

Tuition Policy Changes and Academic Outcomes: The Impact of the Colorado ASSET legislation

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Abstract

In 2013, Colorado became the 15th state to pass a law effectively granting in-state tuition to undocumented students while keeping with a federal ban on specifically targeting them for financial aid. In this paper, we evaluate the effects of Colorado's Advancing Students for a Stronger Tomorrow (ASSET) legislation on the college application, enrollment, persistence, and credit hours of Colorado undergraduates using a differences-in-differences methodology. In the absence of information on legal immigration status, we construct a plausible treatment group from Hispanic non-resident non-citizens who attended high school in Colorado. We find evidence of an increase in the enrollment of likely undocumented students, and an increase in the the number of enrolled credits of new students. We do not find evidence of policy-induced changes in the persistence, full-time status or credit hours completed of continuing students, however.

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1 Introduction

College is a costly investment, and the difference between in-state and out-of-state tuition is substantial. High tuition may make it difficult for students to succeed in college due to financial stress and time spent on employment required to pay for college as well as affecting the decision to enroll in college. While college continues to be a worthwhile investment despite rising costs (e.g., Oreopoulos and Petronijevic (2013)), these costs disproportionately affect access to postsecondary education for disadvantaged groups for whom a college education can increase social mobility. Undocumented immigrants, even those who arrived in the US as children, face particularly high barriers to college, as they are ineligible for federal financial aid and often ineligible for in-state tuition at public colleges and universities.

This paper takes advantage of a change in college tuition policy affecting students at all public colleges and universities in Colorado. Specifically, the ASSET legislation (Colorado SB 13-033) extends in-state tuition eligibility to students who graduated from high school in Colorado but are unable to provide proof of legal residence. Using a difference-in-differences methodology to compare students likely to be affected by the policy change to those who were not, we examine whether tuition eligibility changes under the ASSET legislation affected the re-enrollment, or persistence, of current students, as well as the enrollment of new students. Using student-level data from the Colorado Department of Higher Education, we are able to examine both the extensive margin of enrollment in college as well as the intensive margin by considering the number of credit hours enrolled and whether students have full-time or part-time status. Finally, because we observe all students who applied to public colleges and universities in Colorado, we can examine whether the policy changed the probability of acceptance and the enrollment decision conditional on application.

We focus on the impact of the tuition decrease on students who are likely to be undocumented, which we define as Hispanic non-resident aliens who attended high school in Colorado. While previous literature on similar legislation has examined only a subset of universities in a state or has been limited to survey data, we consider the impact of a recent statewide tuition increase on student persistence, full-time status, and credit hours using detailed administrative data that covers all of Colorado's 31 public postsecondary institutions. Because we observe application behavior as

well as outcomes of enrolled students, we are able to address a major gap in the literature by examining how tuition changes affect the acceptance and enrollment of college applicants. We find that the policy induced more students who are likely to be undocumented to enroll; however, we do not find evidence of improved academic outcomes for students who enrolled prior to the policy change. Yet for students induced to enroll by the tuition decrease, we find evidence of increased credit hours and increased probability of full-time status. Given the current political environment, understanding the impact of state legislation targeting undocumented immigrants is immediately relevant to public debate. Identifying the effects of Colorado's tuition policy changes adds to evidence-based policy discussions about affording opportunities to undocumented youth living in the United States as well as speaking to the broader question of the impact of education costs on student achievement and postsecondary attainment for disadvantaged groups.

2 Background

2.1 Prior Literature

The literature on the effect of college costs on enrollments tends to take advantage of changes in financial aid or tuition policies. For example, Bettinger (2004) finds that Pell grants reduce dropout rates for college students between Freshman and Sophomore year, while Dynarski (2003) shows a clear decrease in the probability of attendance following the end of the Social Security Student Benefit Program in 1982. Other studies have examined the effects of specific scholarships, with mixed results. Goldrick-Rab et al. (2012) analyze the effects of a randomized private grant for first-year Pell Grant recipients in Wisconsin and find an increased probability of both re-enrollment and a full-time course load. Cornwell, Mustard and Sridhar (2006); Cornwell, Lee and Mustard (2005) find that Georgia's HOPE scholarship increased enrollment among first-time freshmen but decreased credit hours and full-time status. Finally, Angrist et al. (2014) examine a randomized, privately-funded scholarship program in Nebraska and show evidence of increased college attendance and persistence among lower achieving students, but they did not find evidence of an effect among high achievers.

Targeting educational opportunities to the undocumented population is especially important due to the lower educational attainment of this group. Undocumented immigrants are substantially

less likely to graduate high school and to attend college than those in the country legally. In Colorado, an estimated 24 percent of undocumented immigrants who moved to US before age 14 have some college education, compared to 60 percent for the rest of the population, and less than 8 percent of the likely undocumented population has a Bachelor's degree. In Colorado, home to approximately 180,000 undocumented immigrants in 2010, policies to address these gaps in educational attainment are a particularly important policy concern (Passel and D'Vera Cohn (2011)). Previous studies have shown that financial aid and scholarships affect the least advantaged students the most (Angrist et al., 2014), and while undocumented students are a small subset of the population of college students, this group resembles other disadvantaged students in lower income and educational attainment. Examining the impact of college tuition on undocumented students can provide insights into how tuition affects disadvantaged students in general.

