Factors Associated with Education and Work after High School for the Classes of 2008 and 2009

A Research Report of the Central Texas Student Futures Project

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LIST OF ACRONYMS

ACT	formerly, American College Testing Program
AP/IB	Advanced Placement/International Baccalaureate
CTE	Career and Technology Education
ERC	Education Research Center
FAFSA	Free Application for Federal Student Aid
G/T	Gifted and Talented Program
GAC	Austin Chamber of Commerce
HS	High School
ISD	Independent School District
NSC	National Student Clearinghouse
PEIMS	Public Education Information Management System
PSAT	Preliminary Scholastic Aptitude Test
RMC	Ray Marshall Center for the Study of Human Resources
SAT	Scholastic Aptitude Test/Scholastic Assessment Test
SSN	Social Security Number
TAKS	Texas Assessment of Knowledge and Skills
TEA	Texas Education Agency
TG	formerly, Texas Guaranteed Student Loan Corporation
THECB	Texas Higher Education Coordinating Board
TWC	Texas Workforce Commission
UI	Unemployment Insurance

ACKNOWLEDGMENTS

EXECUTIVE SUMMARY

Background

The Central Texas Student Futures Project is a research partnership of the Ray Marshall Center and eleven Central Texas independent school districts (ISDs). The project identifies and analyzes the pathways and factors influencing how high school graduates transition from high school to postsecondary education and the labor market.

To determine what students plan to do after high school and the key influences on those outcomes, the Student Futures Project surveys seniors in the spring prior to graduation. Graduates' actual postsecondary education and work outcomes are computed annually (for at least four years) using postsecondary enrollment and employment records. Data from high school records and the senior survey are linked to postsecondary enrollment and employment data, and used to identify those background factors and educational activities that are associated with positive education and labor force outcomes. Findings are shared annually with local educators, business and community leaders, and policymakers committed to furthering improvements in education and employment outcomes in Central Texas.

Research Questions

This report addresses the following research questions for 2008 and 2009 Central Texas graduates:

1. Which factors — family background and influences, student characteristics, pre-high school and individual high school experiences — are statistically associated with graduates' initial postsecondary education and labor market outcomes?

2. How robust are these factors across cohorts, data sources, locations, and model selection?

3. What are the factors associated with postsecondary transitions for specific populations of interest in the Central Texas region, including Hispanic, low-income and first-generation high school graduates?

The third report in a series examining factors linked to successful postsecondary transitions, this analysis builds upon information gained from earlier Student Futures Project multivariate analyses on smaller samples of surveyed 2006 and 2007 Central Texas graduates. In this report, researchers identify those factors consistently associated with

transitions to postsecondary education and employment outcomes, as well as those that vary depending upon the data source, time period or geographic area under study.

Research Methods and Data Sources

Researchers used several methods for their analysis, including descriptive statistics, multinomial logistic regression, and post-regression estimation techniques. The descriptive statistics provided needed context for the subsequent analyses while the regression models were used to determine the individual factors associated with postsecondary enrollment and employment outcomes. Research datasets for the 2008 and 2009 graduating classes were developed from two sources: Student Futures Project (SFP) data collected directly by Ray Marshall Center researchers from a variety of sources that included both senior survey data and high school student education records (available for Central Texas only), and Texas Education Research Center (ERC) data that included longitudinal student education records for the entire state. Both datasets included comparable postsecondary enrollment and employment outcomes data.

A series of multinomial logistic regression models were developed utilizing the different variables available in each data set and applying those models to the 2008 and 2009 research samples for Central Texas and the state as a whole. Findings were then compared across all statistical models, graduating cohorts and locations to determine those factors consistently associated with specific postsecondary outcomes.

Summary of Findings

This analysis of factors associated with initial postsecondary enrollment and employment outcomes for 2008 and 2009 high school graduates in both Central Texas and the entire state has allowed the Student Futures Project research team to test the strength of earlier findings reported for 2006 and 2007 Central Texas graduates who completed senior exit surveys. Researchers developed multiple statistical models that utilized the longitudinal nature of the statewide education data housed in the Texas Education Research Center for all Texas graduates, detailed senior survey information for larger shares of Central Texas seniors than in the earlier studies, and more robust statistical techniques to test the strength of the earlier findings. While the research team was not able to meet its goal of combining all of

these data sources into one unified research data set, the use of multiple models, data sources, time periods and locations nonetheless provides strong evidence as to which explanatory factors are *consistently* associated with initial postsecondary outcomes and employment, and which vary depending upon individual circumstances.

Descriptive Findings for 2008 and 2009 High School Graduates

❖ **Central Texas differs from the entire state, both in the composition of its high school graduating classes and in their initial postsecondary outcomes**.

Central Texas has a smaller share of Hispanic graduates than Texas as a whole (31% vs. 37% in 2009), with a correspondingly higher share of White graduates. Low-income graduates also comprise a larger share of graduates in the entire state than in Central Texas, a 12-percentage point difference for both 2008 and 2009 graduates.

In 2009, 61% of Central Texas graduates enrolled in postsecondary education in the fall semester compared to only 55% of Texas graduates. These differences in postsecondary enrollment rates were due to higher 4-year enrollment rates for Central Texas graduates than for all Texas graduates.

❖ **Changes in student demographics and labor market conditions are affecting outcomes for high school graduates in all parts of Texas.**

From 2008 to 2009, the shares of Hispanic graduates rose by approximately 2 percentage points and the shares of low-income graduates increased by 3 percentage points in both Central Texas and Texas. The shares of White graduates dropped by 3 percentage points over this same time period.

Overall college enrollment rates remained steady between the two years but the share of graduates attending 4-year colleges dropped in 2009, while a larger share of enrollees attended 2-year colleges. Out-of-state enrollment rates also dipped slightly. Overall employment rates for recent graduates in the fall quarter following high school graduation decreased dramatically from 2008 to 2009 (from 44% to 38% in Central Texas and 47% to 38% in Texas).

Factors Associated with Postsecondary Enrollment

❖ **Several factors are consistently associated with 4-year college enrollment, regardless of data sample, location or time period studied but very few consistent patterns could be discerned for 2-year enrollment.**

Graduates who completed one advanced math course beyond Algebra II or more than one AP/IB course were more likely to enroll in 4-year colleges. Conversely, graduates not classified as college-ready based on TAKS exit exams were less likely to enroll in 4-year schools in all statistical models.

In models using the additional longitudinal ERC administrative variables (but not the senior survey variables), failure to meet the 8th grade math standard was consistently linked to lower 4-year enrollment rates. ERC data models also found that ever having participated in the free or reduced lunch program was linked to reduced college enrollment of any kind.

Models that incorporated senior survey variables found students who graduated in the top 10% of a high school class, took an SAT/ACT preparation course, visited one or more college campuses, or reported submitting a FAFSA were more likely to enroll in a 4-year college, after controlling for all other factors, confirming findings from earlier Student Futures Project reports. New variables in the 2008 and 2009 analyses also showed that Central Texas students who graduated in the bottom half of a high school class or who intended to pay for college by working were less likely to enroll in 4-year colleges. Students graduating in the bottom quartile of the class were less likely to enroll in any college, either 2-year or 4-year.

❖ **There are some key differences in the factors associated with college enrollment between Central Texas and Texas as a whole.**

Receiving college credit in high school or being classified as gifted were both positively linked to 4-year enrollment for the entire state but not for Central Texas. Variables linked to lower 4-year enrollment rates in Texas (but not Central Texas) included special education participation, attendance at more than one high school, or failure to meet the 8th grade TAKS reading standard. Taking a coherent sequence of career and technology education courses was associated with higher 2-year enrollment in the state as a whole but not in the Central Texas region.

❖ **While most factors linked to postsecondary 4-year enrollment for Central Texas Hispanic, low-income, and first-generation high school graduates are similar to those for all graduates, several other variables are also important for these student groups.**

As was true for all graduates, taking at least one advanced math course beyond Algebra II, taking more than one AP/IB course, or completing the FAFSA increased the likelihood of attending a 4-year college for Hispanic, low-income and first-generation high school graduates, while graduating in the bottom half of the class or planning to pay for college by working reduced their chances of 4-year enrollment. In addition, meeting with their counselors for help with college applications and essays significantly increased the chances of 4-year enrollment for these three student groups but not for graduates in general. Conversely, Hispanic, low-income and first-generation graduates whose families speak Spanish at home were less likely to enroll in 4-year colleges, which was not true for the general population.

Factors Associated with Employment

❖ **No factors are consistently linked to employment across all statistical models, time periods and locations; however, some consistent employment findings can be observed in models using the additional ERC and the Student Futures survey variables.**

Models using ERC variables found that graduates who had ever participated in the free or reduced lunch program were more likely to be employed in Texas but not enrolled in school in the fall quarter following graduation than was true for other graduates. Conversely, graduates who had ever been considered immigrants were less likely employed in Texas jobs covered by Unemployment Insurance, after controlling for other factors.

The models that included additional senior survey variables for Central Texas graduates found that high school graduates whose parents did not attend any postsecondary education or those graduating in the bottom quartile of the class were more likely to be employed and not in school in the fall following graduation. Conversely, graduates in the Top 10% of the class or those submitting a FAFSA were less likely to be employed and not in school. Survey respondents who planned to pay for college by working were more likely to be working than not working, regardless of enrollment status.

Conclusions

This report provides the third in a series of analyses of factors linked to initial postsecondary enrollment and employment outcomes for Central Texas high school graduates. Major conclusions from the analysis of the 2008 and 2009 graduating classes include:

❖ **Changes in the demographics of high school graduates, coupled with poor labor market conditions, have increased the need for higher skill levels among recent high school graduates.** The shares of high school graduates from groups traditionally less likely to attend college have been growing over time but, due to interventions aimed at changing historical patterns of enrollment, overall rates of college enrollment have been maintained even with these demographic shifts. Weak economic conditions over the past few years have resulted in lower overall employment rates for recent high school graduates. Moreover, the types of jobs held by recent high school graduates do not provide strong potential for earnings growth without further education or skills development.

❖ **This analysis confirms earlier findings on factors associated with 4-year enrollment reported for 2007 graduates, while also providing additional information that could not be measured in the earlier work**. Academic achievement and participation in specific college preparation activities remain the largest and most consistent influences affecting 4-year enrollment. Additional variables contained in this analysis also found that 4-year enrollees are concentrated among students who rank in the top half of their graduating classes and confirmed the importance of college-readiness for students hoping to enroll in 4-year schools.

❖ **The longitudinal variables available through the ERC suggest some areas of concern that could not be fully tested without linking those variables directly to the senior survey variables.** For example, the administrative data models developed from ERC data found that students who had ever participated in the free or reduced lunch program were consistently less likely to enroll in either a 2-year or a 4-year

college. The suggestion that even poverty as a young child could negatively affect any type of future college enrollment for high school graduates is troubling. However, the strength of this variable would need to be tested in statistical models that also include variables linked to increasing the chances of enrollment for low-income graduates (e.g., meeting with college counselors on applications) before drawing policy conclusions from this finding.

❖ **The differences in findings between Central Texas and the state as a whole that are based solely on administrative data confirm the need to conduct local policy analyses but also should prompt readers to think critically about the meaning of the variables constructed from this data source.** Persons reading research findings based solely on administrative data should consider whether some differences in findings across geography might be due to varying meanings of some variables across school districts. Some administrative variables (e.g., attendance at more than one school, 8th grade TAKS standards) have a common meaning across the entire state while others (e.g., participation in a gifted program, receiving college credit in high school, and completion of a coherent sequence of career and technology education courses) could vary based on differing program definitions or availability of services across school districts.

Recommendations

❖ Research on the factors associated with postsecondary outcomes should include multiple years and models that include longitudinal variables to ensure that factors significantly and substantively associated with a particular outcome are consistent.

❖ Local efforts to increase enrollment in 4-year colleges should focus on academic achievement and college preparation activities found to be consistently associated with 4-year enrollment and should start in middle school or early in high school.

❖ Research is needed to measure the impact of programs designed to improve postsecondary enrollment rates for members of student groups that have lagged in their overall enrollment rates.

❖ Researchers should continue to pursue their efforts to link survey variables with the longitudinal data available in the ERC in future research on this topic so as to determine the relative importance of variables found in only one of these data sources.

CHAPTER I. INTRODUCTION

Project Overview

The Central Texas Student Futures Project is a research partnership of the Ray Marshall Center and eleven Central Texas independent school districts (ISDs).[1] This multi-year project follows the progress of Central Texas high school graduates as they make the critical transition from high school to postsecondary education and the labor market. This effort grew out of concerns among key education, business, workforce development and community stakeholders that the region's economy and its residents would not prosper in the near- and longer-term unless more of its graduates obtained higher levels of enrollment in postsecondary education and better labor market outcomes.[2] The purpose of the Student Futures Project is two-fold:

- To provide Central Texas school districts, postsecondary education institutions and employers with comprehensive, longitudinal research on what local high school students do after high school, and how a variety of educational, personal and financial factors relate to their success in higher education and the workforce; and

- To foster best practices through workshops, seminars and applied research, assisting the region's ISDs and postsecondary institutions to increase the number of Central Texas youth who obtain 2-year and 4-year postsecondary education and workforce credentials (e.g., occupational certificates).

To determine what students plan to do after high school and the key influences on those outcomes, the Student Futures Project surveys seniors in the spring prior to graduation. Graduates' actual postsecondary education and work outcomes are computed annually (for at least four years) using postsecondary enrollment and employment records. Data from high school records and the senior survey are linked to postsecondary enrollment and employment data, and are then used to identify those background factors and educational activities that are

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[1] The Central Texas Student Futures Project was previously named the Central Texas High School Graduate Data Center.

[2] These concerns are outlined in the 2006 *Beyond the Numbers* report by King, Schexnayder, and Gourgey.

associated with positive education and labor force outcomes. Findings are shared annually with local educators, business and community leaders, and policymakers committed to improving education and supporting local initiatives.

To date, the Ray Marshall Center has published two reports that used multivariate statistical techniques to identify the factors most strongly associated with successful initial enrollment in both 4-year and 2-year postsecondary education for surveyed Central Texas high school graduates. Those reports analyzed results for surveyed 2006 and 2007 graduates from a small number of Central Texas ISDs. Although findings from these reports added considerable knowledge to the existing literature, those results could not necessarily be generalized to all graduates in participating districts due to student consent issues that may have affected the composition of those research samples.

Summary of Relevant Literature and Earlier Student Futures Project Findings

The original literature review for the Student Futures Project identified five categories of background variables that influenced enrollment in postsecondary education: family background, student characteristics, pre-high school experiences, individual high school experiences, and community and neighborhood effects (King et al., 2006; Schexnayder et al., 2006). Many of the studies from that review focused on a single category of variables or used samples that were too small to identify success factors for small geographic areas or population groups, raising questions about the relative importance of variables and strength of the conclusions. This literature was one of the sources used to develop the conceptual model guiding the Student Futures Project (Levy and King, 2009).

By analyzing a dataset that includes multiple variables from all five categories and has both the breadth and depth required to establish statistical significance for small population groups, the Student Futures Project research design addresses the issue of the relative importance of variables, adding to the literature on postsecondary transitions. The multivariate analysis on 2007 graduates in eight ISDs (Schexnayder et al., 2009) identified personal, academic and social background factors associated with successful postsecondary transitions for all surveyed Central Texas graduates, regardless of the school district in which a high school was located. That research included individual-level variables on family background, student characteristics, pre-high school experiences, and individual high school experiences. It confirmed the importance of some variables on postsecondary enrollment

from prior research (e.g., taking rigorous curricula, parents' education level, knowledge of financial aid process) but also found that some variables statistically linked to postsecondary enrollment in previous research (e.g., parental involvement, participation in some extracurricular activities) were no longer significant when using a more comprehensive set of student-level variables. In addition, the strength and significance of some variables for those population groups least likely to attend college varied from results for all graduates. For example, sports participation was linked to higher odds of 4-year college enrollment for all graduates but not Hispanic graduates, while music participation was quite important for low-income and those who would be first generation college students but not other groups of graduates.

