High Schools Tailored To Adults Can Help Them Complete a Traditional Diploma and Excel in the Labor Market*

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Abstract

More than 18 million adults in the US have no high school credential. Later on, these adults are less likely to earn full diplomas than GEDs, but diplomas are potentially more valuable. A network of high schools helps adults graduate by providing a tailored curriculum, coaching for non-academic barriers, onsite child care, and transportation. After 5 years, earnings increase by 38% more for graduates than applicants who do not enroll. We address selection by conditioning on 5 years of pre-application earnings and comparing to students who exit after positive shocks. Much of the wage gains can be accounted for by sectoral switching, and evidence on completion of credentials is consistent with a human capital explanation for the results.

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More than 18 million adults in the United States lack a high school credential. Young adults with a high school diploma earn 77% more than peers without a high school credential, a gap that increases throughout adulthood.[1] The GED[2] serves as the primary credentialing option for adults who have no diploma, but the effect of the GED on earnings is either negligible (Jepsen et al., 2016) or mixed (Tyler et al., 2000), likely because the GED evaluates rather than creates human capital (Heckman et al., 2011). On the other hand, diplomas have large returns for traditional students (Angrist and Krueger, 1991; Oreopoulos, 2006), mostly due to human capital formation rather than signaling (Clark and Martorell, 2014). Few adults earn diplomas, though, partly because of public policy—18 states provide no legal path for adults to receive a full high school diploma.

In this paper, we estimate the labor market return to high school graduation among adults who dropped out of traditional high school and apply to The Excel Center (TEC), a tuition-free public charter school network for adults. Goodwill of Central and Southern Indiana created TEC in 2010 to help adult learners overcome barriers to graduation by providing an accelerated curriculum tailored to the individual, flexible class schedules, and non-academic support services like free on-site child care, life coaches, and transportation assistance. The program incorporates professional certificates and community college credits into the traditional high school curriculum. These novel supports are designed to help adults achieve a traditional goal, earning a traditional high school diploma.

Using linked administrative data on earnings and educational attainment, we estimate the return to graduating by comparing the earnings of graduates before and after application to both students who enrolled in TEC but exited before graduating and people who applied but did not enroll. Our identification strategy relies on the assumption that, beyond TEC enrollment, earnings of graduates and non-graduates only differ due to pre-existing differences in levels and histories of earnings. Similar trends in the five years preceding application support this assumption. Our primary specification controls for time-invariant differences between graduates and non-graduates using individual fixed effects and for differences in earnings and employment prior to application

[1] Based on authors' calculations using the 2012–2016 ACS (Ruggles et al., 2020). See Table 1.

[2] The GED refers to the General Educational Development (GED) test. Different states use testing companies with differing names. Throughout the paper, we refer to these tests interchangeably as 'GED.'

using inverse propensity weights. Results are robust to an alternative identification strategy that narrows our comparison to a set of students who exit TEC for reasons positively related to earnings.

Graduates earn substantially more and are able to access higher-paying sectors than non-enrolled applicants in the years following application. While earnings initially fall, we find large and statistically significant increases in earnings three to five years after application. By year five, quarterly earnings increase $849 among graduates relative to applicants who did not enroll, a 38% increase. Results across our alternative identification strategies are similar, suggesting that selection on post-enrollment shocks is unlikely to drive the observed difference in earnings. Earnings gains occur alongside greater job stability and consistent employment in the same industry. We find somewhat lower returns for Black women but otherwise similarly high returns for sub-groups defined by other socioeconomic characteristics. Finally, we find evidence that the process of receiving a high school diploma helps adult students gain industry-recognized credentials that leads to new careers. Graduates are more likely to earn post-secondary credits and certificates—particularly in health-related programs—and move into healthcare work and out of hospitality work.

We quantify the importance of these earnings gains using the Marginal Value of Public Funds framework (Hendren and Sprung-Keyser, 2020) and find the Excel Center generates large benefits relative to the cost of serving students. Under the assumption that gains persist through retirement, the typical TEC enrollee can expect a $34,063 increase in the net present value of their after-tax earnings—with $80,917 in gains accruing to the typical graduate. Accounting for the upfront cost of the program ($7,128) and increased tax revenue, we estimate the MVPF to be 20.7, which exceeds estimates for other programs serving low-wage workers (Hendren and Sprung-Keyser, 2020).

This paper contributes to the literature that explores the returns to high school diplomas, the GED, and community college. We find that a high school designed to help adult learners overcome barriers to graduation can meet all the traditional goals of a high school diploma and substantially increase earnings. For comparison, we also estimate the labor market return to both a GED and an associate's degree using a similar estimation strategy, comparing a cohort of people who pass versus fail. Similar to existing studies of the GED (Heckman et al., 2011; Murnane et al., 2000; Jepsen et

al., 2016) and community college (Jepsen et al., 2014; Stevens et al., 2019; Grosz, 2020), we find that the return for the GED is lower and that for an associate's degree is higher. Our results on credentials and sector of employment are consistent with the view that the high school diploma has a greater return than the GED because the GED only signals overall ability while a diploma promotes acquisition of human capital.

We also show how later-life educational interventions can have high returns provided they are sufficiently intense. The returns to many adult vocational training programs have been disappointing relative to the success of many early childhood interventions (Carneiro and Heckman, 2003; Almond et al., 2018), and high school graduation rates have not responded to large increases in the return to skills (Goldin and Katz, 2009; Murnane, 2013). Such facts lead many to infer that the returns to the marginal high school diploma is low. Our results, however, suggest that the marginal diploma has a high return, but students require significant assistance to complete it. The comprehensive supports The Excel Center provides to students bear similarity to successful anti-poverty interventions in housing (Bergman et al., 2020), community colleges (Weiss et al., 2019; Azurdia and Galkin, 2020; Evans et al., 2020), and self-sufficiency (Evans et al., 2023). With supports to address the costs and complexity of returning to high school, adults who previously dropped out can complete a diploma and reap its large labor market returns.

1 Background

1.1 Policy and Research Context

The more than 18 million adults in the US who lack a high school credential earn substantially less than their peers with a diploma.[3] Table 1 compares the employment and earnings of adults with different levels of educational attainment. Young adults who have a high school diploma as their highest credential earn $15,046 per year (column 1), compared to $8,489 for those with neither a

[3]Population counts and earnings reported in this section are based on the authors' calculations using the 2012–2016 American Community Survey (Ruggles et al., 2020).

diploma nor an alternative credential (column 2). A large empirical literature demonstrates that much of this difference is due to the causal effect of high school graduation (Angrist and Krueger, 1991; Oreopoulos, 2006). While technological change has increased the return to skills and thus inequality (Goldin and Katz, 2009), high school graduation rates failed to respond, stagnating for decades, though they have increased recently (Murnane, 2013).

High school equivalency credentials are the primary educational options for those who have dropped out of high school. For example, the General Educational Development (GED) test is a battery of tests on math, reading, writing, science, and social studies. If a student scores sufficiently high on the GED or other similar tests, they receive the credential. These alternative high school credentials represent the highest educational attainment of more than 8 million US-born adults. Figure 1 shows the age profile for educational attainment. Most adults who complete high school do so as teenagers, and the share of adults with no diploma or alternative high school credentials falls rapidly through age 19 (solid navy line). That share continues to fall more slowly throughout the 20s or 30s, while the share of adults with only a GED or other alternative credential rises (gold dashed line). There is not much change in educational attainment beyond those ages.

However, the labor market return to the GED is small. Though GED recipients do have greater employment and earnings than those without a high school credential, as shown in columns (2) and (3) of Table 1, this difference is largely due to selection. Conditional on pre-market factors like test scores and demographics, GED holders have similar earnings to people without a credential (Heckman et al., 2011), and a recent study that exploits the GED passing threshold shows little if any labor market benefits for test takers who just barely pass—earnings increase less than 10% (Jepsen et al., 2016). However, there is some evidence that a GED provides a positive labor market benefit to sub-populations with the greatest challenges in the labor market (Murnane et al., 2000).

A high school diploma has potential labor market advantages over an alternative credential. First, a diploma involves more intense academic instruction. The median GED taker reports preparing for 30 hours compared to the roughly 1,000 classroom hours during a typical high school year (Heckman et al., 2011). Second, attending school may build non-academic soft skills valued by the

labor market. Evidence from the early childhood context suggests the returns to education can be large even when achievement remains the same (Belfield et al., 2006). Finally, a diploma and a GED may provide different signals to employers by grouping the job seeker with a different set of peers, though the signaling benefits of a diploma may be limited (Clark and Martorell, 2014).

Efforts to re-enroll adults who did not finish high school are scare, despite the potentially high returns. Eighteen states prohibit adults without a diploma from enrolling in high school beyond a certain age.[4] While nearly half of 19 year olds without a high school credential report attending secondary school, just under 1.2% of adults aged 25 or older who lack a high school credential report that they are currently attending secondary school. Instead, workforce, welfare, and criminal justice rehabilitation programs encourage the GED by subsidizing test preparation or designing programs around core GED classes (Cave et al., 1993; Quint et al., 1997). In 2000, the federal government spent about $2 billion on adult education programs (Heckman et al., 2011).

Most existing evidence on reducing dropout thus focuses on prevention. Alternative schools, which direct at-risk students to a separate public school, focus on academic remediation, provide support services like childcare, and conclude with a full high school diploma. The Alternative Schools Demonstration found mixed effects on graduation and labor market outcomes (Dynarski and Wood, 1997), although evidence from a remediation program in Israel shows the merit of intervening with students at risk of dropout (Lavy and Schlosser, 2005; Lavy et al., Forthcoming). The published literature on the return to an adult high school diploma is much thinner, though a contemporaneous working paper by (Bennett et al., 2021) studies the effects of introducing a stipend for adult women to complete high school in Norway.

1.2 The Excel Center

The Excel Center (TEC) is a tuition-free, public charter high school for adults operated by Goodwill of Central and Southern Indiana. TEC opened in September 2010, and currently Goodwill operates 15 campuses across Indianapolis and other parts of central and southern Indiana.[5] During our study

[4]Based on the authors' examination of state policies as of summer 2020. See Appendix Table A-1.

[5]Table A-2 provides location and opening dates for all of these 15 campuses.

period, TEC funded its operations using the same per-student funding from the state received by charter schools for traditional high school students. While the model has been replicated by other Goodwill organizations in Arkansas, Missouri, Northern Indiana, Tennessee, Texas, and Washington D.C., this paper studies the original Excel Centers in Central and Southern Indiana.

Students are recruited to TEC through Goodwill's presence in the local community. Goodwill maintains relationships with local schools meaning that many students are referred to TEC by their previous high school. Goodwill also recruits students from other Goodwill-sponsored programs (e.g., Nurse-Family Partnership), as well as other community programs that target a similar population.

To enroll, students first complete an application, which is available year-round. Though Goodwill has worked to make the application accessible to all, one common reason for being unable to complete the application is not being able to provide an official transcript from a previous high school.[6] In addition to the transcript requirement, applicants must be an Indiana resident, lack a high school diploma, not be a sex offender, and be at least 18 years old, though some age exceptions down to age 16 are made. Once the application is complete, all eligible students are assigned an orientation date. Prior to expanding the number of campuses, some students had to wait months for an orientation, but in recent years orientation typically follows shortly after application. After orientation, students can enroll in the next available term and continue taking classes until they graduate or drop out. Time to graduation varies, depending on a student's prior credits, level of knowledge, and performance in course work. The typical graduate finishes in just over one year.

Excel Center graduates earn Indiana's Core 40 diploma, the standard credential earned by most high school graduates across the state. The requirements for obtaining a Core 40 diploma from TEC are the same as at a traditional high school: students must pass 40 specific credits of coursework. For example, the Core 40 requires 6 mathematics credits resulting from passing Algebra I, Geometry, and Algebra II. Typically, students must pass graduation tests in Math and English/Language Arts, though the exact test and rules regarding exceptions have changed over time.

The Excel Center is designed to help students who previously dropped out of high school over-

[6]Individuals who come to the US as adults are eligible for the Excel Center. Because they may not have access to their transcripts, these students often start their TEC career with zero credits.

come barriers to graduation and earn a standard high school diploma. To that end, the school has a number of unique features relative to more traditional high schools.

First, students take a set of courses aimed at their individual level of knowledge and existing credits. Using placement test results and existing transcripts, the school assigns the student a course plan that matches courses to the student's actual level in each subject area. Though many TEC students enter having completed a sufficient number of general credits to graduate, students often begin in remedial classes because they start behind in core areas such as Math and English.

Second, class schedules are flexible to accommodate non-traditional students who live adult lives with greater family and work obligations. Students can register for full-day or half-day schedules. Rather than a typical semester system, the school operates on a year-round schedule with five, eight-week terms. Intensive, frequent terms accelerate the path to graduation for students who are far behind in a particular area.

Third, TEC provides extensive support services targeted at common non-academic barriers to graduation. TEC provides high-quality, on-site child care at no cost to students. Many students have young children, and TEC allows these students to attend school while their children attend daycare at the same location. Campuses are also located near public transit routes and students can receive transportation assistance in the form of bus passes or tokens, gas cards, or carpooling options. Finally, students are paired with a life coach who helps them set goals and navigate graduation requirements and provides support for issues that occur beyond the classroom. TEC funds these extensive services using the same funding levels received by other high schools.

Fourth, TEC directly connects students to post-secondary education and training. In recent years, TEC has strongly encouraged students to use elective credits to participate in professional and course certificate programs that provide an entryway to higher-paying jobs such as pharmacy technician, dental assistant, HVAC maintenance technician, and welder. Other students enroll in dual college-credit programs and use the diploma as a step toward attending college.

2 Data

2.1 The Excel Center

We form our sample using administrative data provided by Goodwill. Our primary analysis sample includes all applicants who applied between January 2013 and June 2015 to The Excel Centers operated in Central and Southern Indiana ($N = 11,079$). The Goodwill data include information from the application: name, address, date of birth, and date of application. Importantly, the data includes both applicants who went on to enroll at TEC and those who completed an application but did not matriculate. For all, we observe their last enrollment or completion status as of mid-2020: did not enroll, withdrew, or graduated.

Goodwill also provided enrollment and course records, which are limited to those who enrolled. These records denote dates of entry and withdrawal from the school, reason for exit, and information for each completed course (title, term, grade).[7] Of note, we are able to identify students who began their schooling at TEC by completing remedial Mathematics or English courses, which provides a proxy for cognitive skills at enrollment.[8] Students placed into remedial courses take at least one course geared at knowledge levels below the ninth-grade level. Because course data are limited to completed courses, we only observe information on remediation for the sub-sample of individuals who completed at least one course while enrolled at TEC.[9]

2.2 State Administrative Records

We measure labor market and education outcomes using administrative data from the Indiana Management Performance Hub (MPH). The data include records from the Indiana Department of Workforce Development (DWD), the Indiana Department of Education (DOE), and the Indiana

[7] Exit reason is missing for less than 0.5% of enrolled students. Analysis that relies on exit reason excludes those students from the sample.

[8] As noted above, students are given tests in Mathematics and English upon enrollment. Results of these tests determine which courses students are placed into. Because we do not observe the test scores used for that assignment, we instead rely on placement into remedial classes as a proxy for cognitive skills at enrollment.

[9] Analysis that relies on remedial coursework excludes the roughly 30% of enrolled non-graduates who are not present in the course completed data.

Commission for Higher Education (CHE). Supplemental details to this section are in Appendix B.1.

Employment and earnings records maintained by DWD come from the unemployment insurance (UI) system. Wages associated with quarterly UI records reflect the sum of all wages earned in a given quarter in UI-covered employment. Our primary outcome is quarterly earnings, including zeros for those without employment. We observe data from the first quarter of 2008 through the first quarter of 2020. This time frame allows us to construct applicants' employment and earnings outcomes for a balanced panel of five years before and after application for our primary sample.[10] We categorize employment by sector using NAICS codes.

Records maintained by DOE allow us to observe secondary school enrollments that occurred within four years of starting ninth grade. While we can measure enrollment in traditional schooling, which we use to define some baseline controls, we cannot observe adult enrollment in or graduation from secondary school (TEC or otherwise) for older students. We supplement these records with results from the Indiana state Graduation Qualifying Exam (GQE), as well as dates and results from the GED and TASC High School Equivalency test.[11]

Finally, we measure post-secondary training and education outcomes using data on professional and course certificates from DWD and data on college credits earned at public institutions in Indiana from CHE.[12] We directly categorize certificates and credits into industry groups (see Tables B-1 and B-2 for details).[13] Alternatively, we have data on certificates and credits earned by all GED test-takers in Indiana (though not all Indiana residents) and use it to categorize certificates/credits empirically by predicting the probability that a person with a given certificate/credit is employed

[10]Earnings are adjusted for inflation to Q1 2014 levels using the CPI-U Midwest (US Bureau of Labor Statistics, 2022). We winsorize earnings at the 99th percentile within each calendar quarter separately for our three comparison groups. Results are similar with no winsorizing. See Appendix Table A-3.