Prior work has considered the effects of similar policies in other states that target undocumented immigrants. This literature has primarily examined the impact of in-state tuition eligibility changes on college enrollment levels and the outcomes of enrolled students, but the results are not conclusive. Using national survey data, Kaushal (2008) finds that enrollment and college attainment increased among Mexican students in California, and Flores (2010) shows that increased enrollment is especially pronounced among women. Amuedo-Dorantes and Sparber (2014) apply a difference-in-difference estimation across multiple states and find positive effects on college enrollment and completion of Hispanic non-citizens, but no evidence of crowding out of native students. Chin and Juhn (2011) use a similar strategy and find evidence suggesting an increase in attendance for undocumented students but no impact on the probability of dropping out. However, national survey data does not include the rich demographic characteristics and academic outcomes of institutional data.

Using more detailed institutional level data from six universities in Texas, Dickson and Pender (2013) analyze a 2001 law in Texas and find an increase in enrollment among the target population at some institutions. Most closely related to our paper, Conger and Turner (2015) examine a 2002 tuition increase for undocumented students in New York that was retracted one semester later. They find that the change led to students putting their education on hold temporarily. In this project, we start by measuring the effect of the legislation on enrollment and completion, as has been done by researchers in other states. However, we will also address how such legislation affects

the decision of high school students to apply to college, an important gap in the literature. The application margin matters to understanding the response of students to tuition changes, since even in-state tuition may be too expensive for the target population of the policy.

2.2 Policy Background

Recently, a vigorous national debate has revolved around undocumented youth, and in particular their access to public programs like public education. The Obama administration's Deferred Action for Childhood Arrivals (DACA) program, enacted in 2012, protects immigrants who arrive at a young age with their parents from the threat of deportation. Moreover, Congress has considered multiple versions of the Development, Relief, and Education for Alien Minors (DREAM) Act (2001, 2007, 2010). Though they failed to pass, these initiatives would provide immigrant youth access to aid for college. DACA and protection of "Dreamers" became the focus of intense political back-and-forth in the beginning of the Trump administration, with no resolution as of early 2018.

Despite the repeated failure of DREAM Act initiatives at the national level, states and cities have made efforts to provide undocumented immigrant youth with support to pursue higher education. In 1996, the federal Illegal Immigration Reform and Immigrant Responsibility Act (IIRIRA) prevented states from extending any benefits to undocumented immigrants that were not available to all US citizens. Thus, undocumented immigrants could not be eligible for in-state tuition benefits in their state of residence because citizens in other states were not eligible. However, in some states, the public university systems provided undocumented students with in-state tuition if they met certain requirements, such as living in the state for a certain number of years. In response to IIRIRA, 18 state governments, beginning with Texas and California in 2001, enacted policies that effectively grant in-state tuition to undocumented students while, in keeping with the federal ban, not specifically targeting them.

In 2013, Colorado became the 15th state to pass such a law, when Governor Hickenlooper signed Senate Bill 33, the Colorado Advancing Students for a Stronger Economy Tomorrow (ASSET) law. Specifically, Colorado ASSET legislation provides in-state tuition to students who attended at least three years of high school in Colorado immediately preceding their graduation or general equivalency diploma (GED). Additionally, students had to be admitted to college within twelve months of graduating from high school or show proof of physical presence for the prior 18 months.

Thus, the policy was an attempt to reach out to not only the latest cohort of high school graduates, but also to earlier graduates who might have applied earlier but were deterred by the costs of out-of-state tuition. Undocumented students are further required to sign an affidavit stating that they have applied or plan to apply for lawful presence in the state. In theory, students with legal resident status could stand to gain from this law; for example, a student who moved to another state after graduating high school and decided to return some years later to enroll in a Colorado university. Still, the intention of the policy is to target undocumented youth with significant links to Colorado for in-state tuition.

Effective in the fall of 2013, the legislation extended in-state tuition eligibility as well as qualification for the College Opportunity Fund (COF), a \$75 reduction in tuition per credit hour available to all low-income Colorado residents. While the relative discount of the COF is smaller at four-year institutions, the tuition reduction of \$900 per semester for a full-time student is a substantial change at community colleges in particular. The ASSET program also made many undocumented students eligible for certain types of university-specific financial aid or scholarships available only to residents.

3 Data

We use data graciously provided by the Colorado Department of Higher Education (CDHE). These data include individual-level information on Colorado's 31 institutions of higher education, which enroll over 250,000 students each year. There are 14 four-year colleges and universities, as well as 17 two year technical and community colleges.