Findings from the Student Futures report on 2007 surveyed graduates also highlighted additional gaps in the literature. Most prior literature focused on *any* enrollment in postsecondary education. Student Futures models demonstrated that many variables positively associated with 4-year enrollment were also associated negatively with 2-year enrollment. Focusing on factors associated with *any* enrollment for these variables showed no association with postsecondary enrollment since the direction of the effect of the variable differed. Furthermore, most variables were more strongly linked to enrollment in 4-year colleges, and far fewer variables were linked to enrollment in 2-year schools. Because 2-year colleges are an important part of the region's strategies for increasing college enrollment, the project partners recommended that better understanding the factors linked to 2-year college enrollments should be an area for further study.

In this report, researchers include additional variables (e.g., college readiness, more detailed high school class rank, and several detailed advanced coursework variables) intended to broaden the portrait of student motivation and preparation for attending college beyond those who are the most academically prepared in an effort to capture factors more clearly associated with 2-year enrollment. Additionally, this work utilizes multinomial logistic regression to better account for the categorical nature of postsecondary outcomes, a technique more likely to find factors associated with 2-year enrollment, if present, than previous Student Futures Project work.

Earlier literature also found student college readiness to be an important predictor of future academic success (Gong and Presley, 2006). Schexnayder et al., 2009 confirmed these findings for top academic performers. However, more work is needed to better understand

those factors that successfully influence postsecondary enrollment for those graduates in the middle of their academic classes, the group that needs to be targeted for increasing overall postsecondary enrollment rates. This work includes variables intended to determine the extent of influence college readiness has on postsecondary enrollment such as quartiles of high school graduation and college readiness (as defined by student performance on state-mandated high school exit exams).

Finally, one area not studied in the earlier Student Futures Project reports concerns how differences in the schools themselves may affect postsecondary enrollment. The literature has found that many school characteristics are linked to the future success of the students who attend those schools. The relatively small number of high schools, and the mobile nature of some students attending them, prevent inclusion of multiple campus-level variables in this analysis. However, researchers used survey information on parental education and administrative data on the percentage of students receiving free or reduced lunch to construct a categorical school variable. Accounting for student attendance at a particular type of high school (e.g., a high school with a high percentage of parents with a Bachelor's degree and a low percentage of students participating in the free and reduced lunch program) provides information on the benefits or disadvantages of attending particular types of schools. Additionally, since attending certain types of schools are proxy indicators for student motivation (in the case of magnet schools) and college-going experience (as parental real estate choices are correlated to parental education), including them allows researchers the ability to more confidently identify the individual factors associated with postsecondary outcomes.

Purpose and Organization of This Report

The analysis contained in this report builds upon the information gained from the earlier Student Futures Project multivariate analyses, resolves the small sample problem, and addresses important topics that the project partners identified as needing further study. In particular, this report:

- incorporates additional variables to measure the influence of college readiness and class rank, better explains high school transitions to 2-year colleges, and accounts for differences in some characteristics of individual high schools;

- uses more sophisticated statistical models and estimation techniques (e.g., multinomial logit/probit) to test the robustness of the earlier findings;

- applies the resulting statistical models both to the larger survey samples available for 2008 and 2009 Central Texas graduates and to datasets on all Texas graduates constructed from longitudinal administrative data housed in the Texas Educational Research Data Center; and

- determines which findings are common to all high schools across Texas and which are unique to the Central Texas ISDs participating in this project.

The report contains both a descriptive analysis and an enhanced multivariate analysis of factors across all domains (discussed in the literature review) associated with successful transitions to 2-year and 4-year colleges and employment. Specific identification of factors associated with successful transitions for those populations traditionally underrepresented in postsecondary education is included.

The report is organized into seven chapters and two appendices. Chapter II describes specific research questions, methods and data used in this analysis. The third chapter summarizes descriptive postsecondary outcomes for the research samples of 2008 and 2009 graduates. Chapter IV identifies those factors consistently associated with successful initial outcomes regardless of research sample or location, while Chapter V highlights the differences between relevant influences for Central Texas graduates compared to those in the entire state. Differences in these findings for the specific population groups of interest (i.e., populations that have traditionally been less likely to enroll in college) are analyzed in Chapter VI. The final chapter summarizes findings from this report. It also identifies policy and practice implications. The technical appendix completes the report, providing details related to the methods and data used in this report. An additional appendix, available upon request, contains selected results from the multinomial logistic regressions.

Future Student Futures Project reports, dependent on funding, will analyze factors associated with *initial* enrollment in postsecondary education and employment for future cohorts of Central Texas graduates. Additionally, the Student Futures Project research team will study the educational and employment pathways for 2008 and 2009 Central Texas graduates for at least four years after high school graduation and identify those pathways linked to longer-term success.

CHAPTER II. RESEARCH QUESTIONS, METHODS AND DATA

This report is the third in a series examining initial postsecondary transitions for Central Texas high school graduates. Previous reports described outcomes and factors associated with these outcomes for the classes of 2006 and 2007.[3] Major changes in this year's report are the inclusion of both the class of 2008 and the class of 2009 in the analysis, additional data, and larger samples of surveyed students (particularly for 2009 graduates). This report also reflects improved statistical techniques for the analysis of the factors associated with postsecondary transitions.

Research Questions

This report addresses the following research questions for 2008 and 2009 graduates:

1. Which factors — family background and influences, student characteristics, pre-high school and individual high school experiences — are statistically associated with graduates' initial postsecondary education and labor market outcomes?

2. How robust are these factors across cohorts, data sources, location, and model selection?

3. What are the factors associated with postsecondary transitions for specific populations of interest in the Central Texas region, including Hispanic, low-income and first-generation high school graduates?

Researchers focus in this report on factors that are *consistently* associated with specific outcomes, particularly those that span graduating cohorts. Discussion is also included for factors that are *ever* associated with particular outcomes, especially factors that differ across cohorts or location and factors that apply to populations that have traditionally been less likely to enroll in college for the Central Texas region.

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[3] See King, et.al., *Education and Work After High School: A First Look at the Class of 2006* and Schexnayder, et.al., *Education and Work After High School: A First Look at the Class of 2007.* These reports are available online at www.centexstudentfutures.com.

Research Methods

To answer these questions and provide adequate context for their analysis, researchers use descriptive statistics and multinomial logistic regression. The methods used to analyze these outcomes are briefly described below.

Descriptive Statistics: Initial postsecondary enrollment outcomes for the classes of 2008 and 2009 were published in the summers of 2009 and 2010, respectively.[4] Chapter III summarizes overall enrollment and employment rates, major demographic group and district rates for each of the research samples used in this report. These descriptive statistics provide needed context for the analyses that follow.

Multinomial Logistic Regression: To address the first research question, researchers employ multinomial logistic regression to determine the individual factors associated with postsecondary outcomes, which improves upon the methods used in previous work. Multinomial logistic regression more clearly accounts for the categorical nature of postsecondary enrollment and employment outcomes than other statistical techniques such as logistic regression, which unnecessarily creates binary comparisons between combined categories (such as comparing 4-year enrollment outcomes with both 2-year and not enrolled outcomes).

Researchers use three different multinomial logistic regression models based on the availability of data from two data sources [Student Futures Project (SFP) and Educational Research Center (ERC) data]. *Model 1* uses common administrative data available in both SFP and ERC datasets. *Model 2* uses only ERC data, adding variables available exclusively to that dataset. *Model 3* uses only SFP data, adding variables available exclusively to that dataset.

The dependent variable for all models describing initial postsecondary enrollment (in the fall following high school graduation) includes three categories: enrolled in a 2-year college, enrolled in a 4-year college or university, or not enrolled. The dependent variable describing the initial postsecondary employment includes three categories: not employed,

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[4] Initial Postsecondary Enrollment Statistics for 2009 Central Texas Graduates through December 2009 and Initial Postsecondary Enrollment Statistics for 2010 Central Texas Graduates through December 2010. These briefs are available online at www.centexstudentfutures.com.

employed and enrolled in postsecondary education, and employed and not enrolled in postsecondary education.

Explanatory variables in the regression models are developed from the categories of individual student factors — background characteristics, student characteristics, pre-high school experiences, and individual high school experiences — that are cited in the literature and could be constructed from prior school records, earnings records, or senior survey data.[5] More detailed information on variables included and their respective data sources are presented in the section on dataset construction.

Estimates derived from multinomial logistic regression describe the association of an explanatory variable to a *comparative* outcome. For example, taking an advanced math course (higher than Algebra II) might be positively associated with 4-year enrollment compared to 2-year enrollment. In this report, researchers also refer to the estimated effect of explanatory variables to a *fixed* outcome (Table 1).[6] For example, taking an advanced math course might be positively associated with 4-year enrollment compared to 2-year enrollment *and* be positively associated with 4-year enrollment compared to not being enrolled. For simplification, this *comparative* outcome result translates to a *fixed* outcome result, i.e., that taking an advanced math course is positively associated with 4-year enrollment. An example of how these fixed outcome results are calculated is provided in Table 1. Not all examples of estimated effects fall into the categories described in the table. Summaries using only fixed outcomes are not able to capture the full subtleties evident in the analysis. The primary benefit of reporting fixed outcomes is their clarity. A similar process is also used to identify the direction of effect of *fixed* outcomes for employment regressions. Results from the multinomial logistic regressions are presented in Chapter IV.

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[5] A complete list of variables and their means are presented in the technical appendix. For the convenience of the reader, only statistically significant variables are discussed in detail in the text of this report.

[6] The fixed outcome comparison is not related to fixed effects models, but is a method designed to simplify the results of multinomial logistic regressions.

Table 1. Comparative and Fixed Outcomes for Multinomial Logistic Regression, using Direction of Association

Fixed Outcomes	Comparative Outcomes		
	4-Year vs. 2-Year	4-Year vs. Not Enrolled	2-Year vs. Not Enrolled
Associated with increased:			
College-going		+	+
4-Year Enrollment	+	+	
2-Year Enrollment	-		+
Associated with decreased:			
College-going		-	-
4-Year Enrollment	-	-	
2-Year Enrollment	+		-

To address the second research question, (i.e., the robustness of findings regardless of cohort or data set) a series of regression models is examined and the directions of estimates of explanatory variables are compared across these regressions. Differences and similarities in estimated effects and statistical significance of factors associated with postsecondary outcomes across cohorts, data sources, and location are discussed in Chapter V.

To answer the third research question, a series of regressions models limited to each population of interest is examined and the directions of the estimates of explanatory variables are presented using fixed outcomes. These results are presented in Chapter VI.

Construction and Description of the Research Datasets

There are two sources of data for the cohorts presented in this research report: Student Futures Project (SFP) data collected directly by Ray Marshall Center researchers from a variety of sources and data housed in the Texas Education Research Center (ERC), which each contain common and unique administrative variables. The research datasets consist of two high school graduating cohorts, the classes of 2008 and 2009. Including multiple cohorts and multiple data sources in this report allows researchers to discern which factors are

consistently associated with initial postsecondary outcomes, regardless of cohort, location, model selection or data source. Additional advantages include the ability to determine whether cohort variability using SFP data is consistent with ERC data cohort variability and to examine whether the factors associated with initial postsecondary enrollment in Central Texas are the same as those for the rest of Texas.

 Data Sources: The SFP dataset contains variables collected by the school districts during students' senior year and reported to the state using the Public Education Information Management System (PEIMS), transcript information collected and maintained by the school districts, a high school exit survey for a large sample of graduates, and information collected on postsecondary outcomes, including employment [using Texas Unemployment Insurance (UI) wage data] and enrollment [using National Student Clearinghouse (NSC) data]. The ERC dataset contains variables collected by the school districts and reported to the state using PEIMS data going back to 1990, and information collected on postsecondary outcomes, including employment (using Texas UI wage data) and enrollment [using Texas Higher Education Coordinating Board (THECB) and NSC data]. The availability of historical ERC data allows researchers to construct the equivalent of course-taking transcript information and provides longitudinal information on some critical student performance and transition indicators, including free and reduced lunch status, home language, and immigrant status. Table 2 uses a Venn diagram to identify the data sources used to construct the research datasets described in this report and the variables available from each source.

Table 2. Variable Availability, by Data Source and Multinomial Logistic Regression Model Samples

Education Research Center (Texas)

Student Futures Project Dataset (Central Texas only)

Additional SFP Variables **Used in Model 3 with the SFP Survey Sample**	*Common Administrative (C.A.) Variables* **Used in Model 1 with the SFP, ERC, and TX ERC Samples**	*Additional ERC Variables* **Used in Model 2 with the ERC and TX ERC Samples**
Background Characteristics Parental Education*	*Background Characteristics* Race/Ethnicity Home Language Gender Free and Reduced Lunch Status Special Program Participation	*Background Characteristics* Home Language status over time Free and Reduced Lunch Status over time Special Program Participation over time Immigration status over time
Student Characteristics When student began thinking about college*		
Individual high school experiences: Coursework Graduation rank Number of high schools attended*	*Individual high school experiences: Coursework* Failed at least one 9th grade course Received college credit in HS Graduation Plan	*Individual school experiences* Retained in the 3rd or 5th grade Number of high schools attended
Pre-High School Experiences HS math credit in middle school HS foreign language credit in middle school	College Ready Advanced Math Courses AP and IB Courses Taken and Passed CTE courses	*Individual high school experiences: College Preparation* TAKS scores in the 8th grade
Individual high school experiences: Extracurricular Activities School-based activities (Dance, sports, etc.)* Typical number weekly hours spent studying* Typical number weekly hours spend working*	*Individual high school experiences: Extracurricular Activities* Income senior year	*Outcome Variables* THECB In-state enrollment
*Individual high school experiences: Counselor Interactions**	*Community & Neighborhood Effects* District (Central Texas only) Campus Groups (Central Texas only)	
Individual high school experiences: College Preparation College preparation activities* Number of college preparation activities* Ease of understanding financial aid* Methods planned to pay for postsecondary*	*Outcome Variables* National Student Clearinghouse (16 months out) TWC UI Wage data	

* HS Exit Survey Variable

Research Datasets: The data sources and availability of variables indicated in Table 2 describe two datasets with some mutually shared variables. The availability of these variables across these two datasets allows for three regression models: one uses the mutually shared variables, and two use the mutually shared variables and the additional variables available from either of the data sources, as presented in Table 3. These three models are applied to four samples of data: three from Central Texas and one including all of Texas. The three Central Texas samples include the following: two samples using the common administrative data covering the universe of Central Texas graduates (one for each source: the SFP Administrative and ERC) and one sample using SFP data that includes the common administrative variables plus additional SFP variables for all graduates who completed the senior survey (the SFP Survey sample). One additional sample uses data from the ERC for the entire state of Texas: the TX ERC sample. The table also indicates sources for each of the samples.

