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The Graduates: Low-Income Central Texas Students' Transitions to College and Work in the Great Recession

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The Graduates: Low-Income Central Texas Students' Transitions to College and Work in the Great Recession

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Abstract

The Graduates: Low-Income Central Texas Students' Transitions to College and Work in the Great Recession

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This report explores the extent, trends, and consequences of academic undermatch, defined as students enrolling at an institution of relatively less selectivity than what their academic qualifications grant them access to, including non-enrollment. Using a sample of two cohorts of Central Texas high school graduates, this report finds that undermatch occurs among all students, but that it was more extensive for low-income students and among students with average qualification levels. Low-income students were found to undermatchmatch at 65.1 percent and non low-income students at 53.9 percent of those who enroll. Between 2008 and 2009, undermatch increased among all students; among the highest qualified low-income students it increased by 10 percentage points. The majority of undermatched students were found to be enrolled at two-year over four-year institutions. A negative relationship between qualification level and annual earnings was found in the earnings of students who did not enroll. This report provides a set of recommendations to address undermatch and college access among low-income students in Central Texas.

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Chapter 1: Introduction

Talent loss, or the circumstance of promising students not realizing their full educational potential, is a phenomenon primarily impacting low-income students. Even in the decades following World War II, when postsecondary enrollment rates rose, low-income students had lower enrollment rates than their counterparts who were not economically disadvantaged.[1] In that era, a college education was not necessary to acquire a well-paying job. But in the 21st century, working adults face a changed labor market; policymakers predict that 60 percent of the American workforce should have a postsecondary degree to meet workforce needs as early as 2018.[2] Yet in 2012, only 36.2 percent of U.S. adults 25 years of age and older held an Associate's or higher degree.[3] As cities, regions, and states attempt to increase their share of residents with postsecondary credentials, increasing access, persistence, and completion among all students have become central policy issues. The Obama Administration has addressed them by focusing in particular on low-income, first-generation, and non-traditional students.

The value of postsecondary education to individual low-income students and their families is high. Publically-funded postsecondary education, first embodied by American land grant universities, was designed to promote socioeconomic mobility by providing a relatively low-cost way for individuals to increase their human capital, with the added benefit of enhancing the quality of one's social and intellectual life. With the proliferation of many types of postsecondary institutions, including for-profit institutions, the issue of where low-income students enroll has formed a part of the postsecondary policy framework.

The concept of college fit considers an enrollment decision in light of all the important factors in a student's ecology, including social, familial and financial. College match is one aspect of college fit that refers specifically to the alignment between a student's academic profile – typically observed through test scores and grades – and the

selectivity of the institution at which they enroll. Undermatch occurs when any student enrolls in an institution of less selectivity than they would have had access to on the basis of their high school test scores and grades. The degree of undermatch varies by student and selectivity level. Slight undermatch occurs when students match just below their qualification level, while severe undermatch occurs when a student enrolls in an institution two or more levels below their qualifications.[i] Undermatch is most closely associated with the most high-achieving students because of their demonstrated ability to excel, implying greater talent loss. Yet, most students have the capacity to develop the cognitive skills required for advanced study. Students who may not be considered the highest achievers in academic terms but still attain the qualifications to attend a four-year or two-year institution should also be a focus of this body of work, including qualified students who do not enroll in any type of postsecondary education. Typically, students at all levels who have explicitly established an intent not to enter postsecondary education are excluded from the definition.[ii]

The issue has taken the name of undermatch as distinct from 'mismatch,' which is associated with affirmative action policy discussions, particularly when relatively less prepared students are admitted to the best public universities. Work on the relationship between institutional selectivity and completion in part originated when researchers became interested in whether affirmative action students were 'set up to fail' when they attended institutions where their grades and scores were lower than the institution's average.

A growing body of work on undermatch, which will be discussed in the next chapter, demonstrates that it is a pervasive phenomenon and that more selective

[i] This definition was drawn from the first study of undermatch, *From High School to the Future: Potholes on the Road to College* from the Consortium on Chicago School Research (citation is included in the bibliography).

[ii] The assumption here is that students who successfully complete high school and transition to a job or career are where they should be.

institutions - which have more resources at their disposal - can enhance the likelihood that low-income students graduate, as well as increase their earnings. The stakes of foregoing this opportunity to surge ahead economically and socially for low-income students - and for policymakers concerned with reducing inequality - could be significant.

Undermatch has received considerable attention from administrators, researchers, and the mass media for all of these reasons.[iii] Certainly some of the phenomenon's appeal to these stakeholders derives from the potential to address postsecondary access, persistence and completion for historically disadvantaged groups without the challenges that come with confronting historical racism or low achievement among low-income and racial minority groups. Understanding the extent of undermatch, its major trends, and potential consequences may yield insights that help policymakers continue to address postsecondary access and completion.

PROBLEM DEFINITION

Undermatch is of concern to policymakers because of its potential adverse effects on completion and earnings for low-income students, as well as its implications for educational equity. Should graduates find themselves in the circumstance of not enrolling in postsecondary education, policymakers should know whether talent loss occurs in the labor market, as reflected by earnings in relation to academic qualifications. The issue speaks to economic and societal well-being, as well as individual for low-income students, their families, and communities.

RESEARCH QUESTIONS

The following research questions will organize this report's approach to the issue of undermatch:

[iii] Major pieces in online magazine *Slate* and the *Chronicle of Higher Education*, in addition to the interest from the White House, demonstrate that this topic has received high-profile interest. The Yale University alumni magazine printed a cover story titled "Wanted: Smart Students from Poor Families" in its Jan/Feb 2014 issue in an effort to address the topic at that institution.

- Do low-income students graduate with qualifications on par with their non-economically disadvantaged peers?
- Do low-income students enroll at postsecondary institutions that match their level of qualifications?
- Do low-income students who enter the labor earn a premium associated with their academic qualification level?

OVERVIEW

This report will first provide a review of the literature regarding undermatch and the evidence of its adverse consequences for students. Then it will examine achievement and enrollment data from the 2008 and 2009 cohorts of Central Texas high school graduates to estimate the extent of undermatch in this region. It will also use earnings data to examine annual earnings for graduates who did not initially enroll in postsecondary education in the fall following high school graduation. Finally, the report will provide insights on how to situate undermatch within the postsecondary education policy landscape, and offer policy recommendations to address the issue in Central Texas.

NOTES

[1] Plank, Stephen B., and Will J. Jordan. "Effects of information, guidance, and actions on postsecondary destinations: A study of talent loss." American Educational Research Journal 38, no. 4 (2001): 947-979.

[2] Carnevale, Anthony P., Nicole Smith, and Jeff Strohl. Help wanted: Projections of job and education requirements through 2018. Lumina Foundation, 2010.

[3] U.S. Census Bureau; American Community Survey, "Selected Social Characteristics in the United States: 2008-2012 5-Year Estimates." Table DP02; generated by Author; using American FactFinder; http://factfinder2.census.gov; (August 12, 2014).

Chapter 2: Undermatch Literature Review

This chapter summarizes the work that has clarified the extent of undermatch and the adverse effects that are believed to result from it.

UNDERMATCH METHODOLOGY

Three major studies have measured the extent of undermatch; two in specific locales (Chicago and North Carolina) and one on a national level. In addition, a study of undermatch in Central Texas was completed in 2009; the results of that study will be discussed in Chapter 3 in order to better compare them with those of this study more closely. Each of the major studies used similar methodology for its analysis. First, multivariate analysis for a sample of high school students is used to determine the most likely institution of enrollment for students with specific academic profiles consisting of GPA and SAT or ACT scores. Then a probability of acceptance threshold – usually 90 percent - is used to construct cutoffs for each level of institutional selectivity. Lastly, a student's enrollment outcome is compared with the institutional selectivity level to which he or she had access. Institutional selectivity is based on the index given by *Barron's Profiles of American Colleges*, which will be discussed in greater detail in the next chapter.[4] All three study samples are restricted to students who indicated an intent to enroll in postsecondary education.

This descriptive methodology yields the broad undermatch rates, which are discussed below. The results are sensitive to the methodological assumptions employed. For example, these studies do not incorporate information on whether each student who had access to a particular selectivity level was actually accepted to an institution in that group, relying instead on probability thresholds. For this reason the following review of the literature on undermatch, will highlight notable methodological features. It may be helpful for the reader to reference the institution selectivity index provided in the appendix of this report in order to gain needed context on definitions of selectivity.

