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By

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ABSTRACT

In 2001, Texas implemented House Bill-1403 policy, which allowed non-citizens to pay in-state tuition if they graduated from a Texas high school and resided in-state for at least three years. This thesis investigates whether receiving in-state tuition benefits effects the academic performance of non-citizen students attending Texas public state-universities. Using data from the Texas Higher Education Opportunity Project (THEOP), I examine the effect of the HB-1403 policy on semester grade point average, credit hours earned per semester, and academic major choices. Using a difference in difference model, I estimate the effect of the policy by comparing outcomes, before and after the policy was passed, on Texas non-citizens (the treatment group) compared to Texas US citizens (the control group). After controlling for possible confounding effects, I find that there is no statistical effect of the policy on semester grade point average, credit hours earned, and academic major choices for non-citizens in comparison to U.S citizens.

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I. INTRODUCTION

The cost of enrolling in a post-secondary institution has been steadily rising in the United States (U.S.). Simultaneously, a vast number of students request financial aid to cover the cost of tuition and fees expenses. Recent data from The National Center for Education Statistics (2015) reported that the percentage of undergraduate students receiving any financial aid from a four-year public institution has increased from 77 to 83 percent, between the 2008 and 2013 academic years. Notably, universities can only distribute financial aid to qualifying students based on federal and state regulations. These regulations are based on immigration status, residency status, and level of income.

Federal regulations have allowed states to offer in-state tuition benefits to students who do not meet the residency qualifications regardless of immigration status. In 2001, Texas was the first state to implement House Bill 1403 (HB-1403) law which permits certain non-citizens including undocumented and some international students to qualify for in-state tuition benefits, if they meet the following criteria: attended a public or private high school, resided at least three years in-state, and received financial support from a family member (Dickson & Pinder, 2010; Chin & Juhn, 2010; Iza & Ruge, 2005). In addition, they must sign a declaration of intent to become a permanent resident. The law applies mostly to undocumented students who were brought to the U.S. by their parents at a young age and to some international students who entered the U.S. under qualifying non-immigrant student visas. In Texas, the cost of in-state tuition for a public four-year college has increased by an average of 31% between 2004-05 and 2016-17 academic years (College Board, 2016). Prior to the policy, majority of non-citizen students paid the out-of-state tuition rate, which is at least three times higher (Gonzales, 2010; Chin et al., 2010) than the in-state tuition rate.

The policy was implemented to offer affordable funding alternatives to non-citizen students who do not qualify for federal and state aid due to their immigration status. Non-citizen students are ineligible for any type of aid. Instead, they are limited to other funding sources such as private scholarships (which are rarely available) or employment (which is not legal because of their immigration status) to cover

tuition (Protopsaltis, 2005). The tuition discount is a pathway to supplement the rising cost of postsecondary education but few non-citizens take advantage of the policy benefits, especially at four-year institutions (Frum, 2007; Fischer, 2004). Perhaps, this may be associated with the lack of financial resources, or may be the lack of academic preparation to succeed in a four-year institution. There is a range of literature on the HB-1403 policy. However, most research has focused on the effect of the policy on admissions and enrollment of non-citizens and rarely explores other academic areas. There are also empirical studies that have explored the academic persistence rate until graduation (Flores & Horn, 2009; Contreras, 2009; Chin et al, 2010) but many do not observe the academic performance of these students, while attending college. Furthermore, academic performance is one of the major determinants of student success in college.

This study examines the effect of the Texas state-legislative policy, HB-1403, on major contributing factors affecting academic achievement of eligible non-citizens. This effect has not been investigated or explored by prior research. I use six years of data (1998-2003) from the Texas Higher Education Opportunity Project (THEOP), which is a ten-year longitudinal study examining the college preparation and enrollment of high school students in Texas. My research investigates the before and after policy effect, by analyzing the difference between the change in outcomes among non-citizens and the change in outcomes among U.S. citizens. Using ordinary least squares regression (OLS), I observe the policy impact on semester grade point average, which measures academic performance in a semester, and on credit hours earned, which indicates whether students are completing more or less credits in a semester. I also use multinomial logit regression (mlogit) to examine the probability that the policy impacts academic major choices. Significantly, the results suggest that the HB-1403 policy has no impact on the academic performance of non-citizen students.