We compile three main student-level files. The first contains term-level information on all enrolled students at all Colorado public institutions, from the 2008 to 2014 academic years. This file contains information on each student's demographics, academic progress, and financial aid received. Academic information includes the number of credit hours the student enrolled in, as well as their GPA. The financial aid information includes whether the student was eligible for Pell grants, and whether the student received one. Demographic information include gender, age, race, and ethnicity. There is also an indicator of whether the student qualifies for in-state or out-of-state tuition, which is crucial for our analysis. Students with out-of-state tuition can include students

enrolling from other states outside Colorado, international students, as well as undocumented students who do not qualify for in-state tuition and may be affected by the ASSET policy change.

The second dataset includes information on each degree and certificate awarded over the same time period. This includes the institution, date of award, type of award, as well as a detailed Classification of Instructional Programs (CIP) code. The CIP code can be used to determine the content of the award. Each award is linked to the individual in the enrollment files.

The third source of data is a list of each individual application to a Colorado institution of higher education between 2008 and 2013.¹ Each record has demographic information for the applicant as well as the tuition classification, as in the enrollment file. Each application record also shows whether the application was accepted and whether the student ultimately enrolled in that institution. The application records also include the associated scores on the various ACT individual tests, the ACT composite score, and the SAT score.

To avoid bias from changes in out-of-state enrollment, which may increase due to changes in the applicant pool or the budgetary concerns of the universities, we restrict our sample to students who attended high school in Colorado. Due to data availability, we consider only students in entering cohorts from 2010-2015, and we further restrict our sample to Freshmen enrolling as degree-seeking undergraduates for the first time. We cannot observe undocumented students directly, so we consider a treatment group of students who are likely to be affected by the policy based on race/ethnicity and tuition classification flags. Specifically, we define the treatment group as Hispanic students who are classified as "non-resident aliens" for tuition purposes. That is, while they may have attended high school in Colorado, they do not show proof of official residency (which would require a Social Security number or visa), and they are not citizens. Our control group is all other Hispanic enrollees.

Table 1 shows summary statistics for all enrolled students in the 2012 and 2013 academic years. Because the ASSET legislation was passed in the summer of 2013, the table shows a cross-section of students immediately before and after the policy change. In both years, approximately 70 percent of students are white, and approximately a fifth are Hispanic/Latino. There is a small increase in the share of students who are Hispanic/Latino from 2012 to 2013. Non-resident aliens comprised a small share of all students in 2012: just over half a percent. However, the following year their

¹Data from 2008 are incomplete and not included in the analysis.

share of all enrollments had more than doubled, to 1.3 percent. This is the first evidence that the ASSET legislation may have had an effect, since these students are the one targeted by the policy. Approximately 45 percent of all students were Pell-eligible, and most of those students did receive Pell grants. Students took an average of just over 12 credit hours per term, and over 70 percent enrolled full-time, defined as enrollment in at least 12 credit hours in a semester. An important takeaway from this table is that, other than slight upticks in the share of students who were Hispanic/Latino and non-resident aliens, there do not seem to be meaningful changes in the overall composition of students enrolled at public Colorado postsecondary institutions following the implementation of the policy.

4 Empirical Approach

4.1 Estimating Equation

We are interested in how the ASSET policy change, which occurred in the summer of 2013, changed student behavior. Following similar research in this literature (e.g Conger and Turner, 2015) we utilize a difference-in-difference approach. The price of tuition changed abruptly for students targeted by the ASSET legislation from the 2012 school year to the 2013 school year, but did not change for other students. As discussed earlier, we consider non-resident Hispanic students to be the "treated" group in this policy context, and all other Hispanic enrollees as the non-treated or "control" students.

Another important obstacle in estimating the effects of the ASSET legislation is that changing the price of tuition likely affected two important margins of student behavior. First, students who had already been enrolled prior to the 2013 law change but were on the margin of dropping out or stopping out might be induced to re-enroll the following Fall semester. We could observe this through evidence of a differential increase in persistence from the 2012 school year to the 2013 school year among the treated group. Second, new students might be induced to attend college. We use enrollment data to explore the first of these two margins and application data to explore the second.

To study the persistence effects we estimate the following:

$$y_{itc} = \beta_0 + \beta_1 Treat_i + \beta_2 PostASSET_t + \beta_3 (Treat_i * PostASSET_t) + X_i \gamma + \eta_c + u_{itc} \quad (1)$$

where y_{itc} is an outcome for student i in year t in college or university c . The outcomes we consider are persistence from one year to the next, full-time status, and number of credits. The variable $Treat_i$ takes a value of one if the student is in the treated group, and zero otherwise. The variable $PostASSET_t$ takes a value of one if the academic year occurs after summer of 2013. Because we only have data through the 2013 academic year, only that year has a value of one, and all prior years have a value zero. Because the sample only consists of first-year students, students with $PostASSET_t$ with a value of one started college the year prior to the passage of ASSET and had their sophomore year subject to the new policy. The outcome we observe for all students occur in the sophomore year. The coefficient of interest is β_3 . We control for a set of individual characteristics X_i , such as test scores and other demographics. We also control for college fixed effects η_c .

