Labor Market Returns for Graduates of Hispanic-Serving Institutions

Toby J. Park
Florida State University College of Education
1205D Stone Building
1114 W. Call Street
Tallahassee, FL 32306-4450
tjpark@fsu.edu
Phone: 724-355-5524

Stella M. Flores
New York University Steinhardt School of Culture, Education, and Human Development
82 Washington Square East, 7th Floor
New York, NY 10003-6674
stella.flores@nyu.edu
Phone: 615-995-4948

Christopher J. Ryan, Jr.
Vanderbilt University Peabody College
230 Appleton Place, #414
Nashville, TN 37203-5721
christopher.j.ryan@vanderbilt.edu

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Labor Market Returns for Graduates of Hispanic-Serving Institutions

It is a well-known fact that Latinos have become the largest minority group in the United States (Ennis, Rios-Vargas, & Albert, 2011).[1] A significant demographic shift also has occurred in the U.S. higher education population: with more than 2.4 million postsecondary students in 2012, Latinos have replaced Blacks as the largest minority group attending two- and four-year institutions (Fry & Lopez, 2012; Krogstad & Fry, 2014). As of 2013, 58.9% of Hispanic college students were attending two- or four-year Hispanic-Serving Institutions (HSIs), a category of institution that is accredited, grants degrees, and whose full-time-equivalent undergraduate enrollment is at least 25% Hispanic (Hispanic Association of Colleges and Universities, 2015; Santiago & Andrade, 2010; U.S. Department of Education, 2009, 2013). While HSIs have not received much attention in terms of policy analysis, their growing presence as the first-choice institution for a majority of Latino students highlights their importance in the Latino postsecondary trajectory (Flores & Park, 2013; Benitez & DeAro, 2004; Laden, 2004; Núñez, & Bowers, 2011; Provasnik & Shafer, 2004). In sum, no other set of postsecondary institutions educates the number of Latino students, as a proportion of the college-going population, than HSIs.

The number of Latinos enrolled in U.S. postsecondary institutions grew more than 240% from 1996 to 2012, far outpacing growth among Blacks, Asians, and Whites. While this unprecedented growth has received increasing attention, so has the value of the college degree (Krogstad & Fry, 2014). While the cost to attend college has risen at a rate that has caused public alarm in many states across the nation, the value of a degree, particularly the four-year degree, has sustained its relevance in the 21st-century U.S. economy (Carnevale, Smith, & Strohl, 2010; Perna & Finney, 2014). For example, Carnevale and colleagues (2010) estimate that the lifetime

earnings of those with a four-year college degree will be $1.6 million higher than those with only a high school diploma; this amounts to more than a 191% difference in lifetime earnings between college and high school graduates. Moreover, those with an associate's degree or some college are likely to earn 26% more than high school graduates, who in turn can expect to earn 68% more than non-high school graduates.

In states where Latinos are already the majority minority group and the majority population in some school districts, the cost of not educating this population goes beyond the matter of individual wages. It may in fact compromise the economic welfare of those states—and the nation (Smith, 2011). These figures suggest that the three points in the education pipeline most likely to have an impact on Latino wages are graduation from high school, enrolling in any college, and earning a bachelor's degree. It is this third milestone that we explore in this paper: the earning power Latino students gain by getting a four-year college degree from the schools they are most likely to attend: Hispanic-Serving Institutions.

Earlier studies of labor market returns on attending college have tended to focus on college as a homogenous treatment, making distinctions only between broad categories, such as two-year versus four-year schools (e.g., Kane & Rouse, 1995). More recently, however, researchers have begun to untangle the heterogeneous nature of college and explore whether different types of institutions have differential returns for graduates in the labor market. Studies conducted in the last five years have provided additional analytic detail by assessing the value of a selective college degree (Long, 2010), of attending a selective flagship public university, and of certain majors (Andrews, Li, & Lovenheim, 2012, 2014; Hoekstra, 2009).[2] This exploration of the role selectivity plays in how college graduates fare in the labor market includes substantial research to back up the convention that attending a more selective institution yields greater

earnings (Dale & Krueger, 2002; Zhang, 2005;). One particular measure used in this exploration is Barron's selectivity index. Studies using Barron's index have consistently found that students who graduate from more selective universities have higher earnings (Brewer & Ehrenberg, 1996; Brewer, Eide, & Ehrenberg, 1999).

Another similar avenue of exploration is the returns on attending a Historically Black College or University (HBCU). Two studies to date have framed the relationship between graduating from an HBCU and individual wages. Fryer and Greenstone (2010), who utilized three large datasets (the National Longitudinal Survey of the High School Class of 1972, Baccalaureate and Beyond, and College and Beyond) to examine the impact in the labor market of graduating from an HBCU, found changes in the returns over time. In fact, from 1970 to 1990, they found a 20% decline in the relative wages of HBCU graduates. By the 1990s, when compared with the market outcome for those attending a traditionally White institution, this decline had in effect become a wage penalty. Strayhorn's (2008) analysis, which used Baccalaureate and Beyond longitudinal survey data for the 1993 and 1997 cohorts, examined labor market outcomes for African American college graduates from HBCUs. The findings revealed a moderate negative statistically significant relationship between attending an HBCU and post-baccalaureate earnings. While these studies used data from several years ago and do not represent the definitive answer on the relationship between attending an HBCU and wages, they will be helpful in future studies that seek to understand the earning power a college degree from other Minority-Serving Institutions (MSIs) brings different groups of students.

Little to no research currently exists on the relationship between Latinos attending a particular type of higher education institution and their individual wages. For example, do wages differ for Latinos based on the type of four-year institution where they earn a college degree?

Previous work that examined the impact on wages of attending a selective public flagship university in Texas found that White students were more likely to benefit from attending this type of institution than their Black and Latino peers (Andrews, Li, & Lovenheim, 2012, 2014). Meanwhile, other studies have demonstrated that Latinos are not likely to attend a selective four-year institution in Texas and, moreover, are at least 350% more likely to attend a two- or four-year HSI than a four-year non-HSI (Flores & Park, 2013). In addition, research on the labor market return to wages has often been assessed by comparing Whites to non-Whites, rather than by comparing Latinos who attend different types of institutions within the four-year sector.

We set out to expand on these studies by constructing an analytic model using more recent data from a comprehensive student-level dataset in Texas. Our goal was to understand the relationship for Hispanic students between graduating from an HSI and their labor market earnings in a post-2000 economy. We specifically asked:

1. Is there a difference in Hispanics' student characteristics and later earnings between HSI and non-HSI graduates in Texas?
2. What is the relationship between attending an HSI and later earnings for Hispanic college graduates in Texas?