[11]In 2014, Indiana switched from the GED to the similar TASC High School Equivalency test. We refer to both of these tests as "the GED" and treat taking and passing either test as interchangeable.

[12]Public post-secondary schools in Indiana cover 79% of college-going by Indianapolis Public School students, and this coverage rate is potentially higher among our sample of Excel Center applicants, which limits concerns about selection.

[13]Common certificates for our study sample include Preparing for College and Careers; Nutrition and Wellness; Child Development; Applied Digital Application and Responsibilities; and Technical Business Communications. Common college credit programs for our sample include Medical/Health Management and Clinical Assistant/Specialist; Liberal Arts and Science; General Studies; Business Administration and Management; and Criminal Justice/Safety Studies.

in different sectors.

2.3 Data Linking

MPH matched TEC applicants to their data warehouse using fuzzy matching on name, date of birth, and address collected at application. Table 2 reports the likelihood that an applicant matched to the administrative records. More than three-quarters of applicants (9,465 of 11,079) match to a pre-application record in the MPH data, and match rates are similar across completion status. To reduce the likelihood of endogenous matches, we limit our analysis sample to individuals who have an MPH record from any state agency (i.e., DOE or DWD) that precedes their TEC application date. The resulting primary analysis sample includes 9,465 applicants.

Because data are limited to the state of Indiana, we cannot distinguish between an outcome not occurring and that outcome occurring in another state. For all outcomes, we assume the lack of a record of that outcome occurring as denoting that the outcome did not occur. For example, if an individual does not have reported earnings in a given quarter, we code that individual as having zero earnings in that quarter. This limitation faces any analysis using state-level administrative data, and is likely mild in our context. In consumer address history data from Infutor, only 3.4% of TEC applicants live outside Indiana 5 years after applying, and enrolling at and graduating from TEC do not noticeably change out-of-state move rates; see Appendix Table A-4. More generally, we focus on a Metro area in the middle of a state and a population for whom inter-state migration rates are low (Molloy et al., 2011).

3 Empirical Strategy

3.1 Trends in Earnings, by Enrollment and Graduation Status

Earnings increase dramatically in the years following application for graduates of TEC. Figure 2a shows quarterly earnings over time. The horizontal axis depicts time relative to application quarter, where quarter 0 represents the calendar quarter in which an individual applied to TEC. The average

earnings of TEC graduates are plotted as navy circles. In the year prior to applying, graduates earn just over $1,000 per quarter ($4,333 per year). Five years later, quarterly earnings roughly triple. Both the extensive margin (Figure 2b) and intensive margin (Figure 2c) contribute to this increase.

As a first pass at measuring the labor market return to graduating, we benchmark the earnings gains experienced by TEC graduates against two natural comparison groups. Figure 2 also shows quarterly earnings and employment for applicants to TEC who do not enroll (teal triangles) and TEC students who enroll but do not graduate (gold diamonds). Comparing graduates to the two groups of non-graduates yields four descriptive facts. First, graduates have lower employment and earnings prior to applying to TEC. Second, all three groups experience similar upward trends in earnings prior to applying to TEC. Third, in the year after applying, earnings continue trending upward for applicants who do not enroll but flatten for graduates and, to a lesser extent, students who enroll but do not graduate. Fourth, earnings grow much more rapidly for graduates in years 2–5 after applying. Their earnings surpass the other two groups 8 quarters after applying.

3.2 Estimating the Effects of TEC Graduation

To formalize this comparison of outcomes across enrollment and graduation status, consider the following simple model:

$$Y_{it} = \sum_{k \in T} \beta_{1k} I(t = k) * D_i + \tau_{1t} + \epsilon_{1it} \tag{1}$$

In this equation Y_{it} is an outcome, such as earnings, for person i measured at time relative to application t. D_i is a dummy indicator of treatment status. Relative time fixed effects τ_{1t} make all comparisons within time period. We make comparisons among three groups: graduates, applicants who enroll but exit before graduating, and applicants who do not enroll. We make all three pairwise comparisons among these groups and at times also pool all enrollees (graduates + exiters) to compare to applicants who do not enroll. The sample and definition of D_i determine the comparison being made. When comparing TEC graduates to applicants who did not enroll, for

example, the estimation sample is restricted to those two groups and D_i indicates graduation. If the comparison group appropriately represents the outcome in the untreated counterfactual, then β_{1k} measures the labor market return to education k periods after applying.

Comparing TEC graduates to other TEC applicants accounts for several sources of selection bias. Applicants to TEC have all previously dropped out of high school, are all drawn from the same labor market, and have outcomes measured from the same data source. Applicants select into applying to TEC. TEC applicants are more likely to be Black, Hispanic, and female than others of similar age in Indiana without high school diplomas (Table 1, columns 4–5). Moreover, they all experienced a similar motivation to apply to TEC and earn a diploma. We implicitly control for these forms of selection by making comparisons with non-graduating applicants, as opposed to the general population of high school non-completers (Bell et al., 1995; Heckman et al., 1997).

Making comparisons among TEC applicants, however, will likely lead to biased estimates of the causal effect of TEC education as graduates are further selected among applicants. Section 3.1 documents the differences in the levels of earnings and employment in the years before application among the three groups. As shown in Table 2, 57% of graduates receive any UI-covered earnings in the year prior to application compared to 66% of non-enrolling applicants and 60% of enrollees who later exit. Lower employment rates correspond to 20% lower baseline earnings for graduates. Additionally, during their prior high school experience, TEC graduates were less likely to be identified as homeless, male, or black than all non-graduates and less likely to be eligible for free or reduced price lunch as compared to applicants. They are also 4 years younger than non-enrollees and 3 years younger than enrollees who exit, on average. Moreover, this selection likely occurs in unobservable ways through differences in motivation and ability to enroll and persist to graduation.

To overcome this identification challenge, we use longitudinal data on employment and earnings to compare the outcomes of observably similar TEC graduates to non-graduates. We pursue two similar but complementary estimation approaches.

First, we leverage longitudinal data on outcomes to estimate a difference-in-differences model:

$$y_{it} = \sum_{k \in T} \beta_{2k} I(t = k) * D_i + \tau_{2t} + \psi_{2i} + X_{it}\Gamma_2 + \epsilon_{2it}. \tag{2}$$

In this specification, we include individual fixed effects (ψ_{2i}), which control for time-invariant differences between TEC graduates and other TEC applicants, in addition to relative time fixed effects (τ_{2t}). At times, we also include relative time effects that vary with applicant age ventile and calendar quarter fixed effects, X_{it}, to non-parametrically adjust for observed differences in age between TEC graduates and other TEC applicants and to control for differences in labor market circumstances over time. β_{2k} is thus identified by comparing the changes in earnings over time among the three groups. We also run models that include data from all three groups simultaneously:

$$y_{it} = \sum_{k \in T} [\delta_k I(t = k) * Enrolled_i + \gamma_k I(t = k) * Graduated_i] + \tau_{3t} + \psi_{3i} + X_{it}\Gamma_3 + \epsilon_{3it} \tag{3}$$

In this case, $Enrolled_i$ is a dummy for those who enroll, both graduates and those who exit, and $Graduated_i$ is a dummy for graduates. Thus, δ_k measures the return only to enrolling while γ_k measures the added value of graduating, above and beyond enrolling. If we omit $Graduated_i$ from this model, then the coefficient on $Enrolled_i$ measures the average return to enrolling, taking into account graduation effects and the probability of graduating.

Interpreting the difference-in-differences estimates as the causal effect of graduating from TEC requires a parallel trends assumption. Figure 2 provides some initial evidence for the plausibility of this assumption. Prior to application, earnings for all three groups proceed roughly in parallel, and we formally test the similarity of pre-trends below as in Borusyak et al. (2021).

Our second approach flexibly controls for differences in pre-application characteristics by estimating Equation (1) using inverse propensity weights (IPW). Specifically, we estimate logit models of the treatment indicator D_i on the full vector of 20 quarters of pre-application employment dummies and quarterly earnings, as well as demographic characteristics.[14] We use the predicted prob-

[14]Demographic controls include a dummy for any employment in the year prior to applying, application quarter

abilities to create inverse propensity score weights and estimate Equation (1) with these weights. For additional robustness, we also report results from re-estimating the difference-in-differences models in Equations (2) and (3) using IPW. In both relying on within-person changes and IPW, this latter estimator is doubly robust. The estimates will be unbiased if either the underlying difference-in-differences model is correctly specified, or if the IPW matching estimator model is correctly specified.

Intuitively, this second approach re-weights the sample such that graduates and non-graduates match on both pre-application levels and trends in earnings (Bitler et al., 2006). Causal interpretation requires a conditional mean independence assumption. Unlike difference-in-differences, this model does not directly adjust for time-invariant differences in unobservable characteristics. Rather, we assume that detailed earnings histories provide a good proxy for characteristics like motivation and ability that both affect post-application earnings and are associated with selection into enrollment and graduation.

Recent work that compares experimental estimates of the returns to education with observational estimates derived from these two approaches suggests the features of our setting may be well-suited to overcome many selection concerns. Experimental estimates of the returns to community college program are similar to observational estimates that leverage the same panel of pre-application earnings as our setting (Grosz, 2020; Leung and Pei, 2020). While different patterns of selection bias could lead one of our two models to perform better (Chabé-Ferret, 2015), we find similar estimates across specifications, potentially because selection does not seem to be based on transitory shocks (Heckman et al., 1999; Heckman and Smith, 1999).

Moreover, recent critiques of difference-in-differences estimators do not pose a concern in our setting (e.g., Borusyak et al., 2021; De Chaisemartin and d'Haultfoeuille, 2020; Goodman-Bacon,

dummies, age, free or reduced price lunch status, homeless status, gender, and race/ethnicity categories. In models with both the $Enrolled_i$ and $Graduated_i$ indicators, we separately model both the likelihood of enrolling and the likelihood of graduating, conditional on enrolling. For the latter, we restrict the sample to enrollees only. In this scenario, the weight is given by $\hat{w}_i = \frac{(1-Enrolled_i)}{(1-\hat{p}_{Enroll})} + \frac{Enrolled_i(1-Graduated_i)}{\hat{p}_{Enroll}(1-\hat{p}_{Grad|Enroll})} + \frac{Enrolled_i(Graduated_i)}{\hat{p}_{Enroll}(\hat{p}_{Grad|Enroll})}$. The propensity scores have very similar support (see Appendix Figure A-1), so we do not limit the sample based on common support. When comparing subgroups of the sample, we re-estimate the predicted probabilities specific to the comparison and sample being used.

2021). Because we can benchmark treatment effects relative to a date that can be observed for the control group (application date), we can conduct a classic difference-in-differences analysis with a never treated comparison group that has a known zero date. That makes our estimation different from a TWFE model with staggered adoption and no known zero date for the control.[15]

In the discussion of our results, our preferred specification is the doubly robust estimates that come from estimating the difference-in-differences model (Equation 2) with IPW. While results are qualitatively similar across all specifications, this specification performs better in tests of differential pre-trends when limiting the sample to smaller subgroups. When estimating effects for outcomes for which we do not have pre-application measures (e.g., employment stability, post-secondary credits and credentials) we present results that come from estimating Equation (1) with IPW.

3.3 Selection on Unobserved Post-Application Shocks

Both difference-in-differences and re-weighting to account for observable differences in trends would be biased if applicants endogenously decide whether to enroll and to persist to graduation based on unobserved individual-specific shocks. Even a matched difference-in-differences approach will misattribute shocks that both discourage graduation and persistently reduce earnings to the return to graduation. For example, a student may experience a personal or family crisis, such as a death of a loved one, that traumatizes them and leads to anti-social behavior. This trauma could both lead the student to exit school and make it difficult for them to find employment in subsequent years.

We address this concern by using alternative comparison groups that are likely positively selected. First, we focus on students who dropout for reasons positively related to earnings. Our data include the recorded reason for why a student withdrew from TEC. The top four reasons recorded in the data are: lack of interest in the material, failure to show up to school without a reason, work conflicts, and interpersonal problems. The direction of bias likely varies with exit reason. Interper-

[15]This point is made by Borusyak et al. (2021) in Section 5.2 of their paper. "Consider conventional DiD designs in which treatment happens at a single date (in the treatment group) or never (in the control group), and the panel is complete. In this case there are no forbidden DiD comparisons, as those require that a unit switches its treatment status in a period when another unit has already been treated. Thus, only admissible comparisons are available, and OLS estimation does not suffer from negative weights. The presence of a never-treatment group also prevents the underidentification problem."

sonal problems might signify negative selection into dropping out, leading to an overestimate. On the other hand, students who exit due to work conflicts are likely selecting on a positive employment shock. Focusing on the latter group likely leads to an underestimate. Similarly, we provide results comparing graduates to TEC students who exit after different lengths of enrollment. With these approaches, we can bound the true treatment effect by examining how the measured return to graduating varies with the reason for and timing of dropping out.

4 Results

4.1 High School Enrollment and Credentials

Most students who graduate from TEC enroll immediately after application and finish within 2 years. In the terms immediately after applying, 90% of eventual graduates are actively enrolled. This figure drops to 60% after one year, 17% after two years, and 4% after three years. For non-graduates, enrollment rates are similarly high at first but drop more quickly; 80% are enrolled in the term after applying, but only 33% are enrolled one year later. See Appendix Figure A-2.

Graduating from TEC does not typically displace acquiring a similar credential elsewhere. For students over age 18 during our sample period, the only routes to a high school diploma outside The Excel Center were two other adult high schools: Christel House and Gary Middle College. Appendix Figure A-3 shows the proportions of TEC applicants who have ever passed an Indiana state Graduation Qualifying Exam as of 2020: 71% of TEC graduates, 11% of those who exit TEC after enrolling, and 6% of non-enrolling applicants.[16] Even completing the GED is uncommon. Appendix Figures A-4a and A-4b show that only 7% of non-enrollees and 6% of exiters pass the GED within 5 years. These results suggest that most people in our comparison groups earn neither a diploma nor an alternative high school credential.

[16]During our time period, high school diplomas in Indiana typically required passing the Graduation Qualifying Exam which makes it a good proxy for graduation, though some exceptions were possible that make the TEC value less than 100%. Exams provide a longer time horizon than graduation and enrollment data, which only extend to 4 years after beginning traditional high school.

4.2 Earnings

4.2.1 Main Effects

Earnings for graduates increase in the long run after dipping in the year after application. Figure 3a displays event study results as in Equation (2) using IPW with the level of unconditional earnings as the outcome. This comparison conditions on fixed effects for individual, relative quarter, calendar quarter, and relative quarter interacted with initial age ventile. The reference period is quarter -1, for which the effect is assumed to be zero. The teal triangles compare graduates and non-enrolling applicants. Because of re-weighting, graduates and non-enrolling applicants show largely similar earnings trends in the 5 years prior to applying, though pre-trends are parallel without weights.[17] After the application quarter, graduates experience a "lock-in" effect when earnings take a pronounced dip in the following year but quickly recover. By the second and third year after applying, earnings for graduates are statistically significantly larger than those of non-enrolling applicants. These differences persist through the fifth year.

Figure 3a also decomposes the comparison between graduates and non-enrollees by comparing graduates to students who exited without graduating (navy circles) and students who exited to non-enrollees (gold diamonds). These two comparisons decompose the return to graduating into the components of completing and enrolling, respectively. Pre-application trends in earnings differences continue to look small. The long-term earnings difference between those who exit and those who never enroll is much more muted than the difference between those who graduate and exit, providing a first piece of evidence that labor market returns are closely tied to graduating and receiving a diploma. Finally, the gray squares in Figure 3a show the average return to enrolling, pooling graduates and exiters and comparing to non-enrollees. These gray squares fall between the teal triangles and gold diamonds because the return to enrolling is a weighted average of the return to graduating and the return to exiting.

