded that, in the 2007-2008 school year, only thirty percent of students from

low-income households received merit scholarships, while fifty-five percent from middle-income households, and forty nine percent from high-income households received merit scholarships (Woo & Choy, 2011). The NCES also tracked the average HOPE award amounts earned by Georgia high school seniors. Low-income students received on average \$3,900, middle class students received \$4,600, and high-income students received \$4,700 (Woo & Choy, 2011). This correlates to other research studies that demonstrate the wealthiest students are the ones most likely to get most of the benefits from merit-aid programs and are more likely to attend higher education out-of-state (Singell & Stone, 2002).

### **Brain Drain**

The term brain drain refers to educated people leaving a job/state and moving to another job/state for a better living (Merriam-Webster, 2015). For the purpose of this paper, brain drain will refer to high-performing high school students leaving the state to attend another institution; a problem merit-based scholarships are trying to address. Researchers Zhang and Ness collected data from the Integrated Postsecondary Education Data System (IPEDS) from 1986-2006 in a multiple regression analysis to see if the thirteen states with merit-based scholarships decrease brain drain in their states compared to states without merit-based scholarships. Their results indicated that all merit-aid based states varied in how effectively they appeared to decrease brain drain. Four out of the thirteen states with merit-based programs (including Kentucky) saw little to no change in the percentage of students choosing to attend college out-of-state. Zhang and Ness explain this could be due to the lower standards set for those states, but they do suggest further research is needed to understand how some states appear to be more effective in retaining students in-state.

As mentioned earlier, states presumably want to retain high-performing students in-state for higher education for the future of the economy. The problem states face is not just trying to retain high-performing students to attend an in-state institution, but also getting the high-performing students to stay in-state after graduation. Merit-based programs focus on retaining the high-performing students in-state for school, because research shows there are more likely to stay in-state if they attended college in their home state. However, one reason high-performing student chose to attend college out-of-state is because they feel that their in-state schools are not good enough (Rogers & Heller, 2003). If this is the attitude of some of the best performing students, merit-based scholarships may not be the answer to retaining these students.

## **Research Design**

### **Hypothesis**

This study aims to investigate whether Kentucky's merit-based program, KEES, keeps high-performing students in Kentucky for higher education. The amount of KEES money granted to students has not changed since 2002, yet tuition for public and private institutions rise every year. The impact of KEES money may have fluctuated over the years, but the KEES program theoretically should display some effect on retaining high-performing students. The following are the null and alternative hypothesis on the effect of KEES on retaining high-performing students:

*Ho: KEES scholarship has not had an effect on keeping high-performing students in-state for higher education.*

*Ha: KEES scholarship keeps high-performing students in-state for higher education.*

## **Descriptive Statistics**

The dataset available for this research was provided by the Kentucky Center for Education and Workforce Statistics from their high school feedback reports. The aggregate data are comprised of the 2009-2010, 2010-2011, and 2011-2012 academic school years. All data are at the school level and represent the 228 public high schools in Kentucky. The variables included are the average amount of KEES money awarded to a high school's seniors, the percent of students attending college out-of-state, the percent of students attending college in-state, the number of high school graduates at a school, average GPA, average ACT score, and the percent of the student population eligible for free-and-reduced lunch price. One of the dummy variables included in the dataset is whether the school is located in Appalachia or not.

To test for normalcy with the dataset, it is necessary to run summary statistics for the variables to make sure the sample is normal and representative of the population. Table 1 below shows most of the variables appear to be normal. The average KEES variable has a normal skewness and kurtosis but the variance is large. Here, a large variance signifies that KEES money awarded to students by school is spread out far from the mean. This could be due to large outliers, causing a wider bell curve and a large confidence interval. One method to modify the variance so it may become normal is to give less weight to the outliers. Giving less weight to the outliers could shrink the variance providing a more accurate description of the whole sample.