We proceed as follows: We first discuss the theoretical foundations that guided our investigation, previous research exploring labor market returns to higher education, and our specific research questions. Second, we provide more detailed information about the demographic and educational landscape of Texas, our focal state. We next present our research design, including a description of the student-level state dataset we used for our analysis, its limitations, and our analytic approach. Fourth, we present our findings, including a descriptive portrait of the data and the results from our econometric model. We end with a discussion of our

findings, including recommendations for future research and a general conclusion, which highlight the challenges and the importance of data access and continued research on HSIs, and MSIs more generally.

Two key points are relevant to this analysis. First, postsecondary education in the United States is becoming increasingly diverse, both in terms of the students enrolled and the types of institutions serving them. The impact these institutions have on their graduates' long-term outcomes, in particular on their wages, is under-examined, despite the many new data sources now available. Second, research suggests that minority students account for the greatest growth in the number of students attending college, many of whom enroll in MSIs (Flores & Park, 2013; Conrad & Gasman, 2015). Despite this trend, little is known about how the labor market outcomes of minority students who attend MSIs, both HBCUs and HSIs, compare to those who attend similarly ranked but less racially diverse institutions. This paper seeks to fill that void by examining the earnings of HSI graduates in a post-2000 economy.

Conceptual Framework

A number of empirical studies confirm that college graduates earn more than high school graduates (Card, 1999; Pascarella & Terenzini, 1991, 2005; Smart, 1986). Indeed, Goldin and Katz (2007) have found that the correlation between education and labor market outcomes continues to increase in the United States. Although some question the extent to which education is the causal mechanism for higher earnings, many have demonstrated that, net of other factors, education has a strong impact on labor market outcomes (Hout, 2012). Previous research demonstrates, for example, that students from socially or economically disadvantaged backgrounds tend to show the greatest gains from getting an advanced education—a theory known as negative selection (Brand & Xie, 2010; Hout, 2012).

One lens through which to investigate the relationship between education and earnings is human capital theory, which suggests that the more education and skills individuals acquire, the greater their earnings in the labor market (Becker, 1964, 1967, 1993). As such, we controlled for measures of academic ability, major area of study, and years of work experience, all known to have a discernable relationship to labor market earnings (specific details on these measures appear later in this manuscript; Mincer, 1974; Pascarella & Terenzini, 2005). Research has demonstrated that an important extension of human capital theory is to condition earning functions on the location of individuals, as local prices and economic health also influence wages (Black, Kolesnikova, & Taylor, 2009).

Social and cultural capital theories provide another approach to investigating differences in labor market outcomes. They suggest that information available via formal and informal networks, as well as normative structures put in place by local context, may influence earnings (Bourdieu & Passeron, 1997; McDonough, 1997). As such, we include proxies for social and cultural capital through measures of community context and economic capacity, which several previous studies have done (Núñez & Bowers, 2011; Perna, 1998, 2004; Strayhorn, 2008; Zhang, 2005).

Given that Hispanic postsecondary students are at least 150% more likely to attend two-year than four-year colleges (Flores & Park, 2013), we argue that, in keeping with the negative selection theory, these students stand to benefit greatly from postsecondary education (Hout, 2012). Furthermore, evidence suggests that Hispanic students graduate from HSIs at rates comparable to those who attend non-HSIs, after controlling for similar measures of capital, as defined above (Flores & Park, 2015). Therefore we evaluate how the wages of HSI graduates

compare to those of non-HSI graduates, an area that has received little scholarly attention to date, due in part to policy interest, data access, and availability.

Previous Literature

There are few reports available on the economic consequences of attending an MSI, and we found none that employs econometric models to examine the individual return on investment of attending an MSI. What is currently known about MSIs, and HSIs in particular, is largely descriptive. For instance, a report commissioned by the Center for Urban Education at the University of Southern California indicates that Hispanic students in California are disproportionately enrolled in community colleges, thus the majority of the state's HSIs are two-year institutions (Malcom-Piquex et al., 2013). However, two concurrent studies—Flores and Park (2015) and Rodríguez and Calderón-Galdeano (2013)—employed a more rigorous approach to compare HSIs to non-HSIs. Both studies used propensity score matching to make more reasonable comparisons between both the students attending HSIs versus non-HSIs and the institutions themselves. These studies suggest three principle findings. First, HSIs and non-HSIs have different student body characteristics, institutional resources, and finance structures; for instance, HSIs tend to enroll more students than non-HSIs. Second, propensity score matching on institutional characteristics yields mixed results; for example, some HSIs (specifically two-year, not-for-profit institutions) did not have non-HSI matches based on institutional characters such as sector. Finally, when matched, HSIs and non-HSIs have comparable outcomes (Flores & Park, 2015; Rodríguez & Calderón-Galdeano, 2013). This result goes directly against the notion that HSIs underperform when compared, perhaps incorrectly, with non-HSI two- and four-year colleges and universities (Dayton, Gonzalez-Vasquez, Martinez, & Plum, 2004; Gastic & Nieto, 2010; Laden, 2004; Rodríguez & Calderón-Galdeano, 2013, 2014; Núñez et al., 2011; Núñez,

Crisp, & Elizondo, 2016; Stearns, Watanabe, & Snyder, 2002). Still, little is known about the economic impact of attending an MSI, and an HSI more specifically (Bridges, Cambridge, Kuh, & Leegwater, 2005; Laden, 2004; Rodríguez & Calderón-Galdeano, 2013).

In fact, much of the research on MSIs to date has dealt with the economic impact of the institutions themselves. For instance, an Institute for Education Sciences (IES) report authored by Humphreys and Korb (2006) described using data from the National Center for Education Statistics and U.S. Bureau of Labor Statistics to analyze the collective short-term economic impact HBCUs have on their regional economies. They concluded that the economic impact HBCUs have on their host communities relates to "output, value-added, labor income, and employment." Employing a similar method of analysis, the American Indian Higher Education Consortium (AIHEC, 2000) produced a report that described the economic development efforts of the Tribal Colleges and Universities. The report argued that, despite the lack of regional and national data to confirm their effect, these colleges do in fact affect local economic development. Importantly, neither the IES nor the AIHEC study focused on individual wage returns to graduates of these institutions. They instead used the institution as the primary unit of analysis, and linked its expenditures to returns to the economies of the host nation's network of colleges or universities that were serving their respective minority populations. Finally, applying an investigatory focus that differed from the IES and AIHEC studies, the National Commission on Asian American and Pacific Islander Research in Education (NCAAPIRE, 2014) issued a brief descriptive report that analyzed three-year-longitudinal institutional data from Asian American, Native American, and Pacific Islander Serving Institutions (AANAPISIs). This report describes the impact federally funded campus programs have on persistence, degree attainment, and transfer to four-year institutions for the low-income Asian American and Pacific Islander

students enrolled at these schools. This report centers on student academic returns and thus does not consider individual economic returns in the short- or long-term. There has not yet been a major study on the economic impact or the individual return on investment of attending an HSI.