EXTENT

The first undermatch study examined students in the 2005 graduating high school class of the Chicago Public Schools. In this study, minimum ACT scores were used to create cutoffs as opposed to average scores. This was done to compensate for the use of holistic factors that override test scores, and the fact that the ACT is taken in the junior year, before students have the opportunity to increase their score by re-testing. The probability threshold is set simply to whichever enrollment outcome is "most likely."[5] A small pool of students were moved from the moderately high to the most selective category if rigorous coursework was completed (AP and honors classes or the IB curriculum).

Among the highest qualified students in the Chicago sample, 38 percent matched to the most selective institutions; another 25 percent enrolled in selective schools, 20 percent in somewhat selective ones, 4 percent in non-selective ones, and 10 percent did not enroll at all.[6] Overall, a high-achieving student was as likely to match as undermatch slightly or severely. For students who ranked just below the most highest-achieving, undermatch was even more extensive. The study also found that Latino and Latina students were far more likely to undermatch.[7]

The next undermatch study examined the 1999 graduating class of North Carolina high school students. Whereas the Chicago study used five institutional selectivity categories, the North Carolina study used just four. However, researchers used a more conservative probability threshold (90 percent) for the highest institutional selectivity category. They did not make curriculum a factor in their grouping of students, so they like underestimate compared with the Chicago study.

Overall in North Carolina, 57 percent of the most high-achieving students matched to the most selective institutions, while 31 percent undermatched to less selective four-years or historically black colleges and universities (HBCUs), 3 percent to two-year institutions, and 9 percent did not enroll at all.[8] Although the North Carolina

students appeared to match at a much higher rate than in Chicago – 57 percent compared with 38 percent - the work on the whole underscored the deep extent of undermatch. Further, with information on acceptance offers from the state's flagship institutions (which made up the large majority of the 'most selective' institution category), it was determined that a majority of students who undermatched did so because they never applied to a flagship in the first place.[9] The North Carolina study contributed an additional important finding: undermatch was driven by low-income students. Among the highest-achieving students in the bottom income quartile in the North Carolina cohort, only about one-third enrolled in a highly selective institution, while three-fourths of their counterparts in the top income quartile matched.[10]

The only published study to examine undermatch nationally supports these points. A major benefit of this work is that data on acceptance offers was available and used to construct the cutoffs for access, making it the most precise of these studies.

Of the most high-achieving students in this national sample, 58.5 percent matched to a the most selective institutions, 25.7 matched to selective institutions, 13.1 percent to somewhat selective institutions, and 2.7 to non-selective and two-year institutions, including those who did not enroll at all.[11] Less high-achieving students experienced higher levels of undermatch, and similar levels of severe undermatch when compared with the highest ability students.[12] This study supplements descriptive statistics with regression analyses that illuminate the statistical differences in undermatch by group. They reveal that students from the lowest income quartile were the most likely to undermatch slightly and severely at all levels, independent of other factors such as parental education, race, and ethnicity.[13]

The work done on undermatch reveals that although it plays out differently by geography and varies by estimation methodology, it exists across communities and effects students at all qualification levels, in particular low-income students in those communities.

INSTITUTION SELECTIVITY AND COMPLETION

There is evidence that selectivity has an impact on college completion. The North Carolina undermatch study found that the six-year graduation rate for undermatched low-income students in North Carolina was 15 points lower - at 66 percent - compared with their low-income peers who attended appropriately selective schools, who graduated at a rate of 81 percent.[14] Students at all ability levels have a better chance of graduating when they match academically to an institution.[15] Previous studies on selectivity and completion were organized along race as opposed to class categorization, however, they support the role of high selectivity in improving college completion. Recent work has also found that completion rates for minority students who overmatched to selective institutions were improved at least in part by high institutional selectivity, although the exact share has been methodologically difficult to estimate.[16]

Evidence has also been found of a negative effect on completion for high-ability students who select a relatively less selective institution. In 2005, Massachusetts policymakers implemented a merit-based tuition waiver program to incentivize high-ability students in the state to attend the state's public universities instead of the more selective institutions out of state that were available to them. The waiver was awarded to students who scored in the top 25 percent (across the state) on a state-based exam, as long as they also achieved a minimum cutoff score on both the math and language arts portions. The study had the ability to observe the counterfactual because the waiver program was awarded to different groups of students between districts. This allowed researchers to observe both a treatment group and a control group of high-achieving students. The students who took up a tuition waiver for an in-state school had lower completion rates and longer time to completion than those with similar academic skills at the same institution who had not been offered the waiver.[17]

Overall, studies on this topic indicate that selectivity has a positive influence on graduation rates. However, much of the work has used data on a small group of very

selective and selective institutions, so the effects of undermatch at institutions that somewhat or not selective is much less well-known or researched.

TRANSFER COSTS

Findings from undermatch studies suggest that two-year institutions are the preferred route into higher education for students who undermatch.[18] Two-year institutions offer a low-cost option for students who are concerned with cost, who are unsure they want to pursue a four-year degree, or who have reasons to stay close to home. In Texas, the savings associated with attending a two-year institution before transferring to a four-year institution are minimal in comparison to the gains from an increased chance of completion.[19] Transfer students receive less grant aid and take on effectively the same level of debt as students who begin their degree at a public four-year institution.[20] At private institutions, which offer less institutional aid to transfer students, the tradeoff makes even less financial sense. Undermatch in this context can disincentivize low-income students from completing a Bachelor's degree.

INSTITUTION SELECTIVITY AND EARNINGS

Degree attainment is a well-known predictor of labor market outcomes; a large body of work has clarified the positive relationship between postsecondary degrees and higher earnings and will not be detailed here.[21] Additional work has been done to clarify the impact of institution selectivity on earnings. It generally pays to attend the most selective institutions, compared to all other institutions.[22] This effect has been shown to disappear when ability is explicitly taken into account; however, it does not disappear among students from the bottom income quartile, who appear to earn a wage premium for attending these schools.[23]

In addition, there is a positive relationship between selectivity and earnings among selective four-year institutions.[24] Because these studies account for non-institutional variation, it would seem that the source of this premium derives from the

institutional resources available that enhance graduates' prospects in the labor market. Earnings premiums were found to be more pronounced for black graduates and all graduates of color compared with white graduates, and that they increase over time.[25]

The literature does not specifically addresses the labor market outcomes of students who have undermatched, although research on the separate effect of ability within institution selectivity type would remedy this gap. Researchers who have addressed the extent of undermatch have also called for further work on the long-term impacts of undermatch.[26] It would appear much is at stake if the relationship between selectivity and earnings holds true for students who undermatch; in particular, low-income students, who would benefit the most from better completion and earnings outcomes, would miss out.

Policymakers should be concerned with the possibility that undermatch results in lowered completion rates and decreased earnings for those who have access to very selective and selective institutions.

NOTES

[4] Barron's Educational Series. *2013 Barron's Profiles of American Colleges, 30th Edition*. Hauppage: Barron's Educational Series, Inc., 2012.

[5] Roderick, Melissa, Jenny Nagaoka, Vanessa Coca, and Eliza Moeller. From High School to the Future: Potholes on the Road to College. Research Report. Consortium on Chicago School Research (March 2008). http://ccsr.uchicago.edu/sites/default/files/publications/CCSR_Potholes_Report.pdf

[6] Ibid.

[7] Ibid.

[8] Bowen, William. G., Matthew Chingos, and Michael S. McPherson. *Crossing the Finish Line: Completing College at America's Public Universities.* Princeton, NJ: Princeton University Press, 2009.

[9] Ibid.

[10] Ibid.

[11] Smith, Jonathan, Matea Pender, and Jessica Howell. "The full extent of student-college academic undermatch." *Economics of Education Review* 32 (2013): 247-261.

[12] Ibid.

[13] Ibid.

[14] Bowen et al, *Crossing the Finish Line.*

[15] Light, Audrey and Wayne Strayer. "Determinants of College Completion: School Quality or Student Ability?" *The Journal of Human Resources,* Vol. 35, No. 2 (Spring, 2000); 299-332.

[16] Melguizo, Tatiana. "Quality matters: Assessing the impact of attending more selective institutions on college completion rates of minorities." *Research in Higher Education* 49, no. 3 (2008): 214-236; Alon, Sigal, and Marta Tienda. "Assessing the "mismatch" hypothesis: Differences in college graduation rates by institutional selectivity." *Sociology of education* 78, no. 4 (2005): 294-315.

[17] Cohodes, Sarah Rose, and Joshua Samuel Goodman. "First degree earns: The impact of college quality on college completion rates." (2012). http://nrs.harvard.edu.ezproxy.lib.utexas.edu/urn-3:HUL.InstRepos:9396433

[18] Smith et al, "The full extent…"

[19] Fernandez, Chris, and Carla Fletcher. "Transfer Students, Financial Aid, and a New Perspective on Undermatching." (2014). http://www.tgslc.org/pdf/Transfer-Students-Financial-Aid-Undermatching.pdf.