II. LITERATURE REVIEW

There is a wide literature that addresses the HB-1403 policy implications and effects on non-citizens. These articles focus primarily on the admissions and enrollment rate, the social and economic impact, as well as the academic persistence of non-citizens and specifically undocumented students.

Following enrollment, it is important to track a student's academic success throughout college. After the policy was implemented, most of the literature has centered their research on the admissions and enrollment of non-citizens under the policy. However, they do not expand their research beyond those areas. Dickson and Pender (2010) examined the policy effect on enrollment rate of undocumented students, and found that there was a 14.1% increase in enrollment at two Texas state public universities and one Texas private university. In a similar empirical study on in-state tuition effect on enrollment, Amuedo and Sparber (2012) also discovered that undocumented students are more likely to enroll in colleges in U.S. states offering tuition benefits. There were no details regarding non-citizens' performance after enrolling in college.

Academic performance is a major determinant of admissions into a college. After admissions, there is no emphasis on how well non-citizens perform academically, when compared to their peers. One study suggested that the increase in the admissions rate of non-citizens, especially international students at some universities could be due to the less selectivity in admissions decisions in accepting foreign students, as a means to highlight inclusiveness and diversity (Owens, 2008). In a review on the admissions rate of undocumented students, Iza and Ruge (2005) pointed out that the U.S. government should be socially and financially accountable for admitting undocumented students and offering in-state tuition because it is beneficial to our society and economy. However, not much information was detailed in their analysis regarding academic progress of these students after admissions.

The financial constraints and immigration status may deter non-citizen students' likelihood to academically succeed. Research has found that undocumented students are more likely to face social and "structural" barriers in college (Gonzalez, 2010) because of the legal constraints and financial inability to

pay tuition expenses. They tend to feel ostracized and marginalized by their peers and institution (Conger & Challman, 2013), which may inadvertently affect their concentration. Studies have indicated that a strong social and financial support network is necessary for smooth transitions, both into and through college, especially for students from economically disadvantaged backgrounds (Tienda & Fletcher, 2008). Additionally, Contreras (2009) studied the impact of Washington state HB-107 policy, which offers similar benefits as Texas state, HB-1403 policy, on the academic resilience of Latino undocumented students. Using survey data on undocumented students, she noted that undocumented Latino students are more likely to fail due to the legal and financial restrictions.

 Prior research has explored the educational attainment of non-citizens but to a limited degree; they focus primarily on the retention and graduation rates, but no mention of the academic performance. In a study on social post-secondary experience for undocumented students, Robert Gonzales (2010) noted that undocumented students were most likely to be susceptible to academic failure due to legal and financial limitations, which can impact their academic progress from high school to college. Without financial assistance, it is reported that non-citizens are more likely to fall into the institutional "at-risk" category (Frum, 2007), which includes students running the risk of dropping out of college. Nevertheless, Flores and Horn (2009) showed that some eligible students under the policy such as Latino undocumented students persist until graduation and perform academically the same as their Latino U.S. citizen and permanent resident peers based on data from the University of Texas at Austin.

 Conger et al, (2013) also compared the academic performance of undocumented students to visa holders (international students), permanent residents, and U.S. Citizens students using data from colleges in New York. They also found that undocumented students perform academically better and have higher associate degrees' completion rates compared to their U.S citizen peers. This may be associated with the affordability of attending a two-year college compared to a four-year college. Chin et al, (2011) also conducted an empirical study of the impact of the law on the educational outcome of undocumented students, and found no significant effects at all, but the research was limited to the Latino population of

undocumented students from 18-24 years old. A number of paper investigate the effect of financial aid on college success (Coonrod, 2008; Dynarski, 2003; Goldrick et al., 2009) and, as Goldrick et al (2009) suggested, further research should be applied to evaluate and analyze the effect of financial aid on academic achievement not only academic attainment.

Although there is a growing literature that examines the policy effect on different areas affecting non-citizens, there is no focused research on the academic performance of non-citizens. This study contributes to the growing literature by examining three major components that affect academic performance of non-citizens. Furthermore, most research emphasized their study on undocumented students whereas, this paper focuses on the effect of the policy on the academic outcomes of all eligible non-citizens (undocumented and international students). The next section discusses the data and methods used to analyze the policy effect on the academic achievement of non-citizen students.