**Table 1: Summary Statistics**

Observations = 684\*

2010-2012 Summary Statistics							
Variable	Mean	Std. Dev.	Min.	Max.	Variance	Skewness	Kurtosis
<b>KEES</b>	1074.55	225.53	359.00	2130.00	50867.20	0.23	4.57
<b>ACT</b>	18.65	1.62	14.30	26.02	2.63	0.59	4.50
<b>GPA</b>	2.88	0.21	2.04	3.57	0.043	-0.16	3.88
<b># of High School Seniors</b>	181.00	105.32	12.00	522.00	11092.30	0.71	3.16
<b>Free &amp; Reduced Lunch</b>	0.49	0.17	0.00	0.98	0.03	0.01	2.62
<b>In-State College Going Rate</b>	0.58	0.10	0.14	0.95	0.01	0.02	4.03
<b>Out-of-State College Going Rate</b>	0.05	0.05	0	0.38	<.00	2.39	11.63

\* All variables have 684 observations except "Out-of-State" which contains 669 and "Free and Reduced Lunch" which contains 680

The percent of students attending school out-of-state has a very small variance, a skewness of 2.39, and a kurtosis of 11.6. These moments of distribution for the percent of students attending college out-of-state at the school level indicate that most Kentucky public high schools have a similar percentage of students leaving the state for higher education. The high kurtosis also means the tail is thick to the right of the distribution. A few extreme outliers could be the reason for such a high kurtosis.

Pairwise matrixes are used to show the correlation between two continuous variable. To give better insight to the dataset, Table 2 below displays the pairwise correlation matrix used to show relationships between the variables. The KEES variable has a positive correlation between GPA, ACT, in-state college going rate, and out-of-state college going rate. The strongest positive relationship with KEES is GPA with a correlation of .84. This is logical because most high school students receive the majority if not all of their KEES money based on their GPA.

Students' ACT and AP score only account for a small portion of their KEES money. The strongest negative correlation in the pairwise matrix is the relationship between ACT score and percent of students on free-and-reduced lunch. An r-value of  $-.77$  ( $p < .001$ ) indicates that if a school has a high percentage of its student's on free-and-reduced lunch, there is roughly a 38% decrease in the school's average ACT score. These correlations are interesting and give further insight into how these variables are indicators for higher education. The relationship pertaining to this study is between KEES money and the out-of-state college going rate. There is a weak correlation with only an r-value of  $.37$  ( $p < .001$ ). This might indicate there is a weak relationship between these two variables. However, considering the relationship between KEES money and in-state college going rate is also relatively weak, there may be other factors affecting percentage of students who attend college beside a school's average KEES award. One reason for this may be because those who earn a small amount of KEES money in high school may be less likely to attend college. As stated earlier, about 88 percent of high school students receive some amount of KEES money, compared to about 60 percent of high school graduates go on to higher education.

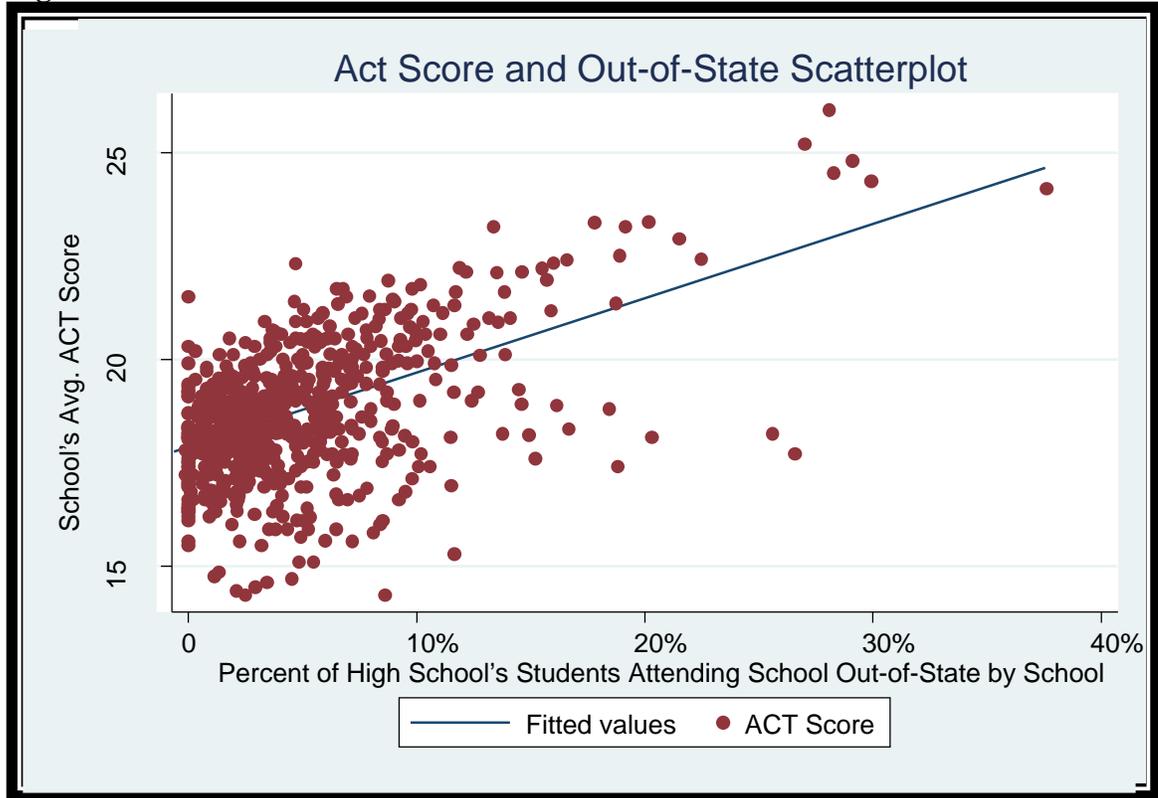
**Table 2: Pairwise Correlation Matrix**