A benefit of estimating equation 1 is that it focuses only on the persistence of students who had already enrolled prior to the policy change. Given the history of the ASSET legislation, the future change in tuition price played no part in the initial decision to enroll in college of any students in the sample. Thus, the estimate of β_3 represents an estimate of the causal impact of the policy change on the enrollment behavior of affected students. A main limitation, however, is that persistence is likely not the most salient margin. It is likely that students who already had enrolled in a year of college do not represent the marginal student. A more policy relevant analysis is of students pushed to enroll for the first time due to the policy.

In order to answer this second question we leverage information from the application file. We ask whether applications were more likely to be received from undocumented students relative to other students after 2013 than before, and whether they were also more likely to be accepted. We estimate a version of equation 1 at the application level, as well as at the applicant level

Examining the effect of the ASSET legislation on application behavior allows us to focus on the effect of the policy on selection into college-going. There are two margins in which we are interested here. The first is whether high school students targeted by the policy are induced to apply to

college because of the policy. Students who knew they would not be eligible for in-state tuition might be less likely to apply to college at all. Thus, changing the tuition faced by these students would induce them to apply, even if they might not be accepted. Second, students accepted into a college might be more likely to matriculate if the tuition they face is higher. Of course, both margins might be shut down if the in-state tuition plus other costs of attending college are still too high for the potential student's family to afford. Undocumented immigrants who are granted in-state tuition because of the policy are still ineligible for federal financial aid programs.

4.2 Threats to Identification

The ASSET legislation passed in the spring of 2013; the first time the tuition decrease affected eligible students was the fall of 2013.² However, students applying to college in the fall of 2012 made the decision to apply and choices about the institutions to which they applied without knowing that they would have in-state tuition eligibility. Thus, if the effect of the policy is to induce students to apply who would not have otherwise, we are unlikely to see effects for this cohort. However, if the policy improves outcomes by giving students more time to spend on coursework, rather than working, or gave students on the margin of re-enrolling the nudge they needed to stay in college, we should see effects on students who already enrolled. Students enrolling after 2012 (beginning with those applying to college in the fall of 2012) would have known about the policy; students induced to enroll because of the lower tuition may be affected differently than those already in school. A potential concern is that students applying to college prior to the policy anticipated the change and some were induced to apply through their expectation; however, we do not find meaningful effects when including this cohort. Another concern is that Metropolitan State University (MSU) in Denver extended in-state tuition benefits to all Colorado high school graduates prior to the ASSET legislation, in the fall of 2012. We find similar results when excluding MSU from our sample.

Figure 1 shows means for the relevant groups for the main outcomes of interest. Because the analysis relies on a differences-in-differences design, it relies on the assumption that the trends in the outcomes are similar in the period prior to the policy for both groups. Panel a) shows the

²Undocumented students enrolling in courses in the summer of 2012 could also be eligible for in-state tuition; however, we are excluding students in summer terms from our analysis.

number of enrolled students who were Hispanic non-residents, Hispanic residents, and all other students. Overall enrollment declined in the years prior to the policy change, in the summer of 2013. However, enrollment overall for Hispanic students remained flat, for both resident and non-residents. This suggests that we will not find much effect on overall enrollment in the regression model, either.

Panel b) of the figure shows persistence rates across the three types of students. In the years prior to the passage of the ASSET legislation, persistence among Hispanic non-residents—the students targeted by the legislation—was slightly lower than for other students. However, while the 2011-2013 trends were almost the same, there is a noticeable increase in persistence rates following the start of the ASSET legislation. However, resident Hispanics and other students continued a gradual increase in persistence. There is a similar picture for full-time status, in panel c). While non-resident Hispanic students began at a much lower rate of full-time status in the years prior to the policy change, they showed an almost 20 percentage point jump in full-time status, with barely a perceptible change for other students. The graphs show visual evidence that there are parallel trends in enrollment variables across the two types of students that we use in the analysis, and also illustrate the difference-in-difference effects we document in the next section.

A final concern is that our results may be affected by the introduction of DACA in the summer of 2012.³ While DACA did not imply in state tuition eligibility, it did grant work permits to young undocumented residents, and there is substantial overlap in the groups eligible for DACA and ASSET. The bulk of previous literature does not find evidence that DACA increased college enrollment; in some cases, results suggests that it decreased college enrollment as eligible students took advantage of work permits and entered the labor force earlier (Pope (2016), Amuedo-Dorantes and Antman (2017), Hsin and Ortega (2017)).

However, Kuka, Shenhav and Shih (2018) find a positive effect of DACA on college enrollment, noting that their results differ from the literature in that they are also considering DACA's influence on motivating students to graduate from high school, a requirement for eligibility. If the main channel through which DACA increases college enrollment is through raising expectations about future human capital, students applying to college in the fall of 2012 and enrolling in the fall of 2013 are less likely to be affected. Thus, we limit our main results to comparing the 2011 and 2013

³DACA applications were beginning to be approved by the fall of 2012

cohorts when considering impacts on students who applied after ASSET was in place. Moreover, as shown in Figure 2 we do not see a substantial change in the number of college applicants or the number of applications for our treatment group; suggesting that the changes we find occurred through the enrollment margin. This also helps alleviate concerns about compositional change: our results do not appear to be driven by a large increase in the number of Hispanic non-resident applicants.