III. METHODOLOGY

a. Data

I use data from the Texas Higher Education Opportunity Project (THEOP), which is a ten-year (2000-2010) longitudinal study examining the college preparation and enrollment surrounding the implementation of the 1998 Texas Top Ten Percent Plan. The plan guarantees admission to high school seniors who graduated in the top ten percent of their class to any college or university in Texas. The study collected survey data between 2002 and 2006 from 13,803 senior and 19,969 sophomore cohorts. They conducted interviews with the cohorts from 105 Texas public high schools, by inquiring about their current and future academic plans for college. It also gathered college administrative data, which includes college applications and transcript information from seven public and two private universities. The college transcript data includes credit hours earned in a semester, semester gpa, cumulative gpa, and academic major fields in order to track academic performance of enrolled and accepted students. The college application data details the applicants' demographic and high school characteristics such as high school economic statistics and high school class rank.

b. Summary Statistics

This paper uses only the college administrative data from two of the nine universities in the study: Texas Tech University (Texas Tech) and Texas A&M University (Texas A&M). After the University of Texas at Austin, Texas A&M and Texas Tech have the second and third largest enrollment of undergraduate cohorts from the study, respectively. In addition, the average tuition and fees costs per semester of in-state undergraduate students is above the state-wide average cost from fall 2003 to fall 2009 semester, when compared to other public universities (Texas Higher Education Coordinating Board, 2010). The sample consists of 499,101 observations, where 70 percent of the observations are from Texas A&M and 30 percent are from Texas Tech. I use data from 1998 to 2003 surrounding the 2001 implementation of the HB-1403 policy. U.S. citizens comprised of majority of the student cohorts, while non-citizens comprised of less than 1 percent of the student cohorts in the sample. There is a higher

enrollment yield of non-citizens and U.S. citizens at Texas A&M compared to the enrollment yield of non-citizens and U.S. citizens at Texas Tech. My analysis focuses on less than 1 percent (4,479) of Texas non-citizens who meet the eligibility criteria under the HB-1403 policy. Due to confidentiality reasons, the initial data did not specify exactly whether a student is an undocumented or international student. Table 1 presents the means, standard deviations and the minimum and maximum range of the primary variables used in this analysis.

My study examines three outcome variables, which are taken from the college transcripts information. *SemesterGPA* is a continuous variable that describes the grade point average in a given semester. It ranges from .5 to 4.0 and has a mean of 2.96. The *SemesterGPA* range is limited to a minimum of 0.5 since THEOP clumped the semester data from 0.0 – 0.5 into one category. *Creditsearn* is a continuous variable that describes the number of credit hours earned within a semester. It ranges from 3 to 19 hours and has a mean of 11.5. *MajorField* is a categorical variable that codes the college majors of students in each term. There are seven unordered categories of major fields: business is category 1, engineering and computer science is category 2, health is category 3, humanities is category 4, natural/physical sciences is category 5, social sciences is category 6, and other/ undecided majors is category 7. Majors are grouped into categories based on actual subject choices. For example, if a student majors in economics or urban studies, he/she is categorized under Social Sciences, or if a student majors in mathematics, he/she is categorized under Natural/Physical Sciences.

Forty-nine percent of the sample is male and 51% is female. 85 % of the student cohort identified as White, whereas 9% comprised of Hispanics and 3% were Blacks and Asians, individually. There is a higher enrollment of Asians than Hispanics and Blacks combined among the non-citizen cohorts. As pointed out by Nores (2009), this difference may be associated with previous studies that found that Asians had a higher likelihood to enroll in four-year colleges, while Hispanics who are more likely to enroll in at two-year colleges possibly due to the affordability of tuition. For this analysis, the additions of

TexasHS, *PrivateHS*, and *TexasRes* variables were necessary in identifying the students who qualified under the tuition benefit policy. Table 1 provides additional variables used in this analysis.

c. Model

This study uses a difference in difference (D.I.D) model with ordinary least squares (OLS) regression to analyze the effect of the policy on semester grade point average and credit hours earned. It also employs a non-linear analysis using multinomial logistic (mlogit) regression to estimate the likelihood of the policy impact on major choices. The D.I.D model assumes that the policy change is like a natural experiment, where one group is effected by a policy change, whereas another group is not effected. The treatment group, non-citizens who reside and went to a high school in Texas, is effected by the law. The control group, U.S. citizens who reside and went to a high school in Texas, is not effected by the law. The model relies on a common trend assumption, which implies that if the HB1403 policy was not enacted, then the trend in academic progress would remain the same for both groups. I examine the parallel trends over time for both groups, by looking at the pre and post policy variation. Thus, I note any changes that may have occur before and after the policy implementation.

