Postsecondary Education, Training and Labor Market Transitions in Texas:

A Regional Analysis

The Texas Workforce Data Quality Initiative

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ACKNOWLEDGEMENTS

The Ray Marshall Center is founded on the belief that research can improve the efforts of practitioners and policy makers to build human capital. By expanding the data available to researchers and ensuring timely access to data, regions within Texas, and the state as a whole, should be able to more clearly understand and develop the productivity of Texas through education and training.

The authors would like to thank the three Texas state agencies and their staff who were involved in the development of processes and procedures allowing researcher access to statewide data – the Texas Workforce Commission (TWC), sponsor of this research; the Texas Education Research Center (ERC) at the University of Texas at Austin; and the Texas Higher Education Coordinating Board.

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INTRODUCTION

Texas is a sprawling, demographically diverse, rapidly changing state. Policy makers must consider the implications of legislative and policy change on rural communities, suburban areas, and large urban centers. Major industries and employers vary considerably by region, including shipping and fishing along the coast, oil and gas in the south and west, and high-tech in Central Texas. Over one-third of Texas' population is of Hispanic origin, and 12% of residents are African American (Census 1, 2014). Texas is also one of the fastest growing states in the nation, with an estimated population growth of over 5% between just 2010 and 2013 (Census 2, 2014). Over this same time period, four of the top ten fastest growing cities in America with over one million residents were in Texas: Austin, Houston, San Antonio, and Dallas/Ft. Worth (Census 3, 2014). Between 2010 and 2013, the compound annual growth rate of GDP (gross domestic product) in Texas exceeded 7%, compared to a national increase of just less than 4%, making Texas one of the fastest growing economies in the country (BEA, 2014). North Dakota was the only state in the nation to experience faster growth in this period (BEA, 2014). Texas was also one of the first states to recover from the Great Recession (Madigan, 2013).

In response to population growth and changes in the labor market over the last decade, some regional stakeholders have developed stronger ties with local school districts, colleges, and the workforce (King et. al., 2005). These efforts capitalize on local high-growth, high-wage industries, providing guidance and support to high school graduates and enabling them to better navigate the post-high school world and land well-paid, high-demand jobs. One of the key features of this work lies in ensuring high school graduates receive some postsecondary education, training, or credential as jobs available in regional high-demand areas require more advanced knowledge and skills.

These regional efforts continue to analyze college enrollment and employment information for recent high school graduates, and some regions, such as the Austin metro area, use this data to perform an analysis of factors related to successful postsecondary

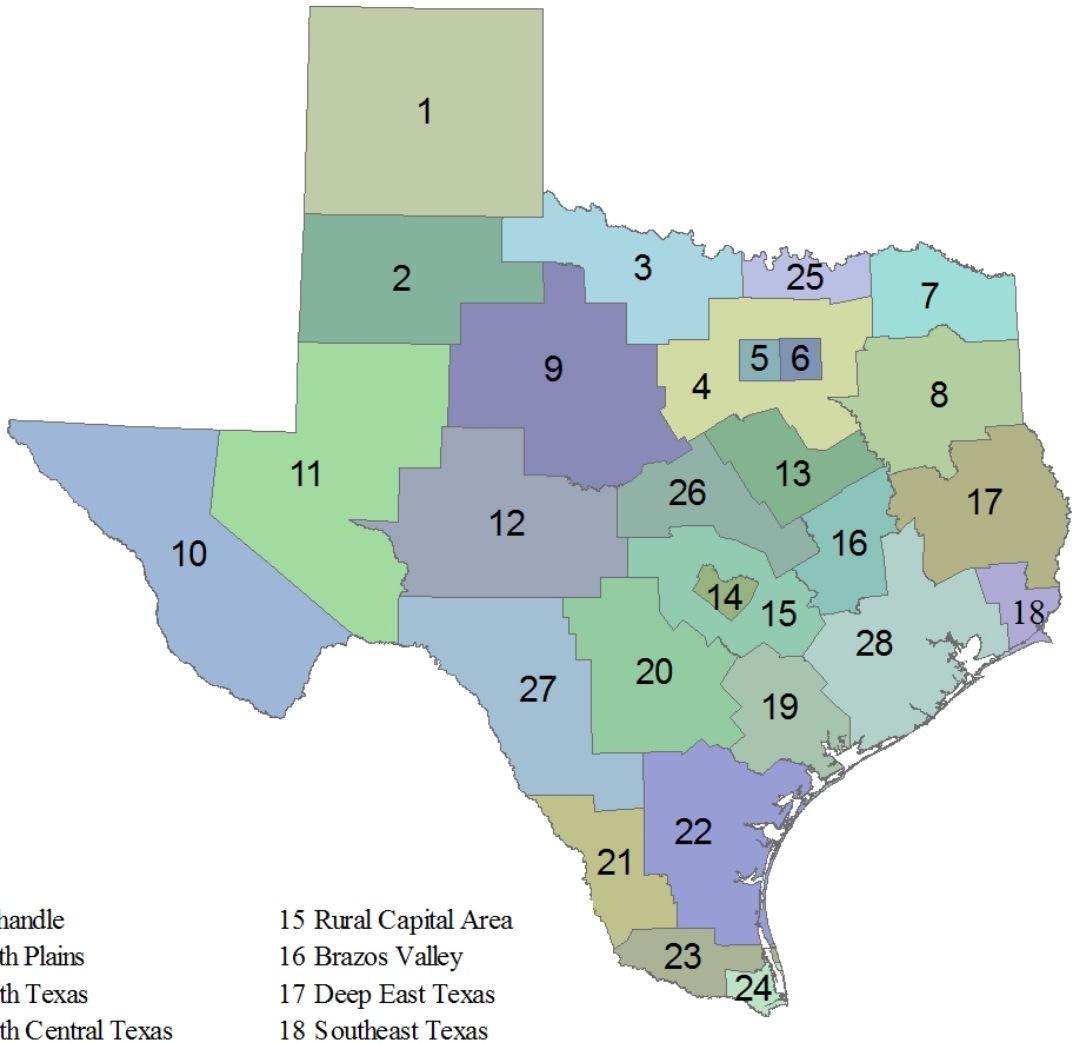
transitions.[1] A 2010 report by the Ray Marshall Center on factors related to postsecondary enrollment and employment trends in 11 Central Texas independent school districts demonstrated the importance of regional efforts to determine key influences on students' future outcomes. Results from the analysis of data from Central Texas differed from statewide analyses (Cumpton, et al., 2012), which provided the impetus for the research presented here.

Each Texas region faces unique challenges in the transition of students from high school to college and the workforce; efforts to an efficient and effective means of supporting this transition should use regionally-based research. As this work is funded by the U.S. Department of Labor through the Texas Workforce Commission (TWC) and since many of the regional endeavors focus on workforce development efforts (often in the context of high school graduates transitioning to college and then the workforce), the regions examined in this report are the 28 Local Workforce Development Areas (LWDAs), largely corresponding to regional labor markets (Figure 1). This report documents the postsecondary transitions of 2008 and 2009 Texas high school graduates in each LWDA through the fall of 2012.[2]

[1] Information on the Central Texas Student Futures Project may be found at the following website: www.centextstudentfutures.org.

[2] Maps that reflect student outcomes based on LWDA reflect the LWDA from which the student graduated from high school and not necessarily the LWDA in which they currently reside.

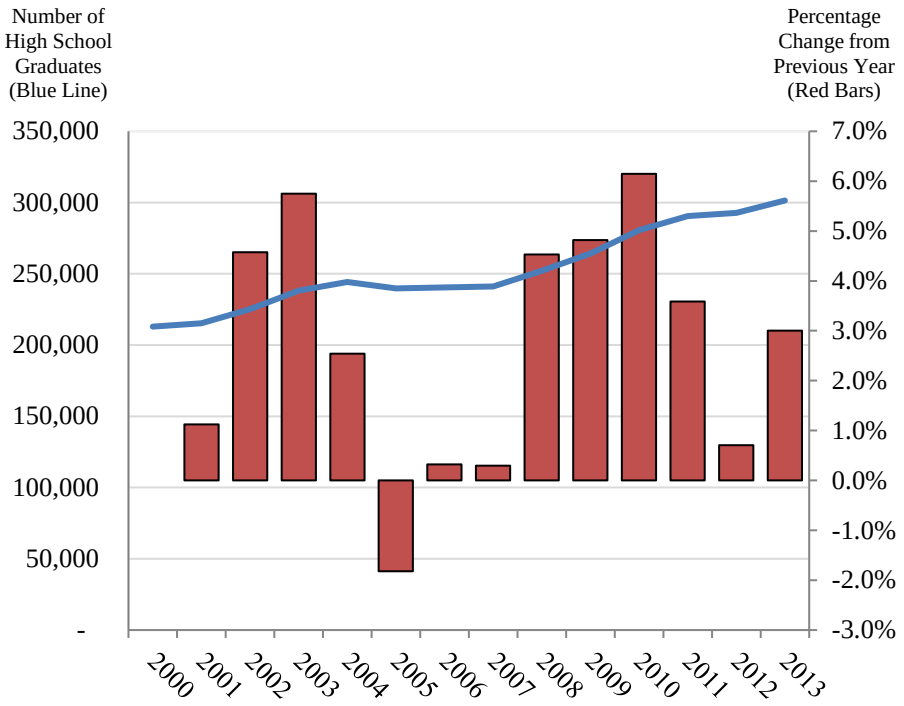
Figure 1. Texas Local Workforce Development Areas



1 Panhandle
2 South Plains
3 North Texas
4 North Central Texas
5 Tarrant County
6 Greater Dallas
7 Northeast Texas
8 East Texas
9 West Central Texas
10 Upper Rio Grande
11 Permian Basin
12 Concho Valley
13 Heart of Texas
14 Capital Area
15 Rural Capital Area
16 Brazos Valley
17 Deep East Texas
18 Southeast Texas
19 Golden Crescent
20 Alamo
21 South Texas
22 Coastal Bend
23 Lower Rio Grande Valley
24 Cameron
25 Texoma
26 Central Texas
27 Middle Rio Grande
28 Gulf Coast

Since 2000, Texas' high school graduate population has increased by 45%, growing from 212,925 in 2000 to 301,418 in 2013 (Figure 2). This rapid growth over the last fourteen years occurred in two relatively rapid bursts rather than continuously. The first large increase took place from 2002 through 2003, with growth rates ranging from 2.8% to just over 6%, followed by a period of decline and very slow growth until 2008. Starting in 2008, the number of high school graduates increased by more than 4% for each of the next three years.

Figure 2. High School Graduates in Texas, 2000 to 2013

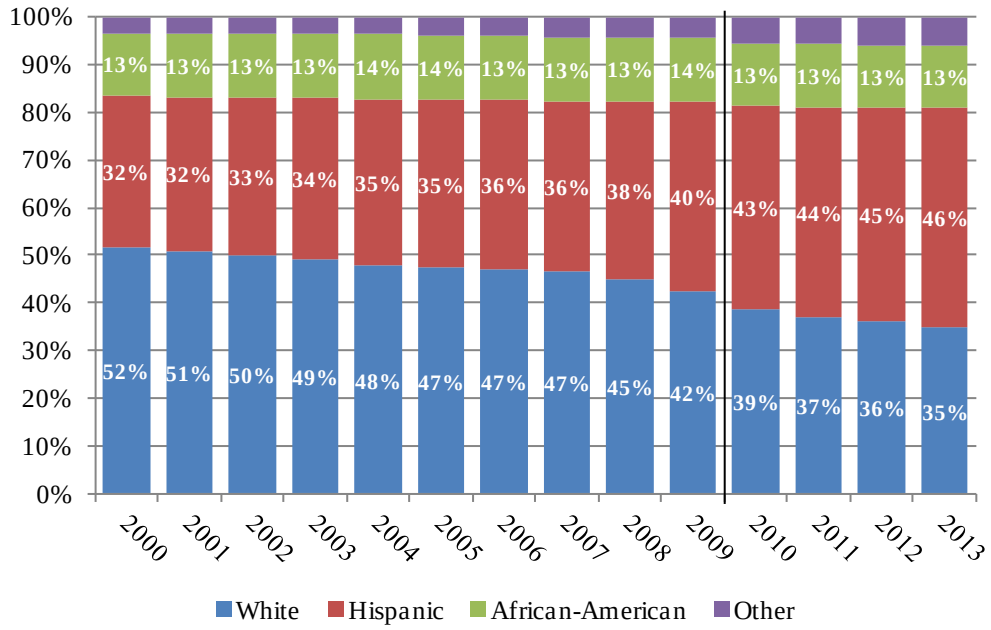


Source: Texas Higher Education Coordinating Board data.

During this same time frame, there were also dramatic changes to the racial and ethnic composition of high school graduating classes in Texas (Figure 3). In 2000, the majority of Texas high school graduates were white (52%). By 2013, just 35% of high school graduates were white, while just shy of half (46%) of graduates were from Hispanic backgrounds.[3]

[3] Starting in 2010, Texas collected racial and ethnicity information in accordance to federal standards, allowing students to choose whether they considered themselves Hispanic or not Hispanic and then also choose a race, allowing students to choose any race or multiple races. Shares of students after 2010 represent THECB calculations that placed students into one of the following categories: Hispanic, African American, White, or other.

Figure 3. Racial/Ethnic Characteristics of High School Graduates in Texas, 2000 to 2013



Source: Texas Higher Education Coordinating Board data.

Note: Texas changed the manner in which it asked students to identify their race and ethnicity beginning in 2010. For details please see footnote number three.

This report seeks to examine and analyze the postsecondary labor market outcomes of Texas high school graduates from the classes of 2008 and 2009. One advantage of looking at these two particular cohorts stems from differences in when they encountered the Great Recession: the class of 2008 graduated prior to the start of the recession in Texas and the class of 2009 graduated immediately after the start of the recession. It is likely that class of 2009 graduates factored in the regional changes in availability of employment as they weighed whether or not to apply for and enroll in college.

Research Methodology

In public policy, one of the chief aims of research is to determine the influence of an intervention on a specific outcome, typically by examining the average influence of an individual factor on the outcome of interest. Unobservable characteristics, however, if they could be detected, may produce different estimates of the effectiveness of the intervention. For example, the estimated effects of a specific intervention that was tested in one region

may not produce the same effect in different regions if there is something unique to the area where the intervention occurred. Additionally, if the measurement of the outcome of interest (e.g., enrolling in college) is imprecisely measured in a non-random manner, the estimated impact of any intervention may be biased, leading to faulty conclusions and/or policy recommendations. For these reasons, it is crucial that policy makers look at local and regional data of high quality before reaching any conclusions about policy efforts that are fundamentally local and regional in their implementation.

Research Questions

This analysis seeks to address the following major research questions:

1. How do recent high school graduates differ by region?
2. To what extent does using different outcome data sources influence which factors are associated with initial college enrollment?
3. To what extent do the factors affecting initial college enrollment differ among regions in Texas?

Research Data and Methodology

The data used for this analysis are drawn from the Texas Education Research Center (ERC), which houses de-identified, individual-level data on all individuals in Texas who either attend school or work. Data included in the ERC are provided by the Texas Workforce Commission (TWC), the Texas Education Agency (TEA), and the Texas Higher Education Coordinating Board (THECB). More specifically, the data include the following:

- Secondary school records, including courses taken, demographic information, and high school graduation records,
- National Student Clearinghouse (NSC) records through Spring 2010,[4]
- THECB college enrollment records through December 2012,
- Unemployment Insurance (UI) wage records and employment and earnings information from TWC through December 2012,
- The Workforce Information System of Texas (TWIST) workforce program

[4] Texas obtained NSC data for the 2008 and 2009 cohorts for the last time in Spring of 2010.

participation records through December 2012, including:

- Workforce Investment Act (WIA)
- Trade Adjustment Assistance (TAA)
- Temporary Assistance for Needy Families Employment and Training (Choices)
- Supplement Nutrition Assistance Program Employment and Training (SNAP E&T)

Previous research using local data from the Central Texas Student Futures Project demonstrated that some information, such as parental education, plays an important role in whether students successfully matriculate to college (Cumpton et. al., 2012). While parental education is not collected through the Public Education Information Management System (PEIMS), some very important variables that help to explain postsecondary enrollment outcomes remain. Available demographic information consists of racial/ethnic characteristics, and gender. Student background information includes the language spoken at home and whether the student received free or reduced lunch during the senior year. Researchers used high school coursework information to determine whether a student failed a course during the 9th grade, took an advanced math course, received credit for taking an Advanced Placement (AP) or International Baccalaureate (IB) course, or received college credit for a course taken in high school (dual credit). The student's graduation plan serves as a proxy for the academic rigor of coursework taken. Employment, workforce program participation, and college enrollment outcomes are also available within the ERC. To answer the first research question, means of each of these variables were calculated by region and presented graphically.

Two strategies were employed to answer the last two research questions. Estimates of factors related to postsecondary education may differ if a region uses either the THECB or NSC data to measure college enrollment. Researchers ran regression models using the same independent variables and then used either of these data sources (THECB or NSC) as well as a 'true' outcome measure that combines information from both data sources. As it is likely that direct-to-college enrollment estimates are correlated within campuses (some campuses likely have a long history of enrolling high school graduates in colleges, while others may not), standard errors are specifically calculated to account for the fact that the individuals are clustered within campuses and thus are not independent. Each comparable regression

estimate was tested across the two data sources in relation to the 'true' measure of direct-to-college enrollment using a generalized Hausman specification test (Hausman, 1978).

In an effort to answer the second research question, these same regressions were run again for each of the regions, but rather than use either THECB or NSC data alone, the constructed dependent variable uses both of these datasets to more accurately measure direct-to-college enrollment. These true results, which omit the measurement error found in using a single outcome dataset, are graphically represented for greater clarity.