Table 3 quantifies these results with difference-in-differences and IPW regressions. Column (1)

[17] See Appendix Figure A-5 for unweighted event studies. The point estimate for the trend in the unweighted difference in earnings is a slight downward pre-trend of about $100 over 5 years. To the extent that this trend carries into the future, post-period differences in earnings will slightly underestimate the return to a diploma.

shows a simple difference-in-differences regression that includes fixed effects for person and quarter relative to application. To be concise, we group the 20 post-period quarters into 5 years. In this first specification, we include interactions between year dummies and dummies for enrolling. Because we do not include graduation dummies, the coefficients on enrolling estimate the total return to enrolling in TEC, averaging across those who graduate and those who exit. For example, the coefficient of -134 on the "Enrolled X Year 1" interaction indicates that, compared to non-enrollees, quarterly earnings for enrollees dip on average by $134 more in the first year after applying to TEC.

Subsequent models include interactions between graduation and year dummies to decompose the overall enrollment effect into the effects of enrollment itself and the effect of graduating. Results in column (2) indicate that quarterly earnings dip in the year after applying by $99 more for graduates than for exiters and by $112 more for exiters compared to applicants who do not enroll. Together, these two estimates imply that the total earnings penalty to TEC graduates averages $210 each quarter in the year following application.

Large positive differences in quarterly earnings emerge in the years following this first post-application year. Estimates are positive and statistically significant beginning in the third year following application. For example, the results in column (2) indicate that the return to graduating from TEC is $895 per quarter five years after applying; $710 comes from graduation conditional on enrollment and $185 comes from enrolling.

The remaining columns of Table 3 demonstrate that these results are stable across other specifications. Column (3) adds calendar quarter and application age-relative quarter fixed effects. Columns (4) through (6) reweights the data using IPW based on demographics and earnings history. Column (5) includes calendar quarter and age-time fixed effects, and column (6) estimates a parsimonious simple difference (SD) specification that uses only post-application observations and includes relative quarter fixed effects. The results are quite similar in all cases.[18] Our preferred specification is the 'doubly robust' specification in column (5). In this specification, we estimate an

[18]We can observe application dates for everyone in the sample and analyze data in relative time, so now-standard critiques of two-way fixed effects models do not apply to our empirical strategy. Even so, our results change very little if we implement a canonical two-way fixed effects model in calendar time or methods that improve upon that approach. See Appendix Table A-5.

$849 increase in quarterly earnings five years after application, a 38 percent increase relative to the weighted average earnings ($2,232) of non-enrolling applicants.[19,20]

Across all specifications, we fail to reject the null hypothesis of no differential pre-trends among the three subgroups of TEC students. We implement the test of Borusyak et al. (2021) and report it at the bottom of Table 3. We follow their approach and restrict the sample to the 20 pre-application quarters and re-estimate the specification used in the given column including relevant group dummies interacted with indicators for each of the 8 quarters prior to application. We report p-values of the test that all 8 interaction terms for the group are equal to zero in the rows titled $P(\hat{\beta}^{Pre1-8}_{Enroll} = 0)$ and $P(\hat{\beta}^{Pre1-8}_{Grad} = 0)$.

4.2.2 Components of Total Earnings

A high school diploma affects both how likely the student is to be employed and earnings conditional on any employment. Figures 3b and 3c show event studies that split total earnings into these two components. The probability of being employed increases both with enrollment and with graduation. However, earnings conditional on employment only increase for graduating, not enrolling. These results suggest that upgrading to higher-paying careers is tied to completing the diploma.

Graduation also improves employment stability. Table 4 compares measures of employment stability during the five years following application using the specification from column (6) of Table 3. Graduating increases employment during this period by 1.28 quarters, 0.78 from graduation and 0.50 from enrolling. Columns (2)–(4) reports effects on the number of quarters continuously employed in any job, the same 2-digit sector, and the same 6-digit industry, respectively. While both enrolling and graduating increase employment in any job, only graduating increases continuous employment within a narrowly defined industry. Similarly, the final column of Table 4 shows that graduating decreases the coefficient of variation in earnings. Together, these results indicate that earnings not only increase but become more stable for graduates.

[19] These effects persist beyond 5 years for sub-samples for which we can observe a longer time horizon for outcomes. See Appendix Table A-6.

[20] For all results, we use standard errors clustered by individual. While these standard errors do not account for uncertainty in estimating weights, in practice, standard errors are smaller if we bootstrap estimation of the weights.

4.2.3 Using Subsets of Students who Dropout as Comparison Groups

Students who exit because of work conflicts are positively selected and comparing graduates to them provides a lower bound on the return to graduating. Those who exit because of a work conflict earn nearly 50% more than graduates in the year prior to application ($6,380 vs. $4,330). After applying, their earnings increase more than other students who withdrew (Appendix Figure A-6a), and this break in trend materializes in the year before exit (Appendix Figure A-7). Because their earnings growth likely overstates the counterfactual trend for graduates, using these non-graduates as a comparison group provides a lower bound for the return to graduating.

Table 5 reports results that limit the comparison group to students with different exit reasons. Within 5 years of applying, graduates experience statistically significant increases in earnings compared to all groups of those who exit. Comparing to those who exit because of a work conflict creates a deeper and more sustained temporary dip in earnings, but even that decrease disappears within 4 years. Graduates earn nearly $500 more each quarter five years later.

We find similar results comparing graduates to students who were enrolled for different lengths of time before dropping out. Students who stay enrolled for several terms may be more similar to graduates, though they may also gain some human capital, which makes this comparison a lower bound. The return to graduation persists even when comparing to students who enroll for multiple years. See Appendix Table A-7 and Appendix Figures A-8a and A-8b. These results suggest selection into graduation does not likely drive our estimates, and the return to TEC depends more heavily on graduating than on gradual human capital accumulation from taking classes.

4.2.4 Heterogeneous Effects

We first show that the labor market return to TEC graduation is similar among older and younger applicants. One potential concern with our identification strategy is that pre-application earnings for younger applicants are not as useful in predicting post-application earnings. If results remain similar among older workers, this concern is less applicable. Younger applicants (23 and younger) earn less than $1,000 in the quarter before application and have experienced a relatively rapid

increase in earnings in the five years preceding application (Figure A-9a). Older applicants receive more stable earnings that are nearly twice as large (Figure A-10a).

Figures A-9b and A-10b present event study results among younger and older applicants, respectively. These figures have three important takeaways. First, any pre-existing difference in earnings between graduates and other applicants disappears when conditioning on age. Second, both younger and older graduates experience substantial gains in earnings relative to their observationally similar non-graduating peers. Point estimates in year five are similar in magnitude to the main results. Finally, while long-term effects are similar, older workers do experience larger and more prolonged lock-in effects than their younger peers. The top two rows of Figure 4 shows these effects in year 5, and Appendix Table A-8 shows the full regression results.

Effects are remarkably stable across a number of other subgroups defined by pre-application characteristics.[21] Figure 4 shows year-5 differences between graduates and exiters (gold) and exiters and non-enrollees (blue) using the specification from column (5) of Table 3 estimated on the listed sub-sample.[22] We also report the graduation rate for each sub-group in parentheses next to the group label. As above, returns to younger and older students are nearly identical. Similarly, confidence intervals for sub-groups defined by free/reduced lunch status, urban location, high school absenteeism, and placement into remediation at TEC include the full sample effect.

On the other hand, some differences by race and gender appear. Black women appear to have lower returns to graduating. Figure 4 shows similar returns to graduating for White females, White males, and Black males (though Black males have a lower graduation rate). On the other hand, female Black students have lower returns to both enrolling and graduating. Appendix Table A-9 indicates that Black female graduates only earn $143 more than their peers who do not graduate, and the 95% confidence interval rules out differences larger than $513. We investigate the potential causes of this gap below when discussing mechanisms.

[21] While age is observable for all applicants (calculated based on date of birth and application date), our additional heterogeneity analysis requires linking individuals to their secondary school DOE record to observe socio-demographic characteristics used to construct other subgroups. Appendix Table A-8, column (3) reports the weighted single-difference results for the sub-sample for whom we observe baseline demographic information ($N = 6,242$).

[22] For each subgroup, we re-estimate inverse propensity score weights that ensure pre-application earnings, employment, application quarter, and age are balanced across graduates and non-graduates within each subgroup.

5 Discussion

5.1 Costs and Benefits of Adult Education

In this subsection, we benchmark the large economic benefits accruing to graduates of the Excel Center to the cost of operating the schools. To compare TEC to a broader set of workforce and education programs, we estimate the marginal value of public funds (MVPF) of The Excel Center (Hendren and Sprung-Keyser, 2020).[23] Then, to contextualize the return to a diploma, we directly estimate the benefits of receiving the GED or an Associate's degree in Indiana.

5.1.1 MVPF of Enrolling at TEC

We take the willingness to pay (WTP) for the Excel Center to be the change in after-tax earnings gains of Excel Center students that occur over the 5 to 40 years after application.[24] The average enrollee experiences a $2,559 increase in the net present value of after-tax earnings within five years of application (Table A-10, column 1). We focus on a primary scenario in which effects persist through retirement—an additional 35 years—and find enrolling in TEC yields a $34,063 increase in the net present value of lifetime after-tax earnings (column 4). This average return to enrolling is split among graduates, who experience a $80,917 increase, and those who enroll but exit without a diploma, who gain $20,556. These returns are less pronounced if we assume a greater discount of 5% or that impacts persist in constant (not relative) terms (columns 5 and 6).

[23]The MVPF of a policy intervention equals the ratio of the willingness to pay for the program and the cost of providing the intervention net any fiscal externalities. Unless otherwise noted, we follow the procedures of Hendren and Sprung-Keyser (2020) when they estimate the MVPF of programs designed to increase educational attainment and make identical assumptions about parameter values.

[24]For this analysis, we estimate the gains (and losses) from enrolling and graduating in the first 20 quarters after applying by estimating Equation (1) with IPW. We then follow Hendren and Sprung-Keyser (2020) in assuming that the relative return in years 6–40 is equal to the year-5 return, and model the lifecycle evolution of earnings for the non-enrolled group using population average incomes of high school non-completers by age in the 2015 ACS. This assumption is reasonable given the effects we estimate for years 6 and 7 on the smaller sub-sample of earlier TEC cohorts and what we know about the earnings gains associated with high school graduation across the life-cycle (Bhuller et al., 2017). Earnings gains for graduates come from summing the coefficients from both the enrolled and graduated time interactions. We discount future earnings with an annual discount rate of 3%. In estimating the impacts of the program on taxes and transfers, we use CBO estimates linked to the 2016 federal poverty threshold for a household of two ($16,151). See Appendix Table G.I in Hendren and Sprung-Keyser (2020). Finally, we construct 95% confidence intervals by drawing 10,000 bootstrap samples and re-estimating weights and treatment effects.

The lifetime present value of the labor market return to attending TEC is much greater than the net fiscal cost. In 2014, the State of Indiana paid adult charter high schools a $6,600 payment per student per year. Unlike traditional schools, TEC does not offer school-funded sports, music, or extracurriculars; nor does TEC offer specialized courses in non-core areas (e.g. art or physical education). Savings from these areas allow TEC to offer services more relevant to students with demanding life obligations—most notably, childcare. The average student in our data attends TEC for 1.08 years, and graduates attend TEC longer (1.49 years) than exiters (0.96 years). While the upfront cost of enrolling an additional student is $7,111—$9,850 for graduates and $6,321 for exiters— the net cost of providing a high school education is lower as students pay additional taxes throughout their working career, particularly during their highest earning mid-career years. Accounting for this additional tax revenue reduces the net cost of educating the typical student to $1,648 (Table A-10, column 4). Importantly, we estimate graduates generate more new tax revenue than the upfront cost of educating them, making their net cost negative (−$6,956).

We use these costs and benefits to construct an estimate of the Marginal Value of Public Funds (MVPF) for The Excel Center (Hendren and Sprung-Keyser, 2020). This measure is given by the ratio of the aggregate willingness to pay for a particular policy and the net cost to provide that policy. Unsurprisingly, the magnitude of the MVPF depends on the length of time that effects persist. Because the program affects educational attainment, we assume gains persist through retirement. Under this assumption, the MVPF of enrolling a typical TEC student is 20.67 (95% CI of 6.78 to 498.67). This estimate is sensitive to how we assume effects persist into the future. For instance, if the year-5 effect persists in levels, rather than as a proportion of the comparison group average earnings, then the estimated MVPF is 6.28 (95% CI of 3.37 to 10.93).

Our analysis omits some items that could be important for a comprehensive cost-benefit analysis of subsidizing adult high school. While TEC students have greater income than non-enrollees, their incomes are sufficiently low that increased earnings would not pay for the program through increased tax revenue. The public finance implications of the program likely depend instead on whether it reduces criminal justice system involvement, increases coverage of private health insurance, or

reduces other public benefits for participants. Additionally, effects on participants' children likely matter for a long-term cost-benefit analysis. For participants, we also omit many difficult-to-measure costs and benefits including non-work activities displaced by employment and education. We also do not incorporate into the WTP the value of benefits received while an Excel Center student such as childcare and transportation assistance. Finally, we cannot account for general equilibrium effects, for example whether TEC students displace other workers in the labor market.

5.1.2 Comparing the Returns to TEC versus the GED and Community College

We can use similar data on GED takers in the state of Indiana to compare the return to TEC to the return to a GED. The existing literature suggests the labor market return to a GED is relatively small. For example, the point estimate for the difference in quarterly earnings between those who barely pass and barely fail is about $250 per quarter (Jepsen et al., 2016). While we do not have a sufficient sample to replicate their regression discontinuity strategy in the Indiana data, we employ a difference-in-differences strategy that compares changes in earnings before and after the test for those who pass and those who fail on their first attempt.[25]

The return to a GED in our data appears similar to results previously found in the literature. Appendix Figure A-11 shows that earnings pre-trends are similar between those who pass and fail. GED passers have slightly lower earnings in levels and a somewhat smaller Ashenfelter dip prior to the test. After taking the test, earnings increase more for those who pass than for those who fail, but these differences are small and sensitive to controlling for baseline differences. The top panel of Table 6 summarizes the results. With only person and relative quarter fixed effects, there is a statistically significant difference in earnings in years 1–5 at the 1% level, and the magnitude is between $250–500 per quarter. However, this difference shrinks when we control for baseline earnings trends using inverse propensity weights in columns (3)–(5). In our preferred specification in column (4), the return to a GED ranges between $154 to $360 per quarter throughout years 1–5, which is consistent with Jepsen et al. (2016).

[25] We limit our analysis window to February 2014 to September 2014 for data quality reasons. We also restrict the sample to those matching to DOE records in order to construct propensity weights based on demographic information.

On the other hand, the literature suggests that the return to community college can be quite large. Estimates of the average return to community college ranges widely, from 7% to more than 50%, with healthcare programs having greater returns (Jepsen et al., 2016; Stevens et al., 2019; Leung and Pei, 2020). For example, Grosz (2020) finds that about half of students who enroll in a nursing associates program after winning an enrollment lottery complete the program, and enrolling increases earnings by 49 percentage points.

In data from Indiana, we find results on the higher end, indicating a greater return to completing community college than completing a high school diploma. We use a similar identification strategy: among students enrolled in an associate's program at Indiana's network of community colleges, comparing earnings between those who graduate and those who do not. We limit the sample to students who previously took the GED exam, both because this sample is more similar to TEC students and because this is a limit of the data. The bottom panel of Table 6 displays the results. Across various specifications, graduates of community colleges earn greater wages than students who do not graduate. In our preferred specification in column (4), graduates receive $1,948 (66%) greater earnings per quarter than non-graduates. Overall, we find that the return to a high school diploma among adults is between the return to a GED and the return to an associate's degree.

5.2 Mechanisms

A high school diploma may provide greater labor market returns than a GED due to either human capital accumulation or signaling. Proponents of a traditional high school degree argue that it provides both non-academic soft skills not provided by the GED, as well as a larger dose of academic skills. However, it could also be the case that high school diplomas are more costly to obtain than the GED, and therefore diploma completion signals ex-ante higher ability. Distinguishing between these two channels is important in determining whether subsidizing high school completion increases productivity or dilutes the signalling value of a high school diploma.

While we cannot fully determine the active mechanisms, we observe two findings consistent with the idea that graduation from TEC provides new skills for participants. First, TEC graduates switch

industries after graduating. The biggest changes are toward healthcare and away from hospitality. Second, TEC graduates are more likely to earn professional and academic credentials, and the types of credentials that TEC graduates earn align closely with the changes in industries of employment. These results suggest that a high school diploma helps students acquire skills that open doors to new types of jobs. They are not consistent with the idea that the diploma only signals overall ability, though they might also be rationalized by sector-specific signaling.