I use the mathematical specification below to estimate the difference in difference estimate on GPA, using OLS regression,

$$(Eq.\,i)\quad SemesterGPA_{i,t}| = \alpha + \lambda Texasnoncitizen_{i,t} + \beta AfterPolicy_t + \delta Texasnoncitizen_{i,t} \cdot AfterPolicy_t + \mu X_{it} + \varepsilon_{it}$$

The outcome variable, $SemesterGPA_{i,t}$, is a continuous variable which measures the academic performance of student i, in semester t. $Texasnoncitizen_{i,t}$ equals to one if a student qualifies under the policy. The coefficient, λ captures the estimated average difference of the treatment and control group prior to the implementation of the policy. $AfterPolicy_t$ equals to one if the time period ranges from 2001 to 2003. The coefficient, β captures the estimated average change after the policy implementation. $Texasnoncitizen_{i,t} \cdot AfterPolicy_t$ is an interaction variable of the treated and time variable. The coefficient, δ captures the difference between the change in outcomes among the treatment group and the change in outcome among the comparison group. It is the difference in difference estimate of the policy

effect. The X_{it} vector includes other covariates such as demographics variable (race, gender, residency status), high school characteristics (high school rank and type), and academic characteristics (fall and spring enrollment) that are included to increase the precision of the results. To correct for heteroskedasicity, robust standard errors are estimated and clustered by student id. I use the following OLS specification to estimate the difference in difference estimate on credit hours earned,

$$(Eq.ii) \quad Creditsearn_{i,t}| = \alpha + \lambda Texasnoncitizen_{i,t} + \beta AfterPolicy_t + \delta Texasnoncitizen_{i,t} \cdot AfterPolicy_t + \mu X_{it} + \varepsilon_{it}$$

The outcome variable, $Creditsearn_{i,t}$, is a continuous variable which measures the number of credit hours student i, earned in semester t. The treatment variable, time variable, covariates, and the difference in difference estimator are similar to the GPA specification.

To estimate effects in major, I use a non-linear model since major is categorical. I use mlogit regression to estimate policy effect on academic major choice. The mathematical specification,

$$(Eq.iii) \quad p(MajorField_i = j) = \frac{e(Z_{it}\gamma_j)}{\sum_{j=1}^{7} e(Z_{it}\gamma_j)}$$

models the probability a student has major in, j=1… 7. The outcome variable, $MajorField_i$, is a categorical variable representing the actual college major choice of the individuals. The coefficients reported will need to assume a baseline or reference category which is normalized to 0 and hence, only *j-1* coefficients reports. Humanities major is selected as the reference category since it is the least enrolled major among the major categories at both universities. Thus, without loss of generality, I report the change in marginal effects of each predictor variable on the probability of selecting major, *j*, relative to another major.

IV. REGRESSION RESULTS

This section discusses the regression results and findings on the tuition aid impact on three measures of academic performance. The first subsection discusses the findings of the policy impact on semester grade point average. The second subsection discusses the results of the policy impact on credit hours earned. The final subsection discusses the policy impact on major choices.

a. *Policy effect on semester grade point average*

Table 2 represents estimates for equation (i) for GPA. Column (1) reports the mean estimates on GPA without controlling for confounding effects. Before the policy was enacted, GPA is lower for non-citizens than U.S. citizens. Since mandating the policy in 2001, there is an increase in semester GPA for both groups but a larger increase is noted for U.S. citizens compared to non-citizens. The difference in the average GPA for non-citizens is higher than the difference in average GPA for U.S. citizens. As a result, the D.I.D. estimate of the policy effect is positive and statistically significant. Without controlling for other factors, the results indicate that the policy had a relatively small effect and is statistically significant but show no substantial effect on semester grade point average.

The regression results, which control for observable factors such as ethnicity, gender, and high school and academic characteristics, are presented in Column (2) of Table 2. The table reports the mean estimates and standard errors of the policy effect on semester GPA for both universities. I find that semester GPA is not statistically different from zero for non-citizens than for U.S. citizens, prior to the policy change. After the policy change, both groups experiences 0.059 higher GPA and this estimate is statistically different from zero. These results are consistent with prior research findings that indicated higher GPAs are earned among non-citizen students than among U.S. citizen students (Conger et al, 2009). In this case, the estimated effect of the policy on average is positive (0.044) and not statistically significant. This suggests that, after controlling for other factors, the policy did not effect GPA.