Background and Institutions

From the mid-1990s to 2004, HSIs grew from 2% to 9% of the nation's total postsecondary institutions (Li, 2007). There were 409 HSIs in the United States in 2014, a 116% increase from 189 institutions in 1995 (Excelencia in Education, 2015a). Of these 409 HSIs, 81 were four-year public universities, 190 were two-year public colleges, 125 were four-year private not-for-profit institutions, and 13 were two-year private not-for-profit institutions (Excelencia in Education, 2015b). HSIs are typically located in the western and the southwestern United States, with the greatest concentration in Florida, Texas, and California (Gasman, Baez, & Turner, 2008; Harmon, 2012). Because of classification requirements, the HSI designation does not mean these institutions were founded specifically to promote the education and growth of Hispanic students (Harmon, 2012). Nevertheless, HSIs serve 42% of all Hispanic students, a figure that grows every year. The students attending HSIs are likely to be first-generation college students from low-income backgrounds and to have a lower level of academic preparation than those attending non-MSIs (Flores & Park, 2013; Gasman et al., 2008; Harmon, 2012; Institute for Higher Education Policy, 2004; Li, 2007). For instance, approximately 44% of Hispanic students attending HSIs in 2003 were low-income, versus 30% of those attending non-MSIs (Li, 2007).

Texas HSIs

In 2004, there were 64 HSIs in Texas (including for-profit institutions) that were educating 23% of the Hispanic students attending U.S. postsecondary institutions. Texas has the second largest number of HSIs, after California, the majority of them two-year schools (Li,

2007). The racial/ethnic breakdown of students attending institutions meeting the 25% Hispanic student enrollment required to eligible for HSI designation in 2008 was 55% Hispanic, 9% African American, 27% White, and 9% Asian American.

The Hispanic population in Texas is projected to grow by 31% from 2010 to 2020, which will far outpace the White population's projected growth of 2% (Fletcher & Webster, 2010). As the HSI designation is determined by its percentage of Hispanic students enrolled, the number of HSIs in Texas likely will increase over the next decade. Therefore, studying the return on investment for HSIs in comparison to non-HSIs is critical to ensuring that President Obama's policy goal and that of some grant-disbursing organizations (e.g., Lumina Foundation) of increasing attainment is met (Lumina Foundation, n.d.).

Table 1 provides a list of the four-year public universities included in our analysis, by selectivity and HSI designation. We included all four-year public universities in Texas from which students in our cohorts graduated.[3] We included only institutions that awarded primarily bachelor's degrees at the time of our analyses, so institutions that have begun since then to award BAs in addition to their primary purpose of awarding associate degrees were excluded. At the time our cohorts graduated from high school, Texas was home to nine four-year public HSIs, all of which were classified either "non-selective" or "somewhat selective."[4] All those classified "more selective" or "selective" were non-HSIs, including the state's two major flagship universities, The University of Texas at Austin and Texas A&M University in College Station.[5] As noted, Hispanic students in Texas experience labor market gains from attending a state flagship university, yet these "more selective" institutions are the schools Hispanic students in Texas are the least likely to attend (Andrews et al., 2012, 2014; Flores & Park, 2013). Therefore, to provide a more accurate and fair comparison of earnings for HSI and non-HSI graduates, we

introduced sample restrictions by selectivity of institution attended, which we discuss in more detail in the research design section.

Texas Economic Regions

Texas state agencies classify the regional economies into (1) economic regions, the classification used by the Texas Comptroller's Office;[6] and (2) workforce development areas, the classification used by the Texas Market and Career Information program of the Texas Workforce Commission. Economic regions often are synonymous with or comprised of multiple workforce development areas. The HSIs used in our analysis are located in the following economic regions: Alamo (University of Texas at San Antonio); Coastal Bend (Texas A&M University-Corpus Christi and Texas A&M University-Kingsville); Gulf Coast (University of Houston-Downtown); South Texas Border (Texas A&M International University, University of Texas Pan-American, and University of Texas at Brownsville); and Upper Rio Grande (Sul Ross State University, and University of Texas at El Paso).

With the exception of the Gulf Coast economic region, which encompasses Houston, the state's largest city, these regional economic areas tend to support service industry jobs rather than professional jobs, and have weekly wages below the state average. The top three industries in these regions by number of employees are (1) trade, transportation, and utilities; (2) education and health services; and (3) travel and leisure. While unemployment rates vary among the regions and are occasionally above state averages, the average weekly wages in these regions are well below the state average (Texas Workforce Commission, 2015).

Research Design

Our research design is divided into two main sections: one that describes the data sources used for this paper, and one that describes the analytic approach we used to answer our research

questions. The description of the data sources includes a section on how we defined post-graduation earnings, our inclusion criteria, and some limitations of the data.

Data Sources

Data for this paper came from the Education Research Center housed at the University of Texas at Dallas (UTD-ERC). The UTD-ERC manages student-level data from the Texas Education Agency, the Texas Higher Education Coordinating Board, and the Texas Workforce Commission. Using a de-identified student indicator, we were able to link these data together and to include information on students from high school through college and on into the workforce.

Our independent variable of interest—whether the school a student graduated from was an HSI—was defined using the federal HSI designation, which includes any higher education institution that is accredited, grants degrees, and whose full-time-equivalent undergraduate enrollment is at least 25% Hispanic (Santiago & Andrade, 2010; U.S. Department of Education, 2009, 2013). We also acknowledged recent work that has begun to examine the heterogeneity within HSIs and to properly question whether the HSI enrollment criteria of 25% or more accurately represents the variation within the HSI institutional community Generally, however, federal HSI designation meets three identity criteria noted by (1) the institution is located in a highly populated Hispanic area and thus is likely to qualify demographically to enroll a significant Hispanic student population; (2) the institution has a stated "mission to serve" Hispanic students; and (3) the institution has executed its mission to serve by formally applying for federal HSI designation (Núñez & Bowers, 2011; Núñez et. al, 2011; Núñez et. al, 2016). The institutions in our sample meet at least two of these three criteria.