5.2.1 Sector of Employment

We observe that TEC graduates switch to higher-skilled industries after graduating. We replicate our main specification using employment in a particular industry as the outcome. Figure 5 displays the difference in probabilities of employment in a given sector between TEC graduates and exiters (navy) and exiters versus applicants (gold) during year 5. Each row lists the sector, the control mean for the employment rate in the sector (denoted "c.m."), and plots the estimate and 95% confidence interval. See Appendix Table A-11 for full results. As discussed previously, graduates are 6.9 percentage points more likely to be employed at all than exiters. Yet, sector of employment also noticeably shifts. Compared to exiters, graduates are 3.2 percentage points (53%) more likely to be employed in the health sector. Employment also increases noticeably in the education and retail sectors, and roughly a third of the increase in retail comes from employment at pharmacies. While TEC graduates shift toward employment in higher-wage health and education sectors, employment actually falls in the hotel & restaurant sector despite the overall increase in employment. Declines in these sectors are primarily driven by falling employment at limited-service restaurants and temporary employment agencies. Graduates shift away from these lower-wage employers, which are more common among non-graduates. Students who enroll but do not graduate increase employment rates but do not experience a similar shift to higher-paying industries.

Graduates access more attractive portions of the health sector as well. Increases in healthcare employment include some increase in vocational rehab employers (1.0 pp), which could include direct employment by Goodwill. However, most of the increase in healthcare related employment comes

from other subsectors, including a 0.7 pp increase in individual and family health employment and a 0.8 pp increase in general medicine employment (see Table A-12). Overall, TEC graduates make a major shift within the service sector toward employers with both greater potential for earnings growth and greater skill requirements.

5.2.2 Credentials

Graduates earn more formal professional and course certificates and community college credits than non-graduates. Figures 6a and 6b display the difference in the probability of earning certificates and credits in different fields. Compared to TEC students who did not graduate, graduates are 43 pp more likely to earn a certificate (on a base of 25 pp) and 21 pp more likely to have earned any college credit (on a base of 8.9 pp). The vast majority of the latter increase reflects credits at community college.

Graduates are particularly more likely to complete healthcare-related credits and certificates. Figures 6a and 6b further break down the overall change in certificate and college credits by type of credential.[26] See Tables A-13 and A-14 for full results. Notably, graduates are 9.2 pp more likely than enrollees to earn certificates in a health-related program (on a base of 7.3 pp). Similarly, graduates are 7.1 pp more likely than enrollees to earn any college credit in a health-related field (on a base of 2.7 pp). TEC also increases the likelihood of gaining a certificate in manufacturing, science/technical services, education, life skills, and business skills as well as the likelihood of obtaining credits in the liberal arts, science/technical services, and business skills. Earning these credits and certificates might explain roughly half of the difference in earnings between graduates and non-enrolled applicants in year 5. If we re-estimate the primary specification reported in column (5) of Table 3 but control for the types of certificates and credits people earn (interacted with post-application year dummies), the magnitude of the total earnings gains of graduates in year 5 decreases from $849 to $493.

[26]We manually link titled certificates and college credits to NAICS 2-digit industry codes based on DOE course descriptions of certificates and CHE's descriptions of credit programs found in the National Center for Education Statistics' Classification of Instruction Programs. See the data section for more details.

TEC graduates earn credentials that, in a similar population, are associated with employment in healthcare. For the general population of GED test-takers, we compute predicted probabilities of employment in different sectors for each credit program and credential. We assign these predicted employment probabilities to people in our main sample based on the credentials they complete. The resulting measure estimates the extent to which the credentials they complete do in fact typically imply shifts in sector of employment.[27] Figures 6c and 6d show the results of using the predicted sector of employment based on credits and certificates, respectively, as the outcome in our main specification. See Tables A-15 and A-16 for full results. Compared to students who enroll but do not graduate, a TEC graduate earns professional and course certificates that increase their predicted probability of being employed in the health sector by 5.9 pp (on a base of 5.5 pp). Similarly, a TEC graduate earns program credits that increase their predicted probability of being employed in the health sector by 1.9 pp (on a base of 5.0 pp). These effects are of similar magnitude to the actual shift into employment in healthcare. Together, these findings suggest that TEC helps its graduates accumulate credentials that enable graduates to switch to higher-earning employment sectors.

The certificate and credit data also predict an increase in hospitality employment that did not materialize. Some TEC graduates get general credentials or earn dual credits that are not associated with degree courses. These credentials predict higher employment generally, of which hospitality is a large component. Actual hotel and restaurant employment, however, falls. One interpretation of these results is that TEC graduates gain credentials that allow them to access hospitality jobs but the diploma allows them to choose more preferred career paths.

5.2.3 Heterogeneity

Industry shifting varies widely by race and gender groups. Appendix Tables A-17 to A-20 show the extent of industry switching by sub-group. White women largely drive the shift into healthcare employment. Similarly, Appendix Tables A-21 shows that White women similarly drive the tendency of graduates to gain more stable employment. Meanwhile, Black women, who show smaller increases

[27] See the data section for more details on how we calculate the outcome.

in earnings, show only a fleeting shift into healthcare that disappears by the fifth year.[28] White men tend to shift into manufacturing, while Black men appear more in retail and healthcare. Most groups show shifts in credentials that align with their industries of employment. Appendix Tables A-22 to A-29 show treatment effects for credentials and college credit by sub-group. White women tend to get healthcare credentials. White men are more likely to gain certificates related to manufacturing.

The results for Black women, though, suggest that this group is more likely to experience broken links in the chain that connects skill acquisition to better careers. Appendix Tables A-22 and A-26 show that Black female graduates of TEC do obtain more healthcare credentials, but these credentials do not typically turn into employment in healthcare. We cannot directly identify what links in the chain are broken. Lower returns to skill could result from labor market discrimination, differences in average skills actually acquired during school, or many other mechanisms.

6 Conclusion

This paper documents the labor market return to a high school diploma for adults who have previously dropped out of high school. Using strategies that compare graduates to non-graduates, conditional on past earnings, we find that graduates earn 38% more ($849) per quarter five years after applying. These results are robust to a variety of specifications, including comparisons with positively selected non-graduates. These earnings gains result from increases in both intensive and extensive margins. Graduates have more stable earnings and stay more consistently employed in the same industry. We find evidence that graduates acquire credentials for particular skills, which drives increased earnings. Graduates are 53 percent more likely than non-graduates to be employed in the high-earning healthcare sector, which requires a unique set of technical skills. Similarly, we observe that graduates are more likely to obtain credentials in healthcare fields that facilitate this shift in sector of employment. Effects are similar for most sub-groups, though Black women experience smaller earnings gains and do not transition into health fields at the same rate despite

[28] The difference in healthcare employment between graduates and students who dropped out is 0, and the 95% confidence intervals rules out increases larger than 4.9 percentage points.

experiencing similar gains in credentials.

We estimate the expected benefits of a high school diploma among adult learners to be large—a more than $80,000 increase in discounted lifetime after-tax earnings—and graduates more than pay for the cost of their education throughout their working life. Even after accounting for the fact that not all students graduate, we estimate the Marginal Value of Public Funds for funding the Excel Center to be 20.67. This estimate suggests that the program generates $20 in benefits for each dollar spent (accounting for additional tax revenue) and exceeds that of other training programs that work with low-wage, low-education trainees. Our estimate exceeds the long-term (until age 65) MVPF estimates for JobCorps (0.18), the National Supported Work Demonstration youth (0.55), and the Job Training Partnership Act Youth program (< 0) (see Hendren and Sprung-Keyser, 2020, Appendix Table C.I). Sector-specific training programs that recruit highly motivated candidates with somewhat higher educational attainment at program start have similar or higher returns—WorkAdvance (8.85), Year Up (∞), and Project QUEST (∞)—as do reductions in the costs of community college tuition (29.46–349.51) (Hendren and Sprung-Keyser, 2020).

Our results suggest that interventions that provide educational opportunities to people who have dropped out of high school could be more ambitious. Most existing efforts focus on alternative training and credentials, such as the GED, which show disappointing results. The Excel Center instead provides a school environment that is designed for adult students but gives a path to complete a traditional diploma. While our data focuses on one set of schools, the Excel Center model has been replicated outside Indiana, and more states are allowing a legal path to a diploma for adults. A full high school degree could be a feasible option for many adults without high school credentials, and the traditional diploma likely encourages greater human capital development than the alternatives. Graduates acquire specific skills, complete credentials, and make different career choices. As a result, earnings increase. Our findings show that adults who dropped out of high school can benefit from a high school diploma that leads to success in the labor market.

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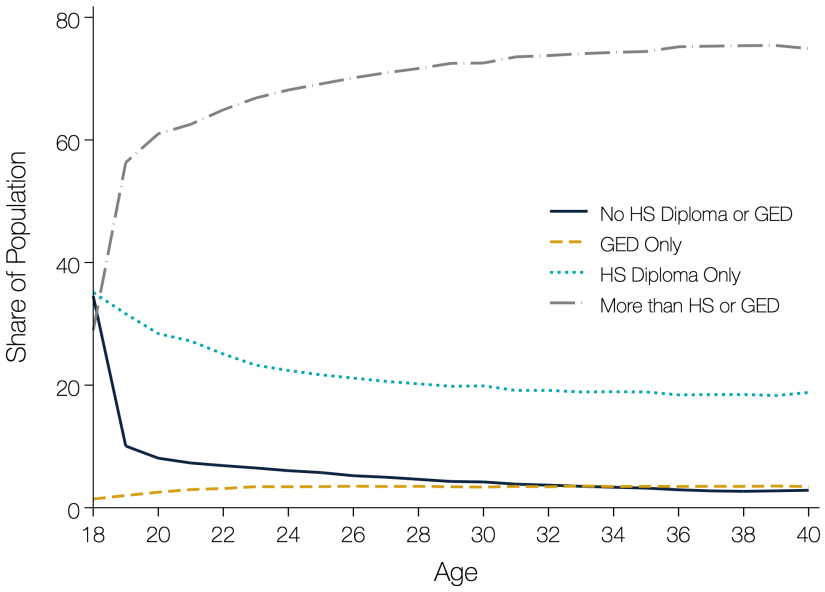
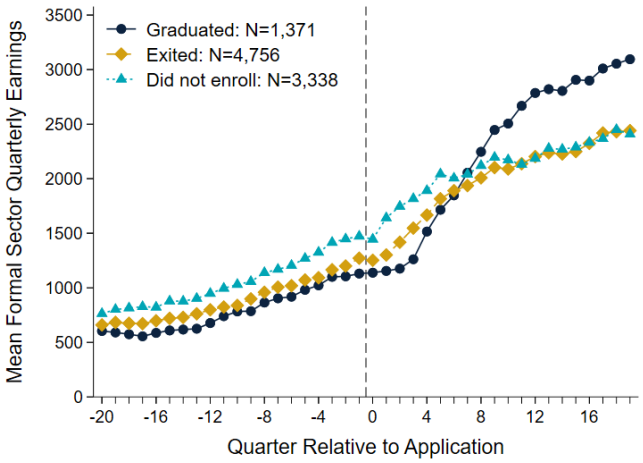
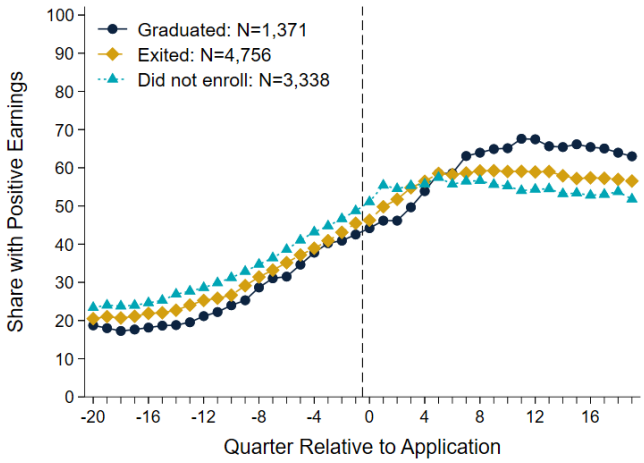


Figure 1: Educational Attainment, by Age

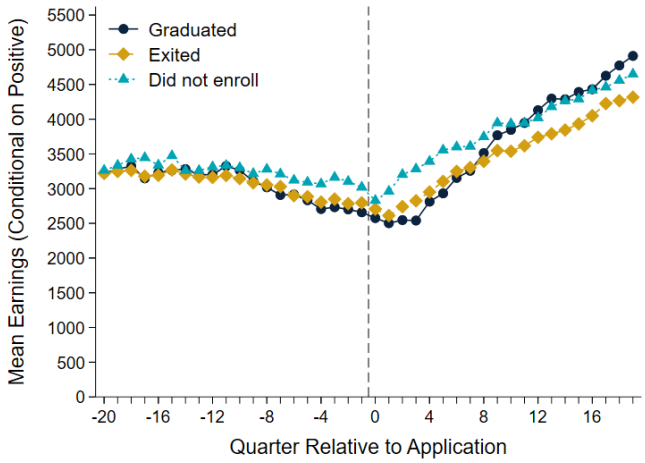
Notes: Data come from the 2008–2019 American Community Surveys (Ruggles et al., 2020). The sample is restricted to US-born adults aged 15–40 at the time of the survey. The figure plots the age fixed effects from an individual-level regression of an indicator for highest level of educational attainment on age fixed effects and year of birth fixed effects, where the constant term is excluded and the 1995 cohort is the reference cohort.



(a) Average Earnings



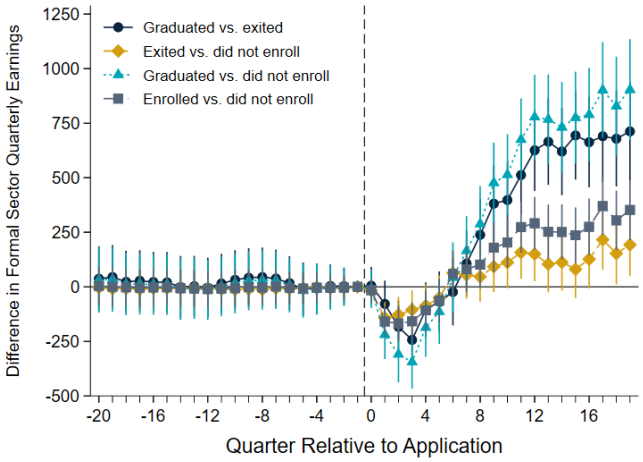
(b) Share with Positive Earnings



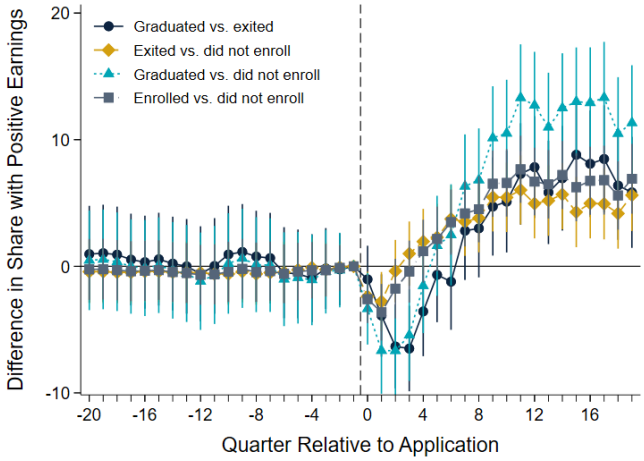
(c) Average Earnings, Conditional on Positive

Figure 2: Earnings Trends, by TEC Completion Status

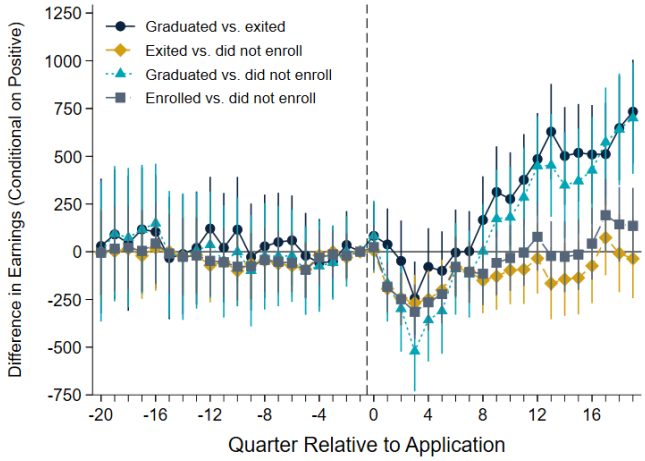
Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development. The sample includes all TEC applicants from January 2013 through September 2015 with any pre-application MPH record, and is divided into three groups: TEC graduates (navy circles), TEC students who did not graduate (gold diamonds), and TEC applicants who did not enroll (teal triangles). The horizontal axis indicates quarter relative to initial TEC application date, where quarter 0 represents the quarter in which an individual applied to TEC. Panel A plots total unconditional earnings (2014Q1 USD). Panel B plots the percent of each group with positive earnings. Panel C plots average earnings among individuals with positive earnings in that quarter.



