

# Regression Analysis of the Commitment to Colorado Program

The Commitment to Colorado (CTC) program provides grant aid to cover full tuition and fees for students who are Pell eligible. It further provides grant aid equal to half the amount of tuition for students who are above Pell eligible but have a family income that is below the Colorado median income. Generally, this program is awarded to full-time, resident, undergraduates who have an Expected Family Contribution (EFC) that falls between 0 and 15,000. Almost half of these students with an eligible EFC do not receive the award because they do not complete the application process by the first day of class or, more likely, they have a family income that is above \$57,000 (frequencies displayed in table 1).

Table 1.

| Frequency (Observed Retention Rate) of FA11 Full-time, Resident, Freshmen with an EFC between 0 and 15,000 |              |                     |
|--|--------------|---------------------|
|  | Received CTC | Did not receive CTC |
| Pell eligible EFC (0-5,273)  | 792 (83.8%)  | 145 (78.6%)*        |
| Above Pell EFC (5,274-15,000)  | 75 (82.7%)   | 588 (80.8%)**       |

\* All of the 145 students with a Pell eligible EFC who did not receive CTC missed the deadline

\*\*Only 3% of the 588 students with an EFC between 5,274 and 15,000 who did receive the CTC missed the deadline. The majority of these students are not CTC eligible because they have a family adjusted gross income that is above \$57,000.

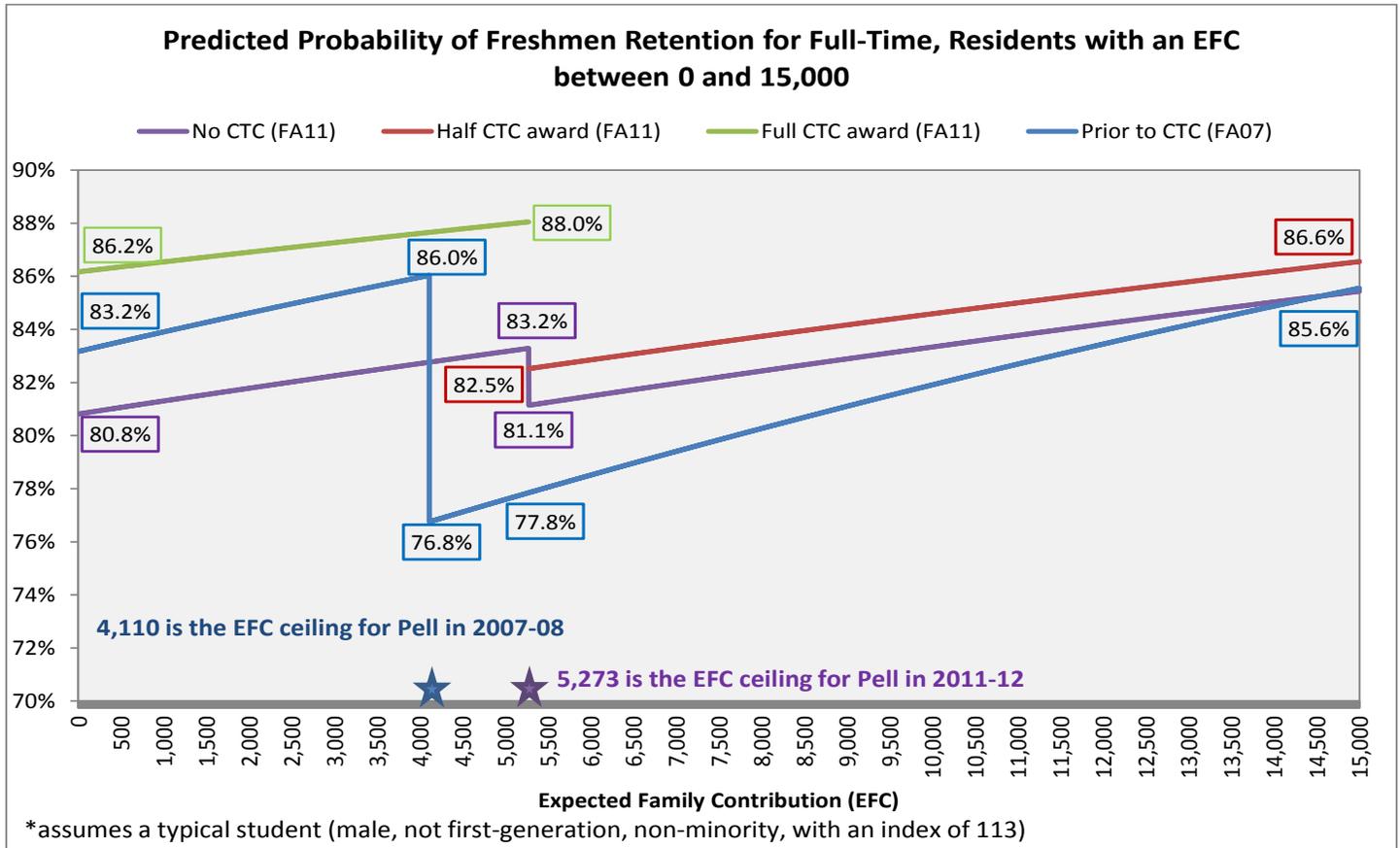
The observed retention rates show that Pell recipients who receive CTC have the highest retention rate (83.8%) and Pell recipients who do not get CTC (because they do not complete their application process in time) have the lowest retention rate (78.6%). Students with a half CTC award have the second highest observed retention rate (82.7%). Students who don't get the half CTC award (most of whom do not qualify because their family's adjusted gross income on their tax return is greater than \$57,000) do slightly better than the Pell recipients who do not get CTC, but worse than the students who get a full or half CTC. These observed retention rates appear to support the statement that CTC receipt improves retention; however, these observed rates do not control for other student characteristics that could also be influencing persistence. The current logistic regression analysis explores the impact of the CTC award on freshman retention while controlling for demographics (first generation status, gender, and ethnicity) and academic preparation (index).