Organization of the Report

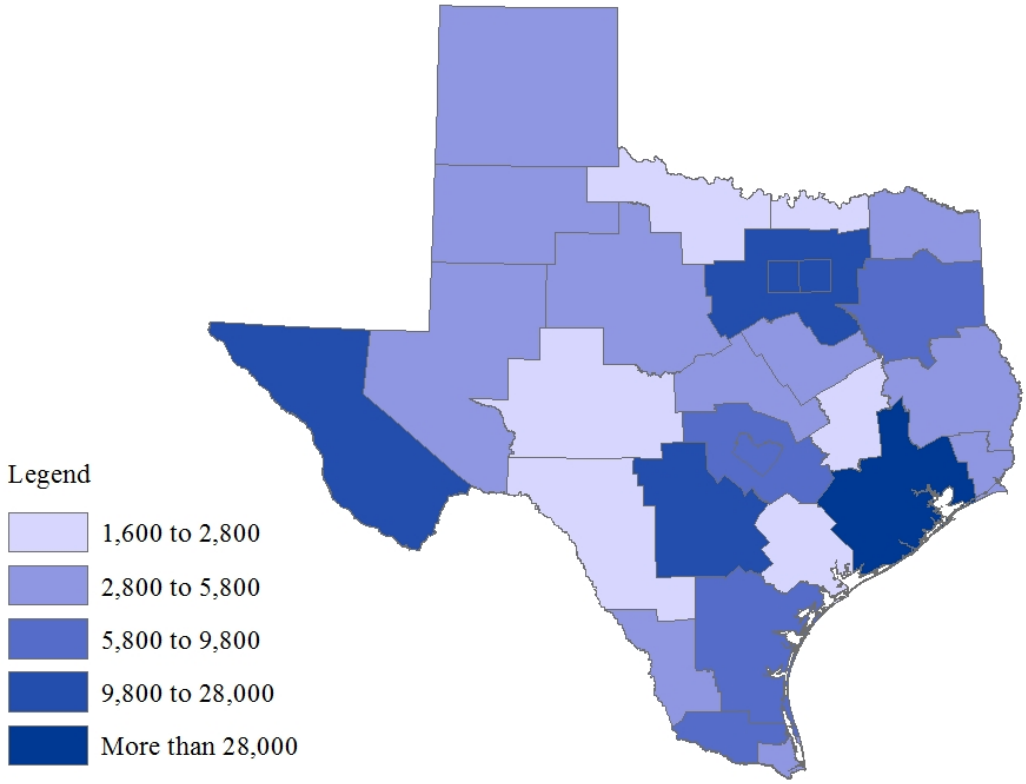
The next section describes regional graduate characteristics at the Local Workforce Development Areas (LWDA) level, including the number, racial/ethnic make-up, and economic status of high school graduates from 2008.[5] Transitions to employment, workforce programs, and college enrollment by region are discussed in the following section. This section also describes the regional analysis, including a discussion of results comparing the use of THECB or NSC data as well as regionally-based factors associated with postsecondary enrollment. The concluding section of the report presents key findings on high school graduate outcomes at the regional level, presenting recommendations for both college and workforce transition services.

[5] These characteristics did not differ significantly between the two cohorts.

REGIONAL HIGH SCHOOL GRADUATE CHARACTERISTICS

A total of 516,232 high school graduates were studied for this analysis: 251,972 in the 2008 cohort and 264,260 in the 2009 cohort. Texas LWDA regions vary greatly in the number of graduates as well as their demographic composition. Some rural regions in Texas graduated fewer than 2,800 high school students in 2008, while the Gulf Coast region (which includes Houston) graduated more than ten times that number (Figure 4).

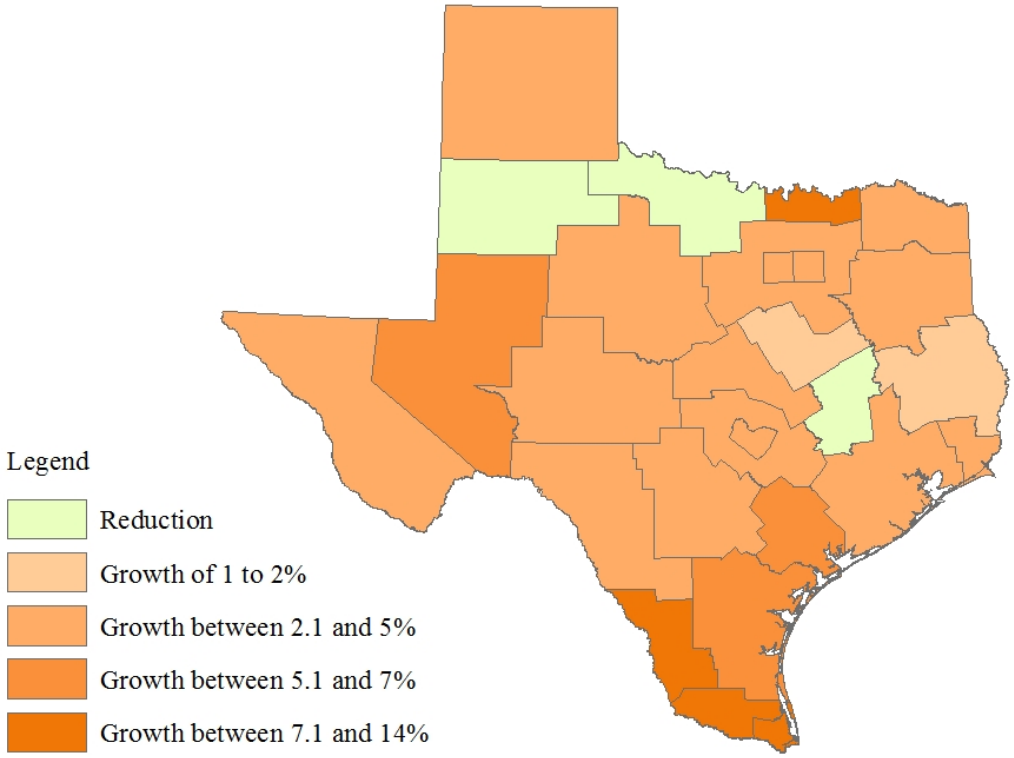
Figure 4. Number of 2008 High School Graduates, by LWDA



Source: Texas Education Research Center (ERC) data maintained at the Texas Higher Education Coordinating Board.

In 2009, three regions – the South Plains, North Texas, and the Rural Capital Area – graduated fewer high school students than graduated in 2008 (Figure 5). Every other region graduated more students in 2009 than 2008, with a growth rate greater than 5% in the northern region of Texoma, and in South Texas, the Lower Rio Grande Valley and Cameron regions.

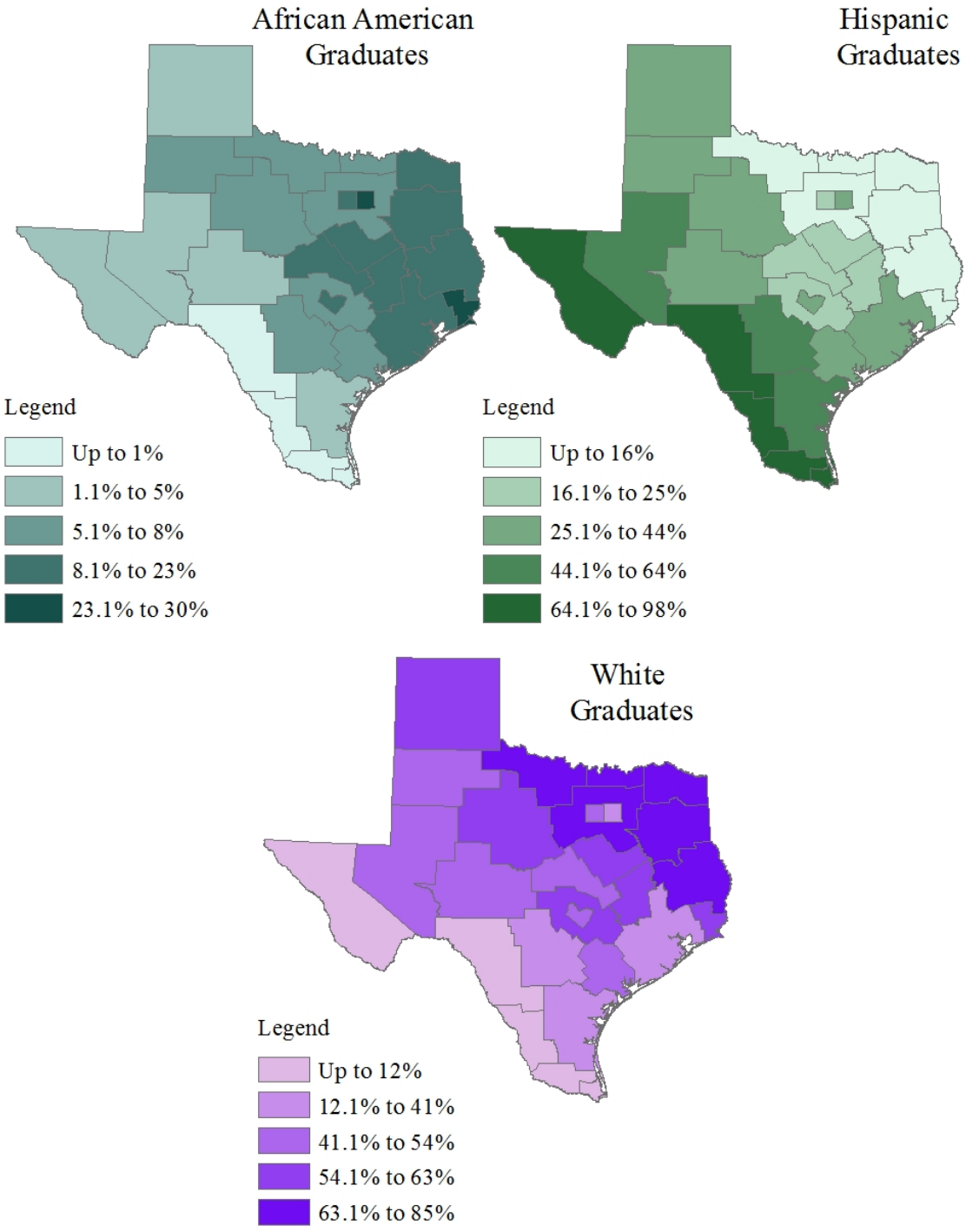
Figure 5. Percentage Change in Number of High School Graduates (2008 to 2009), by LWDA



Source: Texas Education Research Center (ERC) data maintained at the Texas Higher Education Coordinating Board.

The racial/ethnic composition of Texas varies considerably by region (Figure 6). In LWDA regions along the border with Mexico, the overwhelming majority of high school graduates are Hispanic. Generally, the further away from the border, the smaller the share of Hispanic graduates there are in each region. In East Texas and in urban areas like Austin, Houston, Dallas, and Ft. Worth, African-American students make up more than 8% of regional high school graduates, reaching around a quarter of graduates in some East Texas regions. The share of white non-Hispanic students graduating from high school is highest in the northeast of Texas, composing more than 50% of all high school graduates.

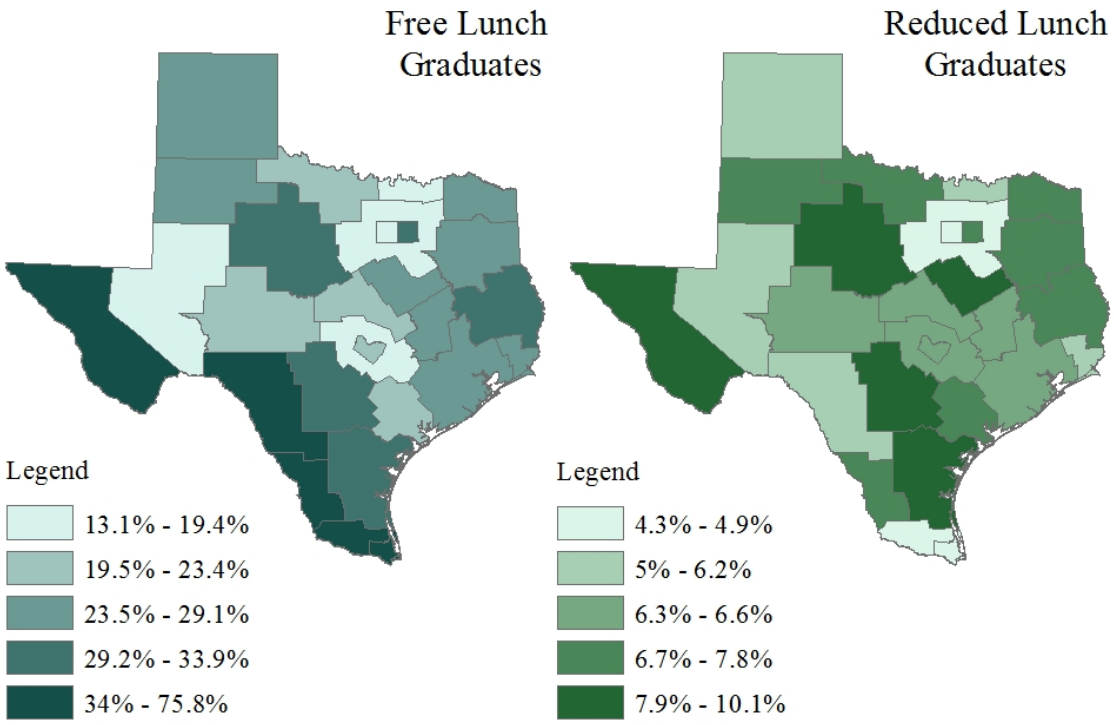
Figure 6. Shares of High School Graduates, by Demographics and LWDA



Source: Texas Education Research Center (ERC) data maintained at the Texas Higher Education Coordinating Board.

In a few Texas regions, just 13% of graduates received free lunch services as high school seniors, while in other regions almost three-quarters of seniors received free lunch (Figure 7). Rates of seniors who received reduced lunch services were similar. The regions with the largest share of graduates receiving free lunch are along the southern border with Mexico. Regions with the smallest share of high school graduates receiving free lunch occur just outside major urban areas, including the Rural Capital Area and North Central Texas.

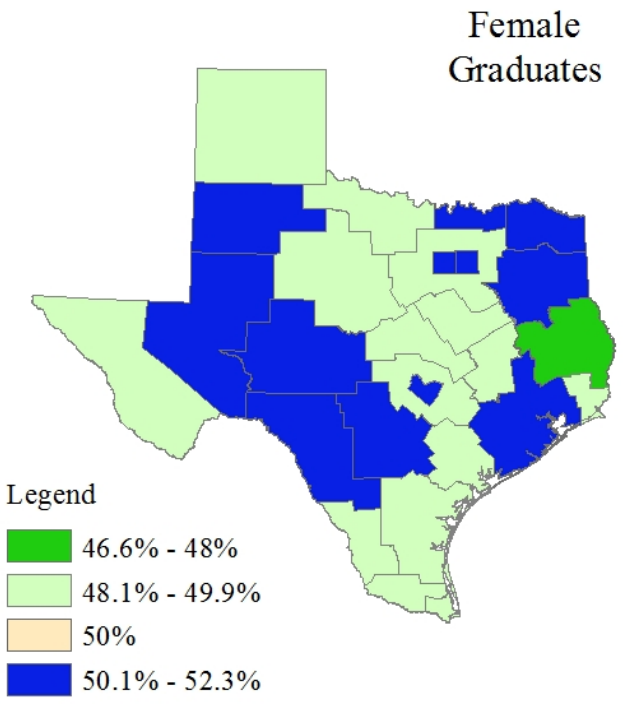
Figure 7. Shares of High School Graduates, by Free or Reduced Lunch Status



Source: Texas Education Research Center (ERC) data maintained at the Texas Higher Education Coordinating Board.

Figure 8 shows gender makeup of the studied cohorts. While statewide the share of male and female graduates is about equal, there are regional differences.

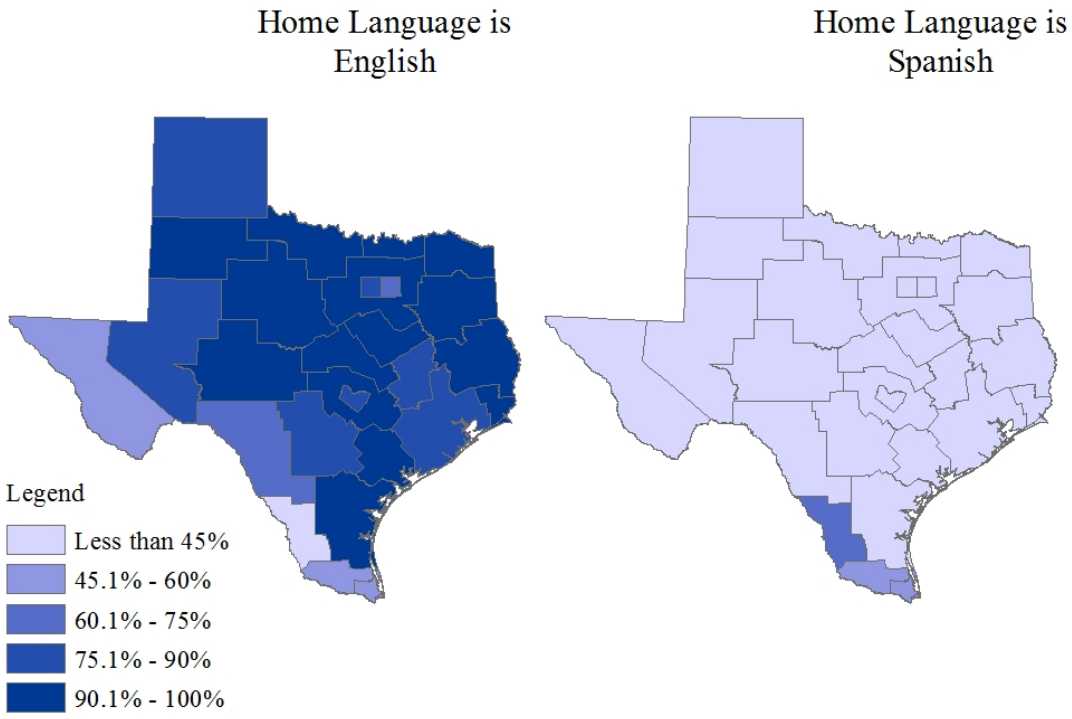
Figure 8. Shares of High School Graduates, by Gender



Source: Texas Education Research Center (ERC) data maintained at the Texas Higher Education Coordinating Board.

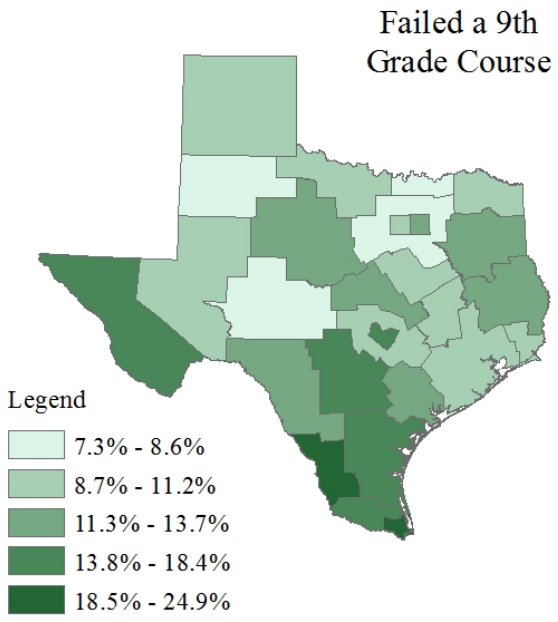
Student backgrounds also vary by region. In most regions, a large share of high school graduates lived in English-speaking households, though some regions in the south of Texas had relatively larger shares of students living in Spanish-speaking households (Figure 9). Only a very small share of graduating students in any region were from families who spoke neither English nor Spanish.

Figure 9. High School Graduates' Home Language, by LWDA



Source: Texas Education Research Center (ERC) data maintained at the Texas Higher Education Coordinating Board.

Figure 10. Share of High School Graduates who Failed a 9th Grade Course, by LWDA



Source: Texas Education Research Center (ERC) data maintained at the Texas Higher Education Coordinating Board.