	<b>KEES</b>	<b>GPA</b>	<b>ACT</b>	<b># of High School Seniors</b>	<b>In-State College Going Rate</b>	<b>Out-of-State College Going Rate</b>	<b>Free &amp; Reduced Lunch</b>
<b>KEES</b>	1.00						
<b>GPA</b>	.84 ( $<.001$ )	1.00					
<b>ACT</b>	.78 ( $<.001$ )	.48 ( $<.001$ )	1.00				
<b># of High School Seniors</b>	.07 (.05)	-.11 (.004)	.48 ( $<.001$ )	1.00			
<b>In-State College Going Rate</b>	.56 ( $<.001$ )	.46 ( $<.001$ )	.56 ( $<.001$ )	.01 (.84)	1.00		
<b>Out-of-State College Going Rate</b>	.37 ( $<.001$ )	.15 ( $<.001$ )	.53 ( $<.001$ )	.21 ( $<.001$ )	.05 (.159)	1.00	
<b>Free &amp; Reduced Lunch</b>	-.57 ( $<.001$ )	-.34 ( $<.001$ )	-.77 ( $<.001$ )	-.43 ( $<.001$ )	-.42 ( $<.001$ )	-.44 ( $<.001$ )	1.00

A scatter plot was also generated showing ACT score and out-of-state college going rate to examine the relationship between schools with high-performing students and the percent of students who attend higher education out-of-state. GPA and ACT scores are both an indication of academic achievement, but ACT scores usually represent a more accurate description of high-performing students and are considered a better indicator for student success in college (Tam & Sukhatme, 2004). Grades can be inflated and the grading scale differs across the state, but the ACT is scored the same across the United States. Figure B below shows the positive relationship between the average ACT score by school and the percent of students at that school who seek higher education out-of-state. A majority of the Kentucky public high schools with the highest ACT scores also have the highest percentage of students attending school out-of-state. One inference is students with high grades and a high ACT are more likely to attend school out-of-

state while students with high grades and a low ACT are more likely to stay in-state for higher education.

**Figure B**



The summary statistics, pairwise correlation, and scatterplot show findings consistent with previous research. KEES money has a positive correlation between percent of students who attend college out-of-state, GPA, and ACT score. The percent of students eligible for free and reduced lunch repeatedly correlates with family income. Schools where there is a high student population from low income generally have lower GPAs and score lower on standardized testing. In addition, the pairwise correlation matrix for all the dataset showed a strong negative correlation between ACT score and percent of students eligible for free and reduced lunch. The matrix also showed that students at schools with a high student population on free and reduced lunch are less likely to attend college in general, in-state or out-of-state.