Table 3. Multinomial Logistic Regression Model Samples for 2008 and 2009 Graduates, by Data Source and Location

Type of Variables	Regression Model	Sample Names, by Data Source and Location		
		Central Texas		Texas
Common administrative (C.A.)	Model 1	SFP Admin	ERC	TX ERC
C.A. and additional ERC variables	Model 2		ERC	TX ERC
C.A. and additional SFP variables	Model 3	SFP Survey		

All samples outlined above are available for each graduating cohort. Thus, SFP Admin 2008 means the 2008 Central Texas sample using the common administrative data available in the Student Futures Project dataset; TX ERC 2009 indicates the sample including 2009 Texas high school graduates using ERC data. The sizes of these cohorts by sample are indicated in Table 4. Each of these respective samples is built based on both the availability

of variables in each source and the availability of students whose information included all of these variables.

Alternative schools in the Central Texas area focus primarily on graduating students from high school; due to this specificity of purpose, students attending alternative schools are excluded from the analysis of factors associated with postsecondary transitions. Furthermore, data have not been imputed, where lacking, for individual students; students with missing data have been dropped from the analyses except where discussed in the text.[7]

Table 4. Multinomial Logistic Regression Model
Analysis Samples, by Graduating Cohort

	Class Samples	
Sample Name	**2008**	**2009**
Central Texas		
SFP Admin	10,336	10,568
SFP Survey	4,849	7,259
ERC	10,990	11,096
Texas		
TX ERC	247,094	256,591

Differences in the process of linking survey responses to administrative data produced a large variation in survey response rates for 2008 (47%) and 2009 (69%) graduates. Prior to 2009, high school seniors completing the survey needed to complete a separate consent form to permit this linking, whereas classes completing the survey beginning in 2009 instead needed to opt-out of this process, which increased the linking rate. The survey instrument administered to 2008 and 2009 graduates contained few differences; variables constructed to align these survey questions are discussed in the text, where relevant,

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[7] Students dropped from this analysis enrolled in postsecondary education at lower rates than those included in this analysis. Conclusions of the analyses performed apply to students who remain within each sample and may not necessarily reflect the entire population of Central Texas high school graduates. Further information on the construction of the research datasets is included in the technical appendix.

with more detailed discussion in the technical appendix. Minor differences in size between Central Texas SFP Admin and the ERC samples are attributable to a smaller number of SFP graduates having complete administrative information for all variables in the datasets.

Regression Models: The research samples are utilized in three regression models which correspond to the explanatory variables presented in Table 2 above. A brief description of the explanatory variables of each model follows:

> **Model 1** uses student data from the SFP Admin, ERC, and TX ERC samples and includes common variables that could be constructed from historical school records and employment records. Examples include: student demographic variables; transcript information, graduation plans; participation in Special Education or Gifted and Talented (G/T) programs; and senior year earnings.

> **Model 2** uses student data from the ERC and the TX ERC samples and incorporates all the variables included in Model 1 plus additional variables, including variables that could be constructed only from the longitudinal ERC database, including measures of free and reduced lunch status, home language, and immigration status over time.

> **Model 3** uses student data from the SFP Survey sample and incorporates all of the variables included in Model 1 plus additional variables cited in the literature that could only be measured from the senior exit survey or available only directly through the school districts. Examples include: parents' educational attainment; extracurricular activities; class rank; and college preparation activities, including plans for financing any further education.

Characteristics of 2008 and 2009 Graduates

The demographic characteristics of each of the research samples of 2008 and 2009 high school graduates in the ten Central Texas school districts included in this study are presented in Table 5. Several notable differences occur across years by location (between 2008 and 2009 for either Central Texas or Texas) and across locations (between Central Texas and Texas).

Across years for Central Texas and Texas: These years saw growth in the shares of minority and low-income graduates for both Central Texas and Texas.[8] Between 2008 and 2009, the share of Hispanic graduates rose by approximately 2 percentage points in both Central Texas and Texas, while the share of White graduates dropped by 3 percentage points. Graduates from low-income families (students who participated in free or reduced lunch during their senior year) made up over 24% of the Central Texas sample and 36% of the Texas sample in 2008, with nearly two-thirds of these students participating in free lunch. The shares of low-income graduates rose by 3 percentage points in both Central Texas and Texas from 2008 to 2009.   Given lower postsecondary enrollment rates for these growing shares of populations who traditionally attend college at lower rates, without interventions, initial postsecondary enrollment rates would be expected to decrease between the two years.

Between Central Texas and Texas: Central Texas has a smaller share of Hispanic graduates than Texas as a whole (31% vs. 37% in 2009), with a correspondingly higher share of White graduates. Central Texas has a smaller share of low-income graduates compared to the entire state of Texas, a 12-percentage point difference for both 2008 and 2009 graduates.

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[8]   Some of the larger differences between SFP Admin and SFP Survey samples are due to differences in how the sample was collected. The difference in district composition in the SFP Survey sample for 2009 compared to the SFP Admin sample reflects different high school exit survey response rates across districts. The difference in district composition in the SFP Survey for 2008 graduates compared to the SFP Survey for 2009 graduates reflects that the procedures for linking survey data to student outcomes required direct consent from students and/or their parents in non-Austin ISD schools in 2008.

Table 5. Characteristics of 2008 and 2009 Central Texas Graduates, by Research Sample

Source	Student Futures Project				Educational Research Center			
Location	Central Texas						Texas	
Graduation Year	2008		2009		2008	2009	2008	2009
Sample Name	SFP Admin	SFP Survey	SFP Admin	SFP Survey	ERC	ERC	TX ERC	TX ERC
N	**10,336**	**4,849**	**10,568**	**7,259**	**10,991**	**~11,175**	**247,102**	**~258,164**
Race/Ethnicity								
Asian	5%	5%	6%	6%	5%	6%	4%	4%
Black	11%	10%	12%	12%	11%	12%	13%	14%
Hispanic	30%	33%	32%	30%	31%	33%	37%	39%
White	53%	52%	50%	51%	52%	49%	45%	43%
Gender								
Female	50%	52%	50%	51%	50%	50%	50%	50%
Male	50%	48%	50%	49%	50%	50%	50%	50%
Free and Reduced Lunch Status								
Not economically disadvantaged	76%	75%	73%	75%	76%	73%	64%	61%
Free lunch	17%	19%	20%	19%	17%	21%	29%	32%
Reduced lunch	6%	7%	6%	6%	6%	6%	7%	7%
School District								
Austin	35%	56%	35%	33%	35%	35%	2%	2%
Bastrop	4%	3%	4%	4%	4%	4%	0%	0%
Del Valle	2%	1%	3%	3%	3%	3%	0%	0%
Eanes	6%	5%	5%	6%	6%	5%	0%	0%
Hays	5%	6%	6%	7%	5%	6%	0%	0%
Leander	12%	8%	13%	13%	12%	13%	1%	1%
Manor	2%	1%	2%	1%	2%	2%	0%	0%
Pflugerville	10%	9%	12%	13%	10%	12%	0%	1%
Round Rock	21%	10%	21%	20%	21%	21%	1%	1%
San Marcos	3%	2%	1%	1%	3%	1%	0%	0%

Means within samples comparing the classes of 2008 to 2009 are included in the technical appendix.
Totals do not always equal 100% due to rounding.

Note: 2009 ERC samples differed by less than 1% point for a few of the characteristics presented here.

Data Limitations and Interpretations

There are three data limitations in these analyses. First, there are some limitations related to measuring student outcomes, including the absence of some postsecondary institutions from the National Student Clearinghouse (NSC) database and an inability to measure out-of-state employment and employment not covered by Texas UI wage records.[9] In-state employment is likely under-reported as some students (~ 10% for Central Texas) did not provide their SSNs to their high school; therefore, student records could not be linked with the UI wage records used for this analysis. Second, this work was not able to link the SFP survey and class rank variables directly with the longitudinal variables available in the ERC as originally planned. Third, different survey response rates across cohorts due to the different consent requirements in 2008 and 2009 mean that there may be greater variation between these cohorts on their survey responses than would actually occur if there had been no such difference. Regression findings and interpretations based on the SFP survey information —especially for the more limited 2008 survey sample — cannot always be generalized to the universe of Central Texas graduates from all participating school districts.

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[9] A complete list of non-participating Texas colleges and universities in the NSC database is provided in the technical appendix. In Texas, more than 95% of wage and salary employment is covered by UI. Gaps in coverage exist for those who are self-employed, including independent contractors, as well as employees of religious organizations, railroads, small farms and the military (Stevens, 2007).

CHAPTER III. INITIAL POSTSECONDARY OUTCOMES FOR 2008 AND 2009 HIGH SCHOOL GRADUATES

This chapter presents initial education and employment outcomes measured in the fall following graduation for students in the analysis samples, both overall and for major subgroups. Researchers examine which graduates in the ten participating school districts for the graduating class of 2008 and 2009 are enrolled in postsecondary education, which are working, and which are both enrolled and working. Context for the results of the analysis presented in later chapters is contained in this chapter.

Initial Postsecondary Enrollment

Initial enrollment outcomes are reported for 2008 and 2009 graduates from Austin, Bastrop, Del Valle, Eanes, Hays, Leander, Manor, Pflugerville, Round Rock and San Marcos ISDs.[10] Outcomes shown in Table 6 reflect initial enrollment rates for *all* graduates from these schools districts, including students who graduated from alternative high schools. There are some differences between high school graduate data collected from the school districts directly (SFP), and data collected from the ERC, but the overall numbers of graduates between the two data sources differ by under 30 students, or less than 1%. Outcomes using ERC data show an overall initial enrollment rate of 60% for the class of 2008, with SFP data showing a rate of 61%. There is a smaller difference when examining class of 2009 outcomes, with a rounded enrollment rate of 61% for both data sources.

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[10] Initial enrollment is defined as any graduate enrolled in a postsecondary institution in the fall following graduation and uses data from the National Student Clearinghouse (NSC) to determine enrollment status.

Table 6. Initial Postsecondary Enrollment, All Central Texas Graduates

	SFP	ERC	TX ERC
Class of 2008 (N)	**11,586**	**11,611**	**252,095**
Overall % Enrolled	61.10%	60.10%	53.09%
Type of Institution			
2-Year	22.10%	21.70%	22.88%
4-Year	39.00%	38.40%	30.21%
Location of Institution			
In-State	52.50%	51.90%	47.64%
Out-of-State	8.60%	8.30%	5.46%
Class of 2009 (N)	**11,993**	**12,016**	**264,184**
Overall % Enrolled	61.00%	60.70%	54.96%
Type of Institution			
2-Year	23.50%	23.50%	24.19%
4-Year	37.50%	37.20%	30.77%
Location of Institution			
In-State	53.80%	53.70%	49.79%
Out-of-State	7.20%	7.00%	5.17%

Differences in the enrollment outcomes of the Central Texas samples in Table 7 stem from differences in which students are included within each regression sample. The ERC regression sample shows the overall enrollment rate for the region using ERC data. The enrollment rate for the SFP Admin sample includes students with complete administrative data from participating school districts for all variables used in the regressions; students lacking this information enrolled in postsecondary enrollment at lower rates than students whose files contained all of this information.[11] The enrollment rate for the SFP Survey sample includes students who completed a senior exit survey; students who completed this survey enrolled in postsecondary education at a higher rate than students who did not complete the survey. The Texas ERC sample shows the statewide enrollment rate in the fall following graduation for the entire state using NSC data.

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[11] Overall enrollment rates using Student Futures Project data have been published, are comparable to ERC results and are available here: http://centexstudentfutures.org/index.php/research-reports/recent-research/53-intitial.html

Depending on the sample used for analysis, there is some variation from the overall enrollment outcomes with 63%-69% of 2008 and 2009 Central Texas high school graduates enrolled in postsecondary education in the fall following graduation. Roughly 41-43% of these students enrolled in a 4-year college or university, while around 23-24% enrolled in a 2-year college or university. In each of the samples, a greater share of 2009 students enrolled in a 2-year college while enrollment in 4-year colleges declined compared to 2008 high school graduates. A greater share of Central Texas students enrolled in postsecondary education outside of the state (~9%) compared to the rate for Texas (~6%), although a large majority of Central Texas graduates enrolled in postsecondary institutions within the state of Texas.

Table 7. Initial Postsecondary Enrollment for 2008 and 2009 Graduates, by Research Sample

	Central Texas			Texas
	SFP Admin	**SFP Survey**	**ERC**	**TX ERC**
Class of 2008 (N)	**10,336**	**4,849**	**10,991**	**247,102**
Overall % Enrolled	66%	69%	63%	54%
Type of Institution				
2-Year	23%	23%	22%	23%
4-Year	43%	47%	40%	31%
Location of Institution				
In-State	57%	59%	54%	48%
Out-of-State	9%	10%	9%	6%
Class of 2009 (N)	**10,568**	**7,259**	**11,175**	**258,164**
Overall % Enrolled	65%	69%	63%	55%
Type of Institution				
2-Year	24%	24%	24%	24%
4-Year	41%	45%	40%	31%
Location of Institution				
In-State	57%	60%	56%	50%
Out-of-State	8%	9%	7%	5%

Note: Differences in the rates between SFP and ERC samples for Central Texas are solely due to SFP students being dropped from the sample due to missing administrative data.

Enrollment by Institution

Central Texas' local community college, Austin Community College (ACC) enrolled the largest share of high school graduates in the fall following graduation (~20%), followed by four other colleges or universities within 100 miles of Austin as can be seen in Table 8. Students attending these institutions make up approximately 60% of those who chose to enroll after high school. While overall enrollment rates vary by research sample and year, the only significant difference in enrollment between the samples in the selection of these top five colleges is for the 2008 SFP Survey sample, which includes a larger share (7%) of students who enrolled in the University of Texas at Austin compared to other groups.

Table 8. Postsecondary Enrollment in Central Texas,
by Cohort and Research Sample

	2008			2009		
	ERC	SFP Admin	SFP Survey	ERC	SFP Admin	SFP Survey
Central Texas (N)	**10,991**	**10,336**	**4,849**	**11,175**	**10,568**	**7,259**
Overall % Enrolled	63%	66%	69%	63%	65%	69%
Name of Institution						
Austin Community College	19%	19%	19%	20%	20%	20%
University of Texas at Austin	5%	6%	7%	5%	6%	6%
Texas State University--San Marcos	5%	5%	6%	5%	5%	5%
University of Texas at San Antonio	5%	5%	6%	5%	5%	5%
Texas A&M University	3%	3%	3%	3%	3%	3%

Table 9 provides the initial postsecondary educational enrollment status of Texas high school graduates and their top 5 schools of enrollment for each year. The two flagship universities, the University of Texas at Austin and Texas A&M, together enroll roughly 10% of high school graduates.

Table 9. Postsecondary Enrollment in Texas, by Cohort

	2008	2009
Texas (N)	**247,102**	**258,164**
Overall % Enrolled	54%	56%
Name of Institution		
Texas A&M University	5%	4%
University of Texas at Austin	4%	4%
Lone Star College System District (Houston)	4%	4%
University of Texas at San Antonio	3%	3%
Tarrant County College (Ft. Worth)	3%	<2%
Texas Tech University, Lubbock	3%	2%

Enrollment by Demographic Characteristics

Table 10 provides information on the initial postsecondary educational enrollment status of 2008 high school graduates by demographic and other characteristics for each research sample; patterns of enrollment demonstrated for the class of 2008 are representative of patterns for the class of 2009 (not presented below). Central Texas data from the ERC shows that Asian and White graduates enrolled in postsecondary education at higher rates (77% and 72%, respectively) than graduates of other racial/ethnic groups, while Hispanic graduates had the lowest overall postsecondary enrollment rate (45%) of any racial/ethnic group. Low-income graduates also enrolled in postsecondary education at far lower rates (37%) than graduates from higher-income families (70%).