To isolate the relationship more clearly between graduating from an HSI and labor market earnings, we controlled for a number of factors also plausibly related to both graduating from an HSI and eventual earnings:

1. *Student background characteristics [S]:* sex (coded as 1 for male) and limited English proficiency status. English learner status is coded as 1 for a student having been designated by their K-12 school district at the time of high school graduation. We note that the English learner designation in 12th grade is distinct from being so identified in earlier grades;[7]
2. *High school academic preparation [ACAD]:* taking an Advanced Placement or International Baccalaureate course (coded as 1 for taken), taking a trigonometry course (coded as 1 for taken), state mathematics exam score (a linear measure), and enrolling at a college while still in high school (coded as 1 for students who dual-enrolled);
3. *Community context [COMM]:* high school pupil-teacher ratio (a simple ratio), high school enrollment (included in the model as 1000s of students), high school minority percentage (a percentage of Hispanic and Black students), high school per-pupil expenditures (logged), urbanicity (as defined by the U.S. Census), county unemployment rate (a percentage), and a binary indicator of whether the student's high school was within 25 miles of a postsecondary institution;
4. *Economic capacity [ECON]:* a binary indicator for free or reduced-price lunch status (FRL) in high school and a binary indicator for whether the student worked while still in high school;[8]

5. *Years of experience [EXPER]:* defined as the number of calendar years following graduation from high school in which an individual earned at least $100 in at least one quarter of the year;
6. *Major area [MAJ]:* included in the model as fixed effects, defined by the two-digit Classification of Instructional Programs (CIP) for the program from which an individual graduated (all graduates regardless of major area are included in the analysis); and
7. *Job location [LOC]:* included in the model as fixed effects for state of Texas economic regions.

Defining Earnings

For our dependent variable—labor market return as represented by wages—data were available from the Texas Workforce Commission, they were reported quarterly, and there were separate records for individuals reporting income from more than one source. First we determined the sum earnings for individuals reporting more than one source in a given quarter to achieve a total quarterly earnings figure. Then we defined annual earnings as the total earnings reported in a calendar year (four-quarter) cycle beginning in January, ten years after high school graduation. Thus, earnings for the 1997 cohort came from 2007, earnings for the 2000 cohort came from 2010, and earnings for the 2002 cohort came from 2012. We selected this timeframe based on work by Mincer (1974), who showed that the return to schooling could be underestimated if measured before enough time had passed. Mincer (1974) and others have suggested specifically that using earnings data from an individual's early twenties can be problematic, as the return to attending postsecondary education may not yet have been realized in the labor market (Andrews et al., 2012, 2014; Hoekstra, 2009; Mincer, 1974). As we investigated each cohort separately and were interested in the difference in earnings between HSI

and non-HSI graduates, we did not adjust wage figures for inflation in our models; however, we do present constant, CPI-adjusted 2002 dollars in our descriptive portraits. Finally, due to the distribution of the earnings data, we used logged wages in our analytic model.

Sample Inclusion Criteria

Given the limitations associated with merging three independent data sources, we included three cohorts of Hispanic students who graduated from public high schools in Texas in the spring of 1997, 2000, and 2002, and analyzed each cohort separately. Each year represents a cohort that enrolled in college prior to a particular policy change in Texas higher education and that meets the required six-year graduation rate for the last year of data available to us at the time of our analyses. For example, 1997 is the year before the Texas Top Ten Percent Plan was fully implemented; 2000 is the year preceding implementation of the in-state resident tuition policy, House Bill 1403, and a new influx of state financial aid; and, finally, 2002 is the year before Texas colleges and universities deregulated tuition, which put Texas tuition significantly higher than other states in the nation (Flores & Shepherd, 2014). Thus, we used these cohorts as a robustness check to determine whether our findings were consistent across multiple cohorts corresponding to significant shifts in Texas higher education policy. To be included in the cohorts, individuals must have (1) enrolled in a public four-year university in Texas in the fall immediately following high school graduation; (2) completed a college degree within six years; (3) had no missing data on any of the covariates used in the analysis; and (4) showed earnings of at least $100 in all four quarters in the calendar year (four-quarter) cycle beginning in January ten years after high school graduation. Unlike other studies, we did not restrict our sample to males; however, we followed conventions similar to those used by Andrews et al. (2012, 2014) and Hoekstra (2009), who also used similar data.

Data Limitations

These data are subject to limitations in regard to the availability of a more comprehensive set of variables that may be available in other datasets, such as parental education and income, and generational status in the U.S. Furthermore, the data do not contain information for students who attended private schools or on earnings for individuals working outside of Texas. However, we emphasize the opportunity made possible by the Texas dataset in that it allowed us to (1) access wage records not available nationally; (2) provide a longitudinal perspective on multiple cohorts across various economic periods in the U.S. and Texas; and (3) link student characteristics and academic preparation as well as high school, postsecondary, and community contexts to wage records in ways not possible with other datasets. Thus, while no dataset is perfect, we argue that it is worthwhile to investigate the individual-level returns to wages the result from attending HSIs, especially since they have not previously been evaluated in this manner.

Analytic Approach

To answer the first research question, we compiled a detailed descriptive portrait that compares Hispanic college graduates who attended HSIs to those who attended non-HSIs, with a focus on labor market earnings. In so doing, we examined the earnings data, the characteristics of graduates, and where these individuals were working. We conducted this investigation using a series of descriptive tables that will be discussed in the following section.

To identify the net relationship between having graduated from an HSI and earnings, we employed the following earnings model,

$$log(earnings) = \alpha + \beta(HSI) + \theta(S) + \delta(ACAD) + \xi(COMM) + \lambda(ECON) + \pi(EXPER) + MAJ + LOC + \varepsilon$$

Under this specification, β captures the net relationship between graduating from an HSI and earnings, controlling for vectors *S, ACAD, COMM, ECON,* and *EXPER,* as identified above, as well as fixed effects for *MAJ* and *LOC;* ε is an individual specific error term. Earnings are logged due to their distribution and in accordance with previous literature (e.g., Cellini & Chaudhary, 2013; Dagdar & Weiss, 2012).

As previous research has indicated that attending a more selective institution has a positive impact on earnings, we also addressed selectivity by performing two iterations of the model, which uses restrictions based on Barron's selectivity index. We first modeled the results using all public universities in Texas and compared outcomes for Hispanic students attending HSIs to those attending non-HSIs. We then restricted our sample to include only Hispanic students who attended a "non-selective" or a "somewhat selective" institution. We did this to provide a more reasonable comparison between the outcomes for those graduating from HSIs and non-HSIs, as there currently are no HSIs in the top Barron categories. In essence, we compared similarly ranked institutions. Given this and the role selectivity plays in labor market earnings, we restricted our comparisons to HSIs and non-HSIs with the same level of selectivity.