5 Results

We examine the effects of the ASSET legislation on two types of students. First, we focus on students who had already enrolled in a Colorado public university or college. This is similar to the approach taken by Conger and Turner (2015), who focus only on the effects of a policy in New York on students who had already enrolled. A benefit of this method is that it is independent of issues of selection of new students into postsecondary education due to the policy. However, this selection is precisely one of the effects of the policy we are interested in measuring. So, as a second approach we look specifically at these selection effects themselves. We focus on the enrollment behavior of new first-time students in their first year. We also leverage information on applications and matriculations of prospective college students to observe how the college-going decision changed.

5.1 Persistence of Previously Enrolled Students

Table 2 shows the effect of the ASSET legislation on one-year persistence rates for first-year students. That is, the outcome we observe is whether a student enrolled in any courses in their second year. We include data on students in the cohorts of the 2010, 2011, and 2012 academic years. Because the policy was enacted in the summer of 2013, the 2012 cohort is the only one of these affected by the ASSET policy, since the policy took effect in the summer between their first and second years. We find that, overall, persistence rates were lower for the 2012 cohort than for the pre-2012 cohorts. Moreover, as shown earlier, Hispanic non-resident students have substantially lower persistence rates than other students. However, the coefficient of interest is the interaction between being in the 2012 cohort and being the target demographic group of the policy. Here, we do not find that there was a differential rate of persistence for Hispanic non-residents than for Hispanic resident

students between the pre-2012 and 2012 cohorts. The coefficient is small and not statistically significant. Thus, we conclude that there is no evidence of an effect of the policy on the persistence of students who had already enrolled in college.

This is a different conclusion than that from the graphs in Figure 1, which showed an uptick in persistence following 2012. This is because the figure conflates the persistence of already-enrolled students with the selection of new students into enrolling for the first time beginning in the 2013 academic year. A lack of an effect here is perhaps not surprising: students who had already enrolled in college are not the marginal cases. These are students who had already enrolled in a year of college, and so their ability to re-enroll the following year would perhaps be less affected by the policy than students who were on the margin of attending whatsoever. In results not shown, we find similar effects on the number of enrolled credits and full-time status for students in their second year.

5.2 Enrollment Behavior of New Students

Next we examine how the ASSET legislation affected the composition of new first-time students. The goal of the policy was to increase college attendance of undocumented students. If it worked, then we should observe heightened rates of credit accumulation, persistence, and full-time status among cohorts entering after the policy than those who entered before. On the other hand, if in-state tuition without access to federal loan and grant programs was still too much of a cost for undocumented students, then the policy may have had a negligible effect.

Table 3 shows the effects of the policy on whether new students entered as full-time or part-time, measured as enrolling in at least 12 units per semester. We include the 2011 and 2013 cohorts. As before, and echoing the descriptive figures discussed earlier, we find that Hispanic non-resident students are less likely to enter as full-time students. However, we do find that Hispanic non-resident students were 0.11 percentage points more likely to enroll as full-time students in the 2013 cohort than in the pre-policy cohort, relative to Hispanic resident students. This result is robust to the inclusion of controls for demographics and placement test scores. This is quite a large effect, of about 17 percent relative to the overall full-time status rate of 65 percent. In fact, the increase in full-time status due to ASSET makes up more than half of the difference in the full-time status between Hispanic resident students and Hispanic non-resident students.

Table 4 shows a similar result, this time for the number of credits a student entered. Here we find that the ASSET legislation had a positive and substantial effect on the number of credit hours of new first-year students. The policy led to an increase of 3.4 credits in a student's first year, or about a 16 percent increase. As with full-time status, this increase made up more than half the difference in the pre-policy number of credits enrolled between the two groups, which is the coefficient in the second row.

In Table 5 we show whether first-year students persisted to take any courses the following year. Because the 2012 cohort is treated by the policy, which took effect after their first year, we do not include them in the sample. This also why we exclude the 2012 cohort from the sample for the other regressions in this subsection, in order to retain the same sample of students.⁴ We find a similar pattern as for the other outcomes we examined in this section. The policy increased persistence rates of the targeted students by 15 percentage points, a substantial increase.

Together, the results on full-time status, the number of enrolled credits, and persistence suggest that the policy changed the enrollment intensity of new students. However, we also wish to understand the mechanisms involve in these changes. Was this substantial closing of the gap between non-resident Hispanic students and other students a result of a change in the composition of students entering colleges in Colorado, or was it a result of students who would otherwise have enrolled being able to enroll in more classes?