Columns (3) and (4) of Table 2 report the means estimates of the policy effect on GPA from Texas Tech and Texas A&M university, respectively. The results indicate that GPA is not statistically

different from zero for non-citizens than for U.S. citizens at Texas Tech and at Texas A&M prior to the policy change. Following the policy change, at Texas Tech, non-citizens have a higher semester GPA (0.041) than U.S citizens. Similarly, at Texas A&M, non-citizens have a higher GPA (0.058) than U.S. citizens, following the policy. Both estimates from each university is positive and statistically significant. I also find that non-citizen cohorts at Texas Tech are statistically differently than the non-citizen cohorts at Texas A&M, after the policy was enacted. This may be due to the lower enrollment of non-citizens at Texas Tech than at Texas A&M. As a result, the D.I.D estimated coefficient is positive but not statistically significant at each university. In addition, the results report a much larger mean difference at Texas Tech (0.140) than at Texas A&M (0.037). This could be associated with what Bridget Long (2004) pointed out as a possible effect of receiving "in-kind benefits…have unintended and undesired effects on the market for higher education and may lead to inefficient matches between students and colleges."

The differences in average semester grade point averages by gender and ethnicity are also reported in the table. At both universities, the estimate for males is negative and statistically different from zero than for females. The results indicate that males have lower GPAs (0.152 point lower) than females. Similar results are obtained at Texas Tech and Texas A&M. Males report lower GPAs than females, at Texas Tech than at Texas A&M. The estimates are statistically different from zero. At both universities, I find that GPA is lower for Blacks, Hispanics and Asians. The coefficients are negative and statistically different from zero. The estimates at Texas A&M and Texas Tech remain consistent with the estimates obtained from both universities. I find that there is a lower GPA for Blacks than non-blacks, at Texas A&M than at Texas Tech. There is also a large point difference for Hispanics compared to non-Hispanics, at Texas A&M than at Texas Tech.

The THEOP study was designed around students who graduated in the Top 10% of their graduating senior class in high school, following the Top Ten Percent Plan of 1998. Some of these students may have been in the Top Ten Percent. The estimate is positive and statistically different from zero for these students. Students who ranked in the top ten percent of their high school class had a slightly

higher GPA point than other students. I also find that there is a lower GPA in the fall semester than in other semesters. Most universities start their initial term in the fall semester, and the lower GPA in the fall may be associated with students adjusting with the curriculum in the beginning of the academic year.

   b. Policy effect on credit hours earned

Table 3 reports the mean estimates for equation (ii) on credit hours earned. The regression results in Column (1) of Table 3 indicates that, prior to the policy change, non-citizens are not statistically different than U.S. citizens. The estimated coefficient is positive and not statistically significant different from zero. After the policy change, both groups earned fewer credit hours (0.269) and the estimate is statistically significant. The coefficient on the D.I.D estimator is negative and not statistically different from zero. Thus, without observable factors, the policy did not effect credit hours earned per semester.

To control for observable factors in the model, covariates were added to the regression. Column (3) of Table 3 presents the estimated mean coefficients and the standard errors of the variables. The results show that, prior to the policy change, non-citizens completed 0.287 credit hours more than U.S. citizens. This effect is positive and statistically significant. After the policy change, both groups earned fewer credit hours (0.270) but non-citizens earned fewer credit hours than U.S. citizens. The estimated effect of the policy is negative (-0.126) and not statistically significant. Therefore, after controlling for observable characteristics, the policy has no effect on credit hours completed in a semester.

The mean estimates from Texas Tech and Texas A&M are presented under Column (3) and (4) of Table 2, respectively. Individual results from each university show that the coefficient for non-citizens is not statistically different than zero, before the policy change. The coefficient from each university is positive and not statistically significant. However, prior to the policy, as previously noted above the coefficient is statistically significant at both universities. This change may have occurred due to a greater variation of non-citizens compared to U.S. citizens, when analyzing each university separately. Following the policy change, there is a decrease in the number of credit hours earned at each university. At Texas Tech, non-citizens earn fewer credit hours than U.S. citizens, while at Texas A&M, I find similar results

but none comparably to the decrease at Texas Tech. Furthermore, the results show that the difference in difference estimated coefficient is also negative and is not statistically significant different from zero, at either university. There is a larger mean difference in the effect of the tuition benefit policy on credit hours earned is reported at Texas Tech than at Texas A&M.