This approach builds on earlier studies that investigated the impact postsecondary education has on labor market oucomes (Andrews et al., 2012, 2014; Hoekstra, 2009; Strayhorn, 2008). However, as noted by Kaymak (2009), without proper statistical controls and carefully chosen comparison groups, it is difficult to identify the relationship between education and labor market outcomes due to the spurious relationship between academic ability, college selectivity, and post-graduation earnings. As such, we were careful to construct our model with a number of controls designed to capture human and social capital factors, and then restricted our sample in a

manner that provided a more accurate comparison between institutions. We now offer a discussion of the results gleaned from these approaches.

Results

Our results are organized into two parts. First we offer a descriptive portrait that discusses the characteristics of Hispanic students who have graduated from HSIs and non-HSIs, and their average post-graduation earnings. We then present the results from our analytic model.

Descriptive Portrait

Tables 2a, 2b, and 2c provide key descriptive statistics, such as mean and standard deviation, or the primary variables of the analysis, organized by the 1997 (N=2,106), 2000 (N=2,781), and 2002 (N=3,196) cohort years. We present them in aggregated totals by year, as well as broken out by institution type (i.e., HSI or non-HSI); the far right column lists the difference between the types of institutions. Three main themes emerge from this table, which we discuss below.

First, it is worth noting that, while the overall samples remain relatively consistent in terms of gender breakdown, with fewer males than females, there is a gender shift between HSIs and non-HSIs. More specifically, approximately 40% of each cohort is male: 39.65% in 1997, 39.23% in 2000, and 40.05% in 2002. However, the proportion of Hispanic male graduates is greater at HSIs (39.8%) than at non-HSIs (37.62%) only in the 1997 cohort. In 2000 and 2002, total HSI graduates (N=1,323 and N=1,636) and non-HSI graduates (N=1,458, and N=1,560) included 3.75% and 2.41% more males than females, respectively. As for English learner status, the percentage of students classified as limited English proficient dropped across all cohorts and across HSI designation, which signals a potentially more selective cohort over time. The data show that the percentage of students classified as limited English proficient dropped from 3.38%

in 1997 to 1.50% in 2000, and to 0.61% in 2002 at HSIs, and at non-HSIs it dropped from 0.64% in 1997 to 0.48% in 2000, and to 0.38% in 2002.

Second, wage differentials and economic disadvantage between institution types are striking. For instance, in the 1997 cohort, graduates of non-HSIs had a $6,227.50 average wage premium over HSI graduates; the number fell to $5,375.13 for the 2000 cohort but increased to $7,667.13 for the 2002 cohort (all expressed in constant, CPI-adjusted 2002 dollars). This widening wage gap is depicted by institution type in Figure 1, and is consistent with the literature on wage gap differentials. Along the same lines, the percentage of students classified economically disadvantaged grew in each cohort year, as did the gap by institution type: 1997—45.98% at HSIs and 23.02% at non-HSIs; 2000—51.85% at HSIs and 28.05% at non-HSIs; and 2002—54.89% at HSIs and 29.94% at non-HSIs. Put differently, the proportion of HSI graduates who were classified as economically disadvantaged was nearly double that of non-HSI graduates in every cohort.

Third, in terms of academic preparation, we found that graduates of both HSIs and non-HSIs were better prepared for college entry over time for each cohort year; however, HSI graduates remained slightly less prepared to participate in rigorous academic coursework at the postsecondary level than graduates of non-HSIs. Participation in AP/IB courses at HSIs was 34.56% in 1997, 68.32% in 2000, and 65.65% in 2002; at non-HSIs it was 48.59% in 1997, 71.87% in 2000, and 75.13% in 2002. In short, HIS graduates were enrolled in advanced coursework at a rate 14.03 percentage points lower than non-HSIs in 1997, but only 3.49 points lower in 2000 and 9.48 percentage points lower in 2002. The gap in the percentage of graduates from HSIs and non-HSIs who participated in dual-enrollment programs while still in high school

was 7.29 percentage points in 1997, but there was nearly no difference in 2002, a mere 0.67 percentage points.

Model Results

Table 3 presents regression results for our cohorts. Model 1 for each cohort is the full sample and Model 2 is the selectivity-restricted sample. All models include the full array of covariates that account for differences in human capital, social capital, and location of employment (Texas economic region) ten years after graduating from high school. The full model for each cohort reveals a negative and statistically significant relationship between graduating from an HSI and earnings; however, the restricted model that accounts for selectivity shows no difference in the earnings of Hispanic who graduated from HSIs and non-HSIs. As our models used logged wages as the outcome variable, the coefficients in the table are interpreted as a percentage change in actual earnings. More specifically, Model 1 shows 7.1%, 6.5%, and 10.8% lower earnings for graduates of HSIs than for non-HSIs for the 1997, 2000, and 2002 cohorts, respectively. However, in Model 2, there is no statistically significant difference between the earnings of HSI graduates and non-HSI graduates—in other words, Hispanic HSI graduates earned just as much as non-HSIs graduates with similar selectivity. Significant in most of the models, however, are gender (males earn more than females), performance on the state math exam (higher scores are associated with higher earnings), and years of experience (averaging nearly 3% more in wages for each additional year of experience).

Discussion

This paper sheds further light on HSIs—which are a growing segment of American higher education—and the population of students these institutions serve. We find that differences exist between Hispanics who graduate from HSIs and those from non-HSIs in terms

of post-graduation earnings, as well as pre-college academic preparation and contextual factors, both of which are known to influence earnings. However, we demonstrate that differences in earnings between Hispanic students who graduate from HSIs and those from non-HSIs are driven by selectivity rather than HSI designation. We found no difference in wages when comparing graduates of HSIs and non-HSIs that are similarly selective, after controlling for our measures of human and social capital and the region of Texas where the graduates were employed ten years after finishing high school.

This finding is important, as HSIs are often criticized for having lower graduation rates and, by extension, lower returns on investment for those attending these institutions. Previous research has provided evidence that, after controlling for student and institutional characteristics, Hispanic students graduate from HSIs at equal rates as from non-HSIs (Flores & Park, 2015). This analysis suggests similar outcomes in regard to labor market outcomes: Hispanic students graduating from HSIs have comparable earnings to those who graduate from non-HSIs, after accounting for selectivity. More selective institutions, by definition, have more restricted admissions policies and enroll a more academically prepared body of students. Analyses that compare HSIs to non-HSIs without accounting for the enormous role selectivity plays should at least acknowledge the important role of selection bias in interpreting such results. Proper comparison groups, when available, are the most accurate way to present research. If such data are not available, which is a common limitation in many analyses, we recommend acknowledging this limitation and the associated implications of policy recommendations based on the limited data.