[20] Ibid.

[21] Thomas J. Kane and Cecilia Elena Rouse. "Labor-Market Returns to Two- and Four-Year College." *The American Economic Review*, Vol. 85, No. 3 Jun. (1995): 600-614; Pascarella, Ernest T., and Patrick T. Terenzini. *How college affects students*. Edited by Kenneth A. Feldman. Vol. 2. San Francisco: Jossey-Bass, 2005.

[22] Brewer, Dominic J., Eric R. Eide, and Ronald G. Ehrenberg. "Does it pay to attend an elite private college? Cross-cohort evidence on the effects of college type on earnings." *Journal of Human Resources* (1999): 104-123.

[23] Dale, Stacy Berg, and Alan B. Krueger. Estimating the payoff to attending a more selective college: An application of selection on observables and unobservables. No. w7322. National Bureau of Economic Research, (1999). http://www.nber.org.ezproxy.lib.utexas.edu/papers/w7322.

[24] Brewer et al. "Does it pay..."

[25] Monks, James. "The returns to individual and college characteristics: Evidence from the National Longitudinal Survey of Youth." *Economics of Education Review* 19, no. 3. (2000): 279-289; Loury, Linda Datcher, and David Garman. "College selectivity and earnings." *Journal of labor Economics*. (1995): 289-308; Behrman, Jere R., Jill Constantine, Lori Kletzer, Michael McPherson, and Morton Schapiro. "The Impact of College Quality on Wages: Are There Differences Among Demographic Groups?" *Williams Project on the Economics of Higher Education, Discussion Paper* 38 (1996).

[26] Smith et al, "The full extent..;" Bowen et al, *Crossing the Finish Line.*

Chapter 3: Analysis of College and Career Paths

This chapter presents the results of the analysis of the 2008 and 2009 cohorts of Central Texas high school graduates. The analysis will be guided by the following questions:

- Do low-income students graduate with qualifications on par with their non-economically disadvantaged peers?
- Do low-income students enroll at postsecondary institutions that match their level of qualifications?
- Do low-income students who do not initially enroll in postsecondary education earn a wage premium associated with their qualification level?

DATA AND VARIABLES

Records of high school graduates were obtained from the Student Futures Project (SFP) for this analysis. SFP is a research partnership between the Ray Marshall Center for Human Resources (RMC) at The University of Texas at Austin, the Greater Austin Chamber of Commerce, and a dozen Central Texas school districts. The partnership began with four school districts; by 2014 it had expanded to include 12 districts. SFP researchers follow students from senior year through their transitions to postsecondary education and/or the workforce, collecting data from a variety of public sources, as well as the self-reported SFP high school exit survey. For this study, the 2008 and 2009 cohorts were selected based on the availability of multiple years of earnings records. The cohorts include all high school graduates from ten (10) school districts in Central Texas, ranging from small semi-rural (e.g., Del Valle) to large urban (e.g., Austin, Round Rock) districts.

Districts regularly report standardized student information to the Texas Education Agency (TEA) through the Public Information Education Information Management System (PEIMS). The information is shared by each of the districts with SFP researchers.

For this analysis, the key variables include: class rank percentile, Texas Assessment of Knowledge and Skills (TAKS) scores, and free and reduced lunch program enrollment. In 2008 and 2009, TAKS served as the state's high school exit exam, taken in the 11th grade.

For this report, the term 'economically disadvantaged' refers to students who qualify for and receive free school lunches, 'economically vulnerable' represents students who qualify for and receive reduced price lunches, and 'non-economically disadvantaged' represents students who are not enrolled in either lunch program, although some may qualify.[iv] Free and reduced lunch eligibility is determined through categorical or income qualifications. Households who are recipients of the Supplemental Nutritional Assistance Program (SNAP) and Temporary Assistance for Needy Families (TANF) qualify, as do individual children in special circumstances, such as homelessness or foster care. However, everyone is required to submit an application separate from other assistance programs each year. Mobile families rely upon an eligibility transfer process. These barriers, combined with the stigma of receiving free or reduced meals, cause some families to opt out of the lunch program, resulting in an underestimation of the numbers of students who are economically disadvantaged and economically vulnerable.[27] The term 'low-income' will be used in this report when numbers of economically disadvantaged and economically vulnerable students are combined.

Postsecondary enrollment data were obtained by SFP researchers through the National Student Clearinghouse (NSC), which keeps records of postsecondary enrollment nationally for 98 percent of all public and private colleges and universities.[28] Enrollment

[iv] The Department of Agriculture's income guidelines for free and reduced-price meals for the 2007-2008 school year were obtained by multiplying the year 2007 federal income poverty guidelines by 1.30 and 1.85, respectively. For a family of four in 2007 dollars, that would be $26,845 and $38,203, respectively. In 2008-2009, they were obtained by multiplying the year 2008 federal income poverty guidelines by 1.30 and 1.85. For a family of four in 2008 dollars, that would be $27,560 and $39,220, respectively (Federal Register, 2007 and 2008).

data are collected for the fall following high school graduation, and thereafter for any student in the cohort who subsequently enrolls. This analysis will not include enrollment beyond the fall following high school graduation. It should be noted that the NSC is not a research-oriented database, rather, it was created to track financial aid. Participation in NSC is voluntary, and a few institutions in Texas are not included in these reports. Additional enrollment records were provided directly from several Texas institutions that are not in the NSC database.

Earnings data were provided by the Texas Workforce Commission (TWC), which collects quarterly earnings based on unemployment insurance (UI) records. About 95 percent of wage and salary records in Texas are captured by UI reporting. [29] The following income sources are not captured: self-employment, independent contracting, employment by religious organizations, railroads, small farms, and the military.

SPECIAL VARIABLES

Previous undermatch analyses have used SAT or ACT scores and high school GPA to assign students an overall academic qualification level as a first step in estimating undermatch rates.[30] SAT and ACT scores were not available for the students studies in this report because of time limits on that data. Instead, a variable called predicted SAT score was created using TAKS scores. TEA and the Texas Higher Education Coordinating Board (THECB) developed an equivalency scale between TAKS and SAT to measure college readiness among high school students including those who did not take the SAT or ACT.[31] The College Board, makers of the SAT test, approved of Texas' effort to design a state test that measured college readiness.[32] This report took advantage of the availability of these equivalency scales, which are provided in the appendix.

Using class rank percentile and predicted SAT score, each student is assigned a qualification level. The qualification levels are based on institution selectivity levels adapted from *Barron's*. The original *Barron's* categories group four-year institutions into

six categories based on entering students' average SAT scores and grades. For this report, these categories are simplified and collapsed into five (5) categories, including one for two-year institutions, which also are provided in the appendix. Each student was assigned a qualification level using their predicted SAT score and class rank quintile reflecting qualification cutoff levels from Barron's. The academic criteria for qualification levels are displayed in Table 3.1. A student's assigned level corresponds to the selectivity of the institution to which he or she would have access.

Students who meet level 1 qualifications would have access to two-year colleges; level 2 students to non-competitive four-year schools, level 3 students to competitive schools, level 4 to highly competitive schools, and level 5 students to the most competitive schools.

Table 3.1: Criteria for Qualification Levels

	Class Rank Quintile				
Average Predicted SAT Score	Fifth 81st – 100th	Fourth 61st – 80th	Third 41st – 60th	Second 21st – 40th	First 1st – 20th
Missing TAKS**	1	1	2	3	3
< 500	1	2	2	3	4
500 - 572	2	3	3	4	4
573 – 599	3	3	4	4	4
600 - 800	3	4	4	5	5

METHODS

Descriptive statistics are used to estimate the extent of undermatch in the SFP sample, in a method similar to the studies described earlier but without probability thresholds. A comparison was made between the selectivity of the institution where a student enrolled and that student's qualification level, yielding a match, an undermatch, or an overmatch. About 50 students from each cohort who attended 'special' institutions

– i.e., art, design, and music schools – were excluded from this analysis because the academic requirements for these institutions are not as well-defined or clear cut. These schools may be selective institutions but they tend to be selective based on performance by field rather than just academics.

To complete the earnings comparison, the sample was restricted to students who did not initially enroll in postsecondary education because out-of-state earnings were not accessible. It is likely non-enrolled students stayed in Texas to work rather than leaving the state. Students who did not have a reported Social Security Number (SSN) were dropped from the earnings analysis, as they could not be linked to TWC employment and earnings records. Earnings were then averaged on an annual basis, each year beginning with the fall quarter following high school graduation.