5.3 Application Behavior

So far, we have found that ASSET did not change the enrollment behavior of students who had already previously enrolled in college prior to the policy, but dramatically increased the intensity of enrollment for new students. In this subsection we use data on the applications of all students to Colorado public colleges and universities to explore whether ASSET affected the quality of candidates and the matriculation behavior conditional on acceptance.

Table 6 shows whether ASSET increased the likelihood that an application would be accepted. The unit of observation is an individual application, with multiple applications possible per students. We include applications from students submitted between 2008-2011 and for 2013. As before, we exclude 2012 because these applications may have been partially treated. Overall,

⁴For full-time status and credit hours, the results are similar when we do include the 2012 cohort.

relative to Hispanic resident students, Hispanic non-residents were equally likely to have their applications accepted. We also find suggestive evidence that the policy slightly increased the probability of being accepted for Hispanic non-residents. However, while the coefficients are large, they are not statistically significant. Thus, the policy may have led to slightly higher acceptance rates for this group, but we cannot be sure. Taking the coefficients on face value, these results imply that applications from the targeted group of students became 11 percentage points more likely to be accepted after the policy compared to other students. This would be a large effect, and does suggest that there may have been a change in the quality of applicants due to the policy.

A related question brought about by the strong results on the enrollment behavior of new students in the previous subsection is whether different types of students enrolled following the policy, affecting the overall composition. Table 7 shows whether students were more likely to take up the offer of admission and matriculate conditional on being accepted. As before, the unit of observation is an application, although in this case it is accepted applications. Here we find evidence that, indeed, selection is a likely cause of the changes in enrollment behavior of new students. We find that accepted applications filed by non-resident Hispanic students were 14 percentage points more likely to be taken up due to the policy. This is a large effect, and shows that a primary consequence of the policy is to push students who would otherwise not have enrolled in college to enroll.

6 Conclusion

In this paper we explore how Colorado's ASSET legislation of 2013, which granted in-state tuition to public colleges and universities for many undocumented students, affected the college-going and enrollment behavior of these students. We find that the policy did not make a significant impact on students who had already enrolled. However, we do find substantial changes in the enrollment behavior of new students entering college after the policy had taken place. The policy was able to close half the gap between non-resident Hispanic students and resident Hispanic students in terms of the number of college credits taken and persistence. Using data on applications, acceptances, and matriculation, we argue that the mechanism driving these results is the effect of the policy on inducing marginal students, who would otherwise not have enrolled in college, to attend.

Our results inform two important policy areas. First, we find that the ASSET legislation, one of many similar “state DREAM acts”, can increase college-going rates of students who would otherwise not have attended. As such, our results echo other findings in the literature that ask similar questions with different research designs or in different states.

More generally, our findings speak to the larger literature on how college costs affect college attendance. The change in tuition granted by ASSET is a substantial one: at Colorado State University in Fort Collins, the per-semester tuition for in-state students was \$5,258 per semester compared to \$13,005 for out-of-state. It is likely that this difference reflects the true difference in cost faced by the targeted students, since they are ineligible for federal financial aid and, prior to ASSET, most types of state financial aid. Thus, our results show that tuition changes in this part of the distribution can have substantial effects on college-going for students on the margins of college attendance.