Our analysis does not suggest that Hispanic students should not attend selective institutions. They instead illuminate the need to account for key elements in order to reduce

selection bias in the analysis of outcomes by institutional selectivity. In other words, Hispanic HSI graduates working in the Texas labor market are earning wages similar to those of their Hispanic peers who attended similarly ranked non-HSIs. This fact is even more relevant when considering that the majority of Hispanic students in Texas enroll at non-selective or moderately selective institutions, and that HSIs tend to be funded at only 66 cents for every dollar spent at all other postsecondary institutions (Hispanic Association for Colleges and Universities, 2013).

Directions for Future Research

This study is one of the first to examine how Hispanic students graduating from HSIs fare in the labor market as compared to non-HSI graduates in a post-2000 economy. As noted, while the chosen dataset is rich, provides for longitudinal tracking of students, and is from a state with a large number of HSIs and Hispanic postsecondary students, studies conducted in other contexts would help tell a more complete story of the labor market returns to attending an HSI across the country. For instance, similar studies could be conducted in California, New York, and Florida, all of which have sizeable Hispanic populations and databases similar to those in Texas. Further, additional research that examines outcomes across state boundaries is imperative if we are to be able to tell a complete story of the role education plays in the well-being of individuals in the United States. The State Higher Education Executive Officers have developed reports that show partnerships beginning within and across states that are linking data between sectors (K-16) and some states (Garcia & L'Orange, 2010). Researchers should take time to familiarize themselves with the possibilities, limitations, and priorities of state governments in order to gain a clear understanding of whether underserved students and institutions are part of the current research agendas.

Conclusion

While we have laid a strong foundation on which to build additional studies, there is still not enough research on the effect of HSIs, and MSIs more generally, have on outcomes such as labor market returns and graduate degree acquisition, and how these effects vary by context. For example, how does the effect of attending an HSI vary by state? What role do HSIs in Texas play in the acquisition of graduate degrees, and what effect do graduate degrees have on labor market outcomes? Finding answers to these questions and others will only be possible if there is more high-quality data available and better access to it. U.S. higher education is experiencing profound changes related to demography, technology, costs, and outcomes. As policies are suggested, implemented, and retracted, we recommend that giving precise and sustained attention to the changing student demography of U.S. higher education be a key priority for all states. A lack of responsiveness to the evolving national demography will be not only costly but also counter to the goal of improving educational opportunity for reasons of civic and social justice, and for the economic survival of states and institutions. The changing demographics in many of our states and institutions will require us to make a unified effort to provide educational opportunity for all. We thus urge state agencies, funding organizations, and other scholars to appreciate the importance and research power of state education data systems, as we have outlined both here and in a 2015 special issue of *Educational Evaluation and Policy Analysis*. Only continued research using sophisticated datasets, and funding to support the research work, will enable us to gain a full understanding of the role played by HSIs in the nation's higher education system, and thus allow us to offer the best possible recommendations for state and federal policy that will improve educational outcomes for *all* students.

Tables and Figures

Table 1: Public Universities in Texas, by Selectivity and HSI Designation

More Selective		Selective		Somewhat Selective		Non-Selective	
HSI	**Institution**	**HSI**	**Institution**	**HSI**	**Institution**	**HSI**	**Institution**
no	UT-Austin	*no*	U. North TX	*no*	Tarleton State U.	*yes*	UT-Pan American
no	A&M-College Station	*no*	U. Houston	*no*	Texas Women's U.	*yes*	U. Houston - Downtown
no	Texas Tech	*no*	Stephen F Austin State U.	*no*	UT-Permian Basin	*yes*	UT-El Paso
no	UT-Dallas	*no*	Sam Houston State U.	*no*	TX Southern U.	*yes*	A&M-International
no	A&M-Galveston*	*no*	UT-Arlington	*yes*	Sul Ross State U.	*yes*	A&M-Corpus Christi
		no	Angelo State U.	yes	A&M-Kingsville	*yes*	UT-Brownsville***
		no	West TX A&M	yes	UT-San Antonio		
		no	Lamar U.	*no*	UT-Tyler**		
		no	TX State U.				
		no	Prairie View A&M				
		no	A&M-Commerce				
		no	Midwestern State U.				

Notes: *Degrees from A&M-Galveston are granted through A&M College Station

**UT-Tyler is not included in the 1997 cohort due to data collection limitations.

***UT-Brownsville is not included in the 1997 and 2000 cohorts due to data collection limitations on status of institution. UT-Brownsville was in a formal partnership with Texas Southmost College, a two-year institution until 2011 making data collection efforts on solely its four-year partner institution difficult for this analysis.

Selectivity rankings come from Barron 1997, are used for all cohorts, and are time-invariant for the time period in this study.

Table 2a: Descriptive Statistics for the 1997 Cohort

	TOTAL (N=2,106	HSIs (N=1,007)	NON-HSIs (N=1,099)	DIFFERENCE
	Mean *St. Dev.*	Mean *St. Dev.*	Mean *St. Dev.*	
Wages				
1997 dollars	48,080.31 *20,676.12*	45,180.66 *16,683.84*	50,737.22 *23,447.15*	-5,556.56
Constant 2002 dollars	53,885.90 *23,172.71*	50,636.12 *18,698.37*	56,863.62 *26,278.34*	-6,227.50
Student background characteristics				
Sex (percent male)	39.65 *48.93*	39.87 *48.98*	37.62 *48.47*	2.25
LEP status	1.95 *13.82*	3.38 *18.07*	0.64 *7.96*	2.74
High school academic preparation [ACAD]				
AP or IB course	41.88 *49.35*	34.56 *47.58*	48.59 *50.00*	-14.03
Trigonometry course	53.47 *49.89*	43.69 *49.63*	62.42 *48.45*	-18.73
Math exam score	50.77 *8.02*	49.27 *8.08*	52.15 *7.71*	-2.88
Dual enrollment indicator	12.35 *32.90*	8.54 *27.96*	15.83 *36.52*	-7.29
Community context [COMM]				
HS pupil:teacher ratio	15.21 *2.28*	14.94 *2.09*	15.45 *2.42*	-0.51
HS enrollment	1,828.43 *842.57*	1,752.70 *775.77*	1,897.82 *894.17*	-145.12
HS percentage minority	70.07 *27.83*	82.45 *19.90*	58.74 *29.20*	23.71
Log HS per pupil expenditures	8.13 *0.11*	8.15 *0.10*	8.11 *0.11*	0.04
HS urbanicity	53.28 *49.90*	56.21 *49.64*	50.59 *50.02*	5.62
County unemployment rate	8.64 *6.33*	10.76 *7.01*	6.69 *4.89*	4.06
Proximity to postsecondary	84.43 *36.27*	86.20 *34.51*	82.80 *37.75*	3.39
Economic capacity [ECON]				
FRL status	34.00 *47.38*	45.98 *49.86*	23.02 *42.12*	22.96
Worked in HS	13.06 *33.70*	10.53 *30.70*	15.38 *36.09*	-4.85