At both universities, I find that males earn fewer credit hours than females. The results indicate that male completed fewer credits hours (0.345) than female. Similar results are obtained separately at Texas Tech and Texas A&M. Males reports lower GPA than females, at Texas Tech than at Texas A&M. The estimate is negative and statistically significant. The estimates for all three ethnic groups in the sample are negative and statistically significant. I find that GPAs are lower for Blacks than for non-Blacks. The magnitude and estimates at Texas A&M and Texas Tech remain consistent with the estimates from both universities in which Blacks, Hispanics and Asians also has negative estimates. Black experienced a much higher point decrease than non-Blacks at Texas Tech. While, Hispanics completed fewer credit earn hours than non-Hispanics at Texas A&M than at Texas Tech.

The THEOP study was designed around students who graduated in the top 10% of their graduating senior class in high school. Some of these students are non-citizens who performed academically better than their U.S citizen peers. The estimate is positive and statistically significant for these students. The results indicate that non-citizens who ranked in the top ten percent of their graduating school class earned more credit hours than other students.

c. *Policy effect on academic major choices*

For purpose of analysis, Humanities major is selected as the reference or base category since it is the least enrolled major among the major categories at both universities. In comparison to Humanities major, non-citizens are more likely to major in S.T.E.M fields (Engineering/Computer Sciences and Natural/Physical Sciences), Social Sciences, and Business; and are less likely to major in Health and other/undecided major fields. More than 60% of non-citizens major in the S.T.E.M fields compared to 36% of U.S. citizens. U.S. citizens are more likely to major in Social Sciences, Business and

other/undecided major fields and are less likely to major in Health rather than major in Humanities. 32% of U.S. citizens major in Social Sciences and Business in comparison to 22% of non-citizens. My results also indicate that U.S. citizens are highly likely to major in other fields or remain undecided in selecting a major choice compared to non-citizens. Moreover, when combining both groups, a total of 12% major in the Health and Humanities fields.

Using a non-linear approach, the marginal effects of the academic major choices from both universities are reported in Table 4, instead of the coefficients, which measure only the relative probability. The marginal effects report the actual probability of non-citizens and U.S. citizens to major in the academic major fields, pre and post policy. Prior to the policy, I find that there is a higher probability of non-citizens to major in S.T.E.M fields, and a lower probability to major in Business, Health, Humanities, Social Sciences, and other major fields compared to U.S. citizens. The coefficients are positive and statistically significant for the S.T.EM. fields. There is a higher likelihood to major in Engineering and Computer Science and a lower likelihood to pursue other major fields than U.S. citizen. Thereafter the policy, non-citizens are more likely to continue pursuing majors in the S.T.E.M fields, while U.S. citizens also, are more likely to continue majors in the other major category fields. The coefficients are all positive for all major fields except the S.T.E.M fields. The average marginal effect of the difference in difference coefficients are positive for all major fields except Health (-0.038) and Social Sciences (-0.017). In addition, the effect of the policy on all academic major choices is not statistically or substantially significant. Thus, the policy did not effect academic major choices.

The average marginal effect for male is negative for Health, Humanities, and Natural Sciences majors. This means that males are less likely to major in the academic fields compared to females. I also find that, there is a higher likelihood for men to major in Engineering/Computer Science and Business, as well as other major fields than females. The probability of majoring in S.T.E.M fields is on average lower for Blacks than for Hispanics and Asians, holding all else equal. All ethnic groups indicate a lower probability to major in Business, and a higher probability to major in Engineering/Computer Science.

These results are consistent with the results obtained from Nores (2009), where he examined the policy effect on major choices at both Texas Tech and University of Texas at Austin.

In addition, I find that students who graduated in the top ten percent are more likely to major in S.T.E.M fields than other non-top ten percent students. They are less likely to major in Social Sciences, Health, Humanities, and Business, as well as other major fields. The average marginal effect for Texas Residents is positive for Business, Natural/Physical Sciences, Social Sciences and other major fields than non-Texas Residents. Students who attended a private high school are more likely major in S.T.E.M and Humanities fields compared to students who attended a public high school. The average marginal effect for students who attended a private high school is negative for Business (-0.001) and Social Sciences (-0.004) majors.