(a) Average Earnings



(b) Share with Positive Earnings



(c) Average Earnings, Conditional on Positive

Figure 3: Event Study of Earnings, by Quarters Since Application

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development. The sample includes all TEC applicants from January 2013 through June 2015 with any pre-application MPH record. The horizontal axis indicates quarter relative to initial TEC application date, where quarter 0 represents the quarter in which an individual applied to TEC. The figure plots the regression coefficients from three event study specifications that compare (1) the employment and earnings of TEC graduates to TEC students who did not graduate (navy circles); (2) TEC students who did not graduate to TEC applicants who did not enroll (gold diamonds); (3) TEC graduates to TEC applicants who did not enroll (teal triangles); and (4) all TEC students to TEC applicants who did not enroll (gray squares), controlling for individual fixed effects, calendar quarter fixed effects, and fixed effects for the interactions of calendar quarter and initial age ventile. Observations are weighted using inverse propensity scores. The outcomes are an indicator for unconditional total earnings (2014Q1 USD) (Panel A), positive earnings (Panel B), and average earnings among individuals with positive earnings (Panel C). The reference quarter is the quarter before application. Vertical bars represent 95 percent confidence intervals, where standard errors are clustered at the individual level.

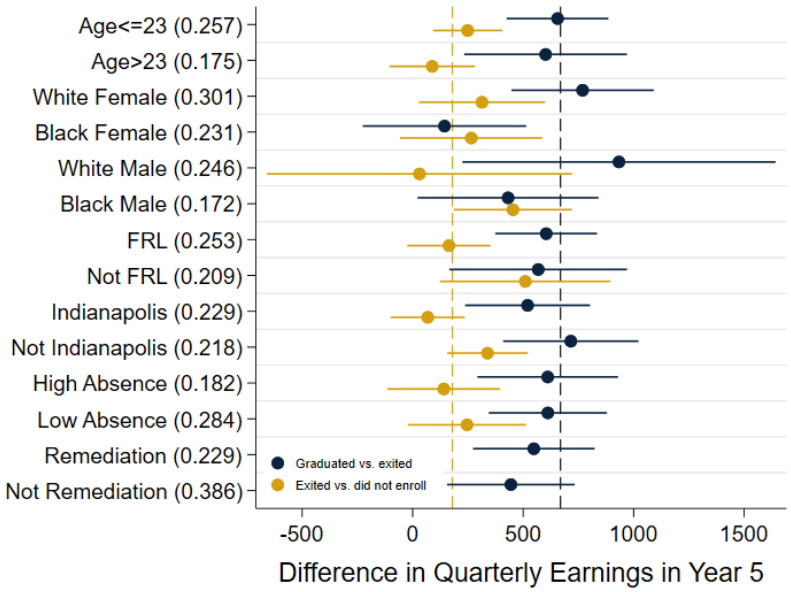


Figure 4: Difference in Earnings in Year 5, by Subgroup

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development, TEC enrollment records from Goodwill, and high school enrollment records from the Indiana Department of Education. The sample includes all TEC applicants from January 2013 through June 2015 with any pre-application MPH record and a pre-application high school enrollment record. The outcome is quarterly unconditional UI-covered earnings (2014Q1 USD), winsorized at 99%. The navy blue circles plot for each listed sub-group the difference in average quarterly earnings in year 5 between TEC graduates and TEC students who did not graduate. The navy dashed line shows the full sample effect. Gold circles and lines compare students who did not graduate and applicants who did not enroll. Each pair of estimated differences comes from an event study specification estimated on the listed sub-sample but otherwise identical to the specification in Figure 3a, which uses inverse propensity score weights and controls for individual fixed effects, calendar quarter fixed effects, and fixed effects for the interactions of calendar quarter and initial age ventile. Horizontal bars represent 95 percent confidence intervals, where standard errors are clustered at the individual level.

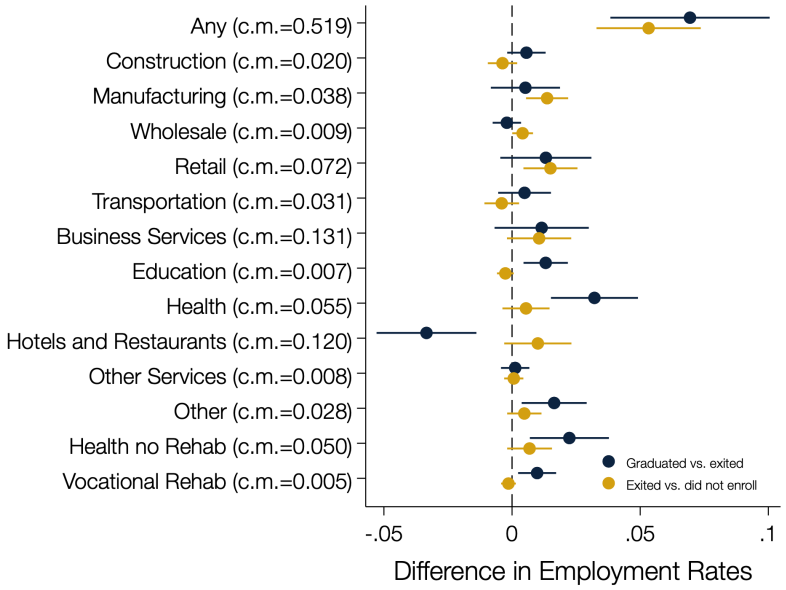
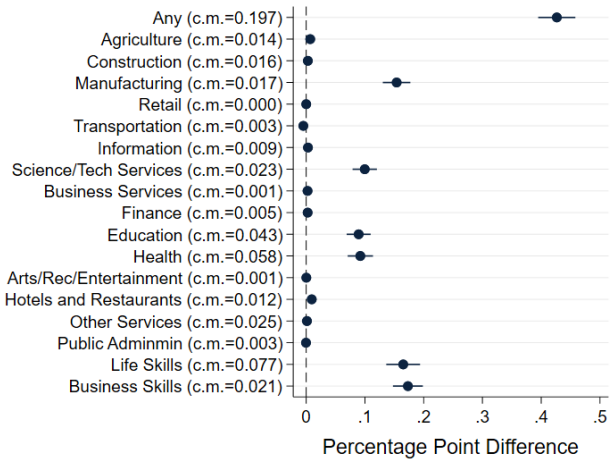
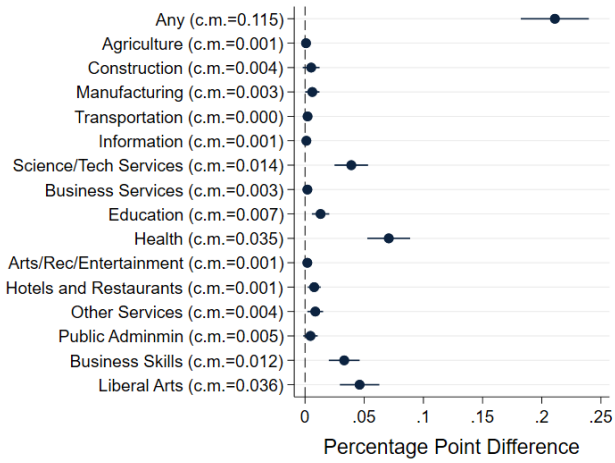


Figure 5: Difference in Sector of Employment in Year 5

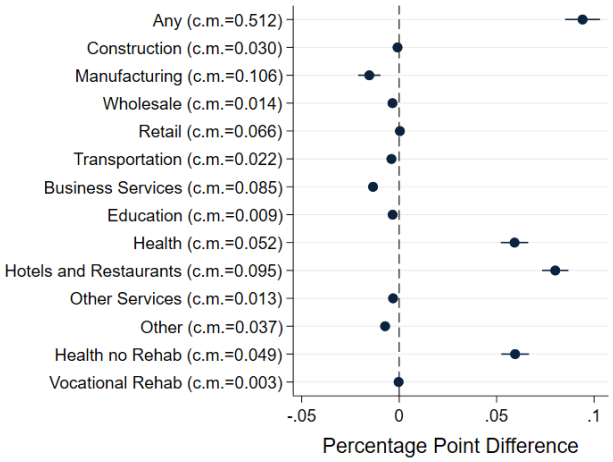
Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development. The sample includes all TEC applicants from January 2013 through June 2015 with any pre-application MPH record. Each row shows the coefficients on 'enrolled' and 'graduated' in year 5 from a specification identical to column (5) of Table 3. In each row, the outcome is an indicator for quarterly employment in a listed sector. The comparison group mean (c.m.) reports the year-5 employment rate of the TEC applicants who did not enroll. Horizontal bars represent 95 percent confidence intervals, where standard errors are clustered at the individual level.



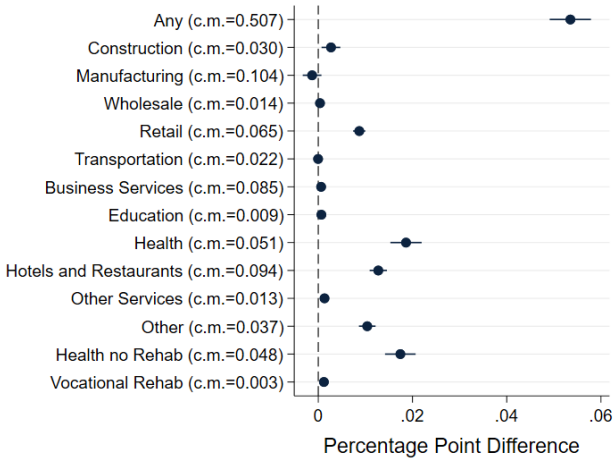
(a) Certificate Receipt



(b) Credit Completion



(c) Certificate-Predicted Employment Probability



(d) Credit-Predicted Employment Probability

Figure 6: Differences in Credentialing, Graduated vs. Enrolled but Exited

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development. The sample includes all TEC applicants from January 2013 through June 2015 with any pre-application MPH record. Each panel reports effects on a different set of outcomes: indicators for certificate completion (panel a), indicators for any post-secondary credit completion (panel b), certificate-predicted employment rates (panel c), and credit-predicted employment rates (panel d). The figures plot simple weighted differences in the outcomes between TEC graduates and TEC students who did not graduate. Observations are weighted by inverse propensity score weights. The same regression is estimated for the program or sector denoted in each row. The comparison group mean (c.m.) reports the average outcome among TEC students who did not graduate. Horizontal bars represent 95 percent confidence intervals, where standard errors are clustered at the individual level.

Table 1: Select Characteristics of US High School Graduates, Non-Graduates, and TEC Applicants

	American Community Survey				TEC
	HS Diploma	GED	Less than HS Diploma or GED		Applicants
			All	IN Only	
	(1)	(2)	(3)	(4)	(5)
Employed in Past Year	0.76	0.68	0.53	0.58	0.62
	(0.43)	(0.47)	(0.50)	(0.49)	(0.49)
Wages in Past Year	15,046	12,974	8,489	9,799	5,191
	(18,906)	(19,531)	(15,822)	(19,500)	(9,231)
Black	0.20	0.19	0.25	0.18	0.43
	(0.40)	(0.39)	(0.43)	(0.39)	(0.50)
Hispanic	0.18	0.14	0.25	0.07	0.12
	(0.39)	(0.35)	(0.43)	(0.25)	(0.33)
Age	24	25	24	24	25
	(3)	(3)	(4)	(3)	(9)
Female	0.43	0.37	0.41	0.43	0.56
	(0.49)	(0.48)	(0.49)	(0.49)	(0.50)

Notes: Data are from the 2012–2016 American Community Survey (ACS) and TEC application records linked to UI earnings data from the Indiana Department of Workforce Development and high school enrollment records from the Indiana Department of Education. In columns (1) through (4), the sample is restricted to US-born respondents to the ACS aged 19 to 30, weighted by ACS person weights. The first three columns show, respectively, respondents whose highest educational attainment is a traditional high school diploma, a GED, and less than high school diploma or GED, respectively. The fourth column shows those with less than a high school diploma or GED living in the state of Indiana. The final column shows similar demographics for our primary sample of TEC applicants at the time of application. For these individuals, employment and wages are from the UI earnings data and other demographics come from high school enrollment records prior to TEC application. Average wages include zeroes for individuals who did not work in the previous year.

Table 2: Descriptive Differences between Applicants to The Excel Center

	Did not enroll	Exited	Graduated
	(1)	(2)	(3)
Record Matching Sample (N = 11,079)			
Age at application	27.05	25.88	23.16
Has any UI records	0.68	0.66	0.64
Has any enrollment records	0.43	0.57	0.70
Has any diploma status records	0.24	0.25	0.24
Has any MPH records	0.81	0.87	0.92
Main Analysis Sample (N = 9,465)			
Age at application	26.28	25.06	22.62
Any formal sector employment:			
Year before application	0.66	0.60	0.57
Year 1	0.74	0.71	0.66
Year 2	0.74	0.76	0.76
Year 3	0.71	0.74	0.80
Year 4	0.68	0.73	0.79
Year 5	0.65	0.70	0.76
Formal sector earnings:			
Year before application	$5,662	$4,730	$4,359
Year 1	$6,650	$5,520	$4,732
Year 2	$7,979	$7,311	$7,135
Year 3	$8,620	$8,338	$9,868
Year 4	$9,023	$8,917	$11,319
Year 5	$9,558	$9,615	$12,060
Analysis Sample with DOE Characteristics (N = 6,370)			
Age at application	19.53	23.32	21.28
Free or reduced price lunch	0.81	0.67	0.72
Homeless	0.09	0.06	0.07
Male	0.51	0.44	0.38
Black	0.46	0.44	0.36
Hispanic	0.10	0.13	0.14
White	0.38	0.38	0.45

Notes: Based on calculations using application data from Goodwill, student records from the Indiana Department of Education (DOE), and unemployment insurance records from the Indiana Department of Workforce Development (DWD). The sample in the top panel includes all TEC applicants from January 2013 through June 2015; the middle panel includes the subset of TEC applicants who link to either employment or K-12 Department of Education records prior to TEC application; and the bottom panel further restricts the sample to applicants with a K-12 school enrollment record prior to TEC application. Missing earnings for a given quarter are assumed to be 0. The columns report sample means for the respective group of applicants.

Table 3: Effect of Enrollment and Graduation from The Excel Center on Quarterly Earnings

	Fixed Effects	Fixed Effects	Fixed Effects	Weighted	Weighted	Weighted SD
	(1)	(2)	(3)	(4)	(5)	(6)
Enrolled X Year 1	-133.84***	-111.79***	-133.78***	-96.11***	-89.45***	-57.17
	(33.47)	(34.88)	(34.83)	(34.23)	(33.73)	(47.56)
Enrolled X Year 2	15.87	3.74	-36.59	-5.02	5.17	33.93
	(42.96)	(44.73)	(44.73)	(45.94)	(45.49)	(56.10)
Enrolled X Year 3	207.95***	100.39**	56.36	99.80*	111.59**	138.74**
	(49.39)	(51.08)	(51.15)	(52.72)	(52.29)	(61.31)
Enrolled X Year 4	300.65***	144.30**	92.90	105.32*	119.65**	144.27**
	(54.98)	(56.78)	(56.68)	(58.24)	(57.61)	(65.32)
Enrolled X Year 5	343.73***	184.96***	131.23**	165.58***	179.68***	204.52***
	(60.10)	(62.28)	(62.09)	(63.56)	(62.99)	(70.37)
Graduated X Year 1		-98.56**	-138.78***	-141.15**	-142.12***	-138.48**
		(44.93)	(44.31)	(56.25)	(55.11)	(69.52)
Graduated X Year 2		54.20	-14.61	-38.63	-39.72	-35.97
		(59.13)	(58.03)	(67.24)	(65.21)	(79.21)
Graduated X Year 3		480.67***	399.78***	367.07***	365.69***	369.74***
		(72.68)	(71.95)	(80.89)	(79.06)	(93.01)
Graduated X Year 4		698.74***	599.84***	637.15***	634.60***	639.81***
		(82.11)	(81.76)	(92.79)	(91.76)	(103.95)
Graduated X Year 5		709.57***	604.20***	672.32***	669.06***	674.98***
		(89.86)	(89.71)	(101.97)	(101.00)	(111.23)
Relative Quarter FE	X	X	X	X	X	X
Person FE	X	X	X	X	X	
Calendar Quarter FE			X		X	
Age Bin X Rel. Quarter FE			X		X	
Comp. Mean-Year 1	1,662	1,662	1,662	1,476	1,476	1,476
Comp. Mean-Year 2	1,995	1,995	1,995	1,831	1,831	1,831
Comp. Mean-Year 3	2,155	2,155	2,155	1,990	1,990	1,990
Comp. Mean-Year 4	2,256	2,256	2,256	2,120	2,120	2,120
Comp. Mean-Year 5	2,389	2,389	2,389	2,232	2,232	2,232
$P(\hat{\beta}^{Pre1-8}_{Enroll} = 0)$	0.332	0.267	0.426	1.000	1.000	0.996
$P(\hat{\beta}^{Pre1-8}_{Grad} = 0)$		0.874	0.534	0.995	0.994	0.995
R^2	0.54	0.54	0.55	0.54	0.55	0.02
Observations	378,600	378,600	378,600	378,600	378,600	189,300
Individuals	9,465	9,465	9,465	9,465	9,465	9,465

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development. The sample includes all TEC applicants from January 2013 through June 2015 with any pre-application MPH record. Time is measured in quarters relative to application date, and the data are a balanced panel from quarter -20 to quarter 19. The outcome is unconditional total quarterly earnings (2014Q1 USD), winsorized at 99%. Non-employment is coded as zero earnings. Columns (4) through (6) are re-weighted using inverse propensity score weights. See text for details. Column (6) is a single-difference specification that only includes the 20 post-period quarters. Standard errors clustered by individual are in parentheses. Statistical significance at the 10, 5, and 1 percent levels are denoted respectively by *, **, and ***.