Notes: LEP refers to Limited English Proficiency; AP refers to Advanced Placement; IB refers to International Baccalaureate; and FRL refers to Free and Reduced-Price Lunch

Table 2b: Descriptive Statistics for the 2000 Cohort

	TOTAL (N=2,781)	HSIs (N=1,323)	NON-HSIs (N=1,458)	DIFFERENCE
	Mean *St. Dev.*	Mean *St. Dev.*	Mean *St. Dev.*	
Wages				
2000 dollars	49,200.85 *22,559.10*	46,503.14 *19,227.95*	51,648.78 *24,959.14*	-5,145.64
Constant 2002 dollars	51,395.17 *23,565.22*	48,577.15 *20,085.50*	53,952.28 *26,072.30*	-5,375.13
Student background characteristics				
Sex (percent male)	39.23 *48.84*	37.26 *48.37*	41.02 *49.20*	-3.75
LEP status	1.01 *9.99*	1.59 *12.50*	0.48 *6.91*	1.11
High school academic preparation [ACAD]				
AP or IB course	70.30 *45.70*	68.63 *46.42*	71.81 *45.01*	-3.18
Trigonometry course	69.76 *45.94*	64.32 *47.92*	74.69 *43.49*	-10.37
Math exam score	52.91 *6.60*	51.87 *7.24*	53.85 *5.80*	-1.98
Dual enrollment indicator	22.76 *41.94*	18.59 *38.92*	26.54 *44.17*	-7.95
Community context [COMM]				
HS pupil:teacher ratio	15.01 *2.39*	14.71 *2.20*	15.28 *2.53*	-0.57
HS enrollment	1,791.75 *827.45*	1,670.17 *702.38*	1,902.08 *912.77*	-231.91
HS percentage minority	70.04 *29.10*	85.37 *17.76*	56.12 *30.37*	29.25
Log HS per pupil expenditures	8.29 *0.10*	8.30 *0.10*	8.29 *0.11*	0.01
HS urbanicity	53.97 *49.85*	59.11 *49.18*	49.31 *50.01*	9.79
County unemployment rate	5.54 *2.63*	6.42 *2.96*	4.73 *1.98*	1.69
Proximity to postsecondary	84.75 *35.95*	86.70 *33.97*	82.99 *37.58*	3.71
Economic capacity [ECON]				
FRL status	39.37 *48.87*	51.85 *49.98*	28.05 *44.94*	23.80
Worked in HS	14.42 *35.13*	9.15 *28.84*	19.20 *39.40*	-10.06

Notes: LEP refers to Limited English Proficiency; AP refers to Advanced Placement; IB refers to International Baccalaureate; and FRL refers to Free and Reduced-Price Lunch

Table 2c: Descriptive Statistics for the 2002 Cohort

	TOTAL (N=3,196)	HSIs (N=1,636)	NON-HSIs (N=1,560)	DIFFERENCE
	Mean *St. Dev.*	Mean *St. Dev.*	Mean *St. Dev.*	
Wages				
2002 dollars	50,316.46 *22,559.10*	46,574.06 *19,227.95*	54,241.19 *24,959.14*	-7,667.13
Student background characteristics				
Sex (percent male)	40.05 *49.01*	38.88 *48.76*	41.28 *49.25*	-2.41
LEP status	0.50 *7.06*	0.61 *7.80*	0.38 *6.19*	0.23
High school academic preparation [ACAD]				
AP or IB course	70.28 *45.71*	65.65 *47.50*	75.13 *43.24*	-9.48
Trigonometry course	70.53 *45.60*	64.49 *47.87*	76.86 *42.19*	-12.37
Math exam score	53.81 *7.13*	53.15 *6.87*	54.51 *7.34*	-1.36
Dual enrollment indicator	33.89 *47.34*	33.56 *47.23*	34.23 *47.46*	-0.67
Community context [COMM]				
HS pupil:teacher ratio	15.01 *2.39*	14.71 *2.20*	15.28 *2.53*	-0.57
HS enrollment	1,818.04 *837.92*	1,735.33 *735.37*	1,904.77 *925.78*	-169.44
HS percentage minority	71.71 *27.93*	84.23 *19.64*	58.58 *29.29*	25.64
Log HS per pupil expenditures	8.37 *0.10*	8.38 *0.11*	8.36 *0.10*	*0.02*
HS urbanicity	53.72 *49.87*	58.99 *49.20*	48.21 *49.98*	10.78
County unemployment rate	7.27 *2.38*	8.01 *2.67*	6.50 *1.71*	1.51
Proximity to postsecondary	82.13 *38.31*	84.60 *36.11*	79.55 *40.35*	5.05
Economic capacity [ECON]				
FRL status	42.71 *49.47*	54.89 *49.78*	29.94 *45.81*	24.95
Worked in HS	12.36 *32.92*	9.78 *29.71*	15.06 *35.78*	-5.28

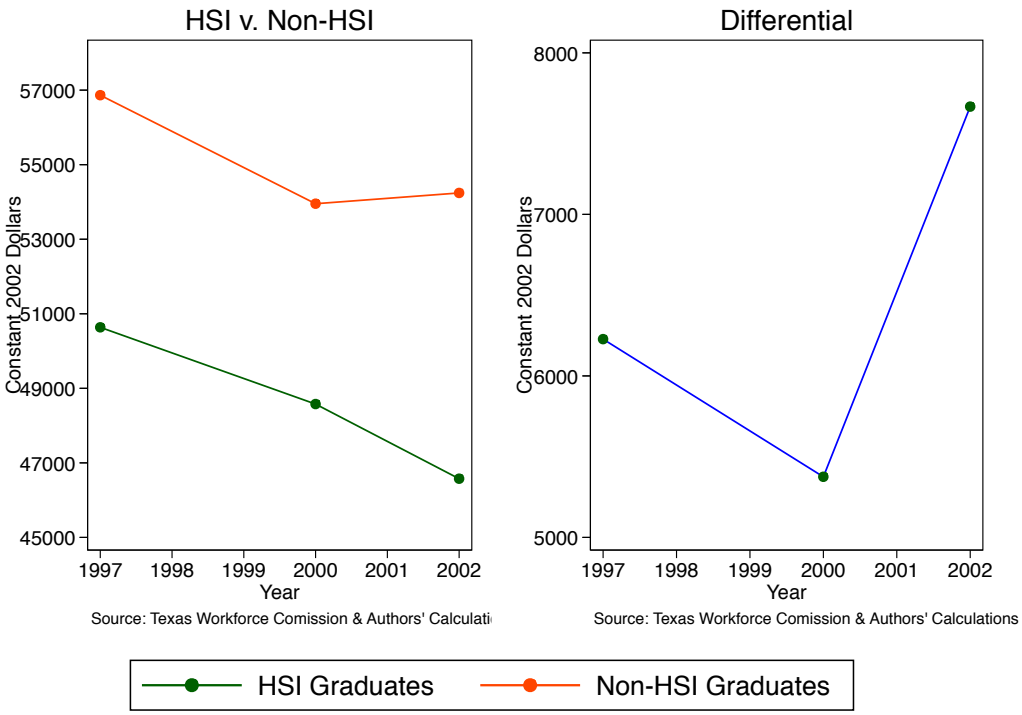
Notes: LEP refers to Limited English Proficiency; AP refers to Advanced Placement; IB refers to International Baccalaureate; and FRL refers to Free and Reduced-Price Lunch