OVERVIEW

First, an overview will be provided of the demographic characteristics of both cohorts (Table 3.2). The demographic characteristics of Central Texas graduates of the 2008 and 2009 cohorts are similar in many aspects, but differ in several important ways. From 2008 to 2009, the graduating cohort grew by about 400 students. The shares of female and male students are nearly equal, and remained that way from one year to the next. The largest racial group among graduates is White students, who made up 52.7 percent of the cohort in 2008, followed by Hispanic, Asian, Black, and students who identified as 'other.' The share of White students in the 2009 cohort declined by 3.9 percentage points. The shift is due to larger shares of Asian (0.3 percent), Black (1.2 percent), and Hispanic (2.5 percent) students in the following year's cohort. In 2008, a combined 24.1 percent of students were either economically disadvantaged or economically vulnerable. In 2009, this share grew to 29.5 percent.

Table 3.2: Demographic Characteristics of Graduates by Cohort

Cohort	2008	2009
Total	10,607	11,061
Female	50.5%	50.2%
Male	49.5%	49.8%
Asian	5.3%	5.6%
Black	10.7%	11.9%
Hispanic	30.8%	33.3%
White	52.7%	48.8%
Other	0.4%	0.4%
Economically Disadvantaged	17.6%	21.5%
Economically Vulnerable	6.5%	8.0%
Non Economically Disadvantaged	75.9%	70.5%

Source: Author's analysis of SFP data.

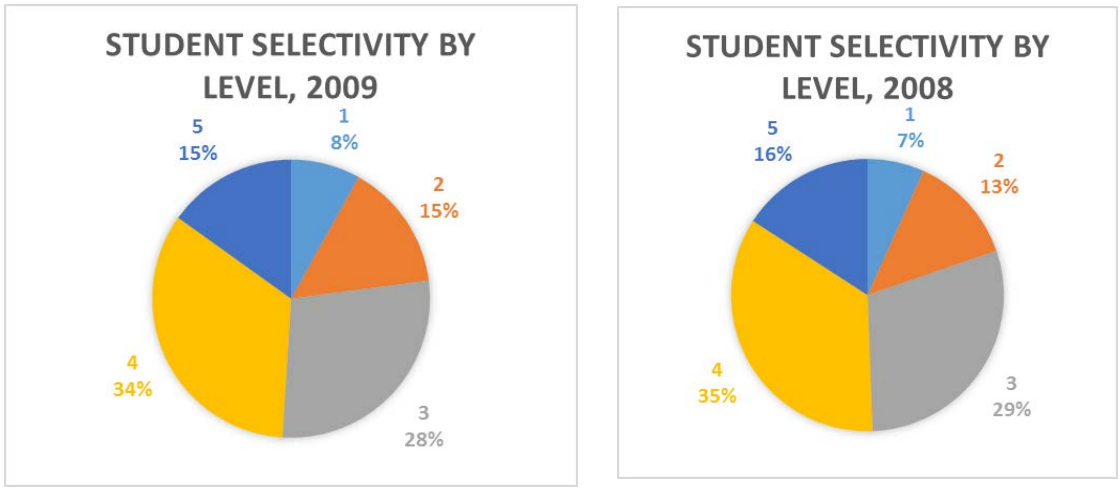
The 2009 recession is an important factor behind the increase in economically disadvantaged and economically vulnerable students. Although officially recognized as beginning in the last quarter of 2008, heavy job losses decreased household income for families in Central Texas and the nation (as unemployment insurance is a fraction of a worker's previous salary). The region is also experiencing widening income inequality, with growing shares of low-income families over time.[33]

STUDENT QUALIFICATIONS

In order to examine the qualifications of low-income students, it is necessary to examine the overall distribution of qualifications. The distribution of qualification levels for the 2008 and 2009 cohorts are displayed in Figure 3.1. In both cohorts, the largest share of students have level 4 qualifications, those required for selective four-year

institutions. The next largest share are level 3 students, who qualify for somewhat selective institutions. The shares who qualify for level 2 (non-selective) and 5 (most selective) are almost equal, while the smallest share of students (8 percent and 7 percent, respectively) possess level 1 qualifications, or the level corresponding to admission standards for 2-year postsecondary institutions.

Figure 3.1



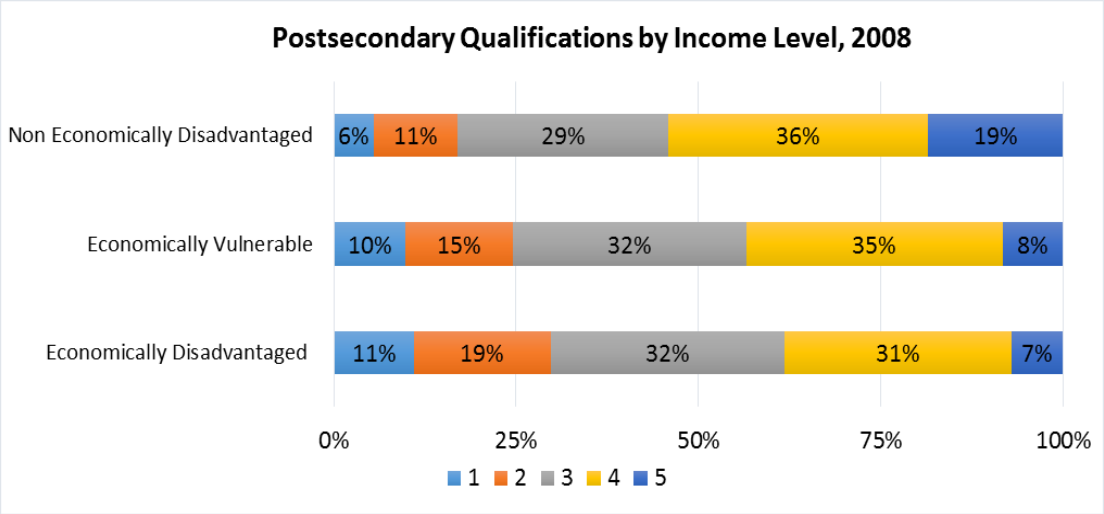
Source: Author's analysis of Student Futures Project data.

Among low-income students, qualifications levels are not as high student who are not economically disadvantaged (Figure 3.2). In the 2008 cohort, as income level decreases, so do student shares who possess level 5 and 4 qualifications. Conversely, shares who possess level 3, 2, and 1 qualifications grow between non-economically disadvantaged to economically vulnerable, and then again between economically vulnerable and economically disadvantaged, highlighting the negative association between family income and qualification level.

The same pattern is observed in the 2009 cohort (Figure 3.3). Further, compared with 2008, the shares of economically vulnerable and economically disadvantaged students who possesses level 1 and 2 qualifications grew from the previous year's cohort,

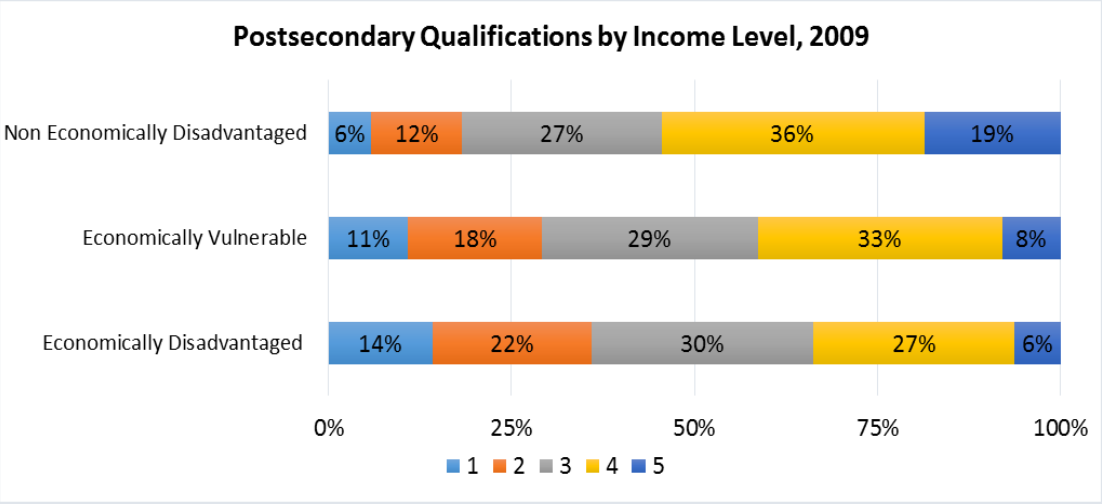
while the shares who possess levels 3, 4, and 5 decreased. Shares stayed the same across the distribution among non-economically vulnerable students.