High school graduates differed by region in their course-taking behavior as well. Figure 10 (above) shows the share of students who failed a 9th grade course. Regions in the south of Texas have the largest share of graduates who failed a course during their 9th grade year, though urban regions like Austin and Dallas also have relatively high shares of graduates who failed a 9th grade course.

In Texas, there are essentially three ways for a student to obtain college credit while in high school. Districts may have dual credit agreements with local community colleges that allow students to take a college course, sometimes at the college and sometimes at the high school. Not all districts have a community college close enough to provide these services, however. Additionally, students may take Advanced Placement (AP) courses and exams developed by the College Board that colleges may accept in place of courses taught at that college, granting college credit as if the student had passed that course while at college. Likewise, not all districts have the capacity to offer AP programs. Finally, students who complete an International Baccalaureate (IB) program at their high school may also receive college credit for higher-level IB courses taken during the junior and senior years (College, 2012).

All of these potential college credit courses require certified teachers who also receive additional training (in some cases PhDs); thus, the supply of qualified teachers in certain regions may be lower than the demand. Alternatively, some regions, particularly rural areas, may have difficulty in developing consistent demand for courses from year to year.

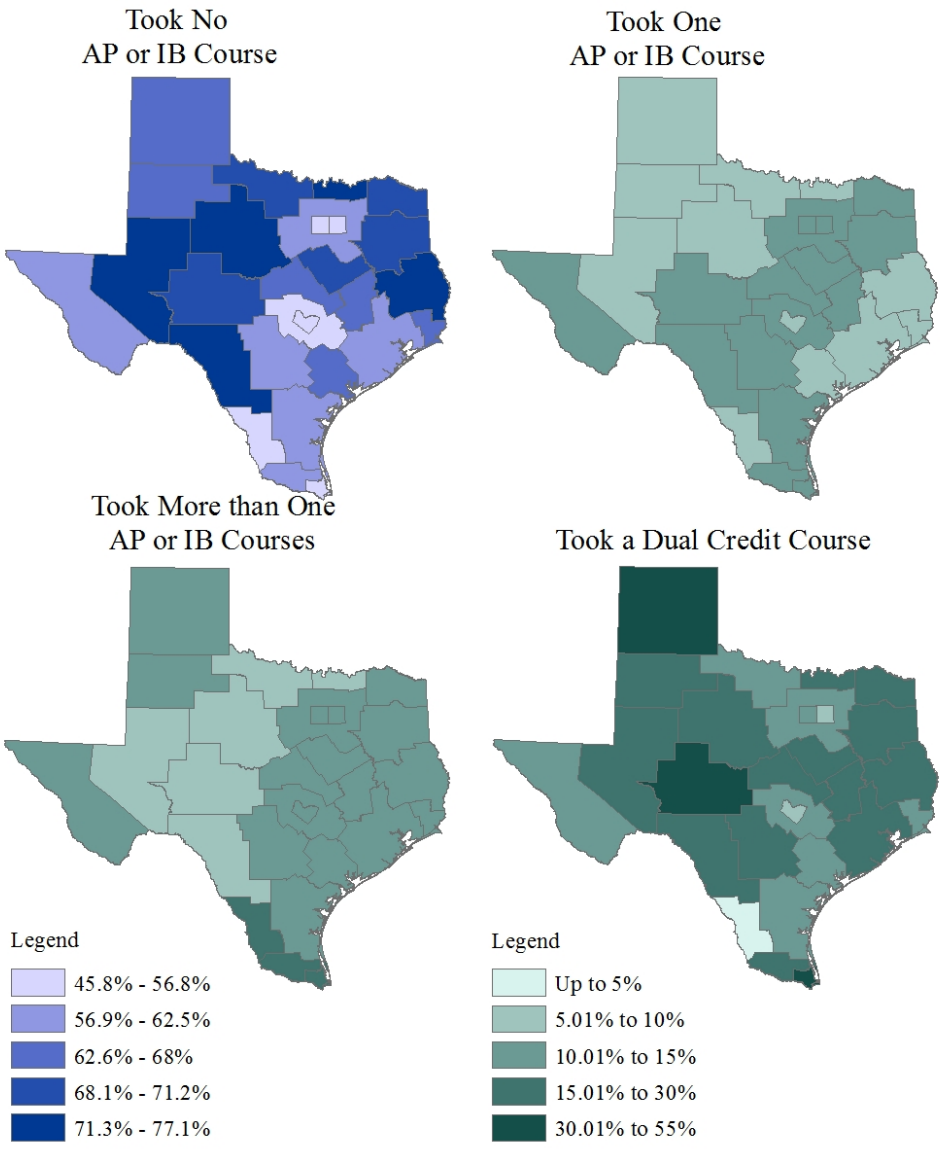
Figure 11 illustrates the share of students in each region that took an AP, IB, or Dual Credit course. The eastern part of Texas and the western rural regions had the largest share of students taking at least one AP or IB course.[6] A broad swath of regions from the northeast of Texas to the border with Mexico had between 10% and 15% of their high school graduating class take only one AP or IB course. In the panhandle of Texas, the Upper Rio Grande region (which includes El Paso) and in regions including and to the east of Interstate Highway 35, between 10% and 15% of high school graduates took more than one AP or IB course. In the far south of Texas, along the border with Mexico, between 15% and 30% of high school

[6] As there are only 59 IB high school campuses across Texas, students taking an IB course are grouped in maps with students taking an AP course. Note that taking an AP course prepares a student for the AP exam. Student performance on the exam may lead to college credit.

graduates took an AP or IB course.

Regions that had a fairly large share of students taking no AP of IB courses had relatively high rates (between 15% and 30%) of students taking a dual credit course. Some regions, including those in the eastern part of the state and in the far south along the border, had relatively high rates of students taking an AP or IB course as well as relatively high rates of students taking dual credit courses.

Figure 11. AP or IB, and Dual Credit Course-Taking, by LWDA

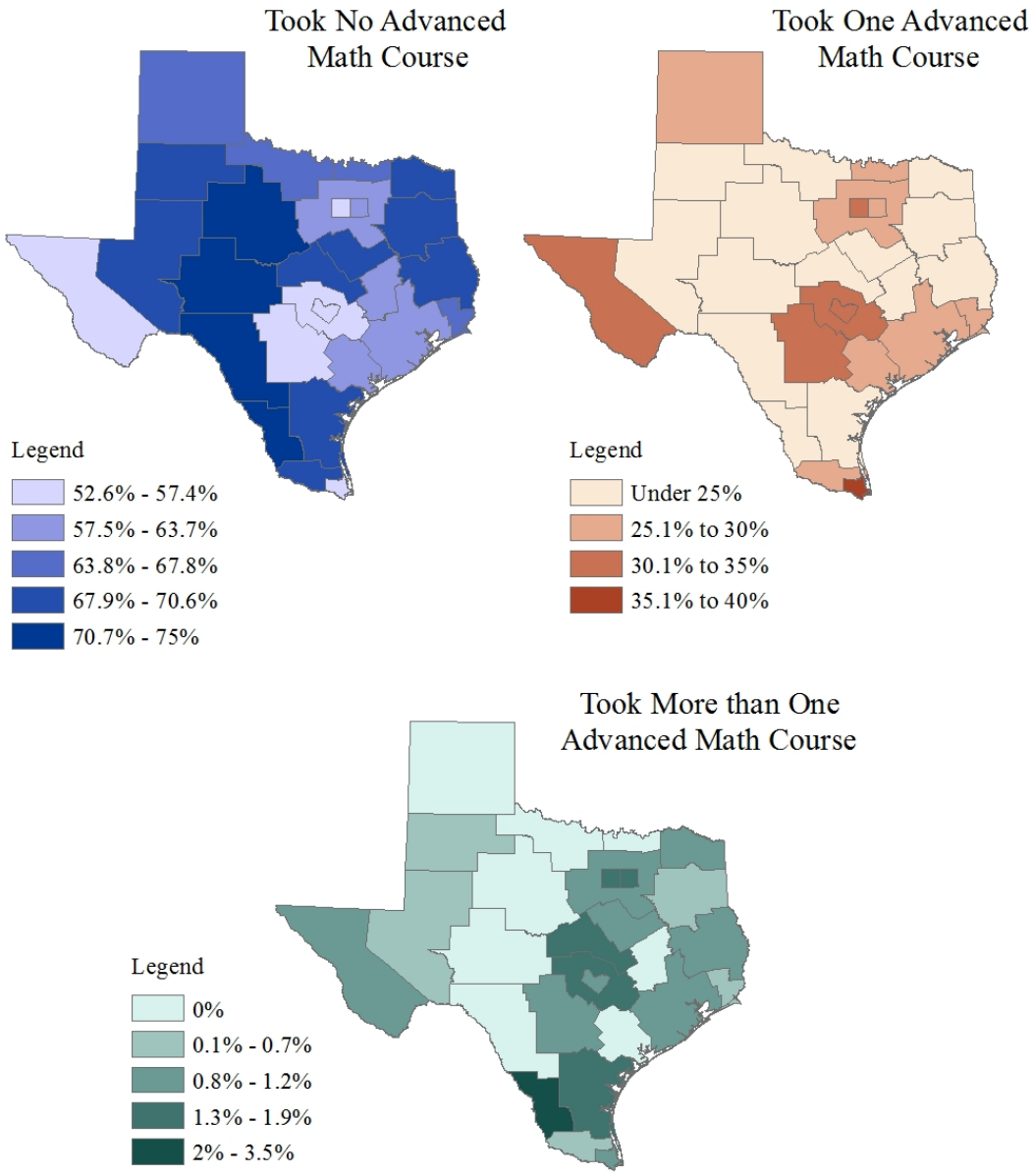


Source: Texas Education Research Center (ERC) data maintained at the Texas Higher Education Coordinating Board.

For this analysis, the classification of "advanced math," includes all courses beyond Algebra II that are intended to provide academic rigor in preparation for college. These courses include all courses for which Algebra II is a prerequisite (such as pre-calculus, calculus, or trigonometry, or statistics) as well as AP math courses usually taught in the junior and senior years of high school. Just as with AP, IB, and dual credit courses, these upper-level mathematics courses require teachers with a relatively high degree of field-level competence, which may be in short supply in certain regions. Additionally, demand for these courses may not be sufficient to ensure they are taught in small schools every year.

Across the state, fewer than 4% of all high school graduates took an advanced math course. In most regions, less than a quarter of high school graduates took one advanced math course, with the Cameron region in the far south of Texas seeing the highest share (between 35% and 40%) (Figure 12). The Upper Rio Grande, Capital Area, Rural Capital Area, and Tarrant County regions had between 30% and 35% of their high school graduates taking an advanced math course. As the sequence of courses required to take an advanced math course includes Algebra I, Geometry, and Algebra II, which usually are taught in the freshman, sophomore, and junior years, the opportunities for students to take more than one advanced math course are often limited. The South Texas region had the highest share of graduates completing two advanced math classes (between 2 and 3.5%).

Figure 12. Advanced Math Courses Taken, by LWDA

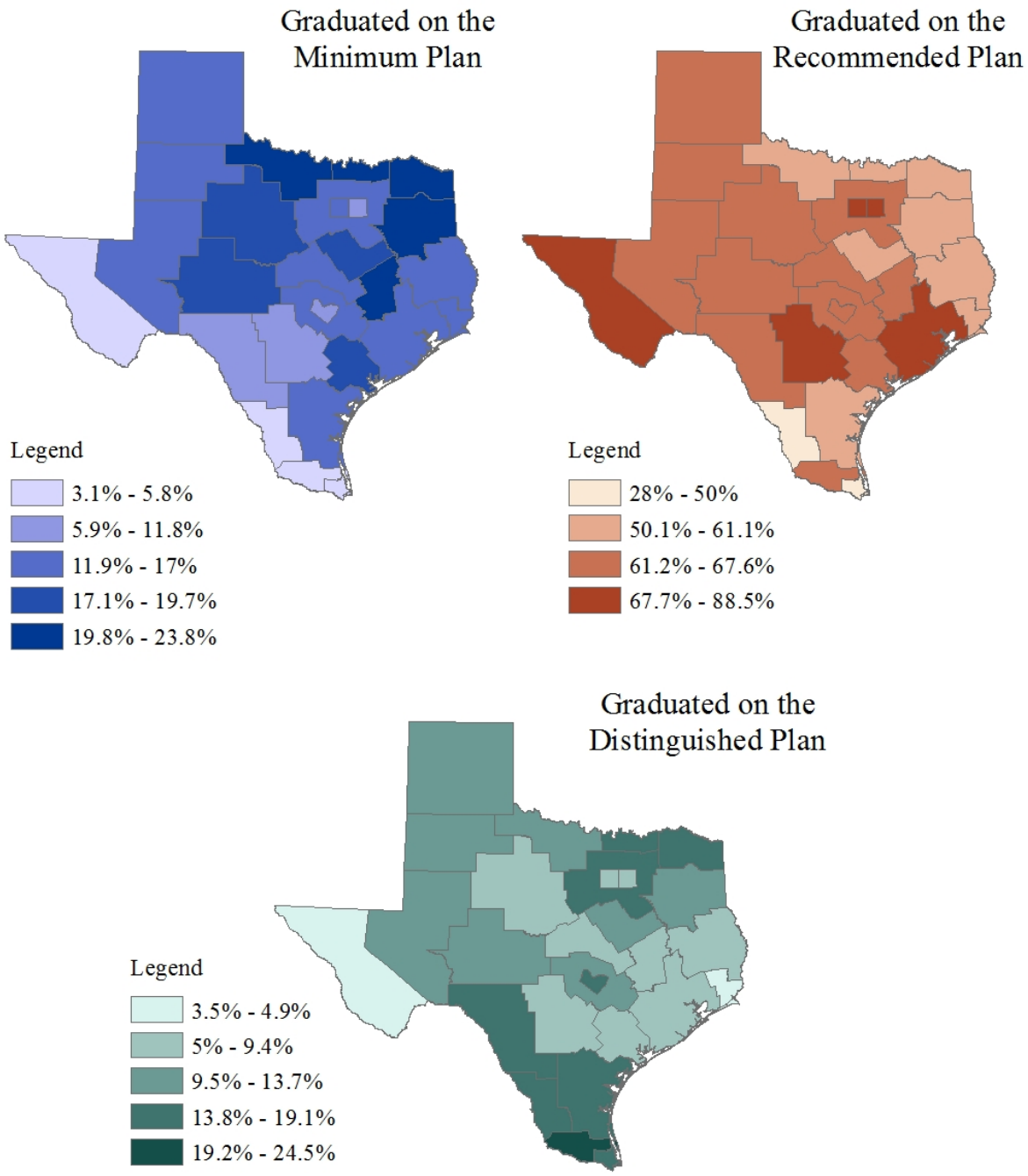


Source: Texas Education Research Center (ERC) data maintained at the Texas Higher Education Coordinating Board.

During the period of this analysis, Texas had five high school graduation plans: the minimum plan, a recommended plan, a distinguished plan, and two types of plans for special education students, one for students who participated primarily in life skills courses and one for students who graduated based on completion of their Individualized Education Plan (IEP). Figure 13 shows the share of students who graduated on each of the three most common graduation plans (minimum, recommended, and distinguished).

Each of the graduation plans is intended to offer a progressively more rigorous curriculum, so students on the recommended plan have to take more academically rigorous courses than students who graduate on the minimum plan and students on the distinguished plan have the plan with the highest level of academic rigor. High school students who entered the 9th grade beginning in the 2004-2005 school year (which includes the class of 2008), were automatically placed into the recommended plan and needed special permission from their parents in order to drop to the minimum plan. However, for most regions in Texas, only between 45% and 68% of high school students graduated on the recommended plan.

Figure 13. Graduation Plan Completed, by LWDA



Source: Texas Education Research Center (ERC) data maintained at the Texas Higher Education Coordinating Board.

POSTSECONDARY TRANSITIONS BY REGION

Students who graduate from high school tend to enroll in college, go to work, or enroll and work. For individuals who hope to complete college, the transition point immediately after high school is particularly important: high school graduates who immediately enroll in college in the fall after graduation are much more likely to graduate from college than those who delay college entry. Once students enter college, they can at least partially delay or accelerate college graduation in response to changing labor market conditions. Individuals who choose to enter the labor market and not enroll in college do not have the option of timing their high school graduation to enter a more favorable labor market and so are more likely to experience the immediate consequences of recessions. This section examines these transitions, beginning with employment and participation in various workforce services and ending with enrollment in college.

Employment Transitions

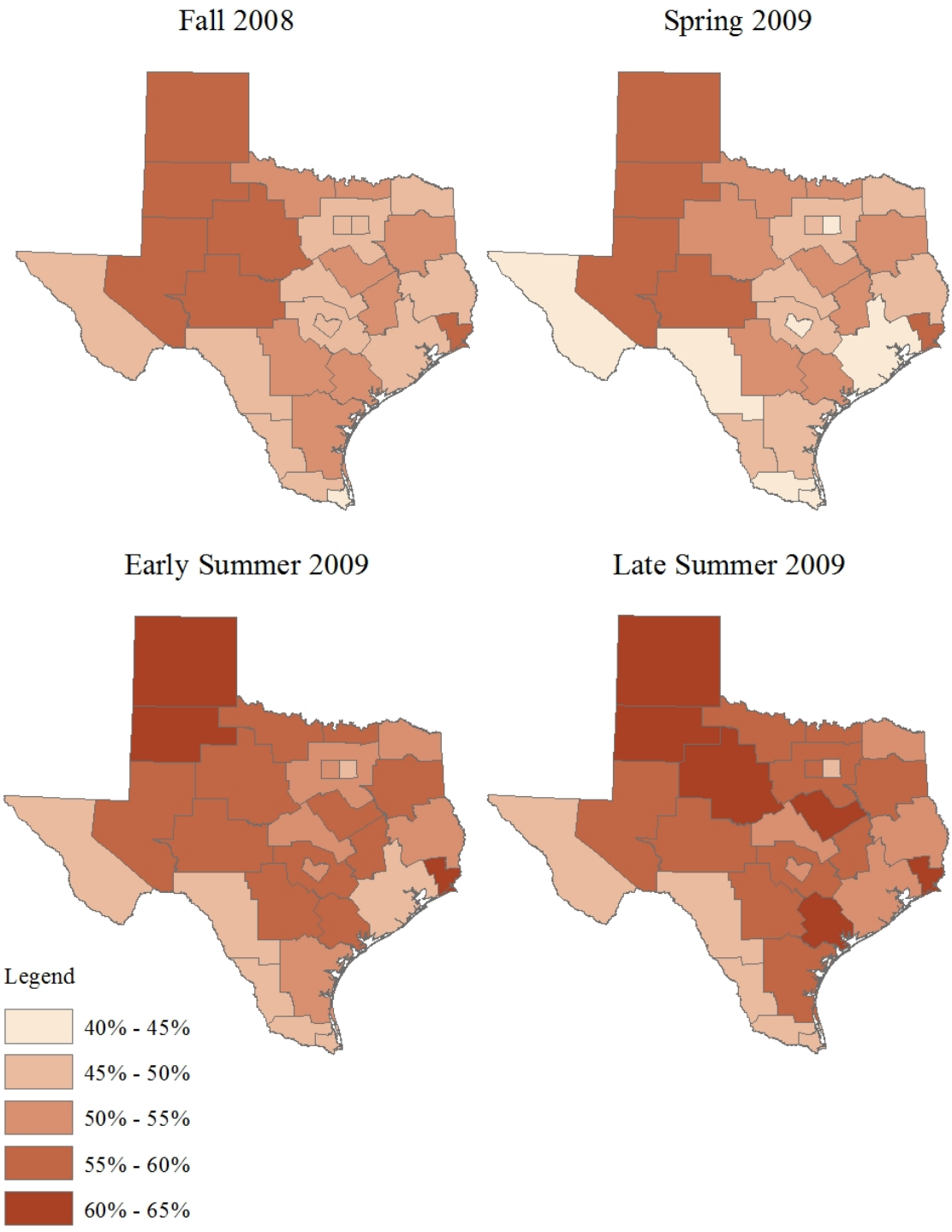
Regardless of whether high school graduates enroll in college, many look for and find work, although this is dependent on the conditions of the labor market they enter. Comparing employment outcomes between the classes of 2008 and 2009 allows a glimpse into whether each class experienced a differential impact from the Great Recession, which hit the Central Texas labor market in earnest in late 2008.