The table also shows both the type and location of postsecondary institutions attended by different subgroups. ERC data shows that Central Texas Asian and White graduates enrolled in 4-year colleges and universities at higher rates (58% and 50%, respectively) than Asian and White graduates in the entire state. Non-Hispanic graduates in Central Texas enrolled at far greater rates than those in the state as a whole but Hispanic enrollment rates were comparable regardless of location within the state. Similarly, 4-year enrollment rates for Central Texas graduates not enrolled in the free or reduced lunch program were far higher

than in the state as a whole (47% vs. 37%) but rates for low-income students were comparable regardless of location. The rates for graduates enrolled in 2-year schools are generally consistent across all groups and all samples presented in Table 9.

**Table 10. Initial Postsecondary Enrollment Rates of 2008 Graduates
by Selected Characteristics and Type of Institution**

	4-Year				2-Year			
	TX ERC	CT ERC	CT SFP Admin	CT SFP Survey	TX ERC	CT ERC	CT SFP Admin	CT SFP Survey
(N)	247,102	10,991	10,336	4,849	247,102	10,991	10,336	4,849
Overall % Enrolled	31%	40%	43%	47%	23%	22%	23%	23%
Ethnicity								
Asian	51%	58%	66%	65%	21%	19%	19%	21%
Black	31%	36%	37%	40%	23%	23%	23%	23%
Hispanic	21%	22%	25%	29%	25%	23%	25%	25%
White	37%	50%	52%	58%	21%	22%	22%	21%
Gender								
Female	33%	44%	46%	49%	23%	23%	24%	23%
Male	28%	37%	39%	44%	22%	22%	22%	22%
Free and Reduced Lunch Status								
Not economically disadvantaged	37%	47%	49%	54%	23%	23%	23%	23%
Free Lunch	18%	18%	19%	21%	21%	19%	20%	21%
Reduced Lunch	23%	27%	28%	32%	26%	26%	25%	26%

Source: Student Futures Project calculations

It seems reasonable that with such different outcomes based on these demographic characteristics that the factors associated with these outcomes might also vary by subgroup, an issue discussed in Chapter VI.

Initial Postsecondary Employment in Texas

The overall employment rate of Central Texas graduates in the fall following graduation continues to decline, with 2009 graduates having much lower employment rates (~38%) than students who graduated in 2008 (44%) and 2007 (46%).[12] Differences between

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[12] See Schexnayder, et.al., *Education and Work After High School: A First Look at the Class of 2007,* available online at: www.centexstudentfutures.org. Note that 2007 employment rates are based on 8 ISDs rather than 10.

data sources on employment outcomes show little variation, with less than a 1% overall employment status difference for the class of 2009 between the SFP and ERC data sources.

Table 11. Initial Postsecondary Employment, All Graduates

	SFP	ERC	TX ERC
Class of 2008 (N)	**11,586**	**11,611**	**252,095**
Overall % Employed	44%	44%	47%
Employment Status			
Not employed	56%	56%	53%
Only employed	21%	21%	24%
Employed and enrolled	23%	23%	23%
Class of 2009 (N)	**11,993**	**12,016**	**264,184**
Overall % Employed	38.00%	38.70%	41.11%
Employment Status			
Not employed	62%	61%	59%
Only employed	17%	18%	20%
Employed and enrolled	21%	21%	21%

The decline in post-graduation initial employment is true both for students who chose only employment and for students who chose employment and enrollment in the fall following graduation as shown in Table 11 for all graduates and for the research samples in Table 12. Surveyed students in 2008 and 2009 are less likely to work than the overall population of high school graduates. For the entire state, employment rates for high school graduates in the fall following graduation dropped from 47% in 2008 to 41% in 2009.

Table 12. Initial Texas Employment Outcomes for 2008 and 2009 Graduates, By Research Sample

	Central Texas			Texas
	SFP Admin	SFP Survey	ERC	TX ERC
Class of 2008 (N)	**10,336**	**4,849**	**10,991**	**247,102**
Overall % Employed	43%	41%	44%	47%
Employment Status				
Not employed	57%	59%	56%	53%
Only employed	18%	15%	19%	24%
Employed and enrolled	25%	26%	24%	24%
Class of 2009 (N)	**10,568**	**7,259**	**11,175**	**258,164**
Overall % Employed	37%	36%	38%	41%
Employment Status				
Not employed	63%	64%	62%	59%
Only employed	16%	14%	16%	20%
Employed and enrolled	22%	23%	21%	21%

Source: Student Futures Project calculations.

As shown in Table 13, the vast majority of post-high school employment centered on work in the retail trade and accommodation and food services industries, with just short of 70% of those working in these industries. A similar share of high school graduates from across the state chose these industries to work in as well.

Table 13. Industry Sector of Employment for Central Texas Students, by Cohort and Research Sample

	2008			2009		
	ERC	SFP Admin	SFP Survey	ERC	SFP Admin	SFP Survey
Central Texas (N)	**10,991**	**10,336**	**4,849**	**11,175**	**10,568**	**7,259**
Overall % Employed	44%	43%	41%	38%	37%	36%
Employment Sector						
Retail Trade	18%	18%	18%	15%	15%	15%
Accommodation and Food Services	12%	12%	10%	11%	11%	10%
Administrative and Support and Waste Management and Remediation Services	2%	2%	2%	2%	1%	1%
Health Care and Social Assistance	2%	2%	2%	2%	2%	2%
Other Services (except Public Administration)	2%	2%	2%	1%	1%	2%
Other Sectors	8%	8%	8%	7%	7%	7%

Table 14. Industry Sector of Employment for Texas Students, by Cohort and Research Sample

	2008	2009
Texas (N)	**247,102**	**258,164**
Overall % Employed	47%	38%
Employment Sector		
Retail Trade	17%	15%
Accommodation and Food Services	12%	12%
Administrative and Support and Waste Management and Remediation Services	4%	3%
Health Care and Social Assistance	2%	2%
Educational Services	1%	1%
Other Services (except Public Administration)	1%	1%
Other Sectors	10%	4%

CHAPTER IV. FACTORS CONSISTENTLY ASSOCIATED WITH INITIAL POSTSECONDARY OUTCOMES FOR CENTRAL TEXAS AND TEXAS 2008 AND 2009 HIGH SCHOOL GRADUATES

This chapter discusses factors consistently and significantly associated with postsecondary enrollment and employment for recent high school graduates, based on a series of multinomial logistic regressions. Using multiple data sources, samples, and cohorts allows researchers to identify factors consistently associated with postsecondary transitions, regardless of data sources, samples and cohorts. Each of the two sections—enrollment factors and employment factors— presents the consistent variables across statistical models that use: 1) common administrative variables (Model 1), 2) additional variables available using ERC data (Model 2), and 3) additional variables available only through the SFP data (Model 3).

Multinomial logistic regression accounts for the multiple postsecondary choices available to high school graduates. Enrollment regressions include 4-year, 2-year, or no enrollment as the three possible outcomes for each student. Factors associated with these outcomes using multinomial logistic regression produce *comparative* outcomes results. Factors are associated with enrollment in 4-year vs. 2-year, 2-year vs. not enrolled, and 4-year vs. not enrolled. As discussed in Chapter II, where the association is consistent across these comparative outcomes (e.g., a factor is shown to be positively associated with 4-year vs. 2-year enrollment AND with 4-year vs. no enrollment) the text indicates that the factor is associated with the *fixed* outcome of 4-year enrollment. For ease of interpretation, the summarized results in this and the next chapter present the direction of the association and include only variables shown to be significantly associated with the particular outcomes though all variables described in Chapter II are included in the models.

All multinomial logistic regression models were run using all samples and cohorts to identify variables that are *consistently* associated with postsecondary outcomes. Variables shown to be statistically significant for all sources, models, locations and cohorts are considered to be consistently associated with postsecondary enrollment. It is important to acknowledge that the threshold for being considered *consistent* varies depending on the type of variables examined as shown in Table 15.

Table 15. Threshold for Inclusion in Consistent Factors

	Statistically Significant Across:			
	Sources	Models	Locations	Cohorts
Common administrative data	x	x	x	x
Additional ERC data			x	x
Additional SFP data				x

Since all models include the commonly available administrative data, administrative variables considered consistently associated with postsecondary enrollment must be statistically significant across source, model, location and cohort. For inclusion in this chapter, additional variables used in the ERC environment must be found statistically significant across cohorts and location, though not across sources. For inclusion in this chapter, additional SFP variables must be consistent across cohorts.

Enrollment Factors

Common Administrative Data (Model 1). Several factors are associated with postsecondary enrollment when accounting for all other factors and regardless of data source, cohort, model, or location. The categories of factors associated with postsecondary enrollment include students' background characteristics and individual coursework experiences.

While the results shown in Table 16 describe the *comparative* outcomes using the multinomial logistic regression, some of these comparative outcomes point toward *fixed* outcomes, including 4-year enrollment. Accounting for all other potential factors in all models, Black high school graduates are more likely to enroll in a 4-year college or university. Students who are classified as either not being college ready using the state-mandated TAKS exit exam, or whose data lacked this variable, are less likely to enroll in a 4-year college. Completion of advanced coursework, including courses on the recommended graduation plan and others, plays a key role in a successful transition to 4-year enrollment. Individuals who took one advanced math course beyond Algebra II are more likely to enroll

in a 4-year college or university. Individuals who took more than one AP/IB course are also more likely to enroll in a 4-year college.

Table 16. Factors Consistently Associated with Postsecondary Enrollment, Using Common Administrative Data [All Models, Cohorts, and Locations]

Common Administrative Variables	4-Year vs. 2-Year	4-Year vs. Not Enrolled	2-Year vs. Not Enrolled
Background Characteristics			
Race/Ethnicity			
Asian			
Black	+	+	
Hispanic			
White‡			
Gender			
Female‡			
Male			-
Individual High School Experiences: Coursework			
Graduation Plan			
Distinguished			-
Recommended‡			
Minimum			-
Special Ed			
College Ready			
Not college ready	-	-	
College ready‡			
Missing college ready	-	-	
Advanced Math Courses (Higher than Algebra 2)			
None‡			
One	+	+	
Two or more	+		
Advanced Placement (AP) / International Baccalaureate (IB) Credits			
No AP/IB high school credits‡			
Up to 1 AP/IB high school credit			
More than 1 less than 4 AP/IB high school credits	+	+	
4 or more AP/IB high school credits	+	+	

‡ Reference category

The *comparative* outcomes describe subtler results. Accounting for all other variables in the model, including high school coursework and background characteristics, males and students who complete either the distinguished or minimum graduation plans are less likely to enroll in a 2-year college compared to not enrolling in any postsecondary education. While taking one advanced math course is clearly associated with 4-year enrollment (compared to either 2-year enrollment or not being enrolled), taking two or more advanced math courses only increases the likeliness of a student enrolling in a 4-year college compared to enrolling in a 2-year college.

Additional ERC Data (Model 2). Several factors are associated with postsecondary enrollment using additional data in the ERC as shown in Table 17. The categories of factors associated with postsecondary enrollment outcomes include additional background characteristics, individual high school experiences, and pre-high school academic preparation as measured using state-mandated TAKS scores in the 8th grade.

Results show that several factors are associated with *fixed* outcomes. Accounting for all other potential factors, any participation in free and reduced lunch from Texas school-entry to graduation is associated with reduced college enrollment. Accounting for all other factors, including high school coursework and academic performance, not meeting the mathematics standard in 8th grade is associated with reduced enrollment in a 4-year college. That results from a standardized test in mathematics prior to high school entry can, despite accounting for multitudinous other factors, influence postsecondary enrollment prospects for students demonstrates the long shadow that the lack of academic preparation can have on students' postsecondary success.

Table 17. Factors Consistently Associated with Postsecondary Enrollment, Using Additional ERC Data [Model 2, All Locations and Cohorts]

	4-Year vs. 2-Year	4-Year vs. Not Enrolled	2-Year vs. Not Enrolled
Background Characteristics			
Home Language is Spanish (Over Time)			
Never			
Ever		-	
Always			
Free and Reduced Lunch Status Over Time			
Never			
Ever	-	-	-
Always		-	-
Immigration Status Over Time			
Ever classified as an immigrant		-	
Individual School Experiences			
Mobility			
Number of high schools attended			
One			
Two		-	
More than two			
Individual High School Experiences: Pre-High School Academic Preparation			
TAKS scores in 8th grade			
Math			
Did not meet standard	-	-	
Met standard			
Commended			
Missing			
Reading			
Did not meet standard		-	
Met standard			
Commended			
Missing			

‡ Reference category

There are several other factors associated with *comparative* outcomes. Students whose administrative records indicate they ever, but not always, spoke Spanish at home from K-12, students who were ever classified as an immigrant, students who attended two high schools, and students who did not meet the TAKS reading standard in the 8th grade were all

less likely to enroll in a 4-year college compared to not enrolling in college, though these variables did not play a role in 4-year vs. 2-year enrollment choices.

Using Additional SFP Data (Model 3). Several factors are associated with postsecondary enrollment using SFP Admin data as shown in Table 18. Once again, the categories of factors associated with postsecondary enrollment outcomes include coursework and academic performance. In addition, other individual high school experiences as well as college preparation work are shown to be associated with postsecondary enrollment.

Results show that several factors are associated with *fixed* outcomes. Students who graduated in the top 10% of a their high school class, who took an SAT/ACT preparation course, who visited one or more college campuses, or students who indicated on their senior survey that they submitted a FAFSA were more likely to enroll in a 4-year college regardless of other factors. Students who graduated in the bottom half of their class or who intended to pay for college by working either during the school year or summer were less likely to enroll in 4-year college. Students who graduated in the last quartile of their class were less likely to enroll in any college, either 2-year or 4-year.

Table 18. Factors Consistently Associated with Postsecondary Enrollment, Using Additional SFP Data [Model 3, All Cohorts]

Additional SFP Variables	4-Year vs. 2-Year	4-Year vs. Not Enrolled	2-Year vs. Not Enrolled
Individual High School Experiences: Coursework			
Graduation Rank			
Top 10%	+	+	
1st Quartile (-Top 10)		+	
2nd Quartile‡			
3rd Quartile	-	-	
4th Quartile	-	-	-
Number of High Schools Attended			
One ‡			+
Two			
More than 2			
Individual High School Experiences: High School Counselor Interactions			
Scheduling, course selection and placement	-		
Individual High School Experiences: College Preparation			
College Preparation Activity			
Visited one or more college campuses	+	+	-
Took the PSAT			
Took ACC courses (Early college start, dual credit)	-		
Took SAT/ACT prep course	+	+	
Participated in college fair/college night			
Submitted a FAFSA	+	+	
Ease of Understanding Financial Aid Process			
Easy or very easy‡			
Neutral			
Difficult or very difficult	-		
Did not apply		-	
Methods Planned to Pay for Postsecondary Education			
Scholarships and/or grants			
Personal or family savings			
Loans	+		
Working during the school year/summer	-	-	

‡ Reference category

Several other factors are associated with *comparative* outcomes. Students who indicated on their senior survey they took courses at ACC while in high school were less likely to enroll in a 4-year college or university compared to a 2-year college.[13] Similarly, students who found the financial aid process difficult or very difficult were also less likely to enroll in a 4-year college compared to a two-year college. High school graduates who intended to pay for college using loans were more likely to enroll in a 4-year college or university compared to a 2-year college.