## General Conclusions Regarding the Impact of CTC on Freshman Retention

- With expected family contribution held constant, CTC recipients have a higher predicted probability of freshman retention than do non-CTC recipients after controlling for demographics and academic preparation.
- Receipt of a full CTC award along with a Pell Grant increases the predicted probability of retention. Predicted probabilities of retention for full CTC recipients is higher than both the non-CTC FA11 Pell recipient cohort and the FA07 Pell recipient cohort's predicted probabilities.
- Receipt of a half CTC award also has a positive impact on retention. However, the magnitude of the half CTC award's impact is not as large as was seen with the full CTC award.
- The CTC program (with its financial commitment to students above Pell) supports recent shifts in institutional financial aid packaging philosophy by redistributing grant aid across a larger EFC range than in the past. This redistribution has positively impacted retention for students just above the maximum allowable Pell Grant EFC.

Figure 1 below displays the predicted probability of freshmen retention for new, full-time, resident freshmen in the FA11 cohort with an EFC between 0 and 15,000 across all three CTC recipient levels (full tuition and fees, half tuition, and no CTC). The predicted probabilities from a second model are also graphed for the full-time, resident, FA07 cohort with an EFC between 0 and 15,000. In order to access the impact of CTC on freshmen retention the predicted probability of freshmen retention for the two levels of CTC awards will be compared to the probabilities for both the FA11 non-CTC group and the FA07 cohort across EFC values while controlling for demographics and academic preparation. Complete information from both models is in the Appendix.

Figure 1.