Figure 3.2



Source: Author's analysis of Student Futures Project data.

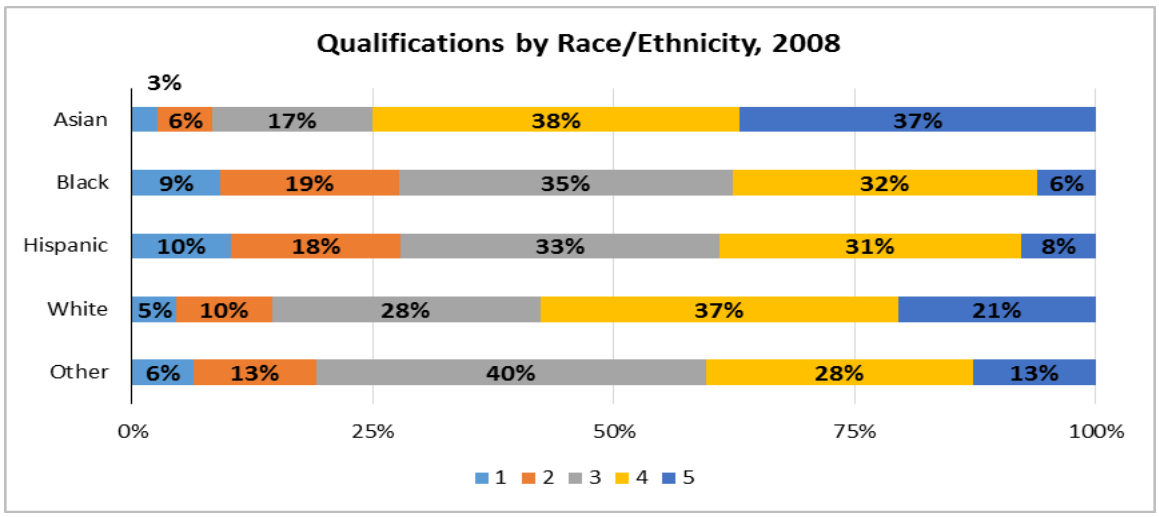
Figure 3.3



Source: Author's analysis of Student Futures Project data.

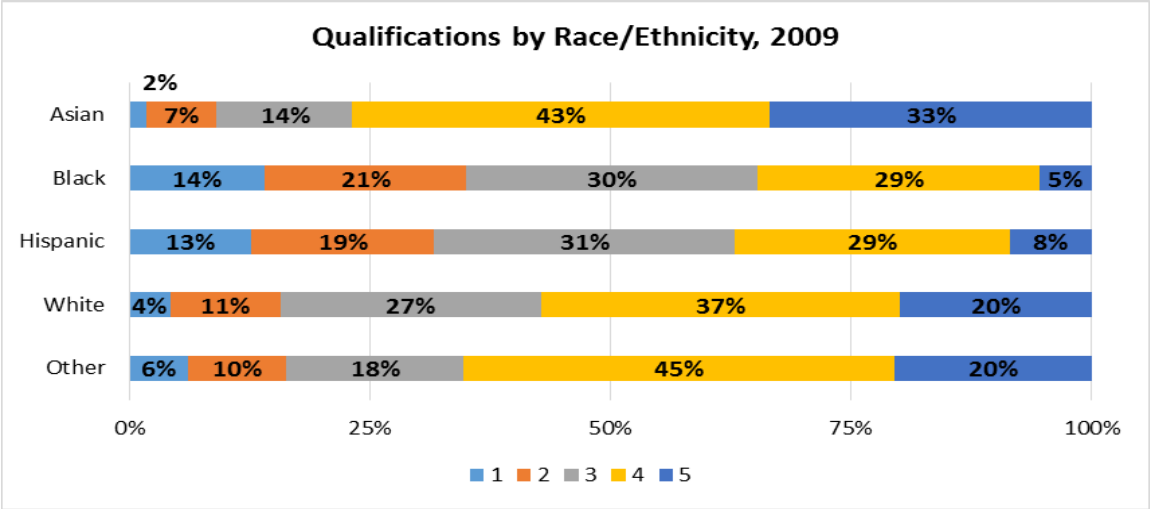
Qualifications are not equally distributed among race and ethnicity groups (Figure 3.4). Asian and White students are far more likely to have level 4 and level 5 qualifications than Hispanic and Black students. Further, shifts from 2008 to 2009 affected groups in different ways (Figure 3.5). At the high end, shares of level 5 students dropped among all students, with the exception of Hispanic students, whose share rose by half a percentage point. At the other end, shares of level 1 students rose for Hispanic and Black students, and declined for Asian and White students. Among Black students, the share of level one students rose by 5 percent, the highest shift among the four largest race/ethnic groups.

Figure 3.4



Source: Author's analysis of Student Futures Project data.

Figure 3.5

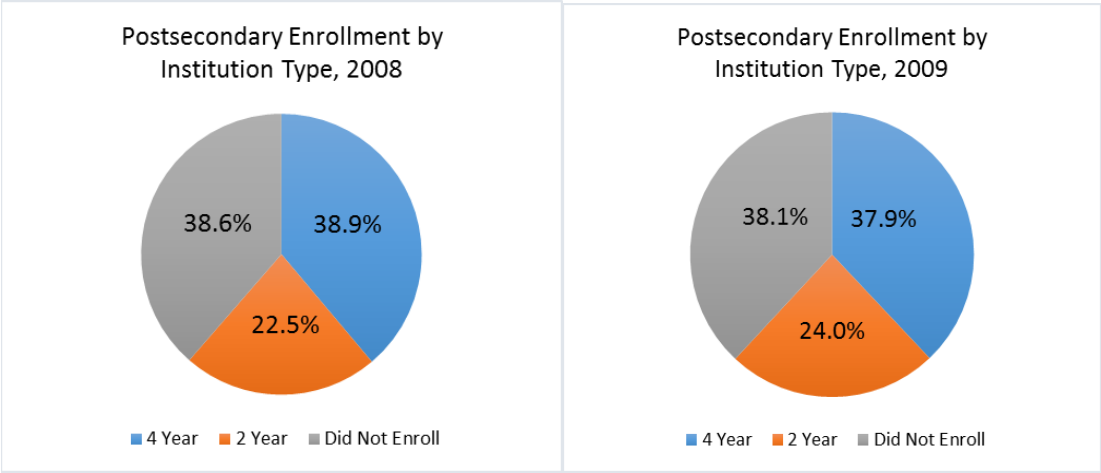


Source: Author's analysis of Student Futures Project data.

POSTSECONDARY ENROLLMENT

The overall enrollment actions of both cohorts by income level are presented in Figure 3.5. In 2008, 38.6 percent of graduates did not enroll in any institution, 38.9 percent enrolled in a four-year institution, and 22.5 percent enrolled in a two-year institution. The following year, 0.5 percent fewer students chose not to enroll, enrollment in four-year institutions dropped by 1 percentage point, and enrollment at two-year institutions rose by 1.5 percentage points.

Figure 3.6



Source: Author's analysis of Student Futures Project data.

Enrollment among non-economically disadvantaged students was 68.2 percent in 2008, compared with 51.7 percent for economically vulnerable students and 35.4 percent for economically disadvantaged students (Table 3.4). Enrollment rates for all groups of students rose in 2009, in particular for economically disadvantaged students, who experienced a 6.3 percent rise.

Table 3.3: Postsecondary Enrollment by Income, 2008 and 2009

2008		
	Did not Enroll	Enrolled
Non Economically Disadvantaged	31.7%	68.2%
Economically Vulnerable	48.1%	51.7%
Economically Disadvantaged	64.5%	35.4%
2009		
Non Economically Disadvantaged	30.8%	69.0%
Economically Vulnerable	47.1%	52.8%
Economically Disadvantaged	58.1%	41.7%

Source: Author's analysis of Student Futures Project data.

MATCHING

The results of the matching analysis for the entire 2008 cohort, including those who did not enroll, are presented in Table 3.5. It is clear that postsecondary enrollment is strongly related to the qualification level of students; the share of students who enrolled increases at each qualification level. To the right of the table are shares of students at each qualification who were found to be enrolled at each level of institutional selectivity level, in the universe of enrolled and non-enrolled students. Those who matched are shaded in grey. Students with the qualifications for level 5 institutions were the most likely to match, at 37.6 percent, than any other group, followed by level 1, 4, and 3 students, while level 2 students were by far the least likely to match. Level 2, 3, and 4

students are all more likely to end up at level 1 (two-year) institutions than to match to any four-year institution, even those that are fairly selective. Level 5 students are more likely to undermatch at institutions that are slightly less selective than the most elite institutions.