Table 4: Effect of Enrollment and Graduation from The Excel Center on Employment Stability

	Number of Quarters				Coef. of Variation Earnings
	Employed	Continuous Employment Any	Continuous Employment in Sector	Continuous Employment in Industry	
	(1)	(2)	(3)	(4)	(5)
Graduated	0.50**	0.81***	0.75***	0.89***	-0.14***
	(0.22)	(0.22)	(0.17)	(0.16)	(0.033)
Enrolled	0.78***	0.66***	0.21*	0.13	-0.12***
	(0.16)	(0.16)	(0.11)	(0.10)	(0.027)
Comp. Mean	10.62	8.21	5.34	4.72	1.52
R^2	0.00	0.01	0.00	0.01	0.01
Observations	9,465	9,465	9,465	9,465	8,656

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development. The sample includes all TEC applicants from January 2013 through June 2015 with any pre-application MPH record. This sample uses one observation per applicant. Outcomes are measured using post-application earnings data in quarter -20 to quarter 19. Column (1) counts the total number of quarters with positive earnings. Columns (2) count the longest string of consecutive quarters of with positive earnings. Columns (3) and (4) narrow to consecutive strings with the same 2-digit NAICS code and 6-digit NAICS code, respectively. Column (5) measures the coefficient of variation of total earnings across quarters within a person. All specifications measure simple post-period differences, weighted by inverse propensity scores. Standard errors clustered by individual are in parentheses. Statistical significance at the 10, 5, and 1 percent levels are denoted respectively by *, **, and ***.

Table 5: Effect of Graduation from The Excel Center on Quarterly Earnings Compared to Enrollees with Different Exit Reasons

	Any	Lack interest	No show	Work conflict	Interpersonal
	(1)	(2)	(3)	(4)	(5)
Graduated X Year 1	-113.22**	-87.04*	-43.66	-263.54***	-93.40
	(50.92)	(49.03)	(76.45)	(71.24)	(102.08)
Graduated X Year 2	-5.68	18.77	117.37	-298.69***	147.18
	(62.51)	(61.71)	(94.23)	(91.48)	(137.11)
Graduated X Year 3	388.24***	437.13***	531.85***	-19.36	668.75***
	(75.71)	(75.82)	(105.34)	(108.99)	(160.35)
Graduated X Year 4	652.02***	677.45***	738.01***	376.29***	821.20***
	(88.51)	(88.04)	(116.46)	(120.56)	(157.87)
Graduated X Year 5	681.69***	693.57***	748.30***	458.85***	726.20***
	(96.55)	(96.17)	(138.67)	(133.89)	(179.47)
Relative Quarter FE	X	X	X	X	X
Person FE	X	X	X	X	X
Calendar Quarter FE	X	X	X	X	X
Age Bin X Rel. Quarter FE	X	X	X	X	X
$P(\hat{\beta}^{Pre1-8}_{Grad} = 0)$	0.997	0.998	0.999	1.000	0.991
R^2	0.54	0.54	0.55	0.55	0.55
Observations	243,920	203,000	76,960	87,600	67,680
Individuals	6,098	5,075	1,924	2,190	1,692

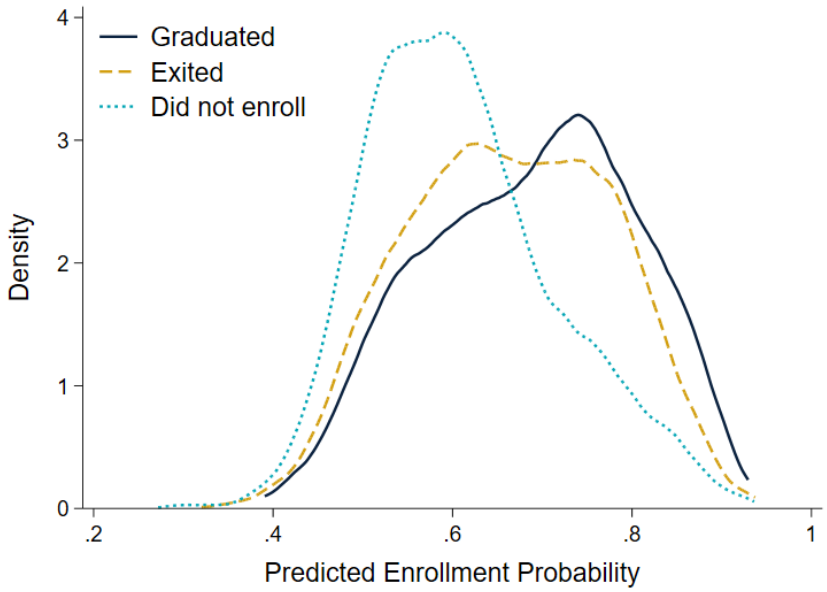
Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development (DWD) and TEC enrollment records from Goodwill. The sample includes all TEC applicants from January 2013 through June 2015 with any pre-application MPH record and an enrollment spell in the TEC enrollment records. The sample excludes students who are missing an exit reason. Time is measured in quarters relative to application date, and the data are a balanced panel from quarter -20 to quarter 19. The outcome is quarterly earnings (2014Q1 USD), winsorized at 99%. Non-employment is coded as zero earnings. The treatment group in all columns is comprised of graduates. The comparison group changes across columns, with each column limited to individuals who were ever identified as dropping out for the listed reason. All columns report the results of a 'doubly robust' specification that includes person, calendar quarter, and relative quarter-age ventile fixed effects and re-weights using inverse propensity score weights. See text for details. Standard errors clustered by individual are in parentheses. Statistical significance at the 10, 5, and 1 percent levels are denoted respectively by *, **, and ***.

Table 6: Effect of Passing the GED and Completing Community College on Quarterly Earnings

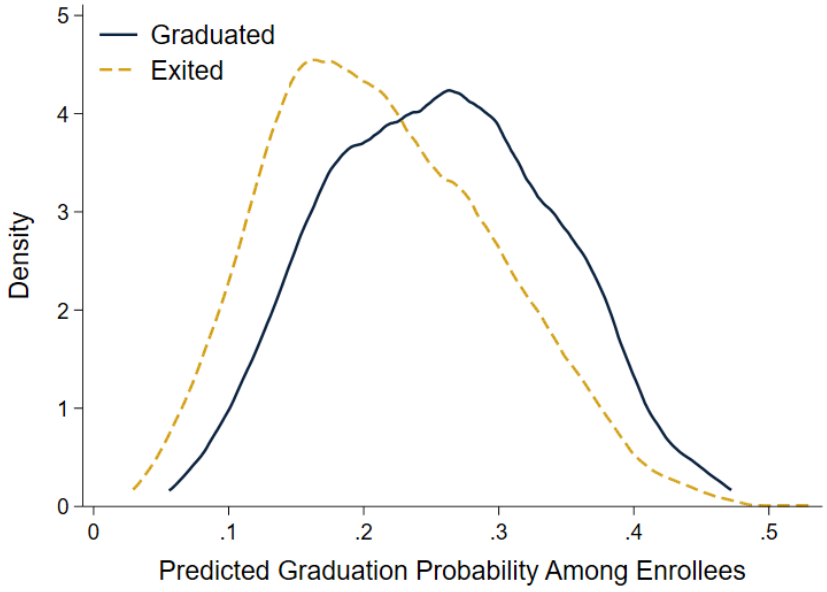
	Fixed Effects (1)	Fixed Effects (2)	Weighted (3)	Weighted (4)	Weighted SD (5)
Panel A: GED					
Passed GED X Year 1	268.27***	227.18***	151.76**	154.16**	171.90*
	(66.32)	(66.59)	(66.88)	(66.32)	(88.27)
Passed GED X Year 2	343.11***	295.11***	232.76**	234.86**	252.89**
	(88.34)	(88.81)	(93.30)	(92.89)	(108.97)
Passed GED X Year 3	413.45***	349.69***	284.99***	286.73***	305.13**
	(100.40)	(100.64)	(106.22)	(104.90)	(120.55)
Passed GED X Year 4	488.61***	417.39***	358.96***	360.01***	379.10***
	(107.80)	(107.94)	(113.44)	(111.80)	(128.21)
Passed GED X Year 5	441.70***	356.10***	284.20**	286.69**	304.34**
	(117.65)	(117.71)	(126.08)	(123.88)	(138.97)
Relative Quarter FE	X	X	X	X	X
Person FE	X	X	X	X	
Calendar Quarter FE		X		X	
Age Bin X Relative Quarter FE		X		X	
Comp. Mean-Year 5	2,634	2,634	2,682	2,682	2,682
$P(\hat{\beta}^{Pre1-8}_{Passed} = 0)$	0.286	0.595	1.000	1.000	1.000
Observations	170,600	170,600	170,600	170,600	85,300
Individuals	4,265	4,265	4,265	4,265	4,265
Panel B: Community College					
Earned Degree X Year 1	-312.27**	-205.49	156.51	167.03	309.35
	(133.69)	(131.58)	(173.51)	(164.23)	(223.27)
Earned Degree X Year 2	-116.87	-2.88	552.17*	550.81**	705.02**
	(165.30)	(166.11)	(298.52)	(269.21)	(351.41)
Earned Degree X Year 3	516.10***	656.02***	996.88***	994.15***	1,149.73***
	(192.62)	(194.22)	(274.67)	(256.80)	(308.78)
Earned Degree X Year 4	996.47***	1,154.01***	1,458.13***	1,463.25***	1,610.97***
	(222.81)	(225.62)	(318.79)	(301.87)	(346.11)
Earned Degree X Year 5	1,334.48***	1,496.68***	1,952.99***	1,948.13***	2,105.83***
	(248.95)	(250.40)	(363.18)	(342.58)	(403.37)
Relative Quarter FE	X	X	X	X	X
Person FE	X	X	X	X	
Calendar Quarter FE		X		X	
Age Bin X Relative Quarter FE		X		X	
Comp. Mean-Year 5	2,967	2,967	2,967	2,967	2,967
$P(\hat{\beta}^{Pre1-8}_{Degree} = 0)$	0.051	0.081	0.926	0.858	0.770
Observations	137,440	137,440	137,440	137,440	68,720
Individuals	3,436	3,436	3,436	3,436	3,436

Notes: Data come from statewide records of GED takers linked to UI earnings data from the Indiana Department of Workforce Development. In Panel A, the sample includes all GED takers who attempted the test between February and September 2014. For people with multiple test dates, relative time and pass status are for the person's first GED test. In Panel B, the sample includes all GED takers who enrolled in a associate's degree program for the first time between 2013 and 2015; relative time is compared to date of first enrollment. For both samples, the post period includes quarters 0 to 19. The outcome is quarterly earnings (2014Q1 USD), winsorized at 99%. Non-employment is coded as zero earnings. Columns (3) through (5) are weighted by inverse propensity scores. Column (5) reports results from a single-difference specification that only includes post-period quarters. Standard errors clustered by individual are in parentheses. Statistical significance at the 10, 5, and 1 percent levels are denoted respectively by *, **, and ***.

A Online Appendix



(a)



(b)

Figure A-1: Distribution of Propensity Scores, by TEC Completion Status

Notes: Each figure shows the distribution of propensity scores estimated by logit. In panel (a), the outcome is enrolling at TEC estimated for our main analysis sample, and in panel (b) it is graduating from TEC estimated among applicants who enroll. In both panels, the predictors are quarterly pre-period employment, quarterly pre-period earnings, an indicator for employment in the year prior to application, demographics from K-12 data (race, gender, free/reduced lunch, homeless), application quarter indicators, and age ventile indicators.

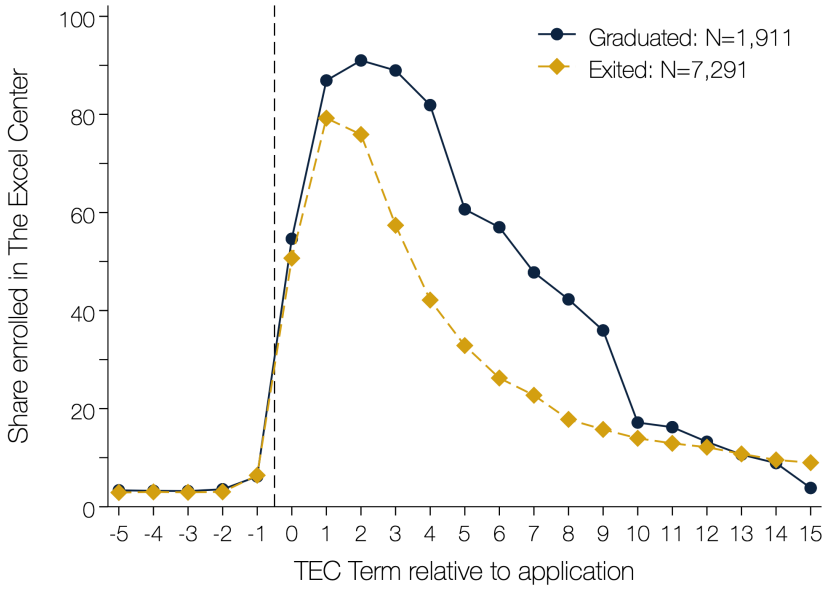


Figure A-2: Enrollment Trajectory, by TEC Completion Status

Notes: Data come from TEC application records and enrollment records reported by Goodwill to the Indiana Department of Education. The Excel Center school year includes five 8-week terms. The horizontal axis denotes the school term relative to application, where term 0 is the first term starting on or after an application date. We code a student as enrolled in a given term if they have an enrollment spell that overlaps with the start and end dates of the term. The sample includes all TEC applicants that can be linked to enrollment records (have a student test number) and could potentially be observed in all 21 relative school terms. The figure plots the enrollment rates of TEC graduates (navy circles) and TEC students who did not graduates (gold diamonds).