Advanced coursework (advanced math and AP/IB courses) and graduating in the top 10% of their class clearly help students in a successful transition from high school to a 4-year college or university. College preparation activities, including visiting one or more college campuses, taking a preparation course for college entrance exams, and submitting a FAFSA also help students transition to 4-year enrollment. Lack of academic preparation as seen in not meeting the TAKS math standard in the 8th grade, not being college ready upon graduation, and graduating in the bottom half of their class, play a role in reducing students' prospects for transition to a 4-year college or university.

Employment Factors

Common Administrative Data (Model 1). Several factors are associated with postsecondary employment in the fall calendar quarter after high school graduation, accounting for all other factors and regardless of data source, cohort, model, or location. Employment regressions use three potential outcomes: employed only, employed and enrolled, and not employed. Note that this partition splits high school graduates who attend postsecondary education into two groups: those that work and those that do not. Graduates who are not employed are grouped with graduates who are neither employed nor enrolled. Table 19 outlines the factors associated with postsecondary employment outcomes using common administrative data.

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[13] Student responses relate to taking a course, not to receiving high school and college credit for that course. Students can take college courses that may not provide high school credit, such as certain vocational training or take courses through their community college that do not provide college credits, such as test preparation courses.

Table 19. Factors Consistently Associated with Postsecondary Employment, Using Common Administrative Data [All Models, Cohorts and Locations]

Common Administrative Variables	Employed Only vs. Employed and Enrolled	Employed and Enrolled vs. Not Employed	Employed Only vs. Not Employed
Background Characteristics			
Gender			
Female‡			
Male		-	
Individual High School Experiences: Coursework			
Advanced Math Courses (Higher than Algebra 2)			
None‡			
One			-
Two or more			

‡ Reference category

There are two factors associated with *comparative* outcomes. Being male reduces the likelihood of being employed and enrolled compared to not being employed. Taking one advanced math course reduces the likelihood of being only employed compared to not being employed, likely the effect of students who are enrolled in postsecondary education and are not employed.

Additional ERC Data (Model 2). Several factors are associated with postsecondary employment using additional data in the ERC as shown in Table 20. Categories associated with postsecondary employment include background characteristics, individual high school experiences, and pre-high school experiences.

Some factors are associated with *fixed* outcomes. Ever having participated in the free and reduced lunch program is positively associated with being only employed in the fall following graduation. Students who are ever classified as an immigrant are less likely to be employed in the fall following graduation.

Table 20. Factors Consistently Associated with Postsecondary Employment, Using Additional ERC Data [Model 3, All Cohorts and Locations]

	Employed Only vs. Employed and Enrolled	Employed and Enrolled vs. Not Employed	Employed Only vs. Not Employed
Background Characteristics			
Free and Reduced Lunch Status Over Time			
Never‡			
Ever	+		+
Always	+		+
Immigration Status Over Time			
Ever classified as an immigrant		-	-
Individual School Experiences			
Mobility			
Number of high schools attended			
One‡			
Two			+
More than two			
Individual High School Experiences: Pre-High School Experiences			
TAKS scores in 8th grade			
Math			
Did not meet standard			+
Met standard‡			
Commended		-	
Reading			
Did not meet standard			
Met standard‡			
Commended			

‡ Reference category

Several factors are associated with *comparative* outcomes. Attending two high schools or not meeting the TAKS mathematics standard in the 8th grade increase the likeliness of an individual being only employed compared to not being employed. Students who received a commendation on their 8th grade TAKS are less likely to be employed and enrolled compared to not being employed.

Using Additional SFP Data (Model 3). Accounting for all other factors and regardless of cohort, several factors are associated with postsecondary employment using SFP data as shown in Table 21. The categories of factors associated with postsecondary employment include background characteristics, coursework while in high school, extracurricular activities while in high school and college preparation activities.

Table 21. Factors Consistently Associated with Postsecondary Employment, Using Additional SFP Data [Model 2, All Cohorts]

Additional SFP Variables	Employed Only vs. Employed and Enrolled	Employed and Enrolled vs. Not Employed	Employed Only vs. Not Employed
Background Characteristics			
Parental Education			
Neither parent has more than a high school diploma	+		+
Either parent attended some postsecondary education			+
Either parent has Bachelor's degree or higher‡			
Either parent's education unknown			
Individual High School Experiences: Coursework			
Graduation Rank			
Top 10%	-		-
1st Quartile (-Top 10)			-
2nd Quartile‡			
3rd Quartile			
4th Quartile	+		+
Number of High Schools Attended			
One ‡	-		
Two			
More than 2			
Individual High School Experiences: Extracurricular Activities			
Typical Number of Weekly Hours Spent Working in High School:			
None*			
1-10 hours			
11 + hours‡		+	
Individual High School Experiences: College Preparation			
College Preparation Activity			
Visited one or more college campuses		-	
Took the PSAT			
Took ACC courses (Early college start, dual credit)			
Took SAT/ACT prep course			
Participated in college fair/college night			
Submitted a FAFSA	-		-
Number of College Preparation Activities			
None			
One		-	
Two or more‡			
Methods Planned to Pay for Postsecondary Education			
Scholarships and/or grants			
Personal or family savings			
Loans			
Working during the school year/summer		+	+

‡ Reference category

Some factors are associated with *fixed* outcomes. High school graduates whose parents did not attend any postsecondary education or students who graduated in the bottom quartile of their class are more likely to be only employed in the fall following graduation. Students who graduated in the top 10% of their class or students who submitted a FAFSA are less likely to be only employed in the fall. Students who indicated they planned to pay for college by working are more likely to be working in the fall following graduation.

Several factors are associated with *comparative* outcomes. Students whose parents had some postsecondary education but no degree are more likely to be only employed compared to not being employed. Conversely, students who graduated in the top quarter of their class are less likely to be only employed compared to not being employed. Students who indicated on their senior survey that they worked 11 or more hours per week during their senior year in high school are more likely to be employed and enrolled compared to not being employed. Students who completed only one college preparation activity or students who visited one or more college campuses are less likely to be enrolled and employed compared to not being employed.

CHAPTER V. COMPARISON OF FACTORS ASSOCIATED WITH POSTSECONDARY OUTCOMES BETWEEN CENTRAL TEXAS AND TEXAS

Work in Chapter IV identified factors consistently associated with postsecondary enrollment across data sources, cohorts, models and location. Local and state policy makers and practitioners need to understand the regional differences in factors associated with particular postsecondary outcomes to determine if statewide targets are appropriate. Policy makers and practitioners also need to know whether and to what degree these factors at the regional and state level vary by cohort. This chapter uses administrative data housed in the ERC for Texas and the Central Texas region (Model 3) to identify differences in factors associated with postsecondary outcomes between Texas and Central Texas and between the classes of 2008 and 2009. Multinomial logistic regressions for enrollment and employment outcomes were run for both Texas and Central Texas. Factors true for both cohorts and associated with particular outcomes across locations are shown with factors true in either Central Texas or Texas. Factors that change from cohort to cohort are then examined to determine the degree of year-to-year change in factors for Central Texas and Texas. Any differences between factors identified as true for both Central Texas and Texas compared to those identified in Chapter IV above are due to using only ERC data.[14]

Enrollment Factors

Comparing Central Texas and Texas

Some factors associated with postsecondary enrollment do differ between Texas and Central Texas, as can be seen in Table 22. Note that + or – indicates that the factor is associated with an outcome for both Central Texas and Texas using only ERC data; on the other hand, +TX or –TX indicates the factor is associated with an outcome for only Texas and +CT or –CT indicates the factor is associated with Central Texas only. *It is important to note that with all cases, the direction of the effects for Central Texas are the same as those for Texas on all statistically significant factors associated with postsecondary enrollment.*

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[14] The original research plan sought to link ERC data and SFP survey data for this analysis. However, due to the long delay in obtaining approval to do so, this analysis relies only on administrative ERC data. In December 2011, RMC researchers received approval to link ERC and SFP data in a future research project.

Table 22. Central Texas and Texas Factors Associated with Postsecondary Enrollment, Using ERC Data [Model 2, Both Cohorts]

	College-Going	4-Year	2-Year
Background Characteristics			
Race/Ethnicity			
Asian	+ (TX)		
Black		+	
Hispanic			
White‡			
Gender			
Female‡			
Male	-		- (TX)
Home Language is Spanish Over Time			
Never‡			
Ever	- (TX)		
Always			
Free and Reduced Lunch Status Over Time			
Never‡			
Ever	-	-	
Always	-	- (TX)	
Special Program Participation Over Time			
Special education			
Never‡			
Ever			
Always	- (TX)	- (TX)	
Gifted			
Never‡			
Ever			
Always			- (TX)
Immigration Status Over Time			
Ever classified as an immigrant	- (TX)		
Individual School Experiences			
Retention			
Retained at least once in the third grade	- (TX)		
Retained at least once in the fifth grade	- (TX)		
Mobility			
Number of high schools attended			
One‡			
Two	- (TX)	- (TX)	
More than two	- (TX)	- (TX)	
High School Coursework			
Failed a course in 9th grade	- (TX)		
Received college credit in high school	+	+ (TX)	
Special Program Participation			
Special education		- (TX)	
Gifted		+ (TX)	

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Table 22. Central Texas and Texas Factors Associated with Postsecondary Enrollment, Using ERC Data [Model 2, Both Cohorts] (cont.)

	College-Going	4-Year	2-Year
Background Characteristics			
Graduation Plan			
Distinguished			-
Recommended‡			
Minimum	-	-	
Special Ed	-	-	
College Ready			
Not college ready		- (TX)	
College ready‡			
Missing college ready			
Advanced Math Courses (Higher than Algebra 2)			
None‡			
One		+	- (TX)
Two or more			-
Advanced Placement (AP) / International Baccalaureate (IB) Credits			
No AP/IB high school credits‡			
Up to 1 AP/IB high school credit	+	+	
More than 1 less than 4 AP/IB high school credits	+	+	
4 or more AP/IB high school credits		+	
Career and Technology Courses (CTE)			
No CTE courses			- (TX)
Enrolled in a CTE course‡			
Participant in a coherent sequence of courses			+ (TX)
Participant in tech prep program			
Individual High School Experiences: Pre-High School			
TAKS scores in 8th grade			
Math			
Did not meet standard	- (TX)	-	
Met standard‡			
Commended			- (TX)
Reading			
Did not meet standard	- (TX)	- (TX)	
Met standard‡			
Commended			

‡ Reference category

Several factors appear to be significant in transitions to postsecondary education for Texas but not for Central Texas. Asian high school graduates are more likely to enroll in college in the fall following graduation in Texas, but not so in Central Texas. Several factors are associated with lower college-going in Texas, but not Central Texas: ever but not always speaking Spanish at home, participating in special education throughout primary and secondary school, being an immigrant, being retained in either the 3rd and/or the 5th grade, attending more than one high school, failing a 9th grade course, or not meeting the math or reading standard TAKS score in 8th grade.

Students who received college credit in high school or were classified as being gifted are more likely to enroll in a 4-year college in Texas, but not in Central Texas specifically. Several factors are associated with lower 4-year college or university transitions in Texas, but not Central Texas including either always participating in free or reduced lunch or being classified as special education while in primary and secondary school, attending more than one high school, not being classified as college ready using the state standard, or not meeting the reading TAKS standard in 8th grade.

Students who participated in a coherent sequence of CTE courses were more likely to enroll in 2-year in the fall in Texas, but not in Central Texas. Students who were either male, classified as gifted throughout school, took an advanced math course, took no CTE courses, or who were commended on their 8th grade TAKS test were less likely to transition to a 2-year college.

Comparing Central Texas and Texas between 2008 and 2009

This section provides some idea of the differences in the factors associated with postsecondary enrollment that occur between cohorts for both Central Texas and Texas. Table 23 shows where these differences occur between cohorts and whether they occurred in Central Texas or Texas.

Table 23. Central Texas and Texas Factors Associated with Postsecondary Enrollment, Year-to-Year Changes, Using ERC Data [Model 2]

	Direction of Effect		Fixed Outcome	Location
	2008	2009		
Background Characteristics				
Home Language is Spanish Over Time				
Never‡				
Ever				
Always	None	-	4-Year	Central Texas
Mobility				
Number of high schools attended				
One‡				
Two				
More than two	None	-	4-Year	Central Texas
Career and Technology Courses (CTE)				
No CTE courses	-	None	2-Year	Central Texas
Enrolled in a CTE course‡				
Participant in a coherent sequence of courses				
Participant in tech prep program				
Individual High School Experiences: College Preparation				
TAKS scores in 8th grade				
Math				
Did not meet standard				
Met standard‡				
Commended	None	-	2-Year	Central Texas
Reading				
Did not meet standard	-	None	2-Year	Central Texas
Met standard‡				
Commended				

‡ Reference category

All of the year-to-year changes related to fixed postsecondary enrollment outcomes occur in Central Texas. Always speaking Spanish at home or attending more than 2 high schools were negatively associated with enrolling in a 4-year college or university for 2009 Central Texas high school graduates, but not for 2008 graduates. Not taking a CTE course while in high school or not meeting the reading TAKS standard in 8th grade reduced the

likeliness of 2008 Central Texas graduates enrolling in a 2-year college. Receiving a commended TAKS score in mathematics in the 8th grade reduced the likeliness of 2-year enrollment for 2009 Central Texas graduates, but not 2008 graduates. These year-to-year and regional differences highlight the importance of using multiple data sources and models to identify the factors *consistently* associated with postsecondary outcomes as described in the previous chapter.

Employment Factors

Comparing Central Texas and Texas

      A large number of factors associated with postsecondary employment differ between Texas and Central Texas, as can be seen in Table 24. However, there are no instances where the *direction* of a statistically significant factor differs between Central Texas and Texas. Certain factors are associated with employment outcomes in Texas, but not for Central Texas while other factors are associated with employment outcomes in Central Texas, but not Texas.

Table 24. Central Texas and Texas Factors Associated with Postsecondary Employment, Using ERC Data [Model 2]

	Any Employment	Employed Only	Employed and Enrolled
Background Characteristics			
Race/Ethnicity			
Asian	- (TX)	- (TX)	
Black	- (TX)		
Hispanic			
White‡			
Gender			
Female‡			
Male			-
Free and Reduced Lunch Status			
Not economically disadvantaged‡			
Free lunch			- (TX)
Reduced lunch			
Home Language is Spanish (Over Time)			
Never‡			
Ever	- (TX)		
Always	- (TX)		
Free and Reduced Lunch Status Over Time			
Never‡			
Ever	+		
Always	+		- (TX)
Special Program Participation Over Time			
Special education			
Never‡			
Ever			
Always	- (TX)		
Gifted			
Never‡			
Ever			
Always			
Immigration Status Over Time			
Ever classified as an immigrant	-	- (TX)	
Individual School Experiences			
Retention			
Retained at least once in the third grade			- (TX)
Retained at least once in the fifth grade			
Mobility			
Number of high schools attended			
One‡			
Two		+ (TX)	- (TX)
More than two		+ (TX)	
High School Coursework			
Failed a course in 9th grade		+ (TX)	- (TX)
Received college credit in high school		-	+ (TX)

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Table 24. Central Texas and Texas Factors Associated with Postsecondary Employment, Using ERC Data [Model 2] (cont.)