Employment Rates

In each region, at least 40% of the class of 2008 graduates were employed in the fall immediately after high school graduation (Figure 14).[7] In Southeast Texas, and in the regions just south of the Panhandle, more than 55% of high school graduates found employment. Employment statistics on recent high school graduates are seasonally variable, with employment rates tending to increase during summers when college-attending students who did not work during the school year flow into the labor market. This seasonal employment pattern is evident in most Texas regions.

[7] Employment and earnings information is derived from UI wage records from the TWC.

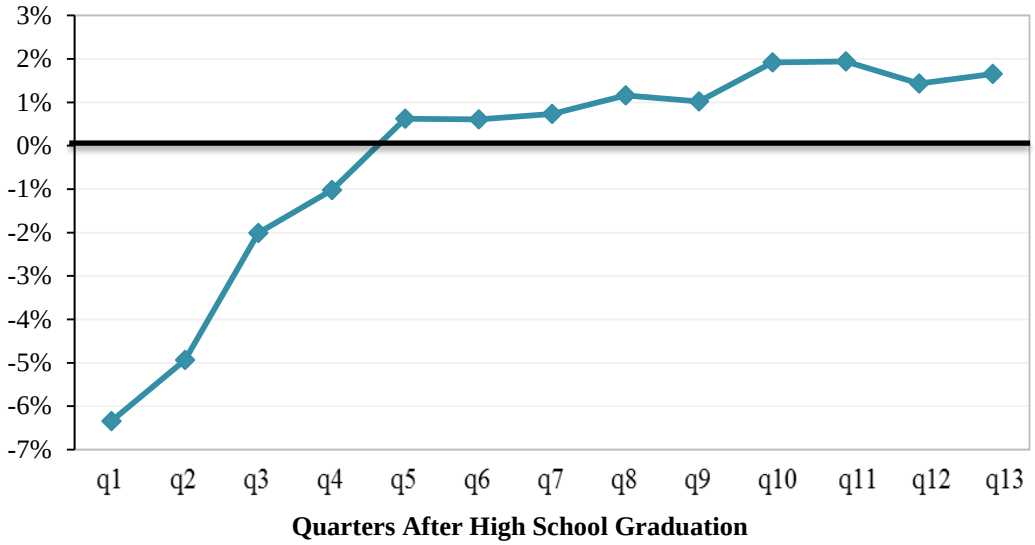
Figure 14. Shares of 2008 High School Graduates Employed, by LWDA



Source: Texas Education Research Center (ERC) data maintained at the Texas Higher Education Coordinating Board.

While the class of 2008 encountered a relatively strong labor market immediately following graduation, the class of 2009 graduated as the Great Recession began to severely affect Texas. However, the initial difference in the employment rates between the classes of 2008 and 2009 diminished rapidly across all regions as Texas' economy improved over the next few years (Figure 15). For a majority of regions, the employment rate for class of 2009 high school graduates was equal to or greater than that of the class of 2008 in the fall one year after graduation.

Figure 15. Difference in Post-High School Employment Rates for the Class of 2009 Compared to the Class of 2008 over Time *

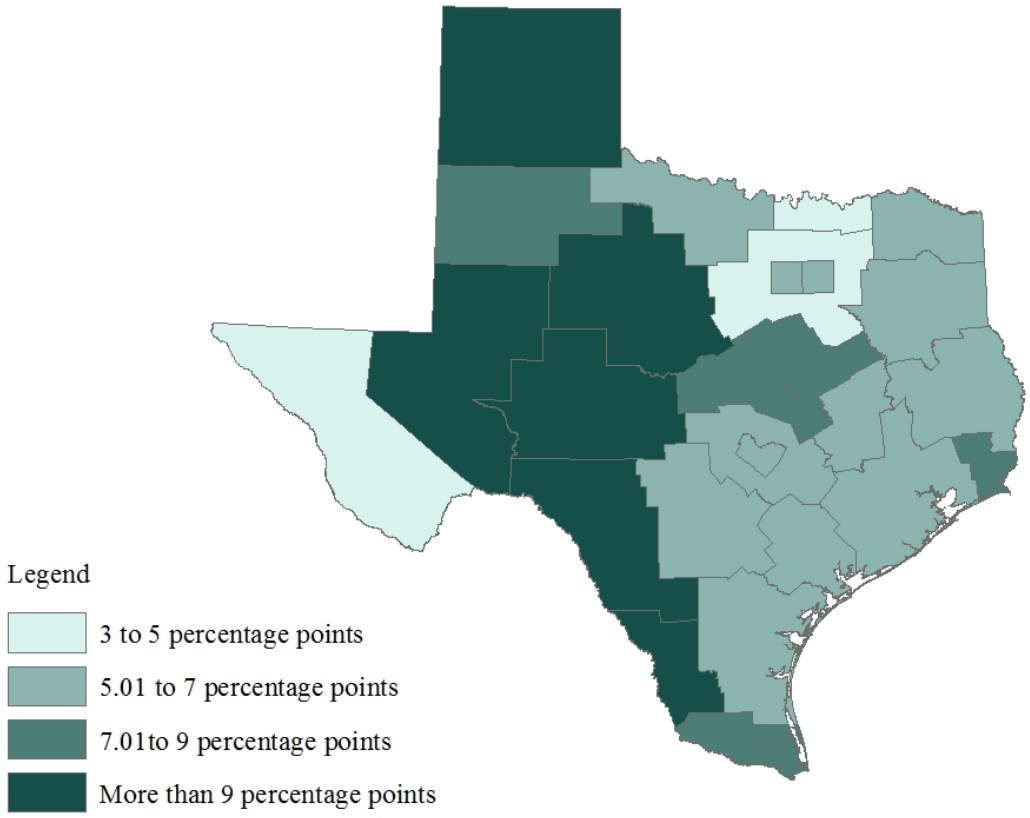


Source: Texas Education Research Center (ERC) data maintained at the Texas Higher Education Coordinating Board.

*Quarter one (q1) is the fourth quarter of the year following high school graduation.

Students graduating from some regions experienced a much sharper drop in their employment rates than others (Figure 16). Students graduating in the counties around the Dallas/Ft. Worth area, the Texoma region, and the upper Rio Grande Valley (which includes El Paso), experienced a drop in employment between the class of 2008 and 2009 of less than 5 percentage points in the 4th quarter of the year in which they graduated. These regions had the smallest drop in employment rate differences. Regions along the border with Mexico and rural regions in west Texas saw the largest declines of 10 percentage points.

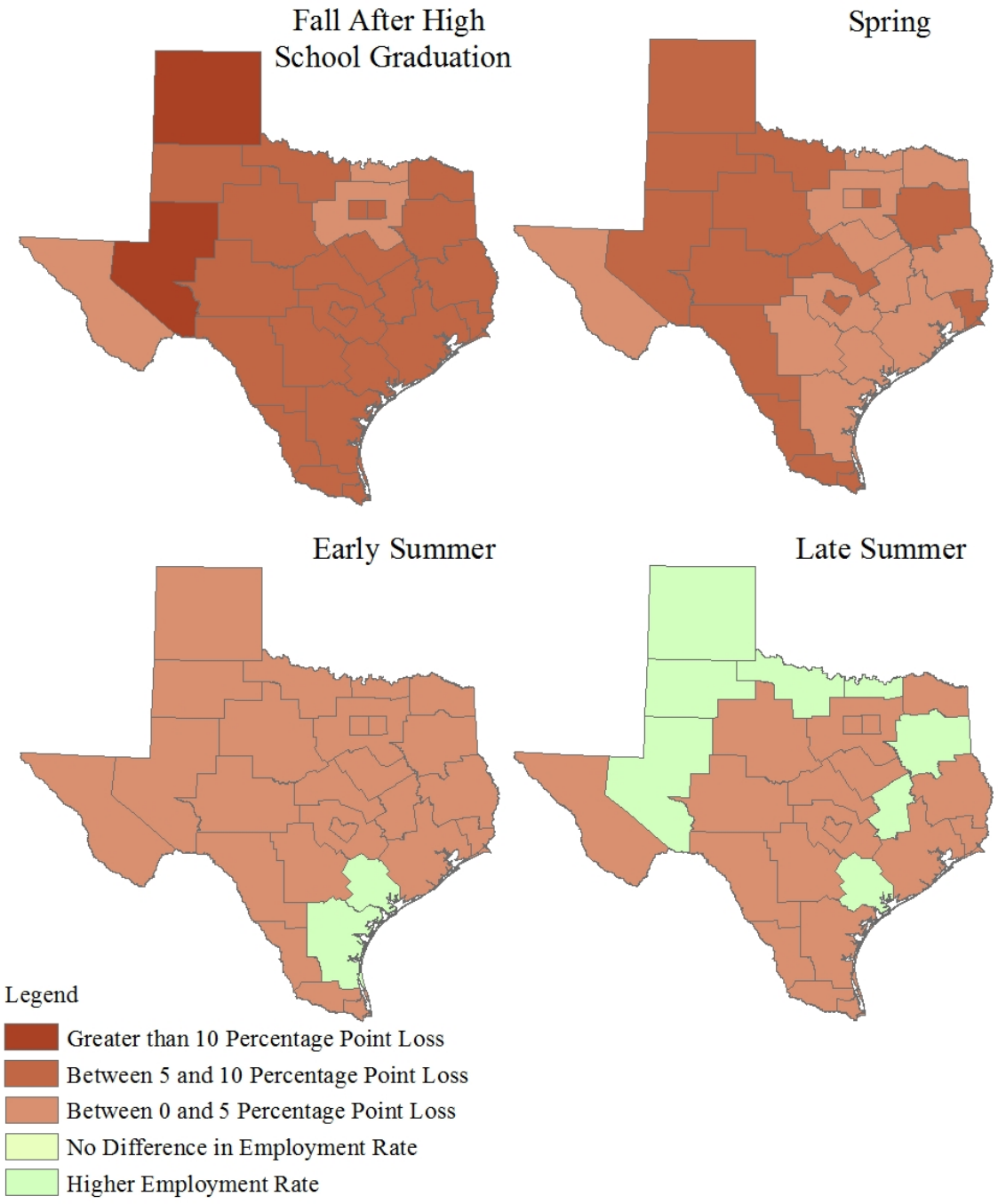
Figure 16. Decline in Fall Employment (4th Quarter) Immediately Following High School Graduation between 2008 and 2009, by LWDA



Source: Texas Education Research Center (ERC) data maintained at the Texas Higher Education Coordinating Board.

All regions experienced a decline between the 2008 and 2009 cohorts in the share of high school graduates employed in the four quarters beginning with the fall following high school graduation. Students graduating from the Panhandle and Permian Basin regions experienced the sharpest drop in employment between the two cohorts (Figure 17). One year after graduation, differences in employment rates between these cohorts were much smaller or even reversed in some cases.

Figure 17. Difference in Post-High School Employment Rates for the Class of 2009 Compared to the Class of 2008 over Time, by LWDA



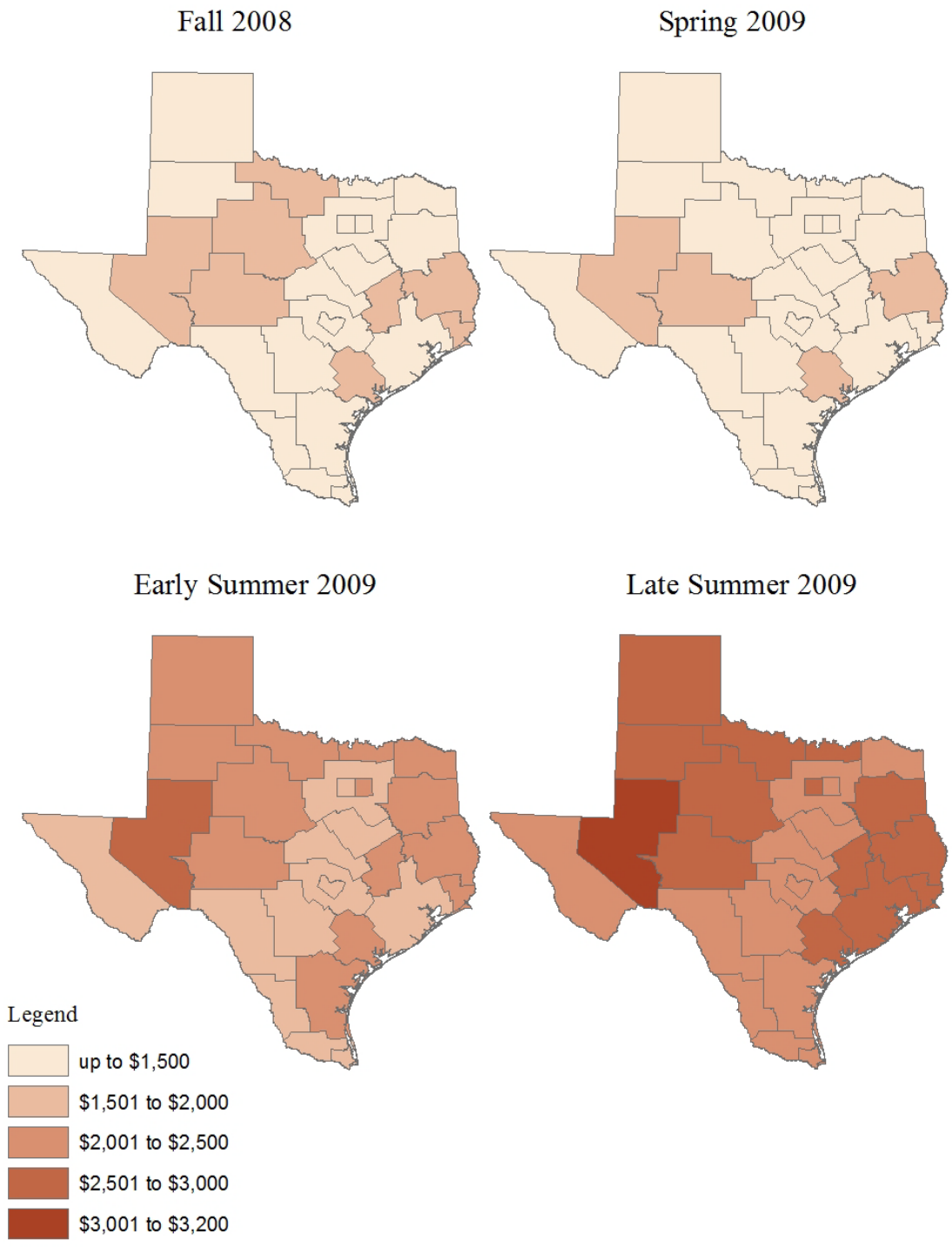
Source: Texas Education Research Center (ERC) data maintained at the Texas Higher Education Coordinating Board.

Mean Earnings

Mean earnings of recent high schools graduates differ significantly depending on whether employed students were also enrolled in college. College students tend to work fewer hours than their non-enrolled counterparts during the fall and spring semesters, which leads to much lower earnings. Texas graduates from the class of 2008 are no exception. Figure 18 shows that in the fall and spring, non-enrolled graduates had average quarterly earnings up to $2,000, while Figure 19 shows that the quarterly earnings of enrolled graduates were only about $1,300 in the fall and spring semesters.

Seasonal trends are also evident in the mean quarterly earnings for workers not enrolling in college in the same semester or quarter, with graduates earning more over the summer a year after high school graduation in all regions (Figure 18). In contrast, high school graduates concurrently enrolled in college and working at the same time during the summer tended to earn less during the summer months (Figure 19).

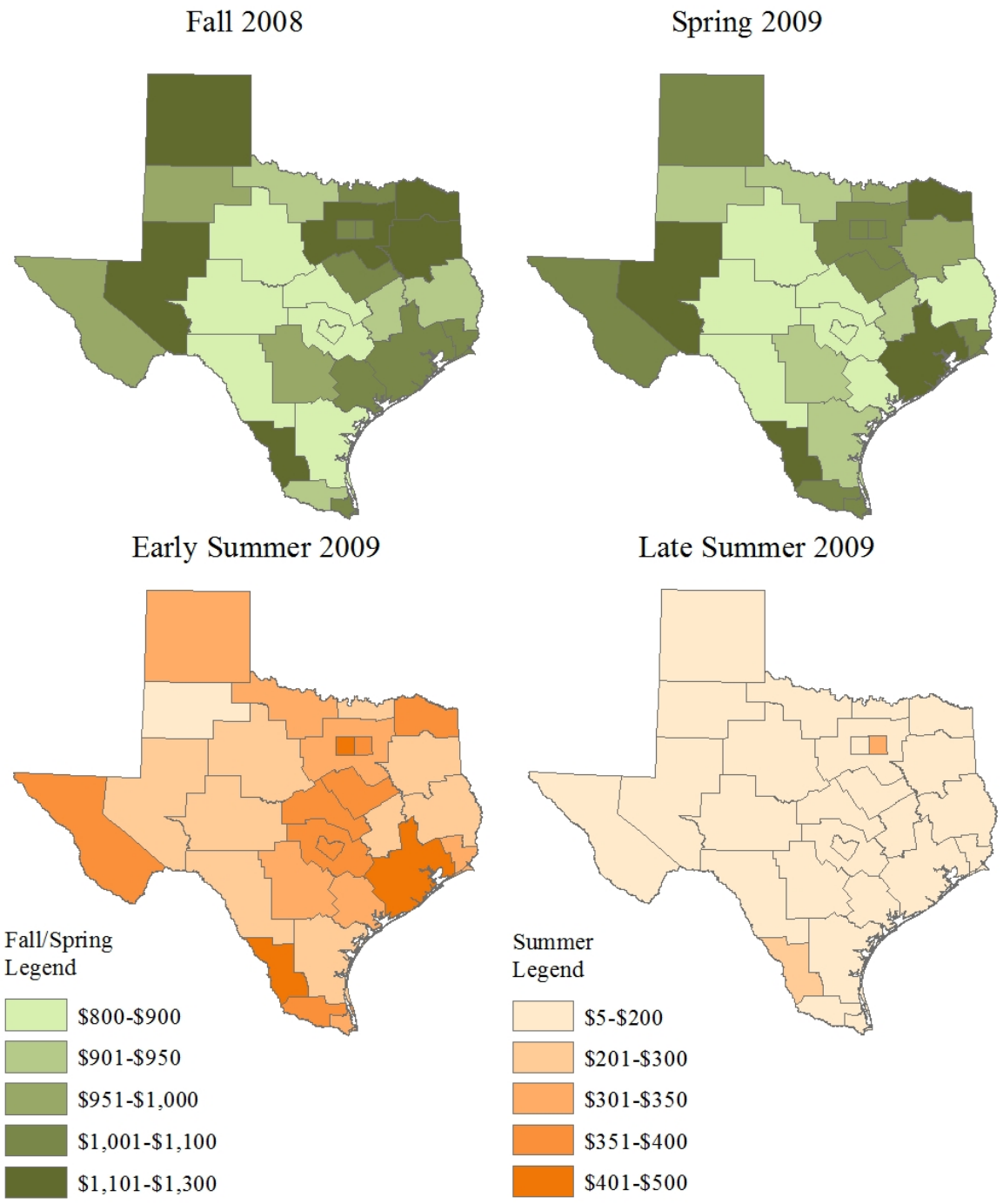
Figure 18. Quarterly Earnings of Non-Enrolled 2008 High School Graduates, by LWDA



Source: Texas Education Research Center (ERC) data maintained at the Texas Higher Education Coordinating Board.