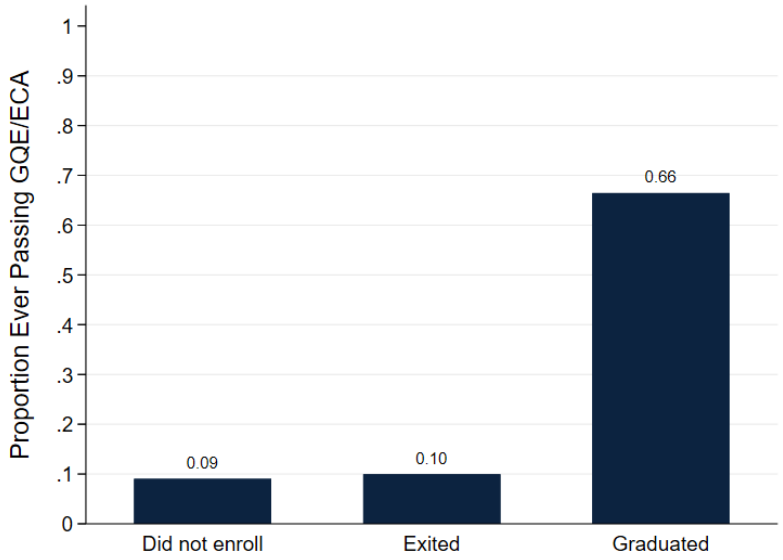
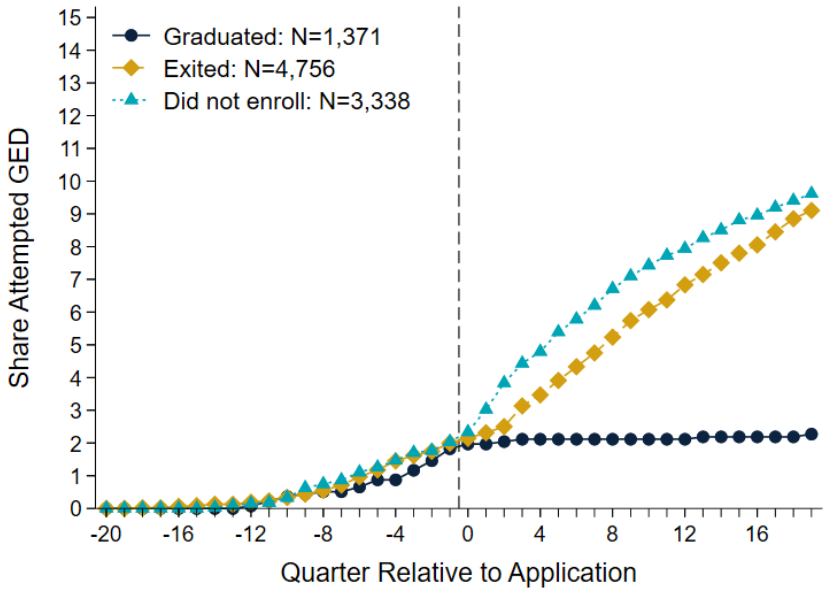
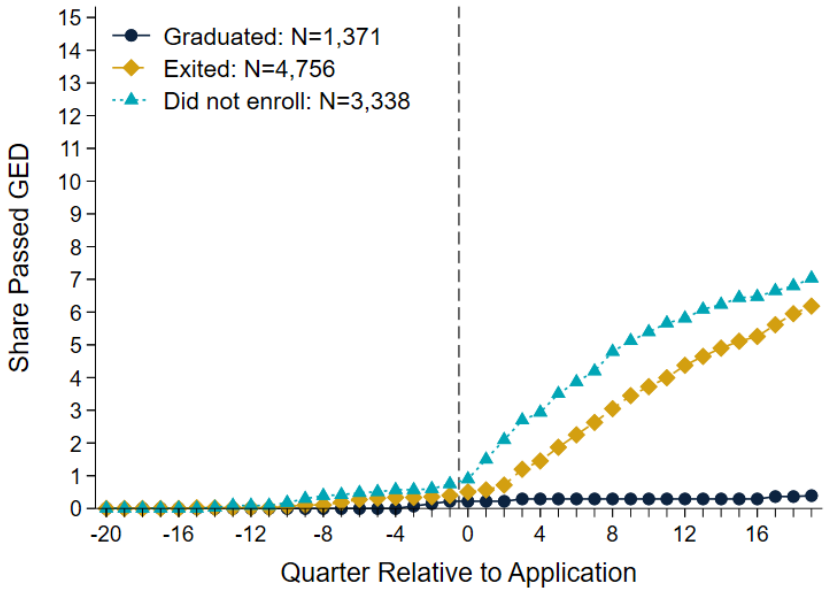


Figure A-3: Ever Passed Graduation Qualifying Exam as Measured by DOE Records

Notes: Data come from TEC application records linked to testing records from the Indiana Department of Education (DOE). Since the data do not have test dates, we measure whether each person has ever passed both English and Mathematics, as of 2020.



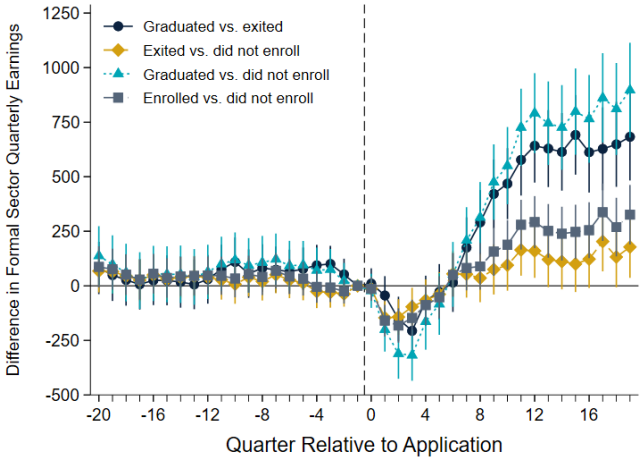
(a) Ever Taken GED



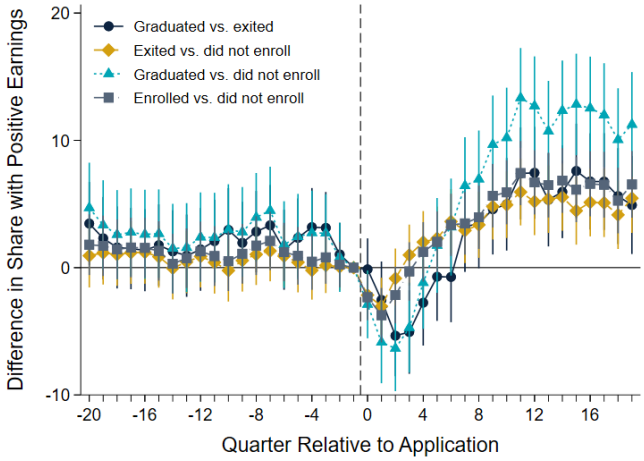
(b) Ever Passed GED

Figure A-4: Share Taking and Passing the GED, by TEC Completion Status

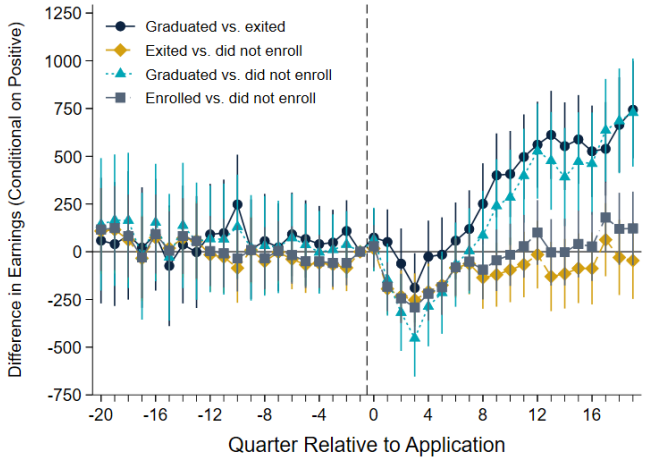
Notes: Data come from TEC application records linked to GED completion data from the Indiana Department of Workforce Development. The sample includes all TEC applicants from January 2013 through June 2015 with any pre-application MPH record, and is divided into three groups: TEC graduates (navy circles), TEC students who did not graduate (gold diamonds), and TEC applicants who did not enroll (teal triangles). The horizontal axis indicates quarter relative to initial TEC application date, where quarter 0 represents the quarter in which an individual applied to TEC. Panel A plots the share who have attempted the GED by the indicated quarter. Similarly, Panel B plots the share that have ever passed the GED.



(a) Average Earnings



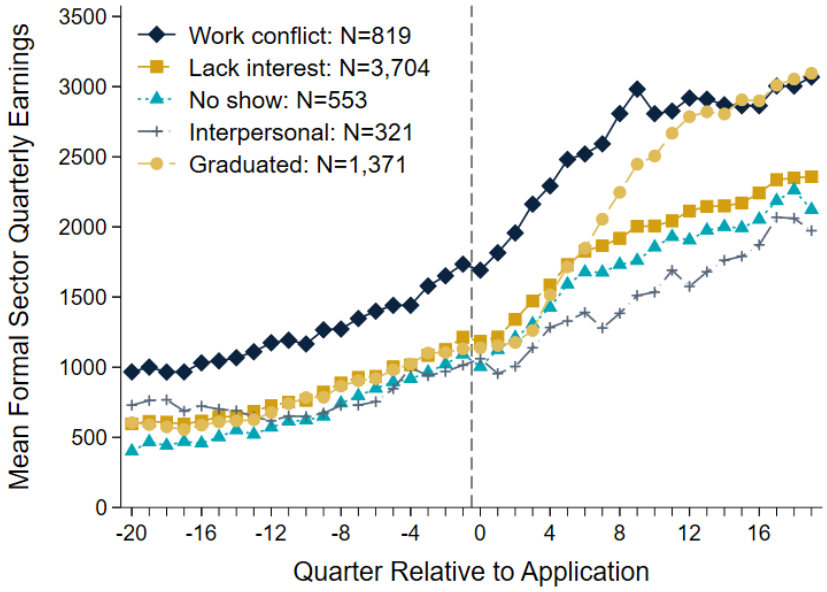
(b) Share with Positive Earnings



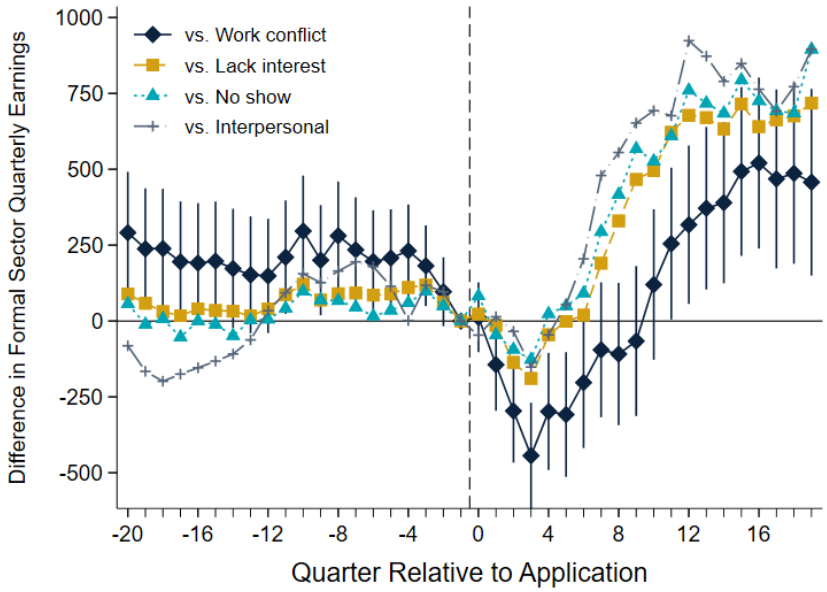
(c) Average Earnings, Conditional on Positive

Figure A-5: Unweighted Event Study of Earnings, by Quarters Since Application

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development. The sample includes all TEC applicants from January 2013 through June 2015 with any pre-application MPH record. The horizontal axis indicates quarter relative to initial TEC application date, where quarter 0 represents the quarter in which an individual applied to TEC. The figure plots the regression coefficients from three event study specifications that compare (1) the employment and earnings of TEC graduates to TEC students who did not graduate (navy circles); (2) TEC students who did not graduate to TEC applicants who did not enroll (gold diamonds); (3) TEC graduates to TEC applicants who did not enroll (teal triangles); and (4) all TEC students to TEC applicants who did not enroll (gray squares), controlling for individual fixed effects, calendar quarter fixed effects, and fixed effects for the interactions of calendar quarter and initial age ventile. Observations are unweighted. The outcomes are an indicator for unconditional total earnings (Panel A), positive earnings (2014Q1 USD) (Panel B), and average earnings among individuals with positive earnings (Panel C). The reference quarter is the quarter before application. Vertical bars represent 95 percent confidence intervals, where standard errors are clustered at the individual level.



(a) Average Earnings



(b) Event Study with Exit Type-Specific Comparison Groups

Figure A-6: Comparison of Graduates to Enrollees Who Drop Out, by Exit Reason

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development and TEC enrollment records. The sample includes all TEC students who applied between January 2013 through June 2015, had any pre-application MPH record, enrolled in TEC, and had a listed exit reason. TEC students are divided into groups based on the reason they exited the school, either because of graduation or their reason for dropping out. The horizontal axis indicates quarter relative to initial TEC application date, where quarter 0 represents the quarter in which an individual applied to TEC. Panel A plots average unconditional quarterly UI-covered earnings (2014Q1 USD) of TEC graduates (light gold circles) and TEC students who exit because of a work conflict (navy diamonds), lack of interest in the curriculum (gold square), stopped coming to school (teal triangle), and had interpersonal problems (light gray plus sign). Panel B plots the regression coefficients from event study specifications that compare the earnings of TEC graduates to TEC students who exited for the reasons listed above, controlling for individual fixed effects, calendar quarter fixed effects, and fixed effects for the interactions of relative quarter and initial age ventile. The reference quarter is the quarter before application. Vertical bars represent 95 percent confidence intervals on the estimates for "vs Work conflict" exit reason, where standard errors are clustered at the individual level.

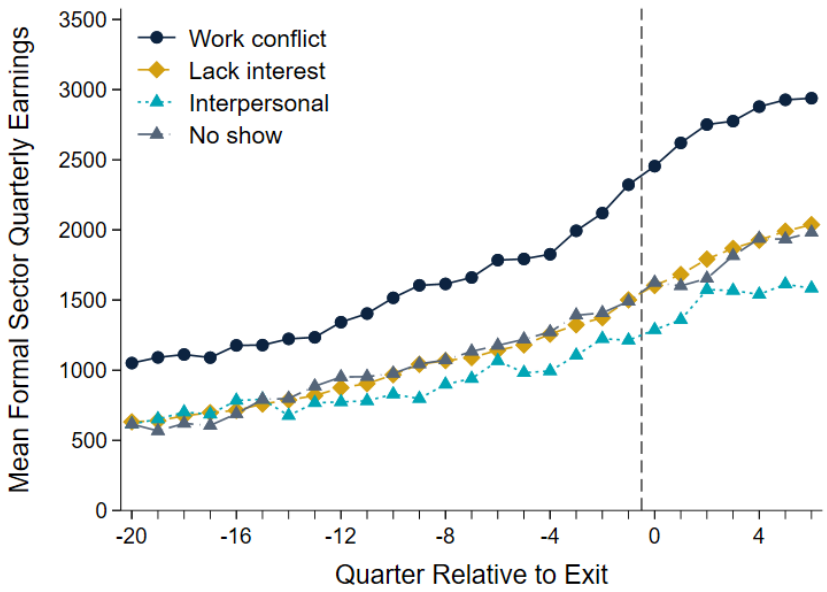
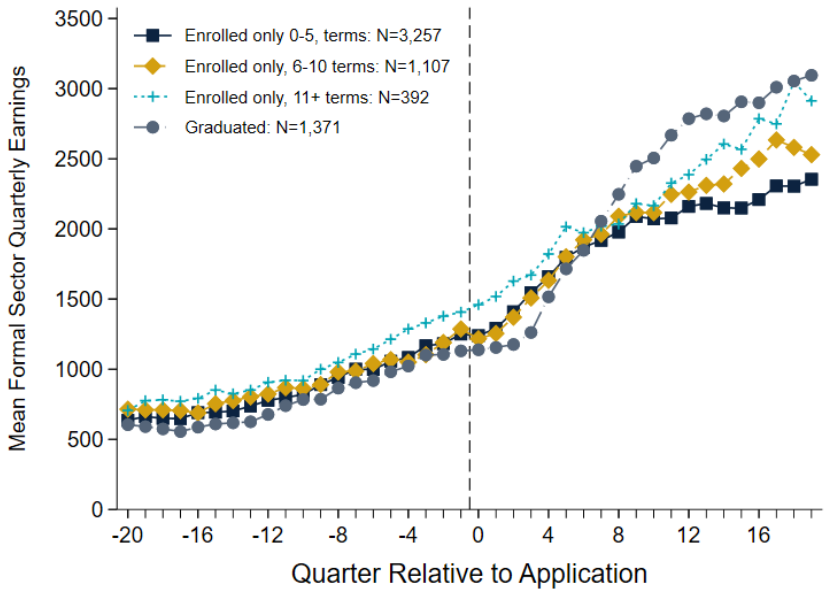
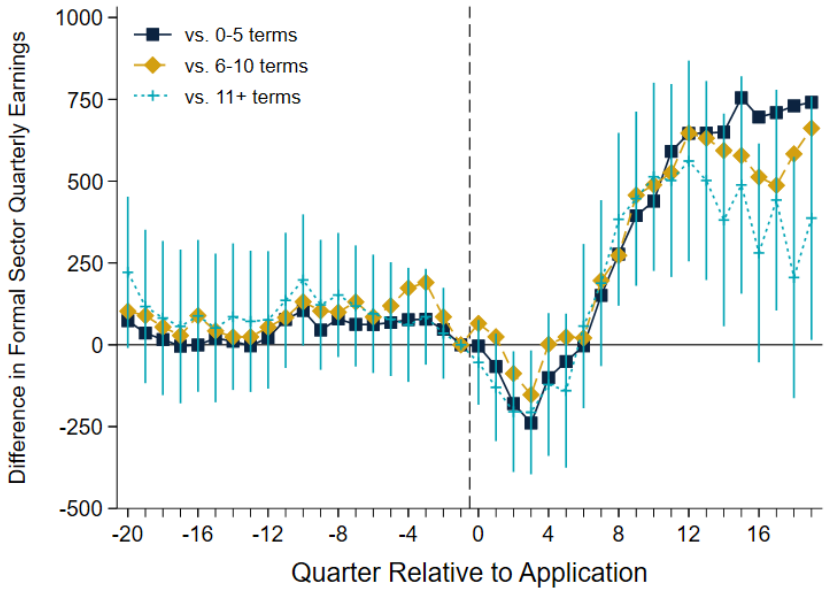


Figure A-7: Earnings Trends, by Time Relative to Exit and Exit Reason

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development. The sample includes all TEC students who applied between January 2013 through June 2015, had any pre-application MPH record, enrolled in TEC without graduating, and had a listed exit reason. The horizontal axis indicates quarter relative to the time the person exited TEC. The figure plots total unconditional earnings (2014Q1 USD), winsorized at 99%.