Table 3.4: Enrollment Rates by Qualification Level, 2008

	Students	Share Enrolled	Selectivity of School Enrolled				
	10,567*	61.3%	1	2	3	4	5
Qualification Level							
1	714	36.4%	23.8%	1.7%	4.9%	3.9%	2.1%
2	1,374	43.4%	30.9%	3.9%	6.9%	1.5%	0.2%
3	3,138	55.5%	30.0%	5.0%	11.3%	7.1%	2.0%
4	3,672	70.8%	19.8%	3.8%	15.4%	19.1%	12.7%
5	1,669	76.6%	7.5%	2.2%	9.8%	19.5%	37.6%

Source: Author's analysis of Student Futures Project data.
* Total reflects 40 students dropped from the sample for this analysis because they enrolled at special institutions. Of the remainder, 6,479 enrolled.

Table 3.6 presents consolidated undermatch, match, and overmatch rates for the universe of enrolled students only. Due to low sample sizes, the data on economically disadvantaged and economically vulnerable students are combined to form the low-income group. Across both low-income and non-low-income students, the majority of enrollees across all qualification levels do not attend the institution of the highest selectivity they could access (with the exception of level 1). The overall match rate, shaded in grey, varies with family income. Non low-income students match at a rate higher than low-income students by 9 percentage points. Their overall undermatch rate is lower by 11 points.

Level 5 students undermatch at the lowest rate with the exception of level 1 students (who don't have the option). For non-low-income students, they split evenly between match and undermatch, while for low-income students, the split is about 3 undermatched students for every 2 matched. The undermatch rate increases as students' qualifications become less exceptional, and it is consistently higher for low-income students than for non-low-income students at every level. It should be noted that level 2 students in general are much more likely to undermatch; only 7.9 percent of these students select the non-competitive four-year institutions for which they are qualified.

Table 3.5: Matching by Qualification Level and Income, 2008 and 2009

		2008			
Income	Level	Enrolled	Undermatch	Matched	Overmatch
Low-Income	1	56	0%	67.9%	32.1%
	2	144	75.0%	12.5%	12.5%
	3	305	71.1%	15.1%	13.8%
	4	417	67.1%	19.2%	13.7%
	5	97	59.8%	40.2%	0%
	All	1,019	65.1%	21.7%	13.2%
Non Low-Income	1	204	0%	64.7%	35.3%
	2	454	69.6%	7.9%	22.5%
	3	1,438	61.4%	21.6%	17.0%
	4	2,183	52.8%	28.4%	18.8%
	5	1,181	50.1%	49.9%	0%
	All	5,460	53.9%	30.9%	15.2%
		2009			
Low-Income	1	110	0%	86.4%	13.6%
	2	268	75.0%	12.7%	12.3%
	3	407	74.4%	17.7%	7.9%
	4	536	63.8%	21.1%	15.1%
	5	140	70.0%	30.0%	0%
	All	1461	64.6%	24.4%	11.0%

Source: Author's analysis of Student Futures Project data.

The 2009 results for non-low-income students were very similar to 2008, with slight increases in undermatch rates (they are not presented here). However, the results for low-income students changed considerably (Table 3.9). Although the rate of undermatch decreased for low-income students overall, it jumped by 10.2 percentage points among level 5 students, and increased for level 4 and 3 students. Less than one in three high-achieving low-income students who had access to the most selective schools in the country were found to have enrolled in them.

In finer grain detail, match also varies by income. Low-income level 5 students are less likely to undermatch slightly to selective institutions than non-low-income students. While only about 9 percent of non-low-income level 5 students enroll in two-year institutions, over one-quarter of their low-income counterparts do.[34] The same pattern is observed for low-income level 2, 3, and 4 students.[35]

NON ENROLLED STUDENTS

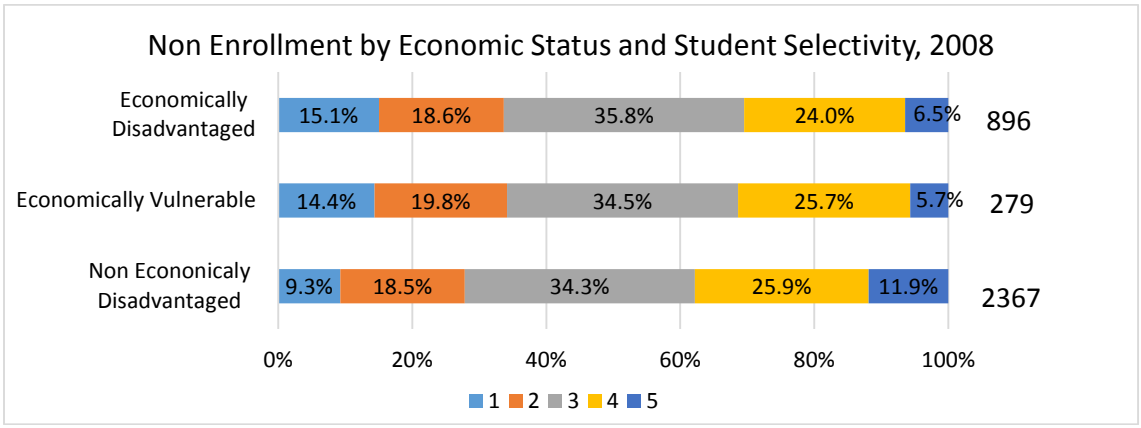
The non-enrolled sample is comprised of students who don't enroll in a postsecondary institution in the fall after high school graduation. They may undertake a variety of unpaid activities, such as raising children, taking a 'gap year', or interning, however, the majority have earnings records for at least one quarter of the year following graduation, indicating that most engage in some type of paid work. Non-enrolled graduates are represented at every level of student qualifications (Figure 3.5).

For each income level, the largest share of non-enrollees are students with qualifications that would have led to enrollment in 4-year institutions: level 3, followed by level 4, and level 2. A much larger share of low-income level 5 students (11.9 percent) were found not to enroll in a postsecondary institution in the fall after graduation compared with their non-economically disadvantaged peers.

Between 2008 and 2009, while the share of non-enrolled students overall shrank, some key differences took place in the selectivity distribution of the 2009 cohort (Figure

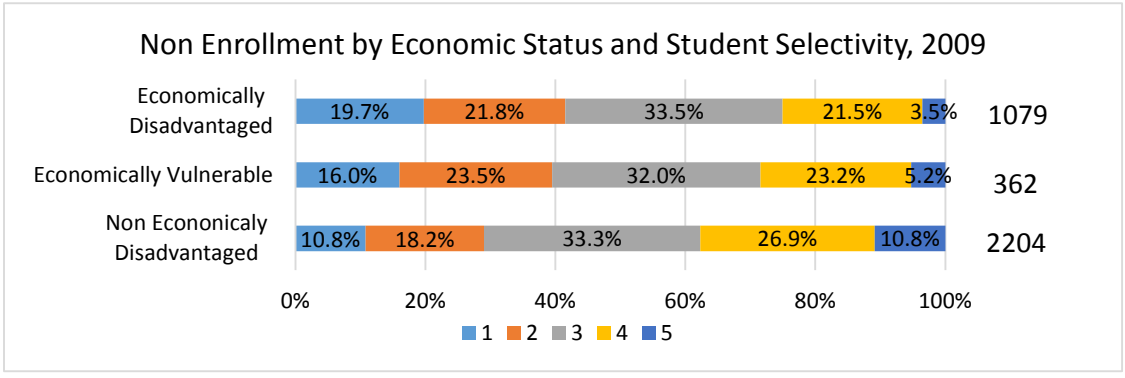
3.6). Shares of economically disadvantaged students who had level 1 and 2 qualifications grew, while higher levels shrank. The spectrum for non-economically disadvantaged students shifted less dramatically, but the share of level 1 students in this group also increased. This suggests that – even among lower-income students - the increase in postsecondary enrollment was experienced by those who earned relatively higher grades and test scores in high school, while lower-ranking students continued to be less likely to engage in postsecondary enrollment. This underscores evidence from the literature supporting the role of academic qualifications as a predictor for enrollment.[36]

Figure 3.7



Source: Author's analysis of Student Futures Project data.
Students without a Social Security number have been removed for earnings analysis.