Note: Each figure includes earnings for individuals not enrolled during that quarter only. Thus, individuals enrolled in college in the fall and spring are included in the early and late summer figures if they were not enrolled in college in the early and late summer.

Figure 19. Quarterly Earnings of College-Enrolled 2008 High School Graduates, by LWDA



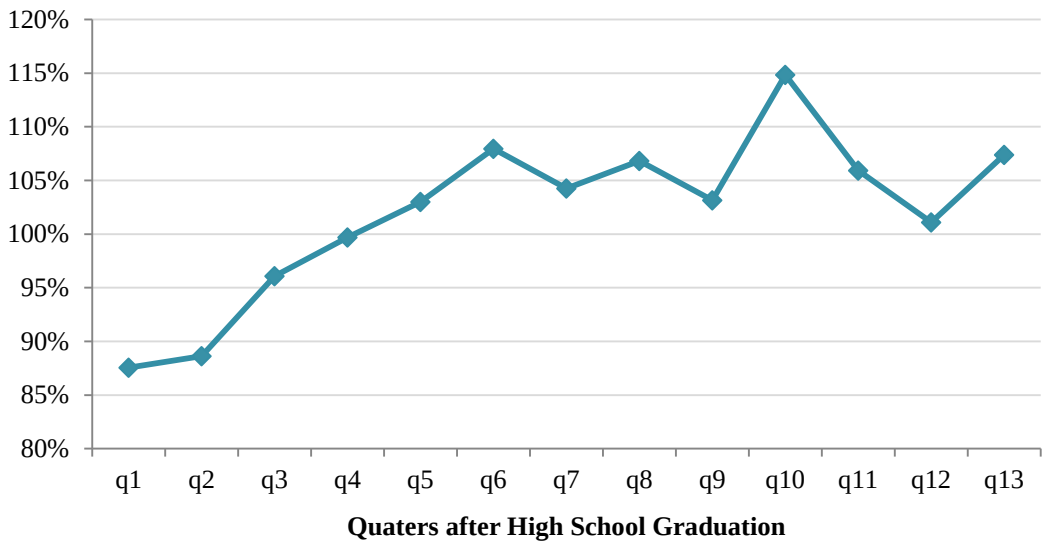
Source: Texas Education Research Center (ERC) data maintained at the Texas Higher Education Coordinating Board.

Note: Each figure includes earnings for individuals enrolled in college during that quarter only. Thus, only individuals enrolled in college during the in the early or late summer are included in those figures.

Young workers encountering a recessionary labor market may experience reduced long-term earnings (Shierholz et. al., 2014). However, high school graduates entering the labor market include both students who plan to attend college and then find a career (which might be unrelated to the work they engage in immediately after high school) and students who do not plan to obtain further education (and whose post-high school employment is a career path signal).

Employed class of 2009 graduates who did not directly enroll in college earned, on average, only 87% of the earnings of the class of 2008 graduates who did not directly enroll in college and who found employment. This drop in mean earnings occurred across almost all regions, with only 2009 graduates from Tarrant and Cameron counties earning mean wages roughly equal to those of 2008 graduates (Figures 20 and 21). Statewide, the decline in mean wages between these cohorts lasted only three quarters, with mean wages between the cohorts being either equal or better for class of 2009 graduates in subsequent quarters.

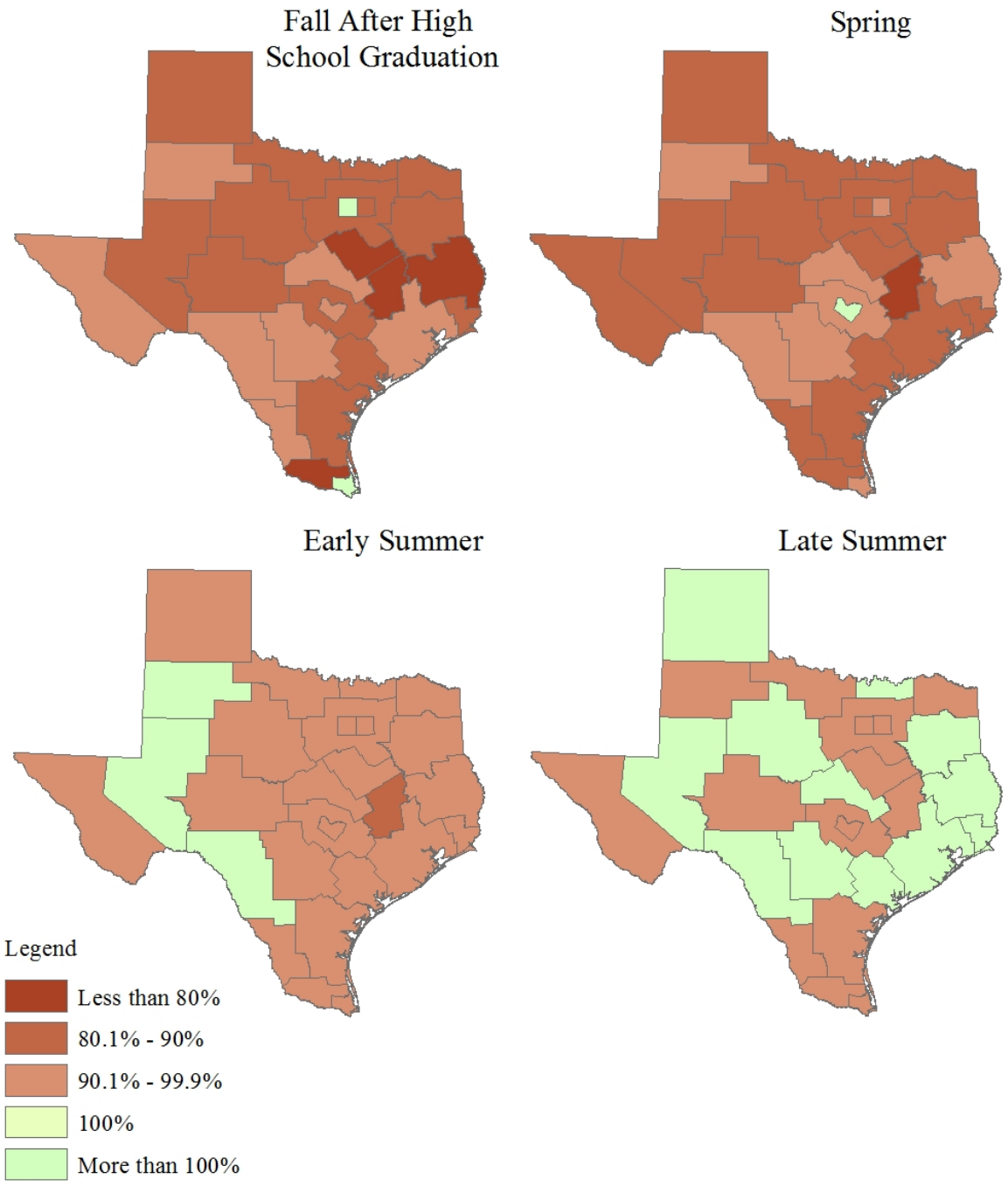
Figure 20. Ratio of Mean Wages of Class of 2009 to Class of 2008 for Graduates Not Enrolled in College and Working After Graduating from High School*



Source: Texas Education Research Center (ERC) data maintained at the Texas Higher Education Coordinating Board.

*Quarter one (q1) is the fourth quarter of the year following high school graduation.

Figure 21. Ratio of Mean Wages of Class of 2009 to Class of 2008 for Graduates Not Enrolled in College and Working After Graduating from High School



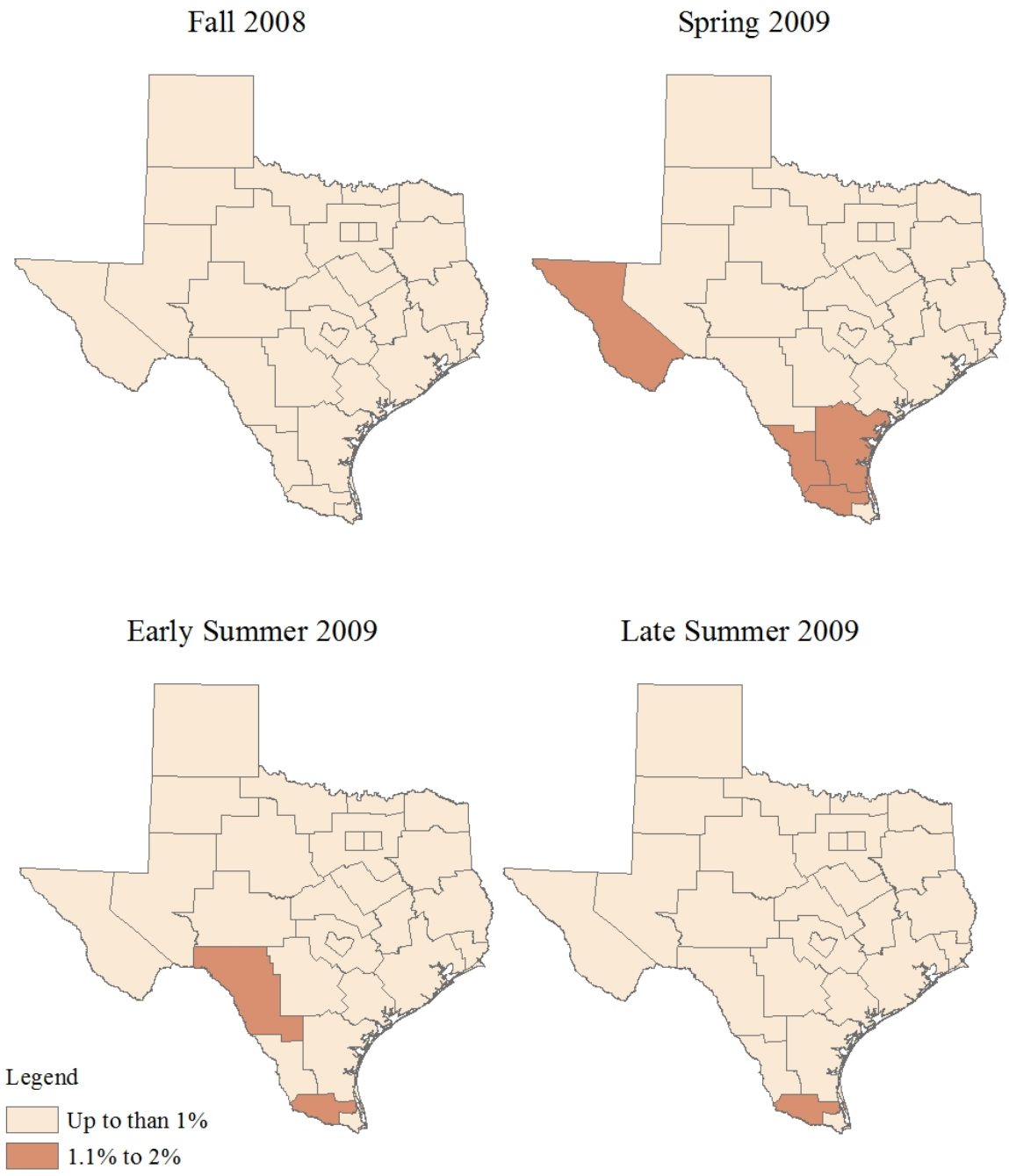
Source: Texas Education Research Center (ERC) data maintained at the Texas Higher Education Coordinating Board.

Workforce Services Transitions

In Texas, recently graduated high school students might be eligible for and participate in a number of workforce programs. Major workforce programs available to these graduates include programs funded through the Workforce Investment Act (WIA), Trade Adjustment Assistance (TAA), Temporary Assistance for Needy Families Employment and Training (Choices), and Supplement Nutrition Assistance Program Employment and Training (SNAP E&T) programs.

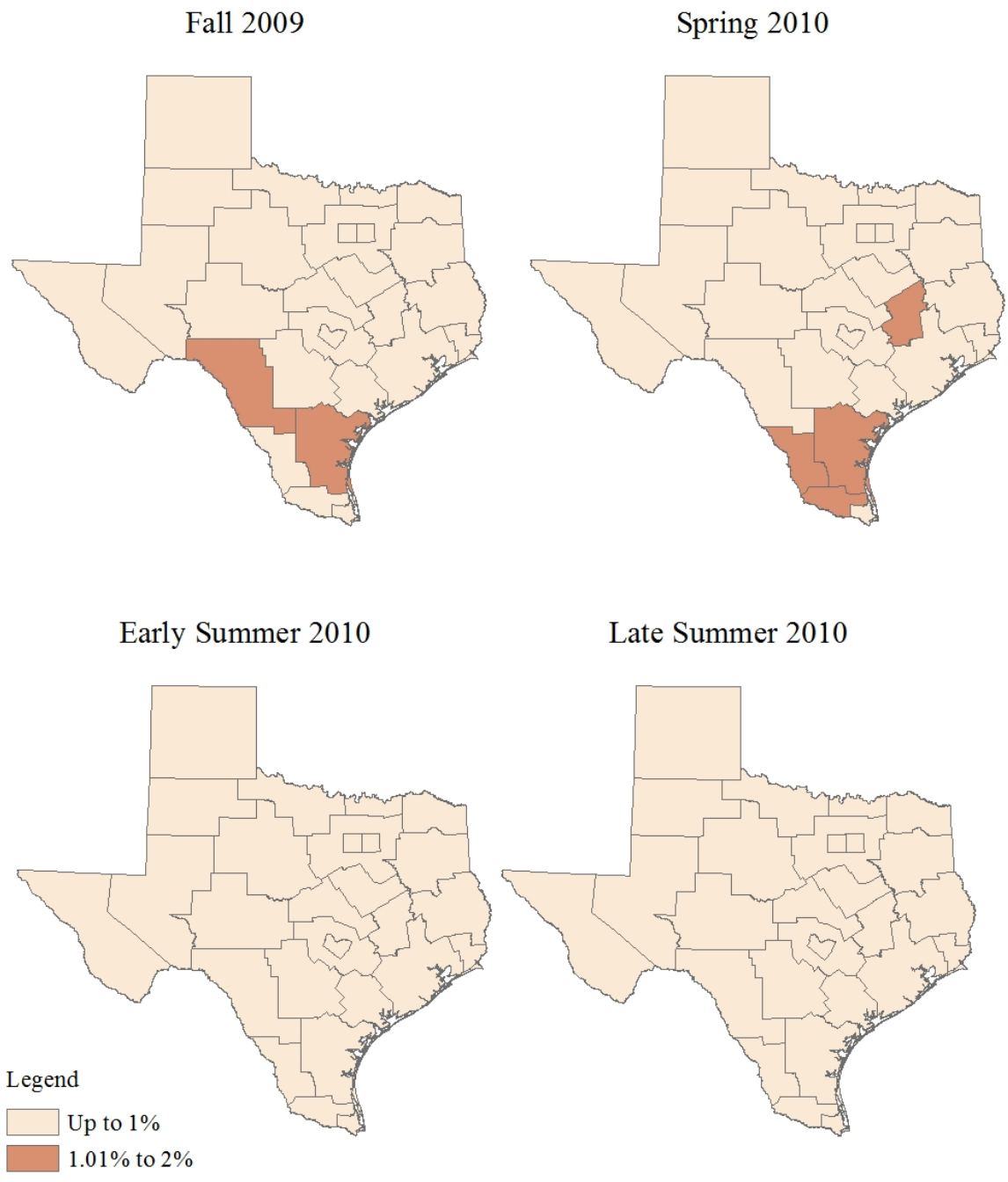
Recently graduated high school students tend not to receive these services, particularly when they encounter a strong labor market. Figures 22 and 23 show the share of students in each region who participated in a workforce program from Fall 2008 through Summer 2010. These figures present the aggregate percentage for all TWC programs as the shares of the individual workforce programs are quite small. In the fall following high school graduation, no more than 1% of the class of 2008 participated in any of these programs. Beginning in the spring of 2009, after the start of the recession, a larger share of the class of 2008 graduates from some regions utilized these services, with utilization rates of up to 2%. This was not a widespread trend, however, as no more than three regions had utilization rates above 1% for the first two years following graduation.

Figure 22. Shares of 2008 High School Graduates Receiving TWC Services (Fall 2008 through Late Summer 2009), by LWDA



Source: Texas Education Research Center (ERC) data maintained at the Texas Higher Education Coordinating Board.