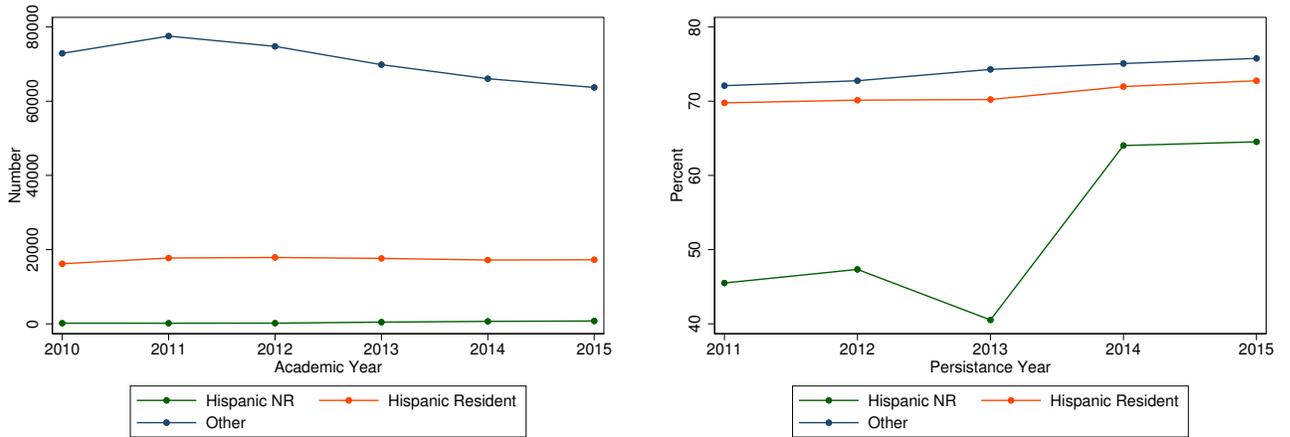
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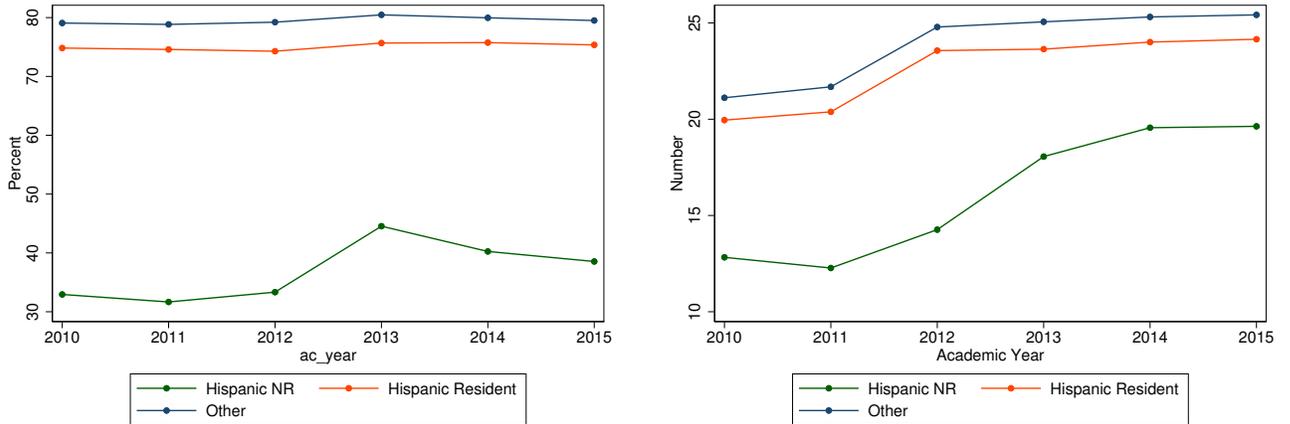
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Figure 1: Enrollment and Persistence Trends, 2010-2015



a) Enrollment

b) Persistence



c) Fulltime Status

d) Credit Hours

Figure 2: Application Trends, 2009-2013

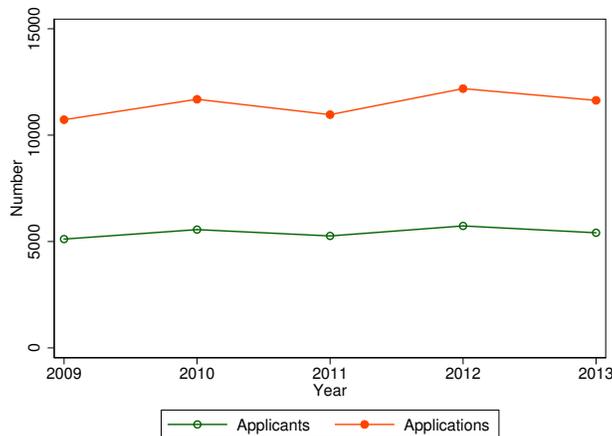


Table 1: Enrollment Summary Statistics

	2012	2013
Male	0.467 (0.499)	0.476 (0.499)
Age	21.63 (7.546)	21.00 (6.767)
White	0.714 (0.452)	0.736 (0.441)
Black	0.0767 (0.266)	0.0697 (0.255)
Hispanic/Latino	0.189 (0.391)	0.220 (0.414)
Other Race	0.0836 (0.277)	0.0981 (0.298)
Nonresident Alien	0.00638 (0.0796)	0.0138 (0.117)
Pell-eligible	0.461 (0.499)	0.450 (0.497)
Pell receipt	0.406 (0.491)	0.387 (0.487)
ACT English	22.14 (5.547)	22.15 (5.601)
ACT Math	22.02 (4.964)	22.07 (4.942)
Credit Hours	12.08 (3.901)	12.40 (3.738)
Fulltime status	0.710 (0.454)	0.730 (0.444)
Observations	32762	33849

Table 2: Re-Enrollment: Freshmen, 2010-2012 cohorts

	(1)	(2)	(3)	(4)
	Model 1	Model 2	Model 3	Model 4
Post-2012	-0.00833 (0.00642)	-0.0124 (0.00734)	-0.0253*** (0.00714)	-0.0303*** (0.00710)
Hispanic Non-Res. Non-Cit.	-0.225*** (0.0344)	-0.226*** (0.0344)	-0.161*** (0.0345)	-0.164*** (0.0348)
Hispanic NR NC x Post	-0.0322 (0.0578)	-0.0319 (0.0578)	-0.0243 (0.0572)	-0.0252 (0.0576)
Y Mean	0.672	0.672	0.672	0.672
N	24840	24840	24840	24840
R2	0.00339	0.00344	0.0663	0.0767
Year Controls	No	Yes	Yes	Yes
Institution Controls	No	No	Yes	Yes
Demographic and SAT Controls	No	No	No	Yes

Notes: * p<0.10, ** p<0.05, *** p<0.01 Includes 2010-2012 cohorts of new students. Demographics include gender, years to application, and age at application. Standard errors clustered at the individual level.