Table 3: Regression Model Results Predicting log (earnings)

	1997		2000		2002	
	Model 1	Model 2	Model1	Model 2	Model 1	Model 2
HSI designation						
HSI	-0.071***	-0.088	-0.065**	0	-0.108***	-0.085
	[0.02]	[0.07]	[0.02]	[0.07]	[0.02]	[0.06]
Student background characteristics						
Sex (percent male)	0.041*	-0.001	0.084***	0.069*	0.068***	0.063**
	[0.02]	[0.03]	[0.02]	[0.03]	[0.02]	[0.02]
LEP status	0.101	0.136*	0	0.018	-0.147	-0.280*
	[0.06]	[0.07]	[0.09]	[0.09]	[0.11]	[0.14]
High school academic preparation [ACAD]						
AP or IB course	0.017	0.032	0.021	-0.019	0.038*	0.045
	[0.02]	[0.03]	[0.02]	[0.03]	[0.02]	[0.02]
Trigonometry course	0.022	0.026	0.056**	0.029	0.004	0.007
	[0.02]	[0.03]	[0.02]	[0.03]	[0.02]	[0.02]
Math exam score	0.003**	0.002	0.004**	0.004*	0.003*	0.005***
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Dual enrollment indicator	0.022	0.057	0.04	0.053	0.054**	0.066**
	[0.03]	[0.04]	[0.02]	[0.03]	[0.02]	[0.03]
Community context [COMM]						
HS pupil:teacher ratio	0	-0.011	0	0.002	-0.001	0.002
	[0.01]	[0.01]	[0.01]	[0.01]	[0.00]	[0.01]
HS enrollment (1,000s)	0.004**	0.007**	0.001	-0.004	0.002	0.002
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
HS percentage minority	0.046	0.079	0.01	0.065	0	0.062
	[0.04]	[0.07]	[0.04]	[0.07]	[0.04]	[0.06]
HS per pupil expenditures	0.203*	0.285	-0.138	-0.028	-0.13	-0.048
	[0.10]	[0.15]	[0.10]	[0.14]	[0.09]	[0.12]
HS urbanicity	-0.055**	-0.032	-0.011	0	-0.013	-0.009
	[0.02]	[0.03]	[0.02]	[0.03]	[0.02]	[0.02]
County unemployment rate	0.002	0.002	0.007	0.003	0.004	-0.004
	[0.00]	[0.00]	[0.00]	[0.01]	[0.00]	[0.01]
Proximity to postsecondary	0.044	0.005	0.034	0.031	-0.033	-0.034
	[0.03]	[0.04]	[0.03]	[0.04]	[0.02]	[0.03]
Economic capacity [ECON]						
FRL status	-0.035	-0.034	-0.057**	-0.048	-0.035*	-0.049*
	[0.02]	[0.03]	[0.02]	[0.03]	[0.02]	[0.02]
Worked in HS	0.069**	0.076	0.052*	0.096*	0.019	0.039
	[0.03]	[0.04]	[0.02]	[0.04]	[0.02]	[0.04]
Years of experience [EXPER]						
Years	0.021***	0.014	0.035***	0.035***	0.028***	0.031***
	[0.01]	[0.01]	[0.01]	[0.01]	[0.00]	[0.01]
Includes major area fixed effects [MAJ]	yes	yes	yes	yes	yes	yes
Includes economic region fixed effects [LOC]	yes	yes	yes	yes	yes	yes
N	2,106	1,046	2,780	1,376	3,196	1,711
R-squared	0.171	0.14	0.174	0.175	0.195	0.201

* p<0.05, ** p<0.01, *** p<0.001
Standard errors are in brackets.
Notes: LEP refers to Limited English Proficiency; AP refers to Advanced Placement; IB refers to International Baccalaureate; and FRL refers to Free and Reduced-Price Lunch

Figure 1: Earnings by HSI Designation and Differential



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[1] This study utilized the same definitional construction of the term "Hispanic" as is used by the 2010 U.S. Census. That is, an individual's self-identification of Hispanic origin, regardless of race, triggers their inclusion in this group. For purposes of this study, the terms "Latino" and "Hispanic" are used interchangeably.

[2] Reducing a university's decision to admit or deny students to both observable—standardized test scores and GPA—and unobservable variables, Dale and Krueger (2002) intuitively define selective institutions as those with higher thresholds necessary for admissions acceptance. Thus, the present study operationalized "selective flagship public universities" as the premier institutions of their respective university systems, such as University of Texas at Austin and Texas A&M University at College Station, which correspondingly have the lowest, and therefore most selective, acceptance rates in the state of Texas.

[3] UT-Tyler is not included in the 1997 cohort as this institution at that time only enrolled upper-division (junior and senior) students; freshman were first admitted to UT-Tyler in 1998. UT-Brownsville is not included in the 1997 and 2000 as the database at that time did not record baccalaureate degree graduates from this institution.

[4] UT-Permian Basin is not flagged as an HSI as it did not meet the 25 percent threshold in 1997. Furthermore, we do not include Brazosport College, Midland College, or South Texas College as HSIs; although these institutions meet the 25 percent threshold, they primarily award associate degrees.

[5] Selectivity rankings come from Barron's 1997 index and are time-invariant in cohort analyses.

[6] For a map of the Texas economic regions, see https://texaspolitics.utexas.edu/archive/html/pec/features/0302_02/regmap.html.

[7] For a more detailed description of the identification of English learners in Texas at the point of classification, see Flores, Batalova, and Fix (2012).

[8] Unfortunately, our data do not include financial aid information for respondents so we are not able to measure issues of affordability. The analysis focuses instead on the level of economic disadvantage.