- **Green:** Predicted probabilities for FA11 Pell Grant recipients who are also CTC recipients. These students were awarded grant aid that was at least equal to the average tuition and fee amount. The line for these students is not graphed past an EFC of 5,273 since in order to get a Pell award a student must have an EFC below this level.
- **Red:** Predicted probabilities for CTC recipients who have an EFC above the Pell ceiling and got grant aid up to half the amount of tuition. The line for these students is not graphed prior to an EFC of 5,273 since under this EFC students are Pell eligible.
- **Purple:** Predicted probabilities for students with an EFC that would qualify them for the CTC award; however, these students did not get the award because they either did not complete the application process by the first day of classes or have a family income above \$57,000. This serves as a control group for the CTC recipients in the FA11 cohort.
- **Blue:** Predicted probabilities of the FA07 cohort with an EFC below 15,000. This cohort was selected for inclusion because it was prior to any financial aid program that assured Pell eligible students of tuition and fee coverage from grant or scholarship. This serves as another control group for the CTC recipients in the FA11 cohort.

### Specific Findings Displayed in the Graph

- For a full-time, resident freshmen with a zero EFC, the receipt of CTC in addition to a Pell award increases the predicted probability of retention by 3.0 - 5.4 percentage points (86.2% minus 83.2%; 86.2% minus 80.8%).
- At the upper end of Pell eligibility (EFC = 5,273) for the FA11 cohort, receipt of CTC in addition to a Pell award results in a 4.8 percentage point increase in predicted probability of retention compared to students who receive Pell but do not get a CTC award (88.0% minus 83.2%). Comparison to the FA07 cohort is less meaningful at this EFC level since a FA07 student with an EFC of 5,273 would not have received the Pell award.
- Statistically, the comparison between FA11 full CTC awards and Pell only awards is a statistically significant difference. A Pell eligible student who receives CTC has 48% higher odds of being retained compared to a Pell eligible student who does not receive CTC after controlling for demographic and academic preparation variables.
- The magnitude of the impact of a half CTC award is not as large as what was seen with the full CTC award. At the cutoff point (EFC=5,274), the receipt of CTC increases the predicted probability of retention by 1.4 - 4.7 percentage points (82.5% minus 81.1%; 82.5% minus 77.8%).
- The magnitude of the impact of a half CTC award decreases as the EFC increases. At the CTC maximum allowable EFC (15,000) a half CTC award recipient has a predicted probability of 86.6% while both control groups have a predicted probability of 85.6%. This 1.0 percentage point difference is the smallest CTC treatment effect seen across any of the comparisons.
- Statistically, the comparisons between FA11 half CTC awards recipients and the students who received neither CTC nor Pell are not statistically significant.

An obvious trend in all four lines of this graph is the dramatic drop in predicted probability at the point at which a student is no longer Pell eligible (EFC of 4,110 in 0708 and 5,273 in 1112).

- There is often a “cliff” in the amount of grant offered in financial packages at the Pell ceiling with Pell students getting sufficient to moderate grant and students just above Pell getting small to zero amounts of grant even though there is probably no practical difference in the family income of a FA07 student with an EFC of 4,109 compared to a student with an EFC of 4,111.
- It should be noted that the retention drop-off at the Pell cutoff for the FA07 cohort is 9.2 percentage points (86% minus 76.8%), which is larger than either of the retention drop-offs in the FA11 cohort. This could be due to changes in institutional financial aid packaging policy between FA07 and FA11 with a shift of philosophy from awarding most of the aid to the lowest income student to more equitably disbursing aid across a broader EFC range.
- The retention drop-off for the FA11 cohort is larger for the CTC recipients (5.5 percentage points; 88% minus 82.5%) compared to the non-CTC recipients (2.1 percentage points; 83.2% minus 81.1%). Expectations for the FA11 non-CTC group could be influencing their retention; for instance, perhaps FA11 non-CTC students plan to get their paper work in on time for the 1213 academic year so the smaller grant awards (for a non-CTC student who has an EFC just above the Pell cutoff) in the current year have less of a negative impact on their probability of being retained.