## **Methodology**

Testing and analysis can help provide insights into the effect the KEES program has on retaining high-performing students in-state for higher education. It is important to use panel data to determine whether there is a difference over time with the percent of high-performing students attending school out-of-state. The data available provides three recent academic school years for analysis. An ordinal least squares regression is used to determine the relationship between the dependent variable, the percent of high-performing Kentucky high school graduates from each public high school attending college out-of-state, with the independent variables. Equation 1 estimates whether KEES money has an effect on high-performing students staying in-state for higher education:

$$(1) Y_{it} = \alpha_1 KEES_{it} + \alpha_2 A_{it} + \alpha_3 S_{it} + \alpha_4 SD_{it} + \gamma_t + \phi_{SD} + \epsilon_{it}$$

Here Y is the percent of high-performing Kentucky high school graduates attending higher education out-of-state from each high school. KEES is the explanatory variable for the average amount of KEES money a student from a given school has received for his or her first year of higher education. A is a vector of coefficients for a student's academic achievements. The variables included for student academic achievement are the average grade point average and average standardized test scores for each high school's senior class. For this study, standardized tests scores are calculated from ACT scores only. S is a coefficient for the number of high school seniors for each high school. SD is a vector of coefficients for student demographic in each public high school in Kentucky. School demographics include the percent of students who qualify for free and reduced lunch and a dummy variable for district location. The district location indicates whether the public school is located in an Appalachian county or not.  $\gamma_t$  is a

variable for the school year and  $\phi_{SD}$  is the fixed effect for each school.  $\epsilon_{it}$  is the random error term. (Some of these variables could be collinear, a test for multi-collinearity is needed to make sure this is not the case.)

## Results and Analysis

After running the initial regression, the dataset was tested for multi-collinearity, KEES money, GPA, and ACT scores all tested high for multi-collinearity. This is rational because KEES money is awarded to students based on their GPA and ACT scores in addition to AP scores. To get further understanding of the effect of these two variables on the KEES variable, three more regressions were tested. For the first regression, only the GPA variable was dropped, in the second regression only the ACT score was dropped, and in the third regression, both GPA and ACT score variables were dropped. Table 3 below shows the regression results only for the KEES variable when ACT and/or GPA variables are included or not. The coefficient for KEES with the out-of-state college going rate is small with or without the GPA and ACT variables, but it does make a difference.

**Table 3: Regression Differences with KEES**

<b>Out-of-State College Going Rate</b>	<b>Coef.</b>	<b>Std. Err.</b>	<b>t</b>	<b>P&gt; t </b>	<b>F</b>	<b>R-sq</b>
<b>KEES (w/GPA &amp; ACT)</b>	0.00005	0.00002	2.3	0.022	56.59	0.3762
<b>KEES (only ACT)</b>	0.0000006	0.00001	0.06	0.954	64.17	0.3692
<b>KEES (only GPA)</b>	0.00014	0.00002	8.67	<.000	49.25	0.3099
<b>KEES (W/O GPA &amp; ACT)</b>	0.00006	0.00001	6.26	<.000	49.03	0.2712

Two factors stand out comparing the regressions. First, the highest coefficient between KEES and out-of-state college going rate is when the GPA variable is included in the regression, not when KEES is by itself. Second, when only the ACT score is included, a p-value of .95

indicates that KEES is not a statistically significant variable when it comes to students attending higher education out-of-state. Because there is such high multi-collinearity between the three variables, the GPA and ACT score variables will be dropped from the equation.

Table 4 below displays the results from the regression with the continuous variables. As stated earlier, the KEES coefficient for out-of-state college going rate is small. Yet, a t-value of 3.55 ( $p < .000$ ) indicates that the KEES money does have some significance, although small, for the out-of-state college going rate. For this regression there is a very weak correlation suggesting KEES money may not be a big deciding factor for students when choosing to go out-of-state. Another interesting result from this regression is the free and reduced lunch variable, with a coefficient of  $-.08$  ( $p < .000$ ). Students from schools with a high percentage of participation in the free and reduced lunch program are less likely to attend college out-of-state (or at all), most likely due to lower income, lower GPA, and lower test scores.