V. CONCLUSIONS

The HB-1403 policy was designed to make college affordable for eligible non-citizens. I evaluated and analyzed the effect of the policy on three measures of academic performance for non-citizen students. The results in this paper indicate that, after controlling for demographic, high school, and academic factors, there are no statistically significant effects of the policy in explaining academic performance of non-citizens, when compared to U.S. citizens. One possible reason why the results were not statistically significant could be due to small percentage (less than 1%) of eligible non-citizens compared to U.S. citizens (more than 90%) in the sample. Another possibility may due to the timing of the policy implementation. Non-citizens may not have taken advantage of the benefits immediately but may react differently to the changes in later years. Further research beyond three years may be useful to find if there are any changes in outcome.

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Table 1: Descriptive Statistics

Variables	Description	Mean	SD	Min	Max
Texas Institutions	TAM=Texas A&M	0.700			
	TT=Texas Tech	0.300			
College Transcript information					
SemesterGPA	Semester grade point average	2.965	0.774	0.5	4
Creditsearn	Credit hours earned per semester	11.501	3.783	3	19
MajorField	Academic major fields in each term				
Business	Major field category 1	0.126			
Engineering/Computer Science	Major field category 2	0.174			
Health	Major field category 3	0.063			
Humanities	Major field category 4	0.022			
Natural/Physical Sciences	Major field category 5	0.190			
Social Sciences	Major field category 6	0.193			
Other/Undecided	Major field category 7	0.233			
Fall	Fall semester	0.438	0.496		
Spring	Spring semester	0.400	0.490		
High school characteristics					
TopTenPercent	Graduated in top 10% of high school class	0.405	0.491		
TopTwentyPercent	Graduated in top 20% of high school class	0.226	0.418		
TopThirtyPercent	Graduated in top 30% of high school class	0.136	0.343		
Private High school	High school was private or public	0.064	0.245		
Texas High School	Attended a Texas high school	0.936	0.245		
Applicant's demographics					
Male	Indicates 1 for Male and 0 for Female	0.494	0.500		
Black	Black student	0.031	0.175		
Hispanic	Hispanic student	0.094	0.292		
Asian	Asian student	0.030	0.171		
Texas US Citizens	Texas US citizen who resided and went to Texas high school	0.918	0.274		
Texas Non-citizens	Texas Non-citizen who resided and went to Texas high school	0.009	0.094		
Texas Resident	Resided in Texas state	0.940	0.238		
Other Key variables:					
AfterPolicy	Pre (1998-2000) and post (2001-2003) time variables	0.533	0.499		
Total: N Observations: 499,101					

Table 2: Regression Results of HB-1403 Policy Effect on Semester GPA

	Both Universities (no controls)	Both Universities (controls)	Texas Tech University	Texas A&M University
	(1)	(2)	(3)	(4)
Texas non-citizen	-0.084	0.014	-0.028	0.038
	(0.028)**	(0.026)	(0.096)	(0.027)
AfterPolicy	0.061	0.059	0.041	0.058
	(0.003)**	(0.003)**	(0.006)**	(0.004)**
AfterPolicy_Texasnoncitizen	**0.076**	**0.044**	**0.140**	**0.037**
	(0.033)*	**(0.031)**	**(0.108)**	**(0.033)**
Male		-0.152	-0.205	-0.127
		(0.004)**	(0.008)**	(0.005)**
Black		-0.361	-0.315	-0.371
		(0.011)**	(0.022)**	(0.013)**
Hispanic		-0.229	-0.161	-0.248
		(0.007)**	(0.015)**	(0.008)**
Asian		-0.065	-0.057	-0.059
		(0.013)**	(0.027)*	(0.014)**
Top Ten Percent		0.347	0.458	0.340
		(0.004)**	(0.009)**	(0.005)**
Texas Resident		-0.092	-0.046	-0.095
		(0.009)**	(0.017)**	(0.011)**
Private High School		0.101	-0.017	0.142
		(0.008)**	(0.020)	(0.009)**
Fall Semester		-0.218	-0.202	-0.214
		(0.003)**	(0.006)**	(0.004)**
Spring Semester		-0.192	-0.174	-0.188
		(0.003)**	(0.006)**	(0.004)**
Constant	2.933	3.151	3.163	3.116
	(0.003)**	(0.010)**	(0.019)**	(0.012)**
R^2	0.00	0.09	0.10	0.09
N	499,101	478,538	138,161	340,377

Notes: Standard robust errors are indicated in parentheses.