	Any Employment	Employed Only	Employed and Enrolled
Background Characteristics			
Special Program Participation			
Special education	- (TX)		
Gifted		- (TX)	
Graduation Plan			
Distinguished		- (TX)	
Recommended‡			
Minimum		+	-
Special Ed		+ (TX)	- (TX)
College Ready			
Not college ready		+ (TX)	
College ready‡			
Missing college ready			
Advanced Math Courses (Higher than Algebra 2)			
None‡			
One		-	
Two or more		- (TX)	
Advanced Placement (AP) / International Baccalaureate (IB) Credits			
No AP/IB high school credits‡			
Up to 1 AP/IB high school credit		-	
More than 1 less than 4 AP/IB high school credits		-	
4 or more AP/IB high school credits		-	
Career and Technology Courses (CTE)			
No CTE courses	- (TX)		
Enrolled in a CTE course‡			
Participant in a coherent sequence of courses			
Participant in tech prep program			
Senior year work characteristics			
Income senior year	+ (CT)		
Individual High School Experiences: College Preparation			
TAKS scores in 8th grade			
Math			
Did not meet standard		+ (TX)	- (TX)
Met standard‡			
Commended	- (TX)		
Reading			
Did not meet standard			- (TX)
Met standard‡			
Commended			

‡ Reference category

Several factors appear to be significant in transitions to any postsecondary employment for Texas but not for Central Texas. Central Texas high school graduates who worked during their senior year are more likely to be employed in the fall following graduation the higher their senior income; this is not the case for Texas high school graduates. Asian and Black graduates in Texas are less likely to be employed in the fall following high school graduation. Several other factors are associated with reduced employment: Students who ever or always spoke Spanish at home during primary and secondary school, students classified as special education throughout school or during their senior year, students who took no CTE courses or students who were commended on their math TAKS scores in the 8th grade.

Several factors are associated with transition to only employment, meaning a high school graduate who was employed but not enrolled in postsecondary education. Factors associated with increasing the likelihood of choosing only employment in Texas include the following: attending more than one high school, failing at least one 9th grade course, graduating under special education specifications, being classified as not college ready according to exit-level TAKS exams, or not meeting the math TAKS standard in the 8th grade. Some factors reduce the likeliness of being only employed in the fall following high school graduation in Texas: being an Asian graduate, ever being classified as an immigrant, being classified as gifted during the senior year, graduating with a distinguished diploma, or taking two or more advanced math courses.

Some factors are associated with high school graduates choosing employment and postsecondary enrollment in the fall following high school graduation in the state of Texas. Students who receive college credit while in high school are more likely to be employed and enrolled in the fall following high school graduation. Factors that reduced the likeliness of employment and enrollment as a outcome include the following: participating in free lunch during the senior year or throughout school, being retained at least once in the 3rd grade, attending two high schools, failing at least one 9th grade course, graduating under special education provisions, or not meeting either the math or reading TAKS standard in the 8th grade. All of the listed factors are true for Texas as a whole, but not for the Central Texas region specifically.

Comparing Central Texas and Texas between 2008 and 2009

This section provides some idea of the differences in the factors associated with postsecondary employment that occur between cohorts comparing Central Texas and Texas. Table 25 shows where these differences occur between cohorts and whether they occur in Central Texas or Texas.

Table 25. Central Texas and Texas Factors Associated with Postsecondary Employment, Year-to-Year Changes, Using ERC Data [Model 2]

Background Characteristics	Direction of Effect 2008	2009	Fixed Outcome	Location
Home Language				
English or Other‡				
Spanish	None	+	Any Employment	Texas
Home Language is Spanish (Over Time)				
Never‡				
Ever	+	None	Any Employment	Central Texas
Always	+	None	Any Employment	Central Texas
Special Program Participation Over Time				
Special education				
Never‡				
Ever	None	+	Any Employment	Texas
Always				
Gifted				
Never‡				
Ever	+	None	Employed Only	Texas
Always				
High School Coursework				
Failed a course in 9th grade	+	None	Employed Only	Central Texas
Received college credit in high school				
Graduation Plan				
Distinguished				
Recommended‡				
Minimum				
Special Ed	-	None	Employed and Enrolled	Central Texas
Advanced Math Courses (Higher than Algebra 2)				
None‡				
One				
Two or more	None	-	Any Employment	Central Texas
Senior year work characteristics				
Income senior year	None	+	Any Employment	Texas
Individual High School Experiences: College Preparation				
TAKS scores in 8th grade				
Reading				
Did not meet standard	None	-	Employed and Enrolled	Central Texas
Met standard‡				
Commended				

‡ Reference category

Year-to-year changes related to fixed postsecondary employment outcomes occur in both Texas and Central Texas. Speaking Spanish at home during senior year, ever being classified as special education, and senior year income each increase the likelihood of any employment in the fall following high school graduation for 2009 Texas graduates, but not for 2008 graduates. Texas 2008 graduates ever classified as being gifted are more likely to be only employed in the fall following graduation; but this was not true for 2009 graduates.

Factors associated with employment outcomes also change from year-to-year for Central Texas high school graduates. In 2008, but not 2009, Central Texas graduates who either ever or always spoke Spanish at home are less likely to be employed in the fall following graduation. Also in 2008, but not 2009, Central Texas graduates who failed at least one course in the 9th grade are more likely to be only employed in the fall following graduation. For Central Texas students in 2009, but not in 2008, taking two or more advanced math courses reduces the likelihood of any employment; also, not meeting the reading TAKS standard in 8th grade reduces the likelihood of being employed and enrolled. These year-to-year and regional differences highlight the importance of using multiple data sources and models to identify the factors *consistently* associated with postsecondary outcomes as described in the previous chapter

CHAPTER VI. FACTORS ASSOCIATED WITH POSTSECONDARY OUTCOMES FOR POPULATIONS OF INTEREST IN CENTRAL TEXAS

Understanding those factors consistently associated with postsecondary outcomes, as shown in Chapter IV, allows policy makers and practitioners to target specific tasks or activities across all populations. However, changing demographics and community efforts currently underway to improve postsecondary outcomes may influence the factors that need to be targeted, as can be seen from Chapter V. This portion of the report focuses on determining which factors are associated with postsecondary outcomes for specific populations of interest, identified as those groups that have traditionally experienced lower transition rates to college. Demographic trends show increases in their number in both Central Texas and the state as a whole. In order to obtain the clearest portrait of which factors are associated with postsecondary enrollment in the Central Texas area, this chapter uses the SFP survey data (Model 3) that includes high school senior exit survey responses. Factors associated with outcomes are identified by performing multinomial logistic regressions on each population for both 2008 and 2009 high school survey takers. Due to constraints on the sample size of the surveyed class of 2008 and the relatively small size of the groups analyzed, factors that demonstrated statistical significance for either cohort are presented below. For ease of interpretation across cohorts, samples and populations of interest, those factors associated with fixed outcomes (e.g., 4-year enrollment) are the focus of this chapter.

Enrollment Factors

Factors Associated with 4-Year Enrollment for Populations of Interest

Several factors are associated with 4-year enrollment for Hispanic, low-income, and first-generation college students, shown in Table 26. Hispanic, low-income and first-generation students whose home language is Spanish, who either graduate in the bottom half of their class, plan to pay for college by working during the school year or summer, or who attend a low-income school are all less likely to enroll in a 4-year college or university following high school graduation. Hispanic, low-income and first-generation students who either take one advanced math class, more than one AP/IB course, get help from their counselor in writing college applications/essays, or indicate on the senior survey they submitted a FAFSA are more likely to enroll in a 4-year college or university.

Table 26. Factors Associated with 4-Year Postsecondary Enrollment for Specific Populations in Central Texas, Using SFP Data

	Type of Student		
	Hispanic	**Low-Income**	**First-Generation**
Background Characteristics			
Race/Ethnicity			
Asian			
Black		+	+
Hispanic			
White‡			
Home Language			
English or Other‡			
Spanish	-	-	-
Special Program Participation			
Special education	-		-
Gifted		+	
Parental Education			
Neither parent has more than a high school diploma	-		
Either parent attended some postsecondary education			
Either parent has Bachelor's degree or higher‡			
Either parent's education unknown			
Individual High School Experiences: Coursework			
Graduation Rank			
Top 10%	+	+	
1st Quartile (-Top 10)	+	+	
2nd Quartile‡			
3rd Quartile	-	-	-
4th Quartile	-	-	-
Individual High School Experiences: Coursework (cont.)			
College Ready			
Not college ready	-	-	
College ready‡			
Missing college ready	-		
Advanced Math Courses (Higher than Algebra 2)			
None‡			
One	+	+	+
Two or more			+
Advanced Placement (AP) / International Baccalaureate (IB) Credits			
No AP/IB high school credits			
Up to 1 AP/IB high school credit			
More than 1 less than 4 AP/IB high school credits	+	+	+
4 or more AP/IB high school credits‡	+	+	+
Individual High School Experiences: Extracurricular Activities			
School Based			
Dance			-
Participated in non-school-based extracurricular activities		+	

Table 26. Factors Associated with 4-Year Postsecondary Enrollment for Specific Populations in Central Texas, Using SFP Data (cont.)

	Type of Student		
	Hispanic	**Low-Income**	**First-Generation**
Individual High School Experiences: High School Counselor Interactions			
Writing college applications/essays	+	+	+
Graduation plans	-		
Individual High School Experiences: College Preparation			
College Preparation Activity			
Visited one or more college campuses	+		
Participated in college fair/college night		+	
Submitted a FAFSA	+	+	+
Ease of Understanding Financial Aid Process			
Easy or very easy‡			
Neutral			-
Difficult or very difficult		-	
Did not apply			
Methods Planned to Pay for Postsecondary Education			
Loans	+		+
Working during the school year/summer	-	-	-
Community & Neighborhood Effects: High School Settings & Programs			
Campus Group			
Low-Income, low percentage of parents with Bachelor Degrees	-	-	-
Not Low-Income, average percentage of parents with Bachelor Degrees			-
Not Low-Income, high percentage of parents with Bachelor Degrees‡			
Not Low-Income, high percentage of parents with Bachelor Degrees			

‡ Reference category

Graduating in the top quarter of their class improves the likelihood of enrolling in a 4-year college for Hispanic and low-income students. For first-generation students, graduating in the top quarter of their class, after accounting for all other factors in the model, does not increase their likelihood of enrolling in a 4-year college, though taking advanced coursework, including AP/IB and advanced math courses does. Black low-income or first-generation graduates also are more likely to enroll in a 4-year college than graduates of other racial/ethnic groups, after accounting for other factors in the model.

Factors Associated with 2-Year Enrollment for Populations of Interest

No single factor was found to be associated with postsecondary enrollment in a 2-year college across all three populations examined, as can be seen in Table 27. Low-income and first-generation students are more likely to enroll in a 2-year college if they plan to pay for their postsecondary education by using personal or family savings. Hispanic and low-income students who received help writing college applications and essays are less likely to enroll in a 2-year college (but more likely to enroll in a 4-year school).

Table 27. Factors Associated with 2-Year Postsecondary Enrollment for Specific Populations in Central Texas, Using SFP Data

	Type of Student		
	Hispanic	**Low-Income**	**First-Generation**
Background Characteristics			
Free and Reduced Lunch Status			
Not economically disadvantaged‡			
Free lunch			-
Reduced lunch			
Individual High School Experiences: Coursework			
Failed at least one 9th grade course			+
Received college credit in high school			
Graduation Rank			
Top 10%		-	
1st Quartile (-Top 10)			
2nd Quartile‡			
3rd Quartile			
4th Quartile			
Graduation Plan			
Distinguished	-		-
Recommended‡			
Minimum	-		
Special Ed			
Career and Technology Courses (CTE)			
No CTE courses‡		-	
Enrolled in a CTE course			
Participant in a coherent sequence of courses			
Participant in tech prep program			
Individual High School Experiences: High School Counselor Interactions			
Scheduling, course selection and placement			+
Writing college applications/essays	-		-
Individual High School Experiences: College Preparation			
College Preparation Activity			
Visited one or more college campuses			-
Methods Planned to Pay for Postsecondary Education			
Scholarships and/or grants			
Personal or family savings		+	+
Loans			
Working during the school year/summer			

‡ Reference category

Hispanic students who graduated on the distinguished plan or on the minimum plan are less likely to enroll in a 2-year college as are first-generation students who graduated on the distinguished plan. First generation students appear more influenced by counselor interactions than Hispanic or low-income students: those who indicate obtaining help from counseling staff on scheduling and course selection show an increase in 2-year enrollment. For both low-income and first-generation students, intending to pay for college using personal or family savings increases the likelihood of 2-year enrollment.

Employment Factors

Factors Associated with Enrollment and Employment for Populations of Interest

No single factor was associated with postsecondary enrollment and employment for Hispanic, low-income, and first-generation students, as can be seen in Table 28. Hispanic and first-generation students who participated in the free and reduced lunch program in their senior year are less likely to be employed and enrolled in the fall following graduation. Both Hispanic and low-income students who received college credit while in high school are more likely to be both enrolled and employed in the fall following high school graduation. Additionally, attending more than two high schools increases the likelihood of being employed and enrolled for both Hispanic and first-generation students.

Table 28. Factors Associated with Postsecondary Enrollment and Employment for Specific Populations in Central Texas, Using SFP Data

	Type of Student		
	Hispanic	Low-Income	First-Generation
Background Characteristics			
Gender			
Female‡			
Male	-	-	
Free and Reduced Lunch Status			
Not economically disadvantaged‡			
Free lunch	-		-
Reduced lunch			
Parental Education			
Neither parent has more than a high school diploma		-	
Either parent attended some postsecondary education			
Either parent has Bachelor's degree or higher‡			
Either parent's education unknown			

Table 28. Factors Associated with Postsecondary Enrollment and Employment for Specific Populations in Central Texas, Using SFP Data (cont.)

	Type of Student		
	Hispanic	**Low-Income**	**First-Generation**
Student Characteristics			
When Student Began Thinking about Going to College			
As long as can remember‡			
As a child			
In middle/junior high school			
In high school			-
Never			
Pre-High School Experiences			
High School Credits in Middle School			
Math			
Foreign language	-		
Individual High School Experiences: Coursework			
Failed at least one 9th grade course			
Received college credit in high school	+	+	
Graduation Rank			
Top 10%			
1st Quartile (-Top 10)			
2nd Quartile‡			
3rd Quartile			
4th Quartile	-		
Number of High Schools Attended			
One			
Two‡			
More than 2	+		+
Individual High School Experiences: Extracurricular Activities			
School Based			
Speech/debate			-
Individual High School Experiences: High School Counselor Interactions			
Scheduling, course selection and placement		+	
Grades/test scores/academic performance	+		
Scholarship/financial aid information		-	
Individual High School Experiences: College Preparation			
Submitted a FAFSA		+	

‡ Reference category

Factors Associated with Only Employment for Populations of Interest

Attending only one high school or submitting a FAFSA reduces the chance of being only employed in the fall (Table 29) following high school graduation for Hispanic, low-

income and first-generation students. Hispanic students who took any high school AP/IB courses reduced their likelihood of being only employed in the fall following graduation. Hispanic and low-income males are less likely to be employed and enrolled.

Table 29. Factors Associated with Only Postsecondary Employment for Specific Populations in Central Texas, Using SFP Data

	Type of Student		
	Hispanic	**Low-Income**	**First-Generation**
Background Characteristics			
Home Language			
English or Other‡			
Spanish		-	
Student Characteristics			
When Student Began Thinking about Going to College			
As long as can remember‡			
As a child			
In middle/junior high school			
In high school			+
Never			
Individual High School Experiences: Coursework			
Failed at least one 9th grade course			
Received college credit in high school	-		
Graduation Rank			
Top 10%		-	
1st Quartile (-Top 10)	-		
2nd Quartile‡			
3rd Quartile			
4th Quartile			
Advanced Math Courses (Higher than Algebra 2)			
None*			
One			
Two or more‡			-
Advanced Placement (AP) / International Baccalaureate (IB) Credits			
No AP/IB high school credits			
Up to 1 AP/IB high school credit	-		
More than 1 less than 4 AP/IB high school credits	-		
4 or more AP/IB high school credits‡	-		
Number of High Schools Attended			
One	-	-	-
Two ‡			
More than 2			

Table 29. Factors Associated with Only Postsecondary Employment for Specific Populations in Central Texas, Using SFP Data (cont.)