**Table 4: Regression with Fixed Effects for Out-of-State College Going Rate**

<b>Out-of-State College Going Rate</b>	<b>Coef.</b>	<b>Std. Err.</b>	<b>t</b>	<b>P&gt; t </b>	<b>Beta</b>
<b>KEES</b>	0.00003	0.00001	3.55	<.000	0.1565
<b># of High School Graduates</b>	0.00003	0.00002	1.71	0.087	0.0673
<b>Free &amp; Reduced Lunch</b>	-0.0875	0.01305	-6.70	<.000	-0.3258
<b>Graduation Year</b>	0.0033	0.00202	1.63	0.104	0.0577
<b>_cons  </b>	-6.5658	4.05811	-1.62	0.106	

The next two regressions tested were the same variables again, this time with only the Appalachian schools and then again with only the non-Appalachian schools. Tables 5 and 6 show the regression with only Appalachian schools and non-Appalachian schools respectively. For the Appalachian schools, the KEES coefficient has a small value of  $-.00002$  ( $p < .306$ ) and t-value of  $-1.03$ , implying that KEES money has no effect on public high schools for their out-of-

state college going rate. For the non-Appalachian schools, it appears that KEES money is statistically significant and does influence high schools for their out-of-state college going rate. Another noticeable difference between the two demographics is the free and reduced lunch variable. The Appalachian schools have a much larger coefficient,  $-.10$  ( $p < .000$ ), compared to the non-Appalachian schools,  $-.03$  ( $p < .048$ ). A reason for this could be an inference made about poverty between the two areas of Kentucky. Poverty in Appalachia is different from poverty in non-Appalachia. In general, people from Appalachia in Kentucky are poorer than people considered low-income in non-Appalachia Kentucky. According to the Appalachian Regional Commission (2013), Appalachian counties in Kentucky have the highest poverty rate compared to all other Appalachian counties in other states. In addition, Appalachia Kentucky has a smaller percent of residents who have completed at least a bachelor's degree compared to other Appalachian states with 13.3 percent.

**Table 5: Regression with only Appalachian Schools**

<b>Out-of-State College Going Rate</b>	<b>Coef.</b>	<b>Std. Err.</b>	<b>t</b>	<b>P&gt; t </b>	<b>Beta</b>
<b>KEES</b>	-0.00002	0.00002	-1.03	0.306	-0.0732
<b># of High School Graduates</b>	-0.00004	0.00003	-1.28	0.202	-0.0795
<b>Free &amp; Reduced Lunch</b>	-0.1066	0.0198	-5.38	<.000	-0.3864
<b>Graduation Year</b>	0.0039	0.0030	1.31	0.190	0.0807
<b>_cons</b>	-7.9016	6.0957	-1.30	0.196	.

**Table 6: Regression with only non-Appalachian Schools**

<b>Out-of-State College Going Rate</b>	<b>Coef.</b>	<b>Std. Err.</b>	<b>t</b>	<b>P&gt; t </b>	<b>Beta</b>
<b>KEES</b>	0.00006	0.00001	5.35	<.000	0.3303
<b># of High School Graduates</b>	0.00005	0.01945	2.55	0.011	0.1284
<b>Free &amp; Reduced Lunch</b>	-0.03856	0.01945	-1.98	0.048	-0.1356
<b>Graduation Year</b>	0.00169	0.00263	0.64	0.520	0.0290
<b>_cons  </b>	-3.41795	5.29124	-0.65	0.519	

To better understand the relationship between the KEES and ACT score, an interaction term was created between these two variables. Table 7 shows relationship between ACT, KEES, and KEES & ACT with the out-of-state college going rate. These results show ACT and KEES have a negative correlation with the out-of-state college going rate, but when KEES and ACT are combined, it has a positive correlation. This could be due to the statement made earlier in the paper regarding a school with a high GPA and high ACT score is a better indicator of high performers at that particular school, as well as a higher amount of KEES money awarded to the high school seniors. Students at schools who are awarded the largest amount of KEES money are the top performers and more likely to attend college out-of-state.