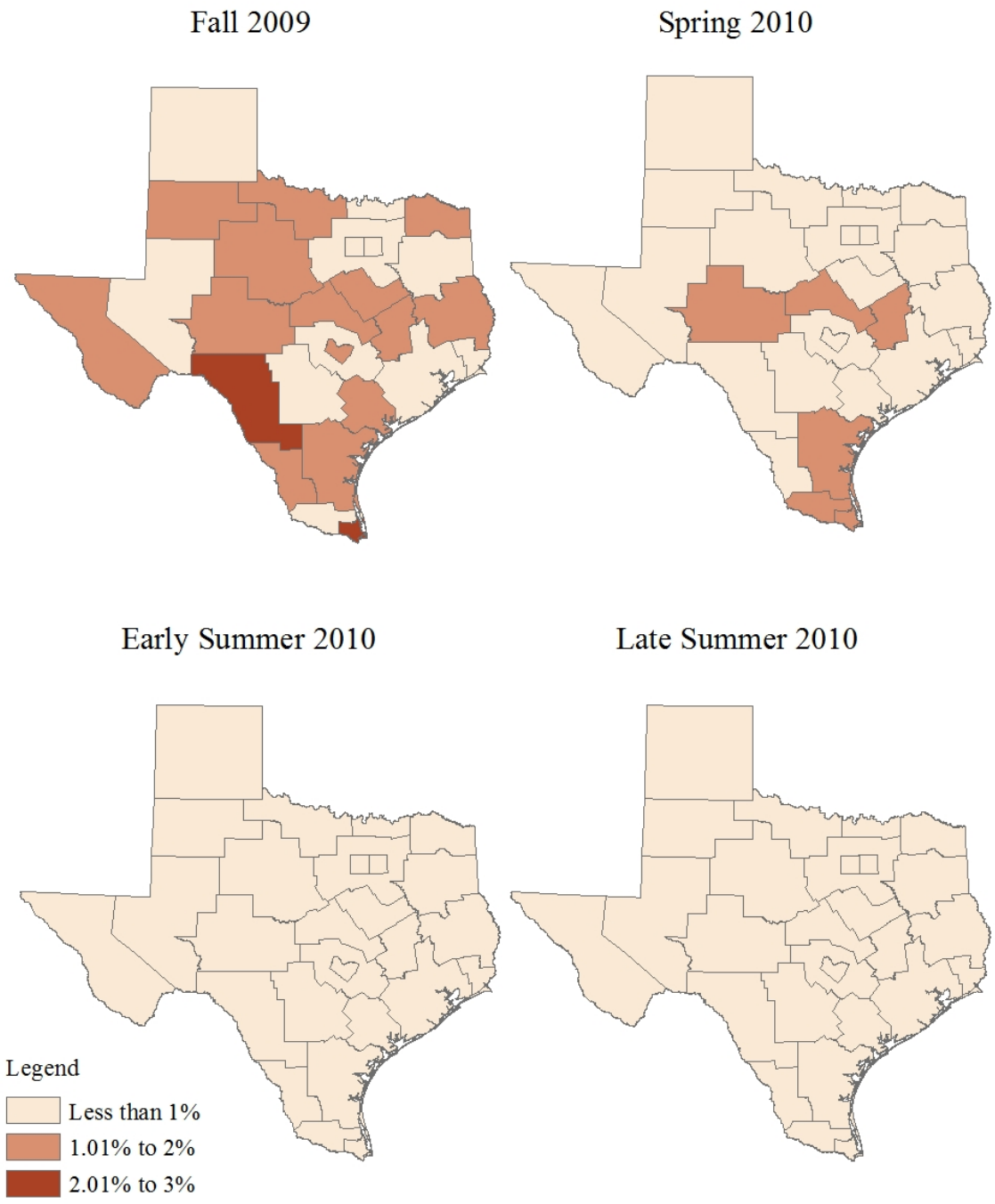
Figure 23. Shares of 2008 High School Graduates Receiving TWC Services (Fall 2009 through Late Summer 2010), by LWDA



Source: Texas Education Research Center (ERC) data maintained at the Texas Higher Education Coordinating Board.

As discussed above, the class of 2009 encountered a much more difficult employment environment immediately following graduation, and a potential consequence of this is that a larger share of this class received workforce services in the fall following their graduation. Figure 24 shows the share of 2009 graduates who participated in a workforce program from Fall 2009 through Summer 2010. In 16 of the 28 LWDA regions, more than 1% but less than 2% of 2009 high school graduates participated in a workforce program. Between 2% and 3% of Cameron and Middle Rio Grande regions' high school graduates participated in a workforce program in the fall of 2009. By the spring of 2010, six of the 28 LWDA regions had workforce program utilization rates over 1% but less than 2%. However, by the summer of 2010, utilization rates for the class of 2009 fell to under 1% for all regions.

Figure 24. Shares of 2009 High School Graduates Receiving TWC Services (Fall 2009 through Late Summer 2010), by LWDA



Source: Texas Education Research Center (ERC) data maintained at the Texas Higher Education Coordinating Board.

Postsecondary Education Transitions

One of the primary goals of most high school students and their parents is to enroll in college following high school graduation. Many of the steps required to enroll in college are typically completed outside of classroom time. These steps include taking a college entrance test, determining which colleges are the best fit for a student, applying to those colleges (which includes the application itself but also completing admissions essays), filling out scholarship applications, completing the FAFSA (Free Application for Federal Student Aid), evaluating financial aid award letters, choosing the college, and enrolling in the college (Levy and King, 2009). With so many complicated and time-specific steps, many of these students encounter barriers along the way, as do their families. Unexpected or additional steps students might encounter include providing additional wage documentation such as IRS tax verification to their college, completing housing applications, and providing housing deposits. Some of these activities are typically completed during the summer, when high school counselors may not be available to offer help and guidance (Castleman, et. al., 2014).

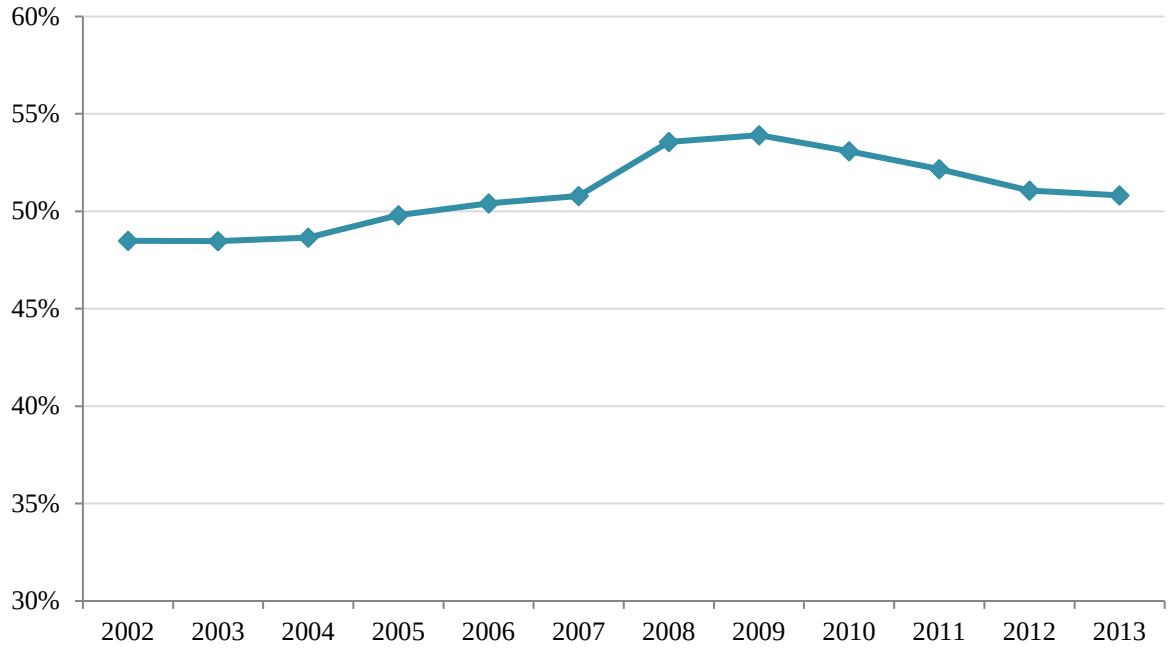
A growing number of schools and school districts, however, are making these college access and enrollment steps a part of the high school routine. For example, in Central Texas, Austin Community College's *College Connections* program shifts much of the college exploration and enrollment process to the high school campus during the students' senior year.[8] Schools and school districts, however, receive very little feedback on whether students enroll in postsecondary education or training and where they enroll, making it difficult to determine whether the college access activities are making a difference for students. Some counselors track this information for their schools, but they often rely only on student self-reporting. While aggregate data on student enrollment in Texas colleges are available through the Texas Higher Education Coordinating Board (THECB), this information may not be available until two years after students graduate from high school. The THECB data lacks individual-level information (preventing counselors from verifying student self-reported data) and only includes college enrollment at institutions within Texas. Some school districts participate in the National Student Clearinghouse (NSC) Student Tracker system for a yearly fee. NSC uses directory information provided by the high school to find students enrolled in colleges across the country, including most Texas colleges.

[8] For more information on college connections, see: http://www.austincc.edu/collegeconnection/

According to their website, NSC maintains enrollment information for 98% of colleges across the country (NSC, 2014). Unfortunately, not all colleges in Texas participate in the NSC.

The transition from high school to college has been tracked by THECB since 2002. Statewide, direct-to-college enrollment rates increased from 49% in 2003 to 54% in 2009. (Figure 25).[9] Since 2009, the initial college enrollment rate to Texas colleges has slowly declined; the direct-to-college enrollment rate in 2013 was the same as it was in 2007.

Figure 25. Direct-to-College Enrollment at Texas Institutions from 2002 to 2013



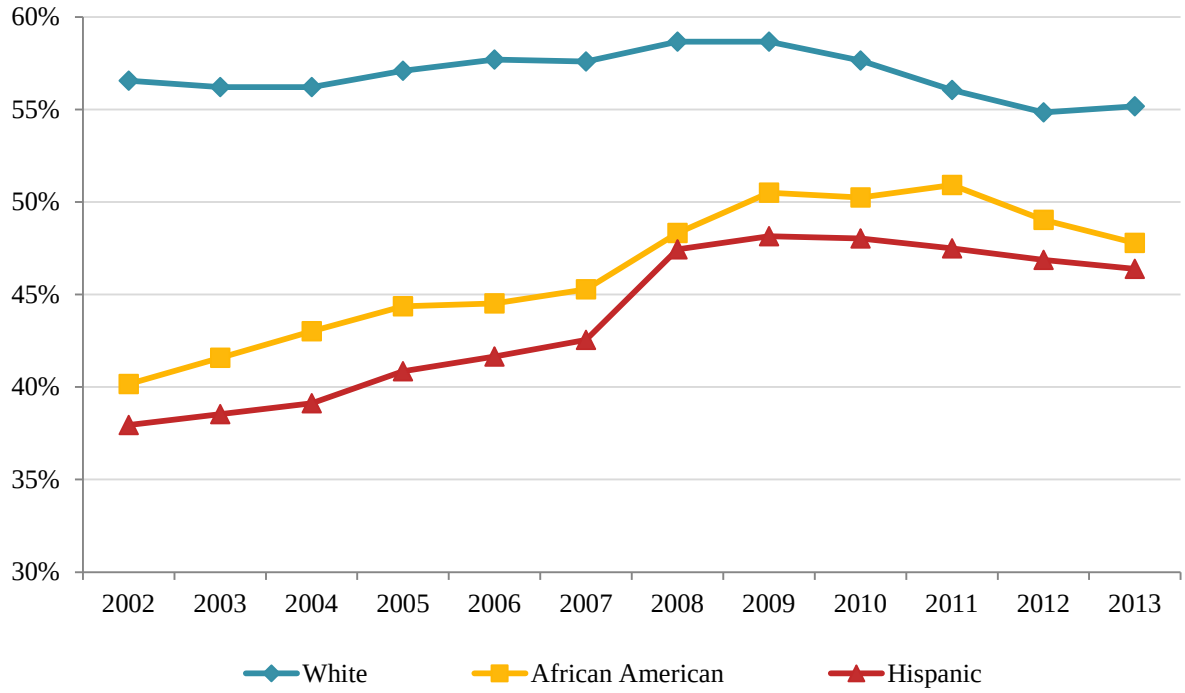
Source: Publicly available Texas Higher Education Coordinating Board data.

Importantly, this decline does not appear to stem from the demographic changes the state has experienced over the last decade. Disaggregating this data by race/ethnicity reveals enrollment rate declines are most pronounced for *White* high school graduates (Figure 24) beginning in 2010 with a drop of nearly 2 percentage points. Both African-American and

[9] Published THECB direct-to-college enrollment rates remove high school graduates who did not provide their SSN to their high school from the denominator. Presented direct-to-college enrollment percentages retain all students in the denominator, even those considered 'not trackable.' Some portion of the jump in direct-to-college enrollment rates between 2007 and 2008 stems from a significant reduction in the number of students classified as 'not trackable' due to improved methods for tracking students, although excluding 'not trackable' students from the denominator does not eliminate this improved enrollment rate.

Hispanic high school graduates had relatively stable or even improved enrollment rates until 2012 (Figure 26). The gap in direct-to-college enrollment rates between White and African-American graduates declined in recent years, partly because of a steady increase in African-American enrollment and partly due to declining enrollment for White graduates after 2009. The gap between Hispanic and White high school graduates also narrowed until 2013. This stopped a long-term trend in evidence since at least 2002 of significant reductions in these direct-to-college enrollment gaps, with the African-American and White enrollment gap declining from 16 percentage points in 2002 to just 5 percentage points in 2011, and the Hispanic and White student enrollment gap declining from 19 percentage points in 2002 to 8 percentage points in 2012.

Figure 26. Direct-to-College Enrollment at Texas Institutions from 2002 to 2013, by Race/Ethnicity



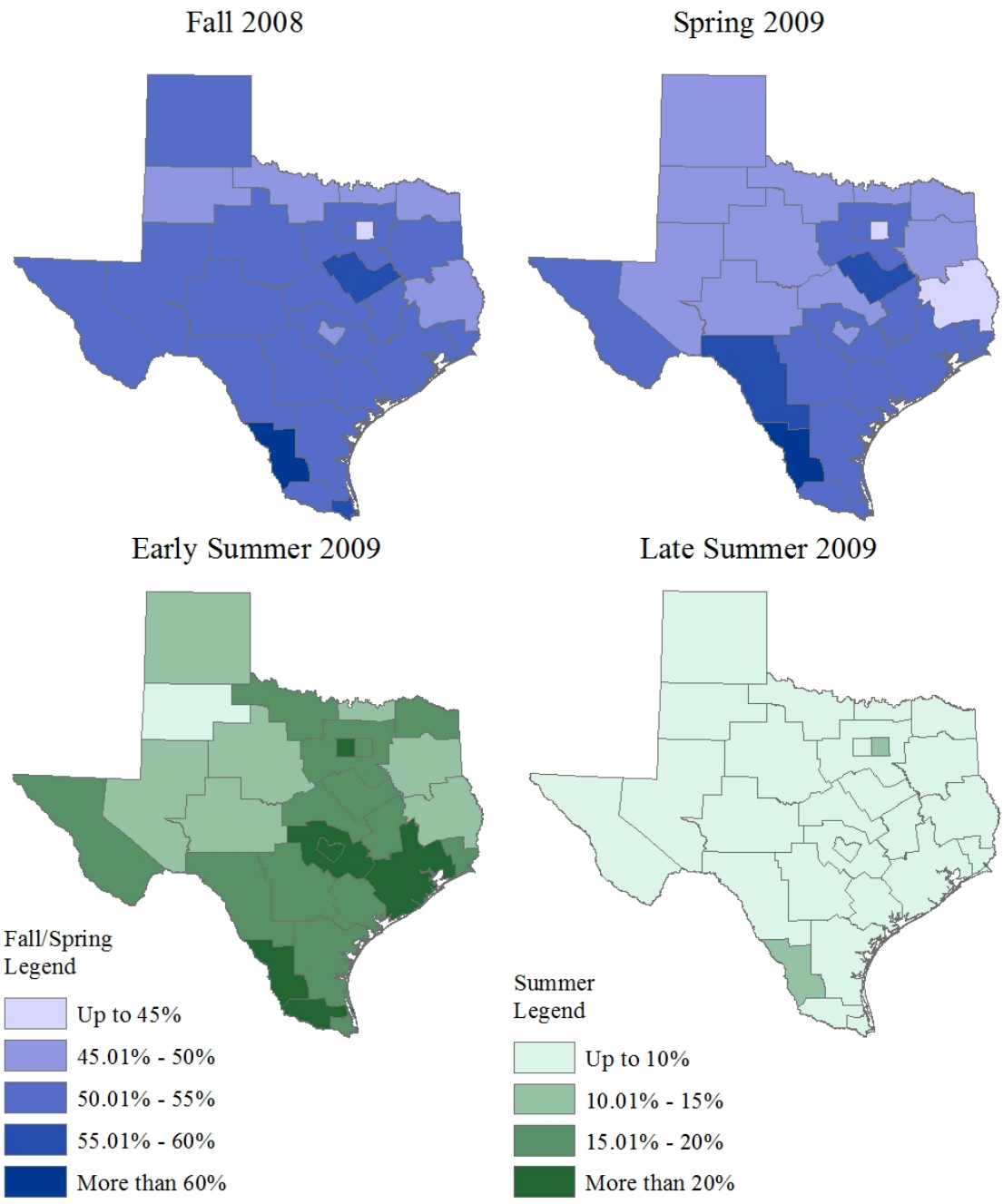
Source: Publicly available Texas Higher Education Coordinating Board data.

Class of 2008 and 2009 graduates generally enrolled in Texas institutions at higher rates than the cohorts before and after them.

Texas Higher Education Regional Enrollment

State-maintained enrollment data relies on reporting by Texas public and independent (private) colleges to the Texas Higher Education Coordinating Board. For the class of 2008, except for the Greater Dallas region, all regions had a direct-to-college enrollment rate above 45% (Figure 27). The highest direct-to-college enrollment rates occurred along the border with Mexico in the Middle Rio Grande region, with just over 60% of high school graduates enrolling in college in the fall of 2008. Between 55% and 60% of students graduating in the Cameron and Heart of Texas regions enrolled in a Texas college that fall. Figure 25 also shows that student enrollment peaks during the fall and spring of each year and then drops significantly during the summer months.