	Type of Student		
	Hispanic	**Low-Income**	**First-Generation**
Individual High School Experiences: Extracurricular Activities			
School Based			
Music		+	+
Theater/Drama		+	
Individual High School Experiences: High School Counselor Interactions			
Scholarship/financial aid information			+
Individual High School Experiences: College Preparation			
College Preparation Activity			
Took SAT/ACT prep course	-		
Submitted a FAFSA	-	-	-
Ease of Understanding Financial Aid Process			
Easy or very easy‡			
Neutral			
Difficult or very difficult			+
Did not apply			+
Community & Neighborhood Effects: High School Settings & Programs			
Campus Group			
Low-Income, low percentage of parents with Bachelor Degrees	+	+	
Not Low-Income, average percentage of parents with Bachelor Degrees	+		+
Not Low-Income, high percentage of parents with Bachelor Degrees‡			
Not Low-Income, high percentage of parents with Bachelor Degrees			

‡ Reference category

CHAPTER VII. SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

Summary of Findings

This analysis of factors associated with initial postsecondary enrollment and employment outcomes for 2008 and 2009 high school graduates in both Central Texas and the entire state has allowed the Student Futures Project research team to test the strength of earlier findings reported for 2006 and 2007 Central Texas graduates who completed senior exit surveys. Researchers developed multiple statistical models that utilized the longitudinal nature of the statewide education data housed in the Texas Education Research Center for all Texas graduates, detailed senior survey information for larger shares of Central Texas seniors than in the earlier studies, and more robust statistical techniques to test the strength of the earlier findings. While the research team was not able to meet its goal of combining all of these data sources into one unified research data set, the use of multiple models, data sources, time periods and locations nonetheless provides strong evidence as to which explanatory factors are *consistently* associated with initial postsecondary outcomes and employment, and which vary depending upon individual circumstances.

Descriptive Findings

❖ **Central Texas differs from the entire state, both in the composition of its high school graduating classes and in their initial postsecondary outcomes**.

Central Texas has a smaller share of Hispanic graduates than Texas as a whole (31% vs. 37% in 2009), with a correspondingly higher share of White graduates. Low-income graduates also comprise a larger share of graduates in the entire state than in Central Texas, a 12-percentage point difference for both 2008 and 2009 graduates. In 2009, 61% of Central Texas graduates enrolled in postsecondary education in the fall semester compared to only 55% of Texas graduates.

These differences in postsecondary enrollment rates were totally due to higher 4-year enrollment rates for Central Texas graduates than for all Texas graduates. Non-Hispanic graduates in Central Texas enrolled in 4-year colleges and universities at higher rates than their statewide counterparts but Hispanic enrollment rates were comparable regardless of location. Similarly, 4-year enrollment rates for Central Texas graduates not enrolled in the free or reduced lunch program were far higher than for the state as a whole (47% vs. 37%) but rates for low-income students were comparable regardless of location. The rates of graduates enrolled in 2-year schools were generally consistent across all groups.

❖ **Changes in student demographics and labor market conditions are affecting outcomes for high school graduates in all parts of Texas.**

From 2008 to 2009, the shares of Hispanic graduates rose by approximately 2 percentage points and the shares of low-income graduates increased by 3 percentage points in both Central Texas and Texas. The shares of White graduates dropped by 3 percentage points over this same time period.

Overall college enrollment rates remained steady between the two years but the share of graduates attending 4-year colleges dropped in 2009, while a larger share of enrollees attended 2-year colleges. Out-of-state enrollment rates also dipped slightly. Overall employment rates for recent graduates in the fall quarter following high school graduation decreased dramatically from 2008 to 2009 (from 44% to 38% in Central Texas and 47% to 38% in Texas). However, the nature of employment for recent high school graduates — primarily jobs in the retail trade and food services sectors — did not vary by year or location.

Factors Associated with Postsecondary Enrollment

❖ **Several factors are consistently associated with 4-year college enrollment, regardless of data sample, location or time period studied but very few consistent patterns could be discerned for 2-year enrollment.**

After accounting for all other variables, graduates who completed one advanced math course beyond Algebra II or more than one AP/IB course were more likely to enroll in 4-year colleges, across all data samples, time periods and locations studied. Conversely, graduates not classified as college-ready based on TAKS exit exams were less likely to enroll in 4-year schools in all statistical models.

In models using the additional longitudinal ERC administrative variables (but not the senior survey variables), failure to meet the 8th grade math standard was consistently linked to lower 4-year enrollment rates. ERC data models also found that ever having participated in the free or reduced lunch program was linked to reduced college enrollment of any kind.

Models that incorporated senior survey variables for 2008 and 2009 Central Texas graduates confirmed many findings from earlier Student Futures Project reports. Specifically, students who graduated in the top 10% of a high school class, took an SAT/ACT preparation course, visited one or more college campuses, or reported submitting a FAFSA were more likely to enroll in a 4-year college, after controlling for all other factors. New variables in the 2008 and 2009 analyses also showed that Central Texas students who graduated in the bottom half of a high school class or who intended to pay for college by working were less likely to enroll in 4-year colleges. Students graduating in the bottom quartile of the class were less likely to enroll in any college, either 2-year or 4-year.

❖ **There are some key differences in the factors associated with college enrollment between Central Texas and Texas.**

Using only the longitudinal administrative data contained in the ERC, researchers found that several factors that prior literature identified as influencing postsecondary enrollment were consistently associated with postsecondary enrollment in Texas but not in the Central Texas region. Receiving college credit in high school or being classified as gifted were both positively linked to 4-year enrollment for the entire state but not for Central Texas. Variables linked to lower 4-year enrollment rates in Texas (but not Central Texas) included special education participation, attendance at more than one high school, or failure to meet the 8th grade TAKS reading standard. Taking a coherent sequence of career and technology education courses was associated with higher 2-year enrollment in the state as a whole but not in the Central Texas region.

❖ **While most factors linked to postsecondary 4-year enrollment for Central Texas Hispanic, low-income, and first-generation high school graduates are similar to those for all graduates, several other variables are also important for these student groups.**

As was true for all graduates, taking at least one advanced math course beyond Algebra II, taking more than one AP/IB course, or completing the FAFSA increased the likelihood of attending a 4-year college for Hispanic, low-income and first-generation high school graduates, while graduating in the bottom half of the class or planning to pay for college by working reduced their chances of 4-year enrollment. In addition, meeting with their counselors for help with college applications and essays significantly increased the chances of 4-year enrollment for these three student groups but not for graduates in general. Conversely, Hispanic, low-income and first-generation graduates whose families speak Spanish at home were less likely to enroll in 4-year colleges, which was not true for the general population.

Factors Associated with Employment

❖ **No factors are consistently linked to employment across all statistical models, time periods and locations; however, some consistent employment findings can be observed in models using the additional ERC and the Student Futures variables.**

Models using ERC variables found that graduates who had ever participated in the free or reduced lunch program were more likely to be employed in Texas but not enrolled in school in the fall quarter following graduation than was true for other graduates. Conversely, graduates who had ever been considered immigrants were less likely to be employed in Texas jobs covered by Unemployment Insurance, after controlling for other factors. These findings were consistent across time periods and locations studied.

The models that included additional senior survey variables for Central Texas graduates found that high school graduates whose parents did not attend any postsecondary education or those graduating in the bottom quartile of the class were more likely to be employed and not in school in the fall following graduation. Conversely, graduates in the Top 10% of the class or those submitting a FAFSA were less likely to be employed and not in school. Survey respondents who planned to pay for college by working were more likely to be working than not working, regardless of enrollment status.

Conclusions

❖ **Changes in the demographics of high school graduates, coupled with poor labor market conditions, have increased the need for higher skill levels among recent high school graduates.**

The shares of high school graduates from groups traditionally less likely to attend college have been growing over time. Without specific interventions to counteract traditional behavior, overall rates of college enrollment would be expected to decline. The many Texas efforts that are attempting to ameliorate these demographic trends have so far managed to maintain overall rates of initial college enrollment for high school graduates even with these demographic shifts. However, weak economic conditions over the past few years have resulted in lower overall employment rates for recent high school graduates. Moreover, the types of jobs held by recent high school graduates do not provide strong potential for earnings growth without further education or skills development.

❖ **This analysis confirms earlier findings on factors associated with 4-year enrollment reported for 2007 graduates, while also providing additional information that could not be measured in the earlier work.**

As was true in the earlier study, the largest and most consistent influences affecting 4-year enrollment are those related to academic achievement and participation in specific college preparation activities. The multiple databases, larger samples and multiple time periods used in this study confirmed the strength of those earlier findings. Additional variables contained in this analysis also found that 4-year enrollees are concentrated among students who rank in the top half of their graduating classes and confirmed the importance of college-readiness for students hoping to enroll in 4-year schools.

❖ **The longitudinal variables available through the ERC suggest some areas of concern that could not be fully tested without linking those variables directly to the senior survey variables.**

For example, the administrative data models developed from ERC data found that students who had ever participated in the free or reduced lunch program were consistently less likely to enroll in either a 2-year or a 4-year college. The suggestion that even poverty as a young child could negatively affect any type of future college

enrollment for high school graduates is troubling. However, the strength of this variable would need to be tested in statistical models that also include variables linked to increasing the chances of enrollment for low-income graduates (e.g., meeting with college counselors on applications) before drawing policy conclusions from this finding.

❖ **The differences in findings between Central Texas and the state as a whole that are based solely on administrative data confirm the need to conduct local policy analyses but also should prompt readers to think critically about the meaning of the variables constructed from this data source.**

Persons reading research findings based solely on administrative data should consider whether some differences in findings across geography might be due to varying meanings of some variables across school districts. Some administrative variables (e.g., attendance at more than one school, 8th grade TAKS standards) have a common meaning across the entire state while others (e.g., participation in a gifted program, receiving college credit in high school, and completion of a coherent sequence of career and technology education courses) could vary based on differing program definitions or availability of services across school districts.

Recommendations

❖ **Research on the factors associated with postsecondary outcomes should include multiple years and models that include longitudinal variables to ensure that factors significantly and substantively associated with a particular outcome are consistent.**

Broad-scale efforts to influence postsecondary outcomes should focus on factors that are consistently associated with particular outcomes rather than rely on a single data source or graduating cohort to draw conclusions. Such research should include variables prior to high school (as a measure for academic readiness) and, for some variables, all the way into primary school (as a measure of economic disadvantage), coupled with variables that report on high school initiatives designed to increase college enrollment.

❖ **Local efforts to increase enrollment in 4-year colleges should focus on academic achievement and college preparation activities found to be consistently associated with 4-year enrollment.**

Planning and preparation to ensure the skill levels necessary for taking advanced coursework should start in middle school and/or early in high school and focus on refining and strengthening conceptual and practical skills in 9th and 10th grade coursework to better prepare and encourage students to engage in these rigorous classes. Local efforts targeting these college preparation activities, such as completing a FAFSA, have increased considerably in recent years. These efforts should continue.

❖ **Research is needed to measure the impact of programs designed to improve postsecondary enrollment rates for members of student groups that have lagged in their overall enrollment rates**.

More research is needed on the programs serving individuals from disadvantaged groups to determine the impact of those programs and the extent to which the successful ones could be scaled so as to reach larger numbers of students in need of such services. Such programs might consider targeting students who have ever participated in the free and reduced lunch program, which would direct such services to those students in the greatest need of assistance.

❖ **Researchers should continue to pursue their efforts to link survey variables with the longitudinal data available in the ERC in future research on this topic**.

 Several variables that were only available from one data source (i.e., SFP or ERC) were consistently and significantly associated with increased college enrollment. The original research plan called for combining the survey variables only available through SFP with the longitudinal variables only available through ERC. The results from this analysis indicate that such an approach is still necessary in order to fully analyze the relative importance of each. In addition to studying initial enrollment, researchers should also explore factors linked to successful completion of postsecondary education.

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APPENDIX A. TECHNICAL APPENDIX

While the original aim of this research included linking Student Futures Project survey data with data contained with the Education Research Center, efforts to accomplish this goal proved fruitless within the time period available for this project. The procedure of utilizing two parallel constructed datasets to perform the analysis in this report stems from this inability to directly link SFP survey data into the ERC and is intended to serve as an example of how far such an analysis can go without such a this linkage.

Construction of Datasets

This research uses two constructed datasets: 1) the Student Futures Project dataset which uses district-provided data and senior exit survey data for the classes of 2008 and 2009 for Central Texas; and, 2) the Education Research Center dataset which uses longitudinal district-provided data for the classes of 2008 and 2009 for Central Texas and Texas as a whole. District-provided data to the SFP dataset includes additional information not available to the ERC, including student high school graduation transcripts and graduation rank. District-provided data to the ERC dataset includes additional information not available to the SFP, mainly student-level data extending back into 2008 and 2009 high school graduates' first year of enrollment in public school. Details of the construction of these two datasets are provided below, followed by a comparison of administrative variables between the two datasets and additional discussion of dataset differences. For the purposes of this technical appendix which is to describe construction of variables and differences between datasets, information provided on the means of variables below focuses on Central Texas students.

The Student Futures Project has conducted research on the transitions of high school graduates in the Central Texas region since 2006. Previously conducted research, including a conceptual model of high-school-to-college transitions and analysis of class of 2007 transitions meant that a set of likely administrative and survey variables had already been constructed and considered prior to the start of this work[15]. Two sources contributed to the SFP dataset: administrative and senior exit survey data.

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[15] See Schexnayder, et.al., *Education and Work After High School: A First Look at the Class of 2007,* available online at: www.centexstudentfutures.org.

The Education Research Center (ERC) collects and maintains de-identified versions of the Public Education Information Management System (PEIMS) records that are collected by districts several times a year. PEIMS records include information on racial/ethnic characteristics of students, gender, program participation (such as special education), courses taken and passed (though not grades), and other information. These records, once provided to TEA by school districts are, after de-identification, eventually placed within the ERC. A key advantage of using data within the ERC environment is that records of individual students from across the state and over time can be linked to create one research dataset.

Common Administrative Variables

Administrative data includes outcome information from National Student Clearinghouse and from Texas Workforce Commission's Unemployment Insurance Wage Data (discussed below) and some explanatory information from school districts. Data available from school districts includes data collected and reported to the Texas Education Agency (TEA) through PEIMS and additional data districts collect that they report to colleges (e.g., class rank and additional transcript information). SFP researchers utilize PEIMS records collected in the fall of the senior year and the spring of the senior year.

Administrative variables used in this report derive from two processes: direct use of a senior-year collected variable (directly from PEIMS) and construction using historical data (from PEIMS for the ERC or transcript for the SFP). Means of shared administrative variables used in this report are reported in Table A-1, along with an indication of whether the variable was collected in the senior year, or constructed using historical data.

PEIMS records collected in the senior year and used for the SFP dataset vary little from those processed through TEA and provided to the ERC. However, significant differences occur between variables constructed using historical data from school-provided transcript information and school-provided longitudinal PEIMS records. Notable differences in the means of these variables include measures of whether a student failed a course in the 9th grade and the number of advanced math courses high school graduates had taken. The same definitions were used to construct these variables across data sources: whether a student had failed at least one course taken during their 9th grade, and the number of mathematics courses taken above the level of an Algebra II course (e.g., Pre-Calculus, Calculus, Statistics, Analysis). There are several plausible explanations for these differences, but without linking individual-level records across SFP and ERC data warehouses, they are to some extent speculative.