* $p<0.05$; ** $p<0.01$

Table 3: Regression Results of HB-1403 Policy Effect on Credit Hours Earned

	Both Universities (no controls)	Both Universities (controls)	Texas Tech University	Texas A&M University
	(1)	(2)	(3)	(4)
Texas non-citizen	0.090	0.287	0.752	0.153
	(0.095)	(0.094)**	(0.668)	(0.094)
AfterPolicy	-0.269	-0.270	-0.187	-0.248
	(0.012)**	(0.012)**	(0.027)**	(0.013)**
AfterPolicy_Texasnoncitizen	**-0.092**	**-0.126**	**-1.240**	**-0.058**
	(0.125)	**(0.121)**	**(0.669)**	**(0.123)**
Male		-0.244	-0.345	-0.213
		(0.014)**	(0.031)**	(0.015)**
Black		-0.661	-0.853	-0.590
		(0.040)**	(0.089)**	(0.042)**
Hispanic		-0.489	-0.532	-0.485
		(0.024)**	(0.057)**	(0.025)**
Asian		-0.151	-0.378	-0.111
		(0.043)**	(0.109)**	(0.044)*
Top Ten Percent		0.730	0.681	0.629
		(0.014)**	(0.037)**	(0.015)**
Texas Resident		-0.405	-0.340	-0.449
		(0.035)**	(0.073)**	(0.038)**
Private High School		0.316	0.018	0.298
		(0.029)**	(0.080)	(0.030)**
Constant	11.644	11.898	11.580	12.082
	(0.009)**	(0.037)**	(0.075)**	(0.039)**
R^2	0.00	0.01	0.01	0.01
N	499,101	478,538	138,161	340,377

Notes: Standard robust errors are indicated in parentheses.

* $p<0.05$; ** $p<0.01$

Table 4: Marginal Effects of HB-1403 Policy on Academic Major Choices

	Business	Engineering/ Computer Science	Health	Humanities	Natural/ Physical Sciences	Social Sciences	Other/Undecided Majors
Texas non-citizen	-0.005 (0.016)	0.131 (0.019)**	-0.038 (0.008)**	-0.008 (0.005)	0.053 (0.018)**	-0.035 (0.018)	-0.098 (0.016)**
AfterPolicy	0.003 (0.002)	-0.017 (0.002)**	0.007 (0.001)**	0.002 (0.001)**	-0.047 (0.002)**	0.046 (0.002)**	0.006 (0.002)**
AfterPolicy_Texasnoncitizen	**0.012 (0.022)**	**0.005 (0.015)**	**-0.038 (0.026)**	**0.009 (0.011)**	**0.013 (0.019)**	**-0.017 (0.026)**	**0.016 (0.030)**
Male	0.007 (0.002)**	0.216 (0.003)**	-0.047 (0.002)**	-0.018 (0.001)**	-0.035 (0.003)**	-0.130 (0.003)**	0.006 (0.003)*
Black	-0.039 (0.005)**	0.050 (0.010)**	0.016 (0.006)**	-0.007 (0.002)**	-0.010 (0.008)	0.017 (0.008)*	-0.026 (0.007)**
Hispanic	-0.033 (0.003)**	0.016 (0.005)**	0.010 (0.003)**	0.007 (0.002)**	0.009 (0.005)*	0.019 (0.005)**	-0.028 (0.004)**
Asian	-0.029 (0.006)**	0.103 (0.010)**	-0.004 (0.005)	-0.011 (0.002)**	0.091 (0.009)**	-0.049 (0.007)**	-0.102 (0.006)**
Top Ten Percent	-0.012 (0.0023)**	0.116 (0.003)**	-0.012 (0.002)**	-0.001 (0.001)	0.113 (0.003)**	-0.087 (0.003)**	-0.117 (0.003)**
Texas Resident	0.034 (0.004)**	-0.054 (0.007)**	-0.005 (0.004)	-0.006 (0.003)*	0.003 (0.006)	0.013 (0.006)	0.014 (0.007)*
Private High School	-0.001 (0.004)	0.015 (0.006)*	-0.013 (0.003)**	0.007 (0.002)**	0.058 (0.006)**	-0.004 (0.005)	-0.061 (0.005)**

N = 478,538

Notes: Standard robust errors are indicated in parentheses.

* *p*<0.05; ** *p*<0.01