Figure 3.8

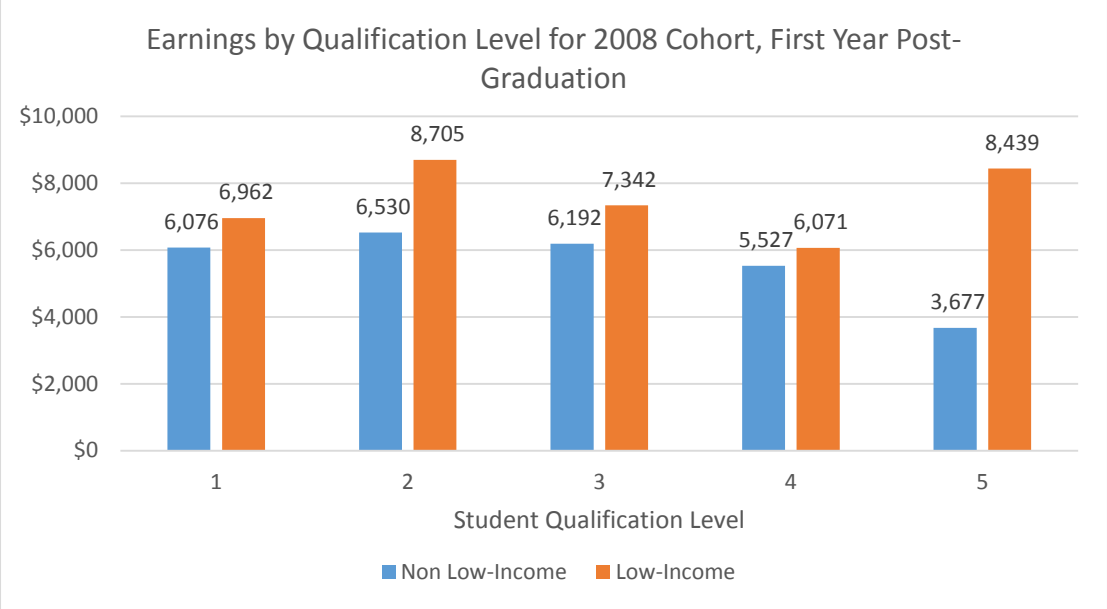


Source: Author's analysis of Student Futures Project data.

NON-ENROLLED STUDENTS' EARNINGS

Presented below are the average earnings - from Texas employment - of graduates beginning in the fall of the year following each cohort's spring graduation, by economic status and selectivity level (Figure 3.7). Students do not appear to earn a wage premium based on their high school qualification level. Both low-income and non-low-income graduates appear to earn less for each increased level of qualifications, except for the highest achieving low-income students. These students earn more than twice as much as their better-off peers.

Figure 3.9

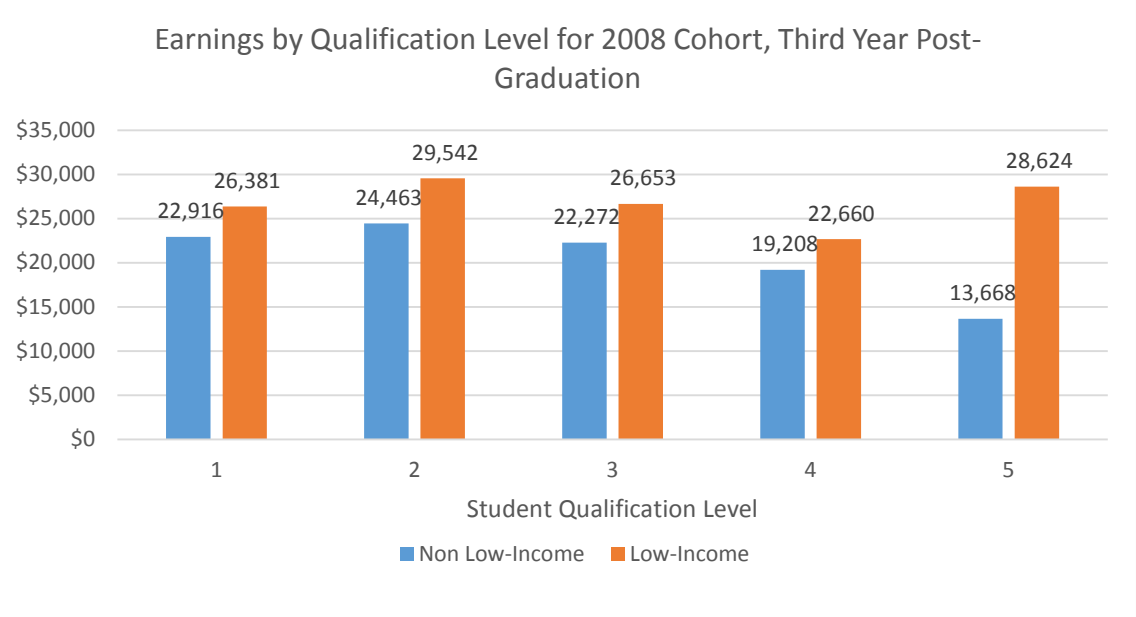


Source: Author's analysis of Student Futures Project data.

The same trends persisted in the third year following graduation for each cohort, although graduates earn more (Figure 3.8). Qualification level does not have a positive relationship with earnings; rather, graduates with higher qualifications earn less than their peers. It is plausible that graduates with higher levels of qualifications are more likely to substitute postsecondary education hours for work hours. Low-income graduates out-earn

their counterparts, presumably because they are in less of a position to forego this loss of income. Level 5 low-income graduates appear to be the least likely to forego this income. It may be that they earn the predicted wage premium for their observed talent, filling the more stable, higher-paying jobs for high school graduates. It is also likely that some level 5 students earn a premium for having earned a certificate or an Associate's degree. Although this analysis is limited in terms of choosing one set of explanations over another, it suggests that the highest-achieving low-income students who do not enroll in postsecondary education may be the least likely to do so.

Figure 3.10



Source: Author's analysis of Student Futures Project data.

INTERPRETATION

Low-income students were less likely than their peers to achieve qualifications that would allow them access to more selective postsecondary institutions. After the first year of the economic recession, the share of low-income students grew. Although postsecondary enrollment rates increased among low-income students in 2009,

achievement decreased for these students, based on the smaller shares who earned level 3, 4, and 5 level qualifications. Those that were more highly qualified drove increased enrollment in this income group.

Undermatch was found to be a pervasive phenomenon across income and academic achievement levels. Broad undermatch rates for low-income students exceeded those of non-low-income students. Undermatch also varies by level of qualifications. Level 5 students undermatch at the lowest rate and tend to be found at selective institutions when they undermatch. Students at all other qualification levels are found overwhelmingly at two-year institutions even when they had access to somewhat selective and selective four-year options. This trends is more pronounced for low-income students. The rates found in this report rank as the highest compared with findings from other studies and are likely overestimated due to less precise methodology, but on the whole they echo previous work.[37]

These findings do differ from those from an analysis of the 2006 cohort of Central Texas graduates, which found that broad rates of undermatch for low-income and non-low-income students were similar at 46 and 48 percent, respectively (compared with 65.1 and 53.9 percent in this report).[38] The sample size of that analysis was limited by two factors: exclusivity to SAT takers and a smaller group of four school districts (5,800 students in one cohort), which may explain the disparity. It is even possible that college entrance exams are a barrier for the qualified students in this sample in matching to somewhat selective, selective and the most selective institutions. Those institutions require these exams to be taken.

The analysis also reveals that in both cohorts the majority of non-enrollees across income levels in fact have academic qualifications to allow them access to a four-year institution, and that significant shares have level 4 and 5 qualifications. Non-enrollees tend to earn less as their level of qualifications rose, suggesting that they enter some form of postsecondary education down the road. The most highly qualified low-income

students earn a premium that suggests they do not follow this path, a finding that is more intriguing than conclusive.

NOTES

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Chapter 4: Conclusions and Recommendations

Earlier, the idea of college match was presented as one aspect of overall college fit. It is reasonable to think that some amount of undermatch is acceptable because there are many compelling reasons why a well-prepared student should choose an institution that is less selective than others to which they have access. Students and families often know what's best for their unique situation, and institutions that are closer to home or provide a unique set of features are not necessarily suboptimal postsecondary destinations. Yet the finding that undermatch is more extensive among low-income students in Central Texas than their non-economically disadvantaged peers is distressing.

The most high-achieving students miss out on an opportunity to benefit from the support (academic and financial) at the most selective institutions that lead to a greater chance of finishing their degree. They would also benefit the most from an earnings boost that their well-off peers would experience even if they did not take up that opportunity. Although relatively few students in this sample form part of this high-achieving, low-income group, from the perspective of their families, schools, and communities, they should have a fair shot at reaching those institutions.