**Table 7: Interaction Variable between KEES & ACT score**

<b>Out-of-State College Going Rate</b>	<b>Coef.</b>	<b>Std. Err.</b>	<b>t</b>	<b>P&gt; t </b>	<b>Beta</b>
<b>ACT</b>	-0.0165	0.00295	-5.59	<.000	-0.5639
<b>KEES</b>	-0.0006	0.00004	-13.39	<.000	-2.6736
<b>KEES &amp; ACT</b>	0.00003	0.000002	13.2	<.000	3.5816
<b>_cons  </b>	0.37053	0.05142	7.21	<.000	

There are many factors and variables that cannot be measured for a student choosing to leave the state of Kentucky for higher education. Hopefully, this study gives a little more insight

into how KEES may or may not influence a high-performing student to stay in-state for higher education.

## **Limitations**

There are a few limitations with this study. First, the high school feedback reports from the Kentucky Center for Education and Workforce Statistics only provides data at the school level. If the data was at the student level, it would be easier to identify a high-performing student and the data would tell us if these were indeed the students choosing to go to school out-of-state instead of making these assumptions. In addition, the data only covers public schools in the state of Kentucky. Students who attended high school at a private institution are not included in this study.

Another limitation is the time series covered by the data. The best way to study the effect of KEES on high-performing students would be a pre and post-test study. If the data were available, the best case for a study like this would be to see how many high-performing students studied out-of-state before KEES was implemented in Kentucky and compare the difference, if any, to how many high-performing students are now attending higher education out-of-state. Fortunately, the dataset available are the years closest to present day which shows the reader a current analysis of KEES' impact on retaining high-performing student's in-state state for higher education.

## **Recommendations and Conclusion**

Roughly twenty five years ago, states began merit-based scholarship programs as a way to help students gain access to college and to keep high-performing students in-state for college. Economists and academics thoroughly research many aspects of merit-aid based programs to see how they affect student choice for higher education, taking into account student demographics.

This study about KEES' influence on retaining high-performing students in the state of Kentucky for higher education showed results similar with previous research. Zhang and Ness (2010) noted that Kentucky was one the states that experienced little change in the percentage of high-performing students going out-of-state for higher education after implementation of a merit-based scholarship program. Kentucky's Legislative Research Commission has also reported little change in the percent of Kentucky high school graduates going out of state for higher education over the past seventeen years. The LRC's 2011 study mentioned that there was a slight decrease for the out-of-state college going rate, from 14 percent in 1998 (before KEES was implemented) to 11 percent in 2008.

If KEES has little to no impact on retaining high-performing students in-state, the legislature could change the policies dealing with the KEES program. The General Assembly may want to consider alternative objectives for Kentucky's merit-based scholarship program to provide a better offer for high-performing students to keep them in-state for higher education. According to the LRC (2011), KEES has lower standards compared to other state merit-based programs because the General Assembly wanted the scholarship to be accessible to most students, the main goal of KEES. As stated earlier, about 88 percent of high school students receive KEES tuition assistance. If there were to be a policy change, it would have to include a solution where access to higher education for Kentucky citizens is still being provided.

One possible solution would be raising the award price for students without lowering the standards, access to all for post-secondary education is still provided while giving a better incentive to high performers to remain in-state. This might entail another study to determine how high the awards need to be raised in order to incentivize these high performers to stay in-state. Next, policy makers would need to find a way to afford it. This solution would probably have to

rely on more than just the lottery to fund the KEES program and the costs might outweigh the benefits.

The KEES program was reviewed and analyzed by the Kentucky Legislative Research Commission, Kentucky Center for Economic Policy, and other government organizations to determine if the program is achieving its objectives. Results from this study showed that there is a very weak correlation between KEES and the out-of-state going rate suggesting the KEES program may not have an impact on students going to school out-of-state. The results also indicated that students from schools with a high percentage of participants in the free and reduced lunch program are less likely to attend higher education either in-state or out-of-state.

However, further research is needed to understand the KEES program. Some suggestions for future research includes studying the student demographics of student's choosing to attend higher education out-of-state. This includes, GPA, standardized test scores, race, gender, high school attended, and household income. If it were possible, interviewing students on their choice of school and why they decided to attend school out-of-state would be beneficial for researchers. If the research continues, the legislature can get a thorough analysis on KEES to see if the program does have an impact on retaining high-performing students in Kentucky for higher education.

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