In conclusion, this analysis supports the statement that the receipt of CTC improves the likelihood that a full time resident freshman will be retained to their second fall semester. The positive impact of CTC appears to be strongest for students who also get Pell since Pell recipients who receive the full CTC award have the highest observed and predicted retention rates. The half CTC award also improves the likelihood of retention; however, the magnitude of this relationship is not as pronounced as it is for the full CTC award.

Appendix

| Was the student <sup>†</sup> retained to their second fall semester? |             |                |            |         |             |                |            |         |
|--|-------------|----------------|------------|---------|-------------|----------------|------------|---------|
| Variables  | FA07 Cohort |                |            |         | FA11 Cohort |                |            |         |
|  | Coefficient | Standard Error | Odds Ratio | P-Value | Coefficient | Standard Error | Odds Ratio | P-Value |
| CTC Full   |             |                |            |         | 0.3911      | 0.2233         | 1.4786     | 0.0798  |
| CTC Half   |             |                |            |         | 0.0929      | 0.2916         | 1.0974     | 0.7500  |
| Pell   | 0.6237      | 0.2613         | 1.8658     | 0.0170  | 0.1470      | 0.3228         | 1.1584     | 0.6488  |
| EFC (divided by 5,000) <sup>††</sup>                                 | 0.2683      | 0.1396         | 1.3077     | 0.0546  | 0.1593      | 0.1388         | 1.1727     | 0.2511  |
| First Generation   | -0.0860     | 0.1522         | 0.9176     | 0.5718  | -0.3562     | 0.1409         | 0.7003     | 0.0115  |
| Index  | 0.0276      | 0.0073         | 1.0280     | 0.0001  | 0.0278      | 0.0065         | 1.0282     | 0.0000  |
| Female   | 0.0150      | 0.1501         | 1.0151     | 0.9204  | -0.1748     | 0.1363         | 0.8396     | 0.1998  |
| Asian Pacific <sup>†††</sup>   | 0.3107      | 0.4554         | 1.3644     | 0.4950  | -0.0728     | 0.4136         | 0.9298     | 0.8603  |
| Black  | 0.5135      | 0.4509         | 1.6712     | 0.2548  | 0.9778      | 0.3692         | 2.6587     | 0.0081  |
| Multi-Racial   | 0.0612      | 0.4604         | 1.0631     | 0.8943  | -0.0351     | 0.3147         | 0.9655     | 0.9112  |
| Native American  | -0.2748     | 0.8350         | 0.7597     | 0.7421  | -0.5499     | 1.1677         | 0.5770     | 0.6377  |
| Hispanic   | -0.1892     | 0.2187         | 0.8276     | 0.3870  | 0.2748      | 0.1880         | 1.3162     | 0.1439  |
| Constant   | -2.1450     | 0.8507         | 0.1171     | 0.0117  | -1.8507     | 0.8023         | 0.1571     | 0.0211  |
| Observations <sup>††††</sup>   | 1,260       |                |            |         | 1,595       |                |            |         |
| Nagelkerke R2  | 0.0323      |                |            |         | 0.0412      |                |            |         |

<sup>†</sup> Includes new full-time, first-time, resident freshmen with an EFC between 0 and 15,000.

<sup>††</sup> EFC and Index are the only two continuous variables in the models. All other variables are categorical with the comparison value reflecting the variable name, e.g. the variable "Pell" has non-Pell as the reference group and Pell recipients as the comparison group.

EFC was divided by 5,000 so the coefficient is interpreted in terms of every 5,000 change in EFC.

<sup>†††</sup> All the ethnicities are compared to the reference group of non-minority students which includes international, white, and students who do not report their ethnicity.

<sup>††††</sup> The number of observations for FA11 in the frequency table (1,600) do not match the number of observations included in the logistic regression (1,595) because 5 of the FA11 students do not have a value for index and are excluded from the regression analysis