It is less clear whether students who have adequate qualifications stand to gain as much because there is little evidence that somewhat selective and non-selective schools confer the same benefits over two-year institutions, other than those that derive from truly choosing these schools for their proper fit.

Of special concern are the considerable number of low-income students who hold the qualifications to attend a fairly selective four-year institution but do not enroll the following fall. Many from this group of non-enrollees form part of the 91 percent of students from both cohorts who said they intended to enroll in some form of postsecondary education following graduation.[39] This group is perhaps not "low-hanging

fruit" as their high-achieving classmates are often described, but due to their large number, they are the most consequential.[40]

The evidence from students in all three circumstances together pose one broad question: how do low-income student navigate the college decision process? It is a particularly salient one because the number of low-income students in Central Texas continues to rise.[41]

The college choice process for students takes place over three stages beginning in grade seven through twelve.[42] At each stage, a variety of academic, parental, financial and social factors come into play to shape a student's decision. Some students make a well-informed decision over a long period of time while others make a last-minute decision based on circumstantial events.[43] It is not difficult to see why; in July 2014, the College Board's "Big Future" college exploration website listed dozens of sortable institutional characteristics in addition to selectivity. They ranged from an institution's available majors to whether the campus can accommodate a freshman with a car.[44] It is unrealistic to think that every student considers the implications of every possible option or that students and families are aware of the empirical evidence on completion rates and earnings discussed here. For low-income students, the interaction of the large amounts of information, lack of knowledge about college costs and financing, and little guidance in defining what's important from their perspective are all factors that affect a low-income student's decision to choose a two-year college or delay enrollment.[45]

Increasing postsecondary access for all low-income students should continue to be a policy goal pursued with knowledge of the benefits that a proper match can bring in terms of completion and earnings for students. The following are a set of policy and program recommendations aimed at Central Texas public and postsecondary education stakeholders that are intended to both decrease undermatch and increase college access in future cohorts.

ENCOURAGE MORE APPLICATIONS

This analysis does not benefit from data on the acceptance decisions of postsecondary institutions because it has not been made available to SFP. However, the vast majority of undermatching at the national level takes place at the application stage rather than the decision stage, meaning that students do not even apply to some of the selective institutions they qualify for.[46] Increasing the number of applications submitted from one to two can increase the likelihood of overall enrollment by 40 percent.[47] Further, for low-income students, reducing the financial burden of college application fees bolsters enrollment overall.[48]

- School districts should pursue strategies that eliminate application fees for low-income students, such as leveraging available fee waivers.
- Schools should encourage students to fill out the Texas common application (Apply Texas) and to consider a recommended number of college applications based on best practice evidence.

ADD COLLEGE COUNSELORS

High schools that do not already have a college-oriented culture are less able to mitigate the influence of low encouragement, lack of information, and lack of college planning among low-income students.[49] College guidance staff can help to establish a college-going culture. Yet the high ratio of guidance counselors to students makes it challenging to meet the postsecondary transition needs of all students within a school. College guidance counselors can find it hard to provide college counseling when their duties also include academic advising, scheduling, assessment, substitutions, and school safety. Low-income students, who tend to rely on school staff more than parents for college information, are particularly affected by the limited availability of counselors.[50]

- School districts should ensure that schools have an appropriate ratio of college guidance counselors based on best practices.

- School districts should ensure that counselors are available to provide intensive college guidance services to students and families, including individual consultation on where and how to apply and help deciding between options.

The services that college guidance counselors provide can also be delivered by college access programs. It would be worthwhile to explore how high schools in Central Texas could develop a collaborative program that addressed both college access and college fit for students at all qualification levels. College Match in the New York City public schools places trained counselors to implement a comprehensive college access curriculum and has shown positive results in helping students enroll based on more informed decisions.[51] The College Advising Corps, which has a chapter located at The University of Texas, serves several Central Texas high schools with recent college graduates who serve exclusively as college guidance counselors.[52]

INCREASE COLLEGE AFFORDABILITY AWARENESS AMONG STUDENTS AND PARENTS

Families decide early on whether college is a reasonable expenditure given their resources. Parents and students who are economically disadvantaged tend to overestimate the cost of college and to be less inclined to engage in preparatory activities as a result.[53] The sticker price of college is misleading, as low-income students may pay far less after institutional grants have been applied, particularly at institutions with need-blind and no-loan admission policies. Although low-income families understand the value of college, they view its costs as a typical expenditure that should be paid for 'as they go.'[54] There is a sizable opportunity to educate students and families about how to finance a postsecondary education early in high school.

- Schools should offer workshops for students and parents to learn about college affordability in 9th or 10th grade. These events should include exercises that detail what the cost of college includes (tuition, fees, books,

housing, transportation, and living expenses) as well as sources of funding (scholarships and loans of different kinds).

- Schools should also help students and parents complete the Free Application for Federal Student Aid (FAFSA) in the 12th grade in order to leverage low-cost federal aid.

REDUCE COST BARRIERS

In 2008-2009, the cost of tuition and fees at a public Texas four-year institution was $6,292, while at a two-year institution the cost was about $1,200.[55] The cost factor makes enrollment less of a decision, and more a matter of circumstance, especially for families who are reluctant to takeout thousands of dollars in loans. Policies should be designed that make the investment decision more attractive for low-income high school graduates and their families.

Low-income students are more sensitive to changes in tuition price than other students. The impact on their enrollment rate in response to grants is much greater compared with loans.[56] Financial aid also affects the type of choices made by students; more aid results in more students attending their top-choice school rather than a second-choice school.[57] Other work has pointed to work-study availability as a motivating factor in enrollment.[58]

- The state should consider increasing the level and availability of need-based grant aid in order to increase enrollment among low-income students.
- Public institutions should provide work-study assignments that provide meaningful learning experiences allowing students to earn money for school while working in a campus-oriented environment.

Finally, while reducing undermatch among low-income students may help a relatively small number of them be in a better position to attend the most selective

institutions, it is unlikely that a corresponding increase in the supply of seats will occur to accommodate everyone who makes the grades and scores to qualify for elite institutions.[59] It would not solve racial inequalities in achievement or postsecondary enrollment, as this report has shown that Hispanic and Black students are less likely to have the best qualifications. A fundamental shift in educational equity for low-income students and racial minorities would require changes that improve the likelihood that these students can enroll in and succeed at any institution. For example, ensuring adequate and equal school funding, and investments in public universities that allow them to provide more support for students facing the challenge of attending college with limited resources.

NOTES

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Appendix

TAKS AND SAT EQUIVALENCY SCALES

TAKS Math Score	Predicted SAT Math Score	TAKS ELA Score	Predicted SAT Verbal Score
1950	399	n/a	n/a
2000	424	n/a	n/a
2050	448	n/a	n/a
2100	472	2100	461
2150	497	2150	481
2200	521	2200	502
2250	545	2250	522
2300	570	2300	543
2350	594	2350	564
2400	618	2400	584

The maximum average SAT score equivalency for TAKS identified by TEA is 601, therefore SAT 600 comprises the cutoff for the highest-scoring category rather than the SAT 620 designated by Barron's institutional selectivity categories. In TEA's equivalency study, researchers used a sample of Texas high school students who took both tests and compared their TAKS and SAT scores, forming probabilities of earning each score. The small number of students scoring above 2400 (roughly 15 percent of the sample) is not adequate to develop reliable probabilities beyond that threshold. Further, the use of TAKS scale scores alone is limited because the official designation of college readiness includes a Writing subscore.

Source: Pearson Educational Measurement. *TAKS Higher Education Readiness Component (HERC) TAKS and College Readiness Correlation Study*. April 2006. Accessed at: http://www.tea.state.tx.us/WorkArea/DownloadAsset.aspx?id=2147494130

SIMPLIFIED BARRON'S CATEGORIES FOR QUALIFICATIONS AND SELECTIVITY

Student Qualification Level	Institution Selectivity Name	Barron's Criteria			
		Category	Class Rank	Average SAT	GPA Point Equivalency
Level 5	Most Selective	Most Competitive	Top 20th percentile	655 - 800	3.3 – 4.0+
		Highly Competitive	20th – 35th percentile	600 – 654*	3.0 – 3.3
Level 4	Selective	Very Competitive	35th – 50th percentile	573 - 599	2.7 – 3.0
Level 3	Somewhat selective	Competitive	50th – 65th percentile	500 - 572	2.0 – 2.7
Level 2	Not Selective	Less Competitive	65th percentile	<500	< 2.0
		Non Competitive	No consistent requirements	No consistent requirements	< 2.0
Level 1	Two-Year Institutions	Not Rated	None	< 450	< 2.0

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Vita

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This report was typed by the author.