Table 3: Full-time status: Freshmen, 2011 and 2013 cohorts

	(1)	(2)	(3)
	Model 1	Model 2	Model 3
Post-2012	0.0190* (0.00744)	0.000371 (0.00645)	-0.0112 (0.00628)
Hispanic Non-Res. Non-Cit.	-0.362*** (0.0459)	-0.167*** (0.0399)	-0.187*** (0.0413)
Hispanic NR NC x Post	0.0664 (0.0522)	0.0975* (0.0460)	0.107* (0.0471)
Y Mean	0.648	0.648	0.648
N	16789	16789	16789
R2	0.0120	0.261	0.302
Institution Controls	No	Yes	Yes
Demographic and SAT Controls	No	No	Yes

Notes: * p<0.10, ** p<0.05, *** p<0.01 Includes 2011 and 2013 cohorts of new students. Demographics include gender, years to application, and age at application. Standard errors clustered at the individual level.

Table 4: Credit hours: Freshmen, 2011 and 2013 cohorts

	(1)	(2)	(3)
	Model 1	Model 2	Model 3
Post-2012	3.295*** (0.170)	3.074*** (0.158)	2.831*** (0.155)
Hispanic Non-Res. Non-Cit.	-6.833*** (0.789)	-4.065*** (0.723)	-4.422*** (0.736)
Hispanic NR NC x Post	2.357* (1.051)	3.186** (0.979)	3.350*** (0.985)
Y Mean	20.69	20.69	20.69
N	16789	16789	16789
R2	0.0265	0.191	0.227
Institution Controls	No	Yes	Yes
Demographic and SAT Controls	No	No	Yes

Notes: * p<0.10, ** p<0.05, *** p<0.01 Includes 2011 and 2013 cohorts of new students. Demographics include gender, years to application, and age at application. Standard errors clustered at the individual level.

Table 5: Re-Enrollment: Freshmen, 2011 and 2013 cohorts

	(1)	(2)	(3)
	Model 1	Model 2	Model 3
Post-2012	0.0141 (0.00731)	0.00313 (0.00707)	-0.000759 (0.00705)
Hispanic Non-Res. Non-Cit.	-0.184*** (0.0508)	-0.110* (0.0506)	-0.105* (0.0510)
Hispanic NR NC x Post	0.143* (0.0564)	0.158** (0.0559)	0.152** (0.0562)
Y Mean	0.679	0.679	0.679
N	16789	16789	16789
R2	0.00130	0.0721	0.0825
Institution Controls	No	Yes	Yes
Demographic and SAT Controls	No	No	Yes

Notes: * p<0.10, ** p<0.05, *** p<0.01 Includes 2011 and 2013 cohorts of new students. Demographics include gender, years to application, and age at application. Standard errors clustered at the individual level.

Table 6: Acceptance of College Applications

	(1)	(2)	(3)	(4)
	Model 1	Model 2	Model 3	Model 4
Post-2012	0.00895 (0.00476)	-0.0100 (0.00959)	-0.0588*** (0.00998)	-0.0462*** (0.00995)
Hispanic Non-Res. Non-Cit.	-0.0433 (0.0527)	-0.0446 (0.0528)	-0.00296 (0.0545)	-0.00100 (0.0501)
Hispanic NR NC x Post	0.111 (0.0600)	0.112 (0.0601)	0.120 (0.0616)	0.110 (0.0570)
Cohort Controls	No	Yes	Yes	Yes
ACT Scores	No	No	Yes	Yes
Demographics	No	No	No	Yes
Y-mean	0.816	0.816	0.816	0.816
N	46152	46152	46152	46152

Notes: * p<0.10, ** p<0.05, *** p<0.01 Includes 2008-2011 and 2013 cohorts. Demographics include gender, years to application, and age at application. Standard errors clustered at the individual level.

Table 7: Take-up of Accepted Applications, Conditional on Acceptance

	(1)	(2)	(3)	(4)
	Model 1	Model 2	Model 3	Model 4
Post-2012	-0.107*** (0.00590)	-0.183*** (0.0110)	-0.153*** (0.0113)	-0.140*** (0.0113)
Hispanic Non-Res. Non-Cit.	0.123* (0.0526)	0.126* (0.0533)	0.102 (0.0540)	0.0834 (0.0536)
Hispanic NR NC x Post	0.148* (0.0667)	0.145* (0.0672)	0.141* (0.0674)	0.142* (0.0666)
Cohort Controls	No	Yes	Yes	Yes
ACT Scores	No	No	Yes	Yes
Demographics	No	No	No	Yes
Y-mean	0.599	0.599	0.599	0.599
N	37648	37648	37648	37648

Notes: * p<0.10, ** p<0.05, *** p<0.01

Includes 2008-2011 and 2013 cohorts. Demographics include gender, years to application, and age at application. Standard errors clustered at the individual level.