Figure 27. Shares of College Enrolled 2008 High School Graduates, by LWDA (THECB Data)

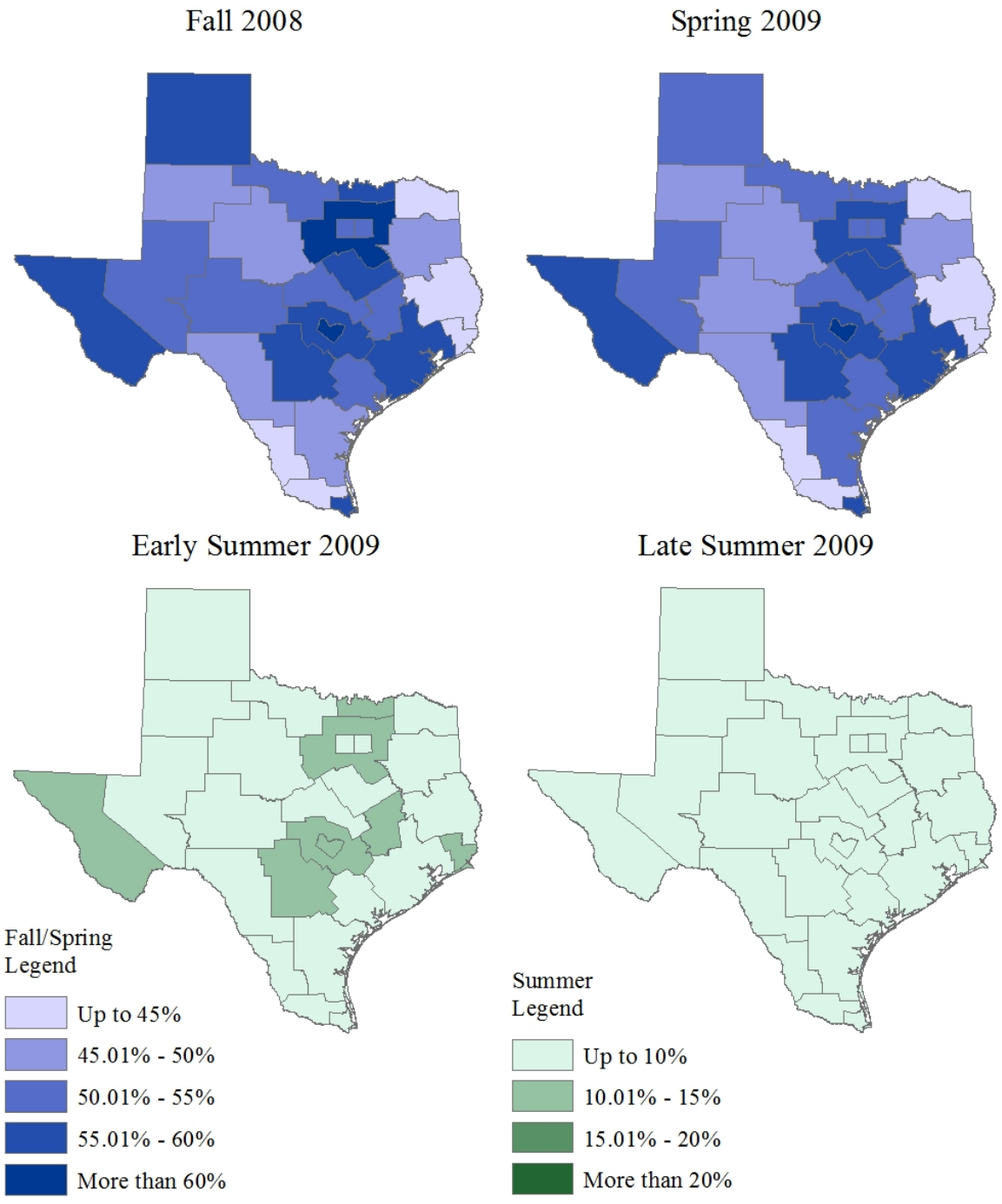


Source: Texas Education Research Center (ERC) data maintained at the Texas Higher Education Coordinating Board.

National Student Clearinghouse Regional Enrollment

National Student Clearinghouse (NSC) Student Tracker data rely on college-provided directory information. For regions where a relatively large share of students enrolls in out-of-state colleges, NSC enrollment data significantly improve the regional direct-to-college enrollment rate (Figure 28). According to NSC data, five regions have a direct-to-college enrollment rate of less than 45% and two have rates over 60%. Regions with the highest enrollment rates include urban regions with substantial college and university presence like the Capital Area and the suburban areas outside of the Dallas/Ft. Worth metropolis in North Central Texas. Using NSC data, only up to 15% of students are enrolled in the summer semesters, regardless of region.

Figure 28. Shares of College Enrolled 2008 High School Graduates, by LWDA (NSC Data)



Source: Texas Education Research Center (ERC) data maintained at the Texas Higher Education Coordinating Board.

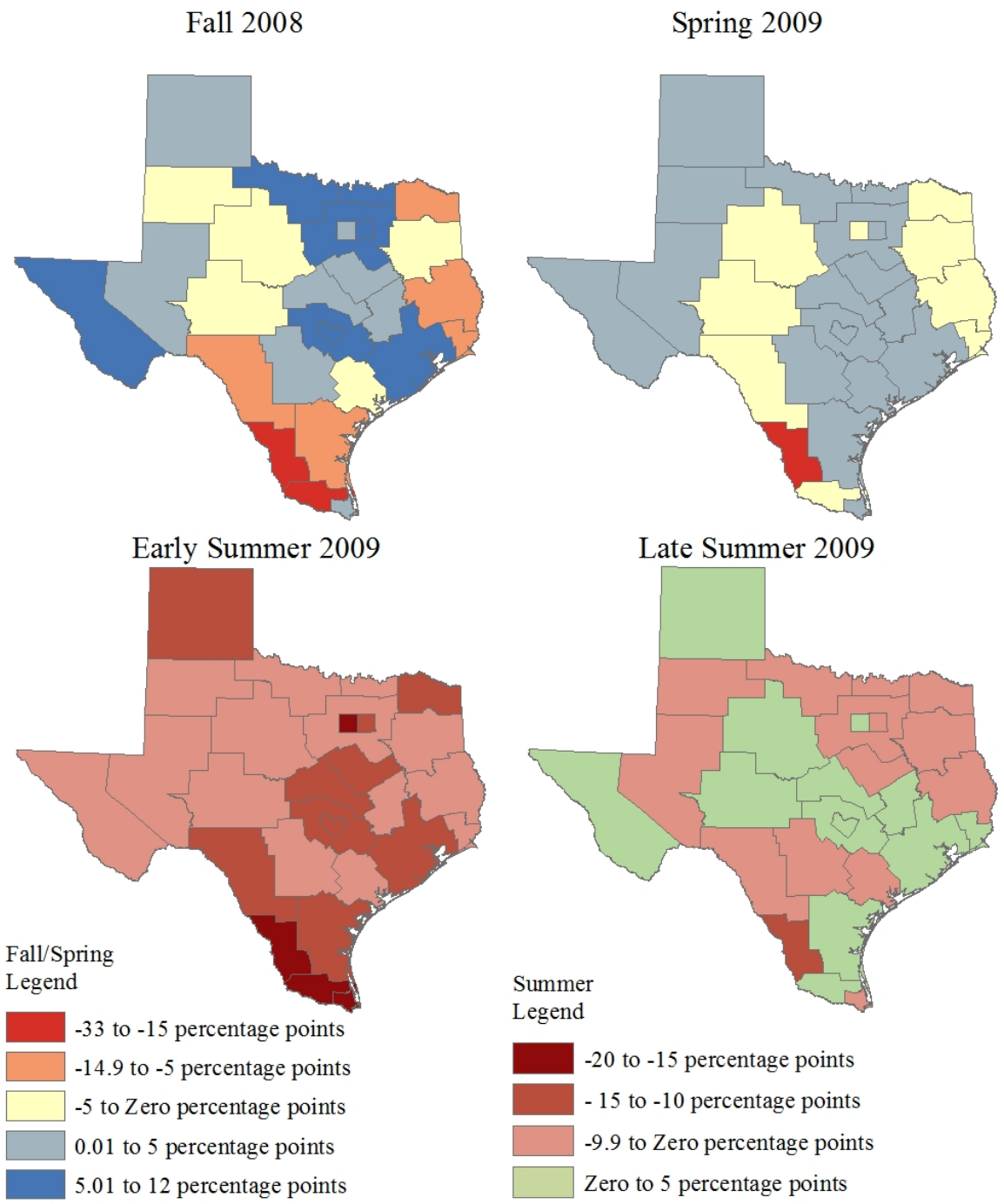
Comparing Regional Enrollment Outcomes using THECB or NSC data

One of the chief disadvantages of relying on either of these single-measurement sources is that neither captures all enrollments. As shown in Figures 29 and 30, measured regional college enrollment rates differ depending on the source of data used. Some regions' direct-to-enrollment rate is more accurately measured using NSC data (central Texas and urban and suburban areas) while other regions see a more accurate representation of student transitions to college using THECB data (along the southern border with Mexico).

Figure 29 maps the difference between calculated NSC enrollment minus calculated THECB enrollment for the class of 2008. The regions in red and pale yellow would receive more accurate information on college transitions using THECB data, as NSC data undercounts those enrolled in college from these regions. Of the 28 regions, 12 see higher measurements of enrollment using THECB as opposed to NSC data. This undercounting is particularly high in the South Texas and Lower Rio Grande regions, where using NSC data would produce direct-to-college enrollment rates between 15 and 33 percentage points less than that measured using THECB data.

The regions in pale and dark blue would receive more accurate information on direct-to-college enrollment using NSC data, as THECB data undercounts those enrolled in college from these regions. Much of this undercounting using THECB data is related to students in the region attending colleges outside of Texas as occurs in many urban and suburban areas of Texas. Of the 28 regions, 16 would see improved accuracy in enrollment using NSC data. Using only THECB data in some of these regions produces direct-to-college enrollment rates between 5 and 12 percentage points less than that measured using NSC data.

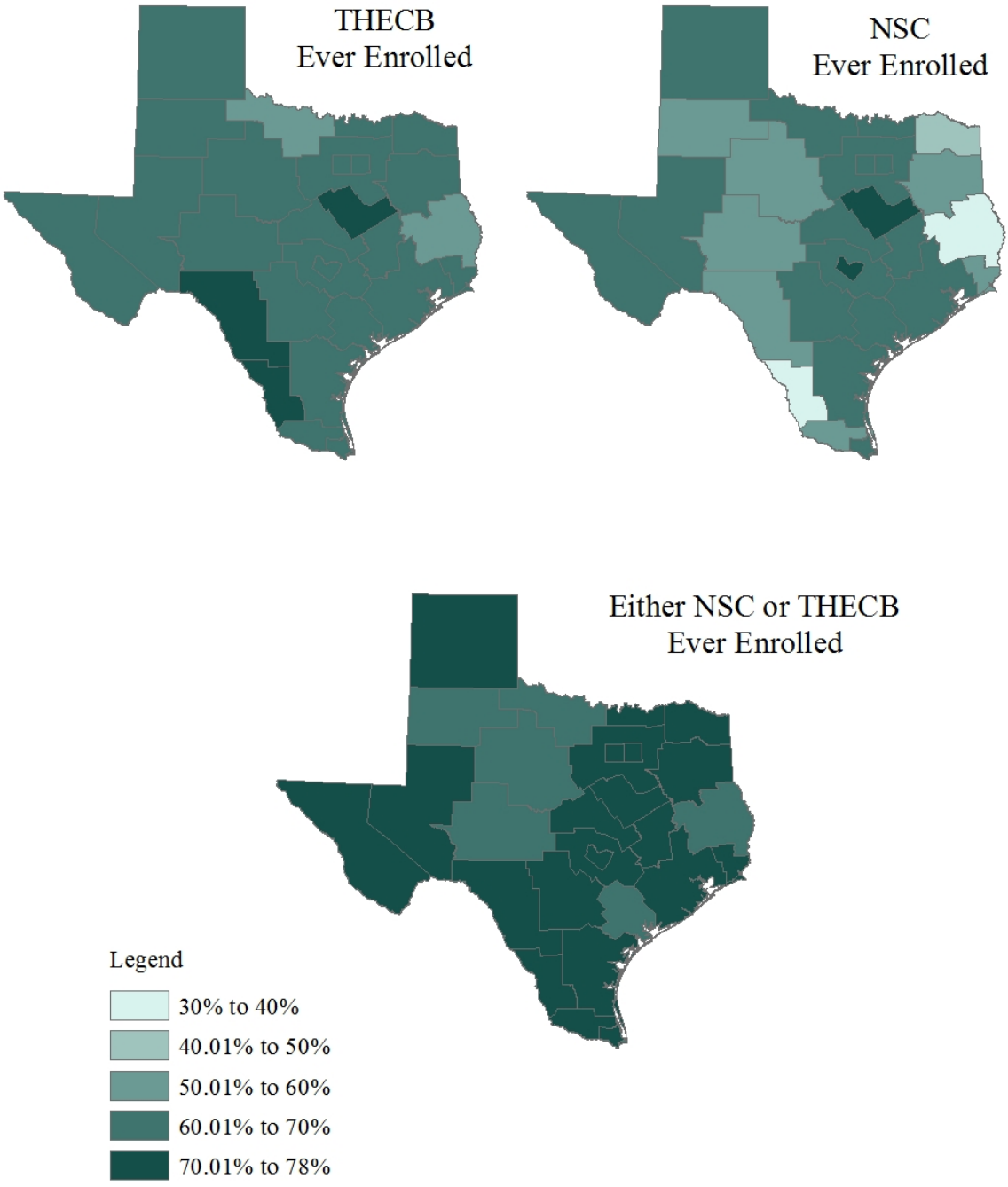
Figure 29. Regional Differences in Shares of College Enrolled 2008 High School Graduates (NSC-THECB)



Source: Texas Education Research Center (ERC) data maintained at the Texas Higher Education Coordinating Board.

Using either of these data sources alone undercounts the share of high school graduates who enroll in college (Figure 30). The share of class of 2008 high school graduates followed until the fall of 2012 who enrolled in college differs depending on both the data source and the region. Using THECB data alone, only three regions had more than 70% of their 2008 high school graduating class experience any college up to the fall of 2012. Using NSC data alone, only two regions had more than 70% of their 2008 high school graduating class experience any college up to the fall of 2012. However, using combined data from both THECB and NSC shows that 20 regions had more than 70% of their high school students experience some college four years after graduation.

Figure 30. Shares of 2008 High School Graduates Ever Enrolled, by LWDA



Source: Texas Education Research Center (ERC) data maintained at the Texas Higher Education Coordinating Board.

The importance of comprehensive college enrollment data cannot be overstated. Without accurate and independent verification of college enrollment, regional efforts to improve direct-to-college rates may falter in light of perceived lack of progress.

Factors Associated with Postsecondary Enrollment

This section examines the factors associated with postsecondary enrollment. The first part of this section looks at whether, and to what extent, differences in outcome data measured by THECB or NSC influence the estimated coefficients of regressions. The second part of this section uses data from both the THECB and NSC to estimate the association of model variables on postsecondary enrollment.

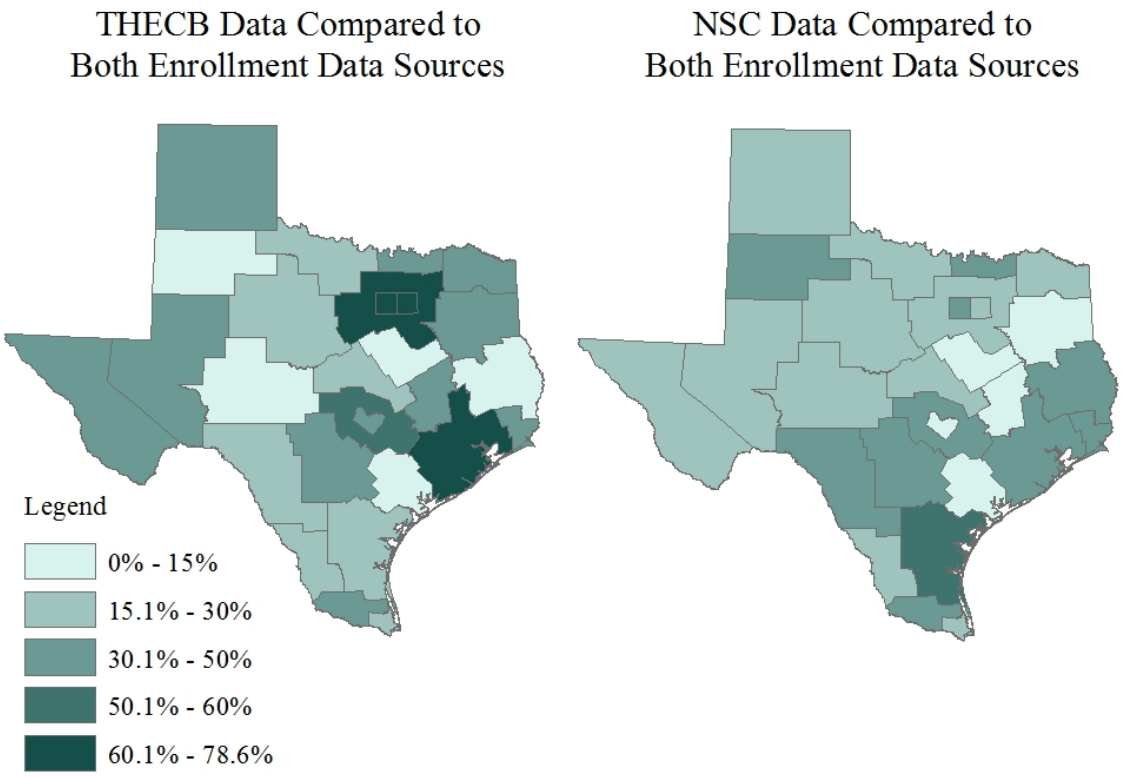
As demonstrated in the previous section, regional college enrollment rates clearly differ depending on whether THECB data or NSC data are used. A key difficulty in any econometric analysis stems from error in measuring variables. Measurement error occurs when the true value of the variable differs from the measured valued of a variable. The effect of measurement error on any regression analysis differs based on whether the error occurs in the dependent or the independent variables. In the case of measurement error in independent variables, the estimates are biased toward zero (Chester, 1991). This means that the regression estimate of the effect of a variable on an outcome will move closer to zero in relationship to its true value, and thus statistically significant variables may not appear substantively significant.

In the case of measurement error in the dependent outcome variable, if this error is random and uncorrelated to the independent variables, then the estimated regression coefficients are unbiased. The tradeoff, however, is that the estimated variances are larger, meaning that the test for statistical significance is less precise (Chester, 1991). As discussed in the previous section, the error in measurement of college enrollment is not random: students attending colleges in southern Texas are less likely to have their college enrollment measured by the NSC and students who attend college outside of the state would be recorded as non-enrolled if only THECB records were used. Since these data sources measure slightly different aspects of college enrollment, errors in measurement are clearly not random. For regionally based researchers using only one of these sources, these omissions may have serious consequences.

For researchers using only THECB data in a region where a significant share of students enroll in college out-of-state, it is possible that the estimated influence of specific types of coursework and high school activities may be incorrect. Students who attend college out-of-state tend to have above-average academic profiles, which may include higher than average GPA and a history of taking more academically rigorous courses while in high school. Analyses that incorrectly classify these students as having not enrolled in college may then underestimate the effect of taking academically rigorous courses. If this regional research is used to guide local school policies such as determining the availability of rigorous coursework, this could have adverse long-term consequences for future cohorts of students. Using only one of these outcome data sources instead of using the 'true' measure of enrollment (by combining data from both THECB and NSC) might lead regionally-based researchers to incorrectly estimate the association of coursework on direct-to-college enrollment.