Researchers determined that multinomial logistic regression analyses excluding these two variables do not alter results of analysis on other variables; furthermore, the direction of effect and statistical significance of these two variables in all models do not conflict (i.e., taking advanced math courses shows a stronger positive association with 4-year college enrollment using ERC data compared to SFP data, but taking advanced math courses using both datasets shows a statistically significant positive association with 4-year enrollment).

Some variables available through local school districts are not reported to the ERCs, or are not consistently reported and/or processed through the ERC environment. Key among these variables is high school graduation rank, used in the analysis of this report where possible, but not available in the ERC environment. While transcript information includes high school credits earned while in middle school (such as taking Algebra I or a foreign language in the 8th grade), not all middle schools report high school credits to TEA.

Table A-1. Means of Administrative Variables, by Dataset Source

Senior-Year	Historical	Administrative Sample Means for Central Texas, by Cohort	2008			2009		
			ERC	SFP Overall	SFP Survey Sample	ERC	SFP Overall	SFP Survey Sample
		N	10,991	10,336	4,849	11,175	10,568	7,259
		Background Characteristics						
X		**Race/Ethnicity**						
		Asian	5%	5%	5%	6%	6%	6%
		Black	11%	11%	10%	12%	12%	12%
		Hispanic	31%	30%	33%	33%	32%	30%
		White‡	52%	53%	52%	49%	50%	51%
X		**Home Language**						
		English or Other‡	90%	90%	88%	89%	89%	89%
		Spanish	10%	10%	12%	11%	11%	11%
X		**Gender**						
		Female‡	50%	50%	52%	50%	50%	51%
		Male	50%	50%	48%	50%	50%	49%
X		**Free and Reduced Lunch Status**						
		Not economically disadvantaged‡	76%	76%	75%	73%	73%	75%
		Free lunch	17%	17%	19%	21%	20%	19%
		Reduced lunch	6%	6%	7%	6%	6%	6%
X		**Special Program Participation**						
		Special education	10%	9%	6%	10%	9%	7%
		Gifted	12%	12%	14%	11%	11%	11%
		Pre-High School Experiences						
	X	High school math credit in middle school		30%	31%		29%	30%
	X	High school foreign language credit in middle school		41%	46%		41%	42%

Table A-1. Means of Administrative Variables, by Dataset Source (cont.)

Senior-Year	Historical	Administrative Sample Means for Central Texas, b y Cohort	2008 ERC	2008 SFP Overall	2008 SFP Survey Sample	2009 ERC	2009 SFP Overall	2009 SFP Survey Sample
		N	10,991	10,336	4,849	11,175	10,568	7,259
		Individual High School Experiences: Coursework						
	X	Failed at least one 9th grade course	9%	21%	17%	10%	28%	25%
	X	Received college credit in high school	8%	7%	8%	10%	9%	8%
X		**Graduation Rank**						
		Top 10%		10%	12%		10%	11%
		1st Quartile (-Top 10)		15%	17%		15%	16%
		2nd Quartile‡		26%	28%		25%	27%
		3rd Quartile		25%	24%		25%	25%
		4th Quartile		24%	20%		24%	21%
X		**Graduation Plan**						
		Distinguished	17%	18%	19%	17%	18%	20%
		Recommended‡	68%	69%	71%	67%	67%	69%
		Minimum	12%	11%	9%	12%	12%	9%
		Special Ed	3%	2%	1%	3%	3%	1%
	X	**College Ready**						
		Not college ready	37%	31%	34%	34%	33%	32%
		College ready‡	63%	55%	58%	66%	57%	60%
		Missing college ready		13%	9%		11%	8%
	X	**Advanced Math Credits (Higher than Algebra 2)**						
		None*	77%	55%	52%	78%	58%	56%
		One	18%	30%	27%	18%	28%	29%
		Two or more‡	5%	15%	21%	4%	14%	15%
	X	**Advanced Placement (AP) / International Baccalaureate (IB) Credits**						
		No AP/IB high school credits	46%	44%	39%	47%	45%	41%
		Up to 1 AP/IB high school credit	12%	15%	14%	12%	15%	15%
		More than 1 less than 4 AP/IB high school credits	15%	21%	22%	15%	21%	21%
		4 or more AP/IB high school credits‡	26%	20%	25%	26%	20%	22%
X		**Career and Technology Courses (CTE)**						
		No CTE courses‡	30%	32%	43%	28%	28%	27%
		Enrolled in a CTE course	25%	27%	30%	23%	23%	24%
		Participant in a coherent sequence of courses	31%	23%	17%	34%	33%	34%
		Participant in tech prep program	14%	18%	9%	15%	15%	15%
		Individual High School Experiences: Extracurricular Activities						
X		Income senior year (divided by 100) [missing classified as zero]	$1,287	$1,258	$1,147	$1,097	$1,096	$1,005

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Table A-1. Means of Administrative Variables, by Dataset Source
(cont.)

Senior-Year	Historical	Administrative Sample Means for Central Texas, by Cohort	2008			2009		
			ERC	SFP Overall	SFP Survey Sample	ERC	SFP Overall	SFP Survey Sample
		N	10,991	10,336	4,849	11,175	10,568	7,259
		Community & Neighborhood Effects: High School Settings & Programs						
X		**Campus Group**						
		Low-Income, low percentage of parents with Bachelor Degrees	15%	14%	16%	14%	14%	14%
		Not Low-Income, average percentage with Bachelor Degrees	28%	28%	26%	30%	28%	26%
		Not Low-Income, high percentage with Bachelor Degrees‡	30%	30%	27%	30%	31%	32%
		Not Low-Income, high percentage with Bachelor Degrees	27%	28%	32%	26%	27%	27%
X		**School District Variables**						
		Austin‡	35%	35%	55%	33%	35%	33%
		Bastrop	4%	4%	3%	4%	4%	4%
		Del Valle	3%	2%	1%	3%	3%	3%
		Eanes	6%	6%	5%	5%	5%	6%
		Hays	5%	5%	6%	5%	6%	7%
		Leander	2%	2%	1%	2%	2%	1%
		Manor	12%	12%	8%	13%	13%	13%
		Pflugerville	10%	10%	9%	11%	12%	13%
		Round Rock	21%	21%	10%	21%	21%	20%
		San Marcos	3%	3%	2%	3%	1%	1%

‡ Reference category for categorical variables

ERC Longitudinal Variables

One of the primary purposes of using data contained in the ERC was to include longitudinal measures for key variables known to influence academic achievement and/or college transitions (see Table A-2). There are few differences between years for most of these variables with the exception of a noticeable improvement in reading 8th grade TAKS performance for the class of 2009 compared to the class of 2008. Performance on TAKS tests is directly reported from the first 8th grade year TAKS exam score classification for each student. Instances of 3rd and 5th grade retention involved linking records from high school graduation to the first instance of being classified as enrolled in 2nd grade; if an individual had more than one recorded enrollment in more than one year of enrolling in 3rd or 5th grade they were classified as retained.

Table A-2. Means of Variables from the Education Research Center, Central Texas Only

	2008	2009
N	10,991	11,175
Background Characteristics		
Home Language Over Time		
Never	87%	85%
Ever	6%	5%
Always	7%	9%
Free and Reduced Lunch Status Over Time		
Never	54%	51%
Ever	30%	31%
Always	16%	18%
Special Education Over Time		
Never	82%	83%
Ever	14%	14%
Always	3%	3%
Gifted Over Time		
Never	83%	83%
Ever	16%	15%
Always	1%	2%
Immigration Status		
Ever classified as an immigrant	6%	6%
Pre-High School Experiences		
Retained in 3rd grade	0.32%	0.43%
Retained in 5th grade	0.33%	0.32%
Math TAKS Scores in 8th Grade		
Did not meet standard	28%	27%
Met standard	41%	42%
Commended	18%	19%
Reading TAKS Scores in 8th Grade		
Did not meet standard	13%	13%
Met standard	47%	34%
Commended	27%	41%

‡ Reference category for categorical variables

To construct all of the variables in background characteristics, researchers linked high school graduates to records for all of the previous years a student was enrolled in a Texas public school, maintaining in each linkage a record of the grade of enrollment, the student's home language, free and reduced lunch status, special education classification, gifted status, and immigrant status. For all but immigration status, each student who had no record of that variable over the entire time period was classified as "Never," each student who had at least one recorded instance but not 100% of involvement over that time period was classified as

"Ever," and each student who was consistently involved over the entire time period was classified as "Always."

Schools collect an immigration variable for the first three years a non-citizen enrolls in a Texas school. Once a student has been enrolled for three years, this variable is no longer collected. A complete history as described above was constructed for the immigration variable and if a student had any instance of immigration status recorded during their time in Texas public schools, that student was classified as having ever been classified as an immigrant.

SFP Survey Variables

The Student Futures Project senior survey collects important information related to college transitions not traditionally captured using administrative records. The survey's worth, both as a metric and a tool for analysis, has been demonstrated on multiple SFP projects since 2006. Table A-1 shows that the demographic characteristics of the survey samples for the class of 2008 and 2009 closely reflects the composition of their graduation cohorts, though surveyed graduates include a smaller share of special education students. Other differences in the means between survey takers and the entire graduating class are best understood as stemming from the fact that survey takers who graduate in the top half of their class are over-represented in the survey population. For example, a higher share of survey takers are college ready in comparison with the overall population of high school graduates and a higher share took four or more AP/IB classes while in high school.

Means by variables for the surveyed classes of 2008 and 2009 are provided in Table A-3 below. One possible reason for differences between the means for 2008 and 2009 survey takers rests in the change in procedures needed to obtain individual consent to link survey responses to administrative records. As mentioned in the text of the main report, the desire to engage in the procedures needed to complete and submit an individual consent form mean that fewer survey takers in 2008 could be included in the analysis. Students from the lower half of their class were less likely to provide consent.

Most survey variables collected for the 2008 and 2009 seniors were exactly the same. The one exception to this is that, for simplification, students in 2009 were provided fewer answer choices on their senior survey in regard to the issue of what method they planned to pay for postsecondary education. Thus, students in 2008 could have indicated they planned to pay for college using "family savings" alone, students in 2009 would have needed to indicate that they planned to pay for college using "family or personal savings."

Additionally, students in 2009 could indicate either or both that they intend to pay for college by "working during the school year," and/or "working during the summer." The 2008 senior survey made so such distinction, only offering the choice of "working during the summer/school year." Student responses in 2009 were combined such that answering in the affirmative for either of these options placed them under the category of "working during the summer/school year."

Table A-3. Means of Variables from the Student Futures Project Survey

	2008	2009
N	4,849	7,259
Background Characteristics		
Parental Education		
Neither parent has more than a high school diploma	23%	23%
Either parent attended some postsecondary education	21%	19%
Either parent has Bachelor's degree or higher‡	48%	47%
Either parent's education unknown	8%	11%
Student Characteristics		
When Student Began Thinking about Going to College		
As long as can remember‡	43%	48%
As a child	10%	9%
In middle/junior high school	20%	17%
In high school	24%	25%
Never	2%	2%
Individual High School Experiences: Extracurricular Activities		
School Based		
Music	32%	30%
Theater/Drama	17%	21%
Dance	18%	20%
Sports	53%	56%
Speech/debate	16%	23%
Academic clubs	21%	27%
No school-based extracurricular activities	12%	13%
Participated in non-school-based extracurricular activities	68%	73%
Typical Number of Weekly Hours Spent Studying in High School:		
None	8%	8%
1-5 hours‡	52%	49%
6-10 hours	26%	27%
11+ hours	15%	16%
Typical Number of Weekly Hours Spent Working in High School:		
None*	36%	39%
1-10 hours	19%	20%
11 + hours‡	46%	42%

Table A-3. Means of Variables from the Student Futures Project Survey (cont.)

	2008	2009
N	4,849	7,259
Individual High School Experiences: High School Counselor Interactions		
Scheduling, course selection and placement	75%	68%
Grades/test scores/academic performance	46%	30%
Writing resumes/job applications	10%	5%
Writing college applications/essays	14%	28%
Scholarship/financial aid information	34%	43%
Graduation plans	52%	29%
College information	45%	55%
Career information	18%	28%
Individual High School Experiences: College Preparation		
College Preparation Activity		
Visited one or more college campuses	59%	60%
Took the PSAT	71%	66%
Took ACC courses (Early college start, dual credit)	33%	32%
Took SAT/ACT prep course	38%	33%
Participated in college fair/college night	48%	47%
Submitted a FAFSA	50%	56%
Number of College Preparation Activities		
None	9%	10%
One	14%	13%
Two or more‡	77%	76%
Ease of Understanding Financial Aid Process		
Easy or very easy	36%	22%
Neutral‡	36%	44%
Difficult or very difficult	14%	12%
Did not apply	14%	22%
Methods Planned to Pay for Postsecondary Education		
Scholarships and/or grants	57%	60%
Personal or family savings	60%	56%
Loans	38%	42%
Working during the school year/summer	52%	60%

‡ Reference category for categorical variables

National Student Clearinghouse

Postsecondary enrollment outcomes were developed using National Student Clearinghouse (NSC) data. The NSC's Student Tracker system provides information on attendance and completion data for over 3,300 postsecondary institutions. NSC data incorporated into the SFP dataset came from an existing agreement with the Ray Marshall

Center (RMC) and NSC (in which RMC staff obtained high school graduate information from school districts and then submitted it to NSC). NSC data incorporated into the ERC dataset came from an agreement with the state of Texas and NSC to provide data on two cohorts of students (2008 and 2009 high school graduates) for 16 months after graduation. As shown in Table 6 in the main body of this report, there were very little differences between SFP NSC outcomes and ERC NSC outcomes for 2008 and 2009 high school graduates. While NSC currently includes student enrollment information for most large Texas institutions, NSC provides a list of Texas schools with an enrollment greater than 1,000 (Table A-4) that did not have an agreement with the NSC as of early 2010.

Table A-4. Texas Colleges Serving over 1,000 Students not in National Student Clearinghouse Records

School Name	Enrollment Size
Laredo Community College	8,256
Trinity Valley Community College	6,046
Lee College	5,868
Angelina College	4,931
Texarkana College	4,682
Alvin Community College	4,402
Texas Wesleyan University	3,202
Le Cordon Bleu Institute of Culinary Arts - Austin	2,996
The Art Institute of Houston	2,331
Lamar State College-Orange	2,147
Lamar State College-Port Arthur	2,013
Lubbock Christian University-Undergraduate	1,868
The Art Institute of Dallas	1,857
Ati Career Training Center	1,632
Remington College - Houston	1,475
Western Technical College	1,337
Career Point College	1,012
College of Biblical Studies-Houston	1,005

Source: National Student Clearinghouse

Texas Workforce Commission (TWC) Unemployment Insurance (UI) Wage Data

TWC produces quarterly wage data detailing earnings for individuals working in Texas. The Ray Marshall Center currently maintains these records back to 1990 and receives

quarterly data on a regular basis. As part of the ERC, individual-level de-identified TWC UI quarterly wage data from 1990 through the fall of 2010 is also available. As shown in Table 11 in the main report, employment outcomes for Central Texas graduates in 2008 and 2009 are virtually the same regardless of the source of TWC UI wage data used.

Wages in the senior year were calculated by summing non-zero wages for any and all jobs collected for an individual in the fall prior to graduation and the spring of graduation for each class. Wages for individuals who had no reported UI wages over this time period were set to zero.