The research model used here to estimate direct-to-college enrollment consisted of 23 variables including demographic variables, student family background variables, coursework variables, graduation plan, and income earned during the senior year. Models run with each of the two outcome variables (THECB or NSC) then had their regression estimates compared to results using data from both the THECB and NSC using a Hausman specification test. In an effort to provide some information on the scale of statistically significant differences at the regional level, the number of statistically different estimates was tallied for each region. Then the total number of statistically significantly different variables was divided by the total number of variables in the model. Depending on the region, between 0% and 78% of regression estimates differ when using THECB or NSC data compared to using the 'true' measure which includes data from both sources (Figure 31). The variables most often found to be statistically different are those associated with region-specific variation, including upper-level high school coursework such as AP or IB course taking and whether a student completed an advanced math course.

Figure 31. Share of Regression Model Variables with Statistically Significant Differences, by LWDA



Source: Texas Education Research Center (ERC) data maintained at the Texas Higher Education Coordinating Board.

Researchers used the same regression model as above and included direct-to-college enrollment regardless of the data source for each of the 28 LWDAs. Selected regression estimates from this work are presented in Figures 32 through 34.[10]

Figure 32 examines the regional association of demographic characteristics on direct-to-college enrollment for regions where all presented results were derived using categorical variables, so regression estimates are in relationship to an omitted variable. Thus, the estimated association of coming from a Hispanic background on direct-to-college enrollment is in comparison to White high school graduates from the same region.

Estimated coefficients provide a sense of the scale of these differences, with each of

[10] Selected variables are chosen primarily because of their relatively large size in relation to estimates for variables with relatively small size. For example, the share of students taking two advanced math courses is always less than 4% and is therefore not shown.

the statistically significant coefficients representing the percentage point difference in direct-to-college enrollment rates, accounting for other factors in the model. When controlling for family background and student course work, African-American high school graduates in the Deep East Texas region directly enroll in college at a rate almost 14 percentage points higher than their White counterparts in the same region.

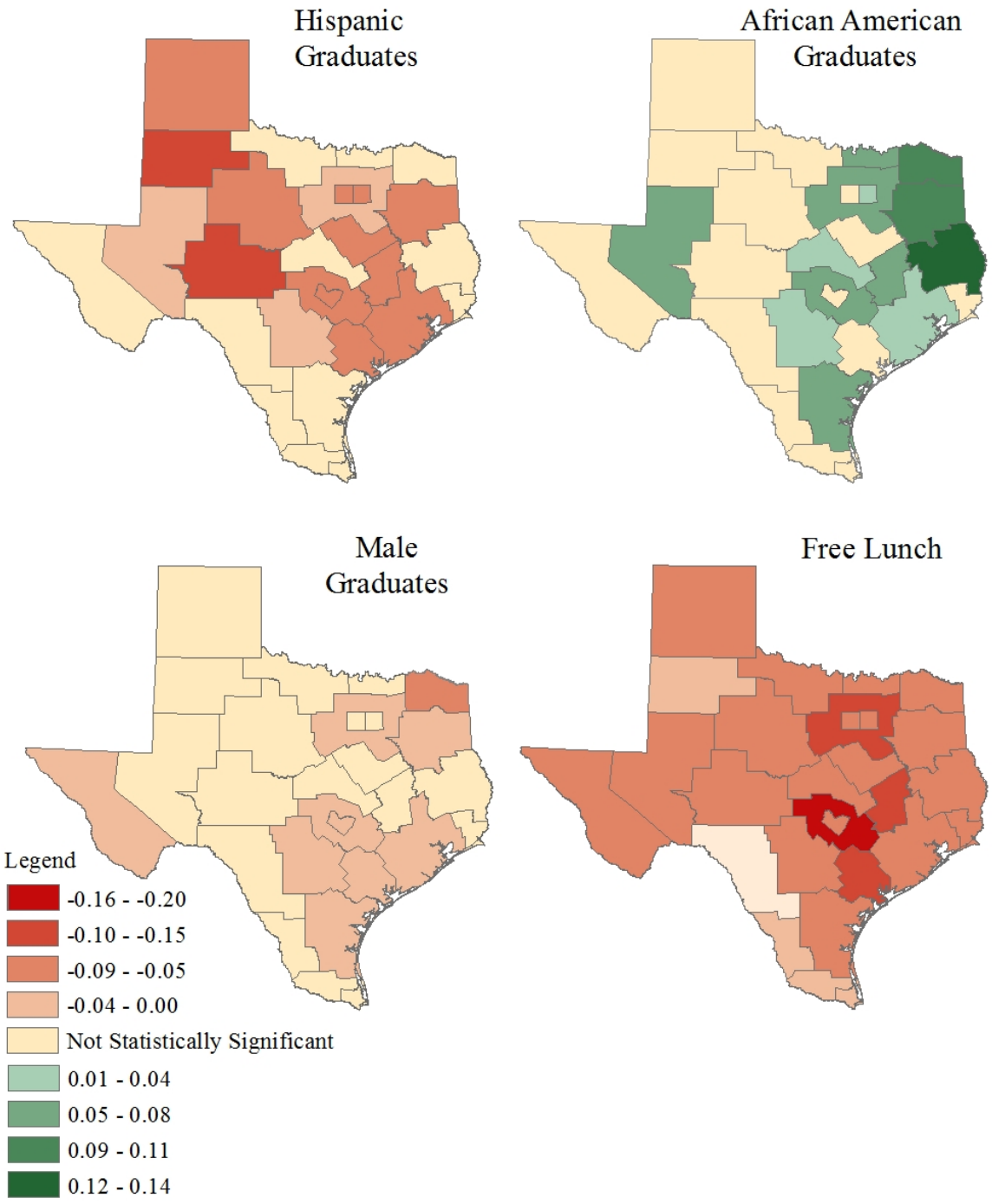
The estimated influence of each of the characteristics associated with reduced direct-to-college enrollment is presented in shades of red. Regions shown in shades of green indicate that, in that region, that demographic characteristic is more likely to enroll in college, accounting for other factors in the model. In regions shown in tan, graduates with that demographic characteristic are as likely to enroll in college, accounting for other factors in the model.

Hispanic graduates are as likely to directly enroll in college as their White, non-Hispanic counterparts in 12 of the 28 regions. However, they were less likely to directly enroll in college in the rest of the regions. It is important to note that those regions with the highest share of Hispanic high school graduates show no difference in the estimated direct-to-college enrollment rates in comparison with White high school graduates from the same region.

African-American high school graduates are as likely to directly enroll in college as White high school graduates in each of the 28 regions. Many of the regions with the highest share of African-American high school graduates post higher direct-to-college enrollment rates than their White counterparts.

Male high school graduates, depending on the region, are either as likely or less likely to directly enroll in college compared to female graduates. All but one region's high school graduates on free lunch directly enrolled at lesser rates than graduates not on free lunch.

Figure 32. Regression Coefficient Estimates of Direct-to-College Enrollment for Demographic Characteristics



Source: Analysis based on Texas Education Research Center (ERC) data maintained at the Texas Higher Education Coordinating Board.

Note: As the regional direct-to-college enrollment represents the share of high school graduates enrolled in college, the estimated coefficients represent the percentage point difference in direct-to-college enrollment rates while accounting for other factors in the model.

With the exception of just one region, regions see some benefit for students taking a dual credit course, an advanced math course, or an AP or IB course (Figure 33). For those regions that do not see a statistically significant benefit, students taking these courses certainly do not see lower direct-to-college enrollment rates when accounting for other factors in the model.

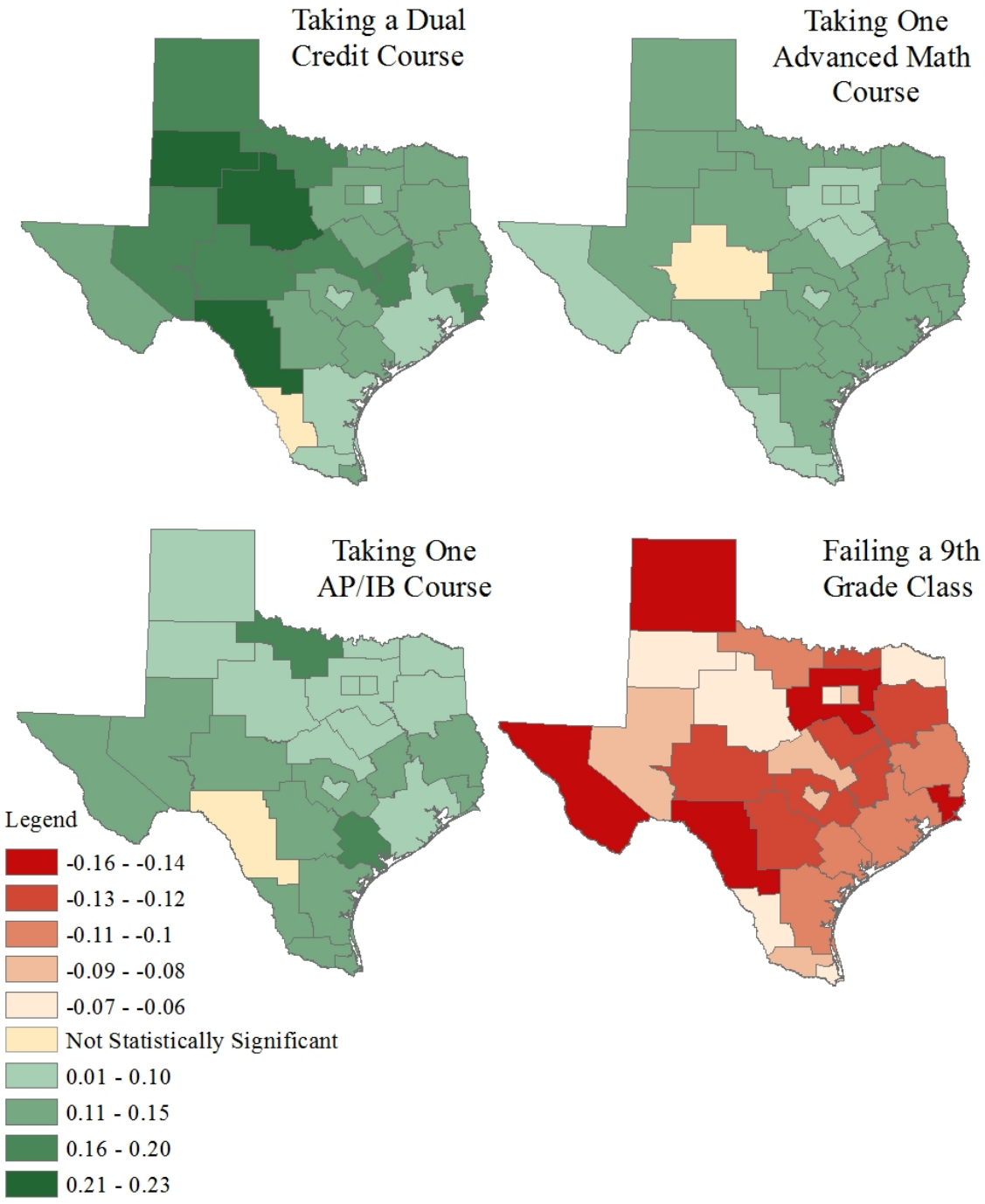
Students who took a dual credit course in the South Plains, West Central Texas, and Middle Rio Grande regions directly enrolled in college at significantly higher rates (between 21 percentage points) than their regional peers, accounting for student demographics, background, and other courses taken. While nearly all regions see benefits for students taking a dual credit course, a few regions see less benefit than others, particularly those regions along the coast and in the far northeast of Texas

Compared to taking no advanced math course, high school graduates who took one such course were more likely to directly enroll in college, with 18 of the 28 regions seeing initial enrollment rates between 11 and 15 percentage points higher than high school graduates who did not take an advanced math course.

Some regions, such as Golden Crescent, with a relatively large share of high school graduates who took an AP or IB course also had significantly higher direct-to-college enrollment rates for those who took these courses when accounting for other factors in the model.

Students who failed a 9th grade course were less likely to enroll in college after graduating from high school in all regions. However, students who graduated from the Panhandle, North Central Texas, Southeast Texas, Middle Rio Grande, and Upper Rio Grande regions and failed a 9th grade course, directly enrolled in college at rates between 14 and 16 percentage points below their peers who did not fail a 9th grade course, accounting for other factors in the model.

Figure 33. Regression Coefficient Estimates of Direct-to-College Enrollment for High School Coursework

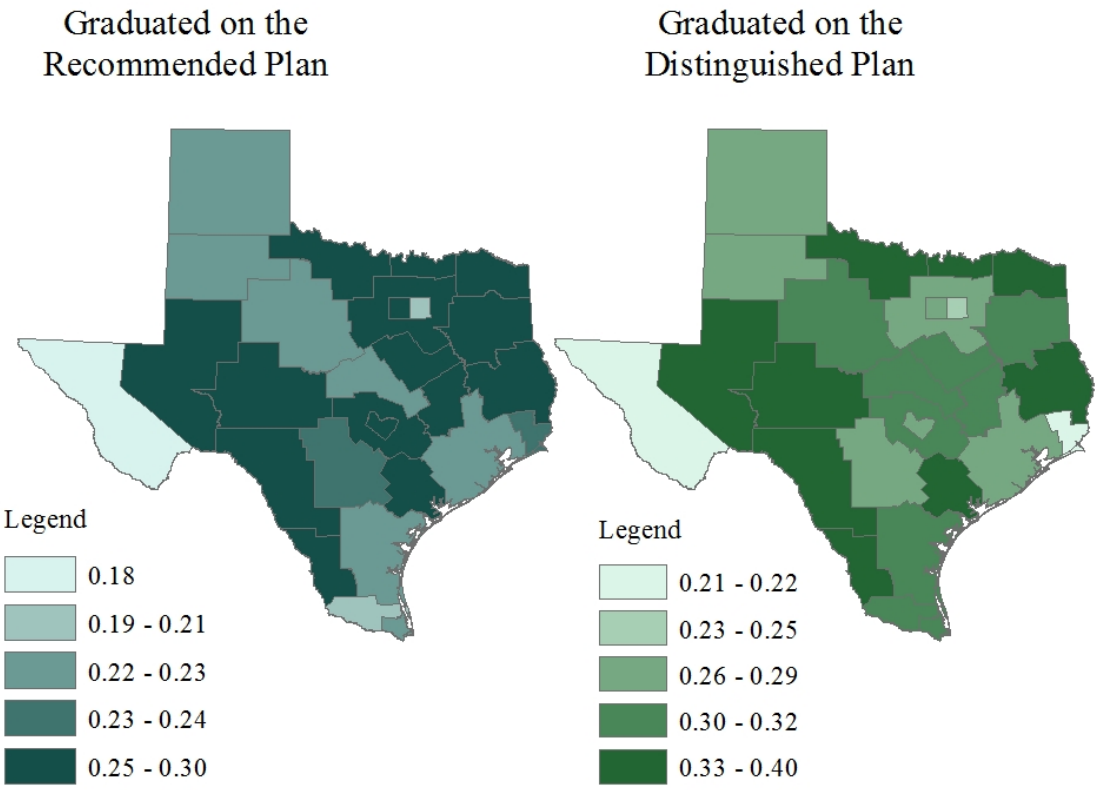


Source: Analysis based on Texas Education Research Center (ERC) data maintained at the Texas Higher Education Coordinating Board.

Note: As the regional direct-to-college enrollment represents the share of high school graduates enrolled in college, the estimated coefficients represent the percentage point difference in direct-to-college enrollment rates while accounting for other factors in the model.

Overall, students who graduated using the recommended plan were more likely to directly enroll in college than students graduating on the minimum plan (Figure 34). The effect of graduation plan differs by region, however, with some regions seeing significant improvements in the direct-to-college enrollment rates for students on the recommended plan and other regions seeing smaller improvements. Students who graduated along the non-panhandle portion of the border with Oklahoma, where a larger share of high school students graduated on the minimum plan, experienced particular benefit from graduating using the recommended or the distinguished plan, enrolling at rates more than 25 percentage points higher than their minimum-plan peers.

Figure 34. Regression Coefficient Estimates of Direct-to-College Enrollment for Graduation Plan



Source: Analysis based on Texas Education Research Center (ERC) data maintained at the Texas Higher Education Coordinating Board.

Note: As the regional direct-to-college enrollment represents the share of high school graduates enrolled in college, the estimated coefficients represent the percentage point difference in direct-to-college enrollment rates while accounting for other factors in the model.

CONCLUSIONS AND RECOMMENDATIONS

This report suggests that students who graduate from different regions in Texas experience unique challenges as they transition into the workforce and college. Evidence from this report shows that high school graduate outcomes vary depending on locally-available opportunities. For example, in some regions Hispanic students are much less likely than White students to go to college, while in other regions there is no difference in college enrollment between these two groups. Also, failing a 9th grade class is associated with lower rates of college enrollment across all regions, but there is an especially strong association in some regions. Because of these regional differences, statewide efforts to address college enrollment and workforce training needs should be adjusted to fit the needs of local communities.

As regions in Texas develop partnerships between high schools, employers, and colleges to help students transition to life after high school, it is important for these partnerships to gain access to accurate and timely information related to these transitions. As many of the courses offered at the high school level are determined by local policy makers, efforts to determine where school districts should allocate scarce resources should be based on evidence of their efficacy and alignment with regional goals for local high school graduates. As this report demonstrates, using regional data allows for a more accurate reflection of how student background and course taking influence outcomes such as college enrollment. In light of these lessons, this report provides three major recommendations for policy makers.

Encourage regional research partnerships linking education and employment data.

Recent legislative efforts (House Bill 5 passed in 2013) have re-written the high school graduation requirements to encourage schools to offer coursework that will prepare students for the local labor market. Since the educational and workforce opportunities differ for each region of Texas, programs that work for one area may not be as effective in other areas. Local workforce development boards, community colleges and school districts should have a clear understanding of labor market demands in their region. When regional partnerships between local colleges, workforce development boards, and school districts

focus on high school to post-high school transitions, school districts capitalize on already collected regional employment information and students obtain access to relevant training and experience for future employment.

Allow broader access to individual-level data for evaluating the efficacy of local programs and interventions.

Regional partnerships involving local colleges, workforce development boards, and school districts need to be able to rely on high-quality, real-time data to drive regional efforts to improve the quality of high school graduate transitions. Individual-level data on student transitions to postsecondary enrollment and employment, aggregated for regional stakeholders, would allow partners the opportunity to reflect and consider how such information could be applied to local programming. Following well-established and secure procedures to deal with FERPA-compliance, including specific data-sharing agreements between the local college, school district, and TWC, will ensure the confidentiality of all data.

Obtain and maintain records on out-of-state college enrollment for Texas high school graduates.

Research in this report indicates the importance, especially for some regions, of using college enrollment information that captures out-of-state enrollment and the perils of using only one data source (such and THECB or NSC) to measure college enrollment. Unfortunately, individual-level data on college enrollment by the THECB is available only through the ERC or by direct request for use at the THECB's secured computer terminal. Therefore, regional collaborations intending to evaluate the effectiveness of a local intervention on college enrollment must often rely on a single data source (NSC) to measure the outcome. As has been shown in this report, both data sources provide incomplete information on college enrollment. Hence, statewide availability of both NSC and THECB individual-level data is necessary for regional partnerships to capture a truer picture of where their students go after graduation.

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