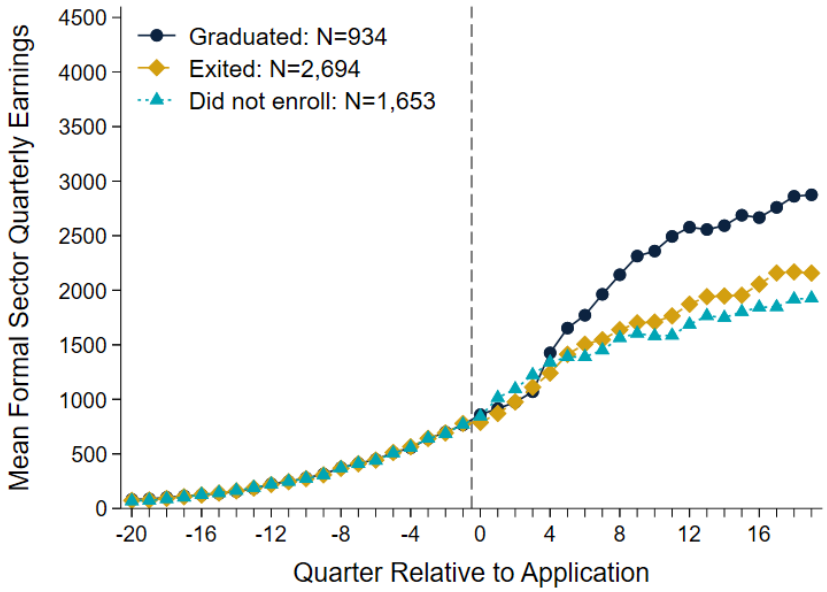
(a) Average Earnings



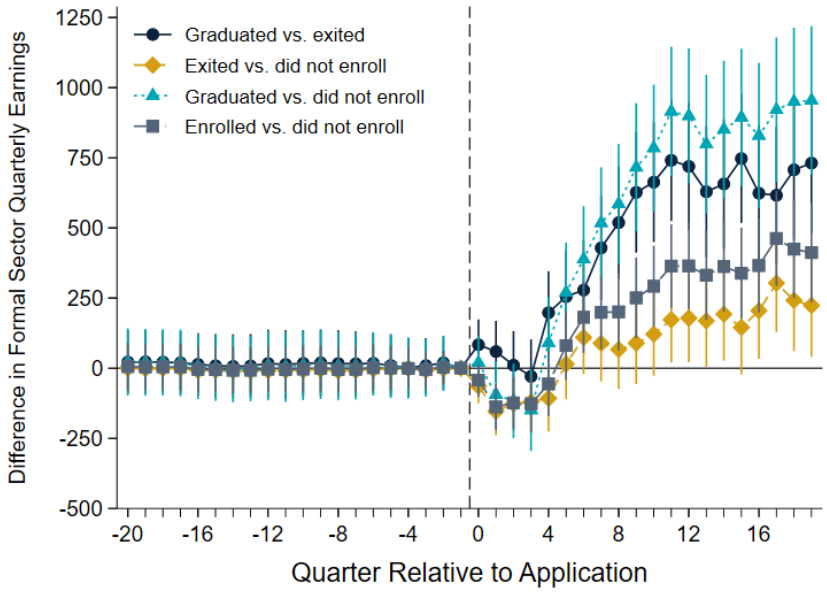
(b) Event Study with Enrolled Terms-Specific Comparison Groups

Figure A-8: Comparison of Graduates to Enrollees Who Drop Out, by Number of Terms Enrolled

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development and TEC enrollment records. The sample includes all TEC students who applied between January 2013 through June 2015 with any pre-application MPH record. TEC students are divided into groups based on the number of terms they ever enrolled at TEC. The horizontal axis indicates quarter relative to initial TEC application date, where quarter 0 represents the quarter in which an individual applied to TEC. Panel A plots average quarterly UI-covered earnings (2014Q1 USD) of TEC graduates (light gray circles) and TEC enrollees who exited after 0-5 terms (navy squares), 6-10 terms (gold diamonds), and 11+ terms (teal plus signs). Panel B plots the regression coefficients from an event study specification that compares the earnings of TEC graduates to TEC students who exited after the number of terms listed, controlling for individual fixed effects, calendar quarter fixed effects, and relative quarter-age ventile fixed effects. The reference quarter is the quarter before application. Vertical bars represent 95 percent confidence intervals for the 11+ terms comparison, where standard errors are clustered at the individual level.



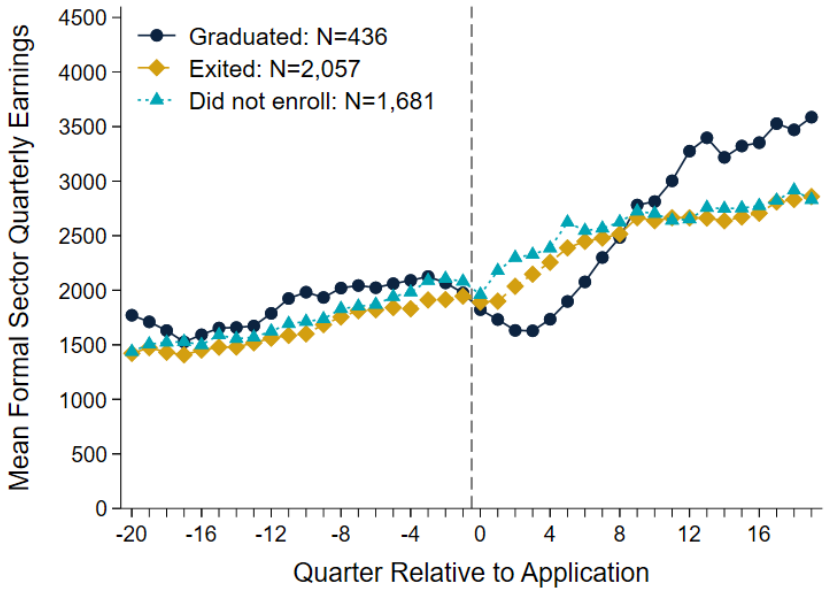
(a) Average Earnings



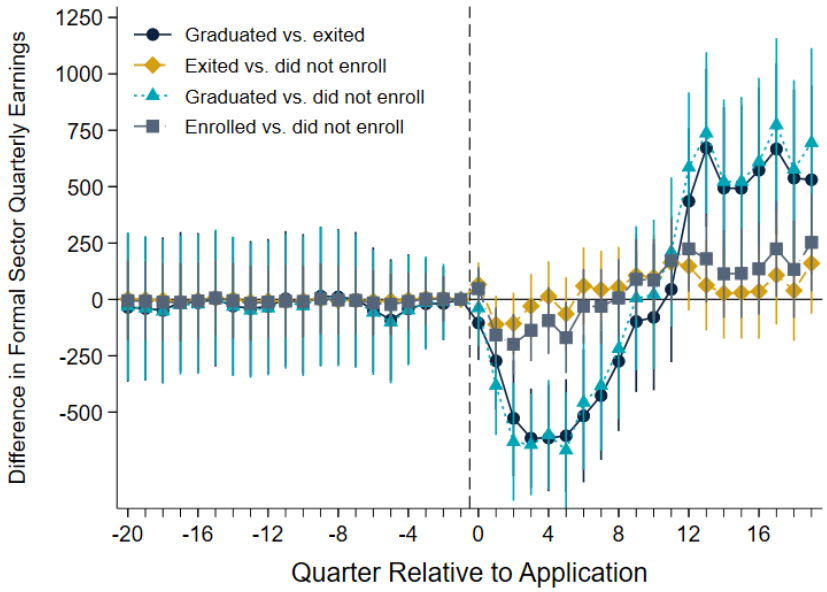
(b) Weighted Event Study

Figure A-9: Comparison of Graduates to Non-Graduates, 23 or Younger at Application

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development and TEC enrollment records. The sample includes all TEC applicants who applied between January 2013 through June 2015 with any pre-application MPH record and were 23 years or younger at application. Applicants are divided into groups based on enrollment and graduation. The horizontal axis indicates quarter relative to initial TEC application date, where quarter 0 represents the quarter in which an individual applied to TEC. Panel A plots average quarterly UI-covered earnings (2014Q1 USD) of TEC graduates (navy circles), TEC students who exited before graduation (gold diamonds), and applicants who did not enroll (teal triangles). Panel B plots the regression coefficients from weighted event study specifications that control for individual, calendar quarter, and relative quarter-age ventile fixed effects. The reference quarter is the quarter before application. Vertical bars represent 95 percent confidence intervals, where standard errors are clustered at the individual level.



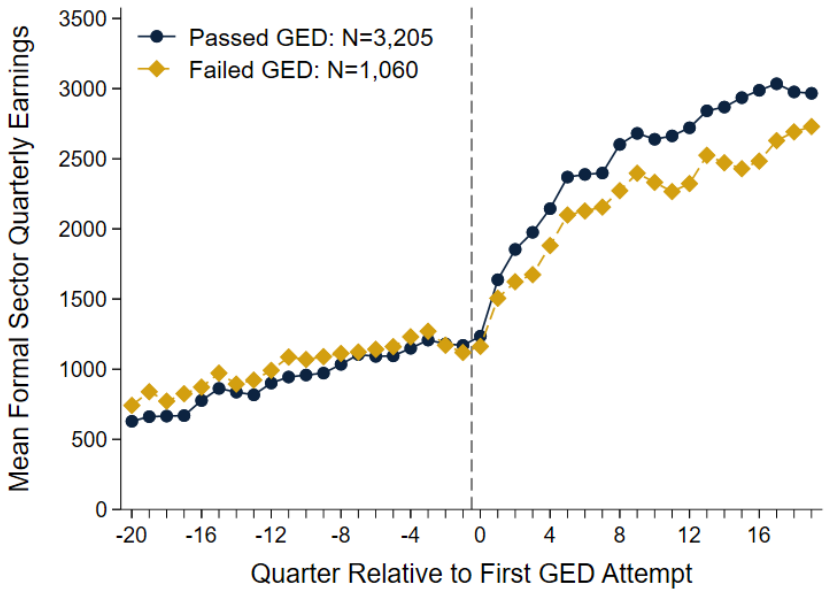
(a) Average Earnings



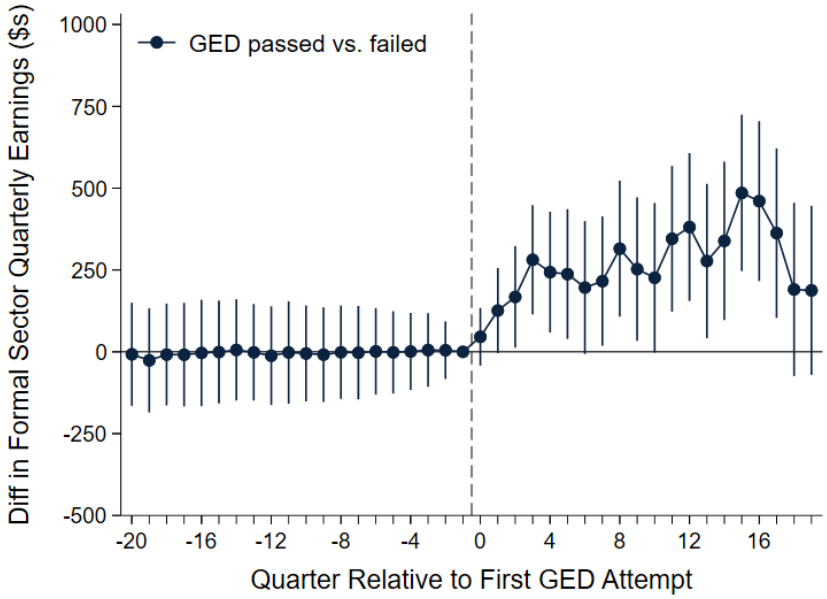
(b) Weighted Event Study

Figure A-10: Comparison of Graduates to Non-Graduates, 24 or Older at Application

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development and TEC enrollment records. The sample includes all TEC applicants who applied between January 2013 through June 2015 with any pre-application MPH record and were 24 years or older at application. Applicants are divided into groups based on enrollment and graduation. The horizontal axis indicates quarter relative to initial TEC application date, where quarter 0 represents the quarter in which an individual applied to TEC. Panel A plots average quarterly UI-covered earnings (2014Q1 USD) of TEC graduates (navy circles), TEC students who exited before graduation (gold diamonds), and applicants who did not enroll (teal triangles). Panel B plots the regression coefficients from weighted event study specifications that control for individual, calendar quarter, and relative quarter-age ventile fixed effects. The reference quarter is the quarter before application. Vertical bars represent 95 percent confidence intervals, where standard errors are clustered at the individual level.



(a) Average Earnings



(b) Event Study of Earnings

Figure A-11: Effect of Passing the GED on Earnings

Notes: Data come from TEC application records linked to GED completion and UI earnings data from the Indiana Department of Workforce Development. The sample includes all adults in Indiana who attempted the GED exam for the first time between February 2014 and September 2014. Test takers are divided into groups based on whether they passed the GED during their first attempt. The horizontal axis indicates quarter relative to initial GED exam attempt date, where quarter 0 represents the quarter in which an individual first took the GED exam. Panel A plots average quarterly UI-covered earnings (2014Q1 USD) of Hoosiers who passed the GED on their first attempt (navy circles) and Hoosiers who did not pass the GED on their first attempt (gold diamonds). Panel B plots the regression coefficients from an event study specification that compares the earnings of GED passers to GED non-passers, controlling for individual fixed effects, calendar quarter fixed effects, and relative quarter-age ventile fixed effects. The reference quarter is the quarter before the test quarter. Vertical bars represent 95 percent confidence intervals, where standard errors are clustered at the individual level.

Table A-1: State Laws Regarding Adult High School Diplomas

State	Has Adult Diploma	Adult Diploma = Standard Diploma
AL	Yes	Yes
AK	No	
AZ	No	
AR	No	
CA	Yes	Yes
CO	Yes	Yes
CT	Yes	No
DE	Yes	Yes
FL	Yes	Yes
GA	No	
HI	No	
ID	No	
IL	Yes	Yes
IN	Yes but limited	Yes
IA	Yes	No
KS	Yes	Yes
KY	No	
LA	No	
ME	Yes	Yes
MD	Yes	Yes
MA	Yes	Yes
MI	Yes	Yes
MN	Yes	Yes
MS	Yes	No
MO	Yes but limited	Yes
MT	No	
NE	No	
NV	Yes	No
NH	Yes	No
NJ	Yes	Yes
NM	No	
NY	Yes	No
NC	Yes	Yes
ND	No	
OH	Yes	Yes
OK	No	
OR	Yes	Yes
PA	No	
RI	Yes	Yes
SC	No	
SD	No	
TN	Yes but limited	Yes
TX	Yes	Yes
UT	Yes but limited	Yes
VT	Yes	Yes
VA	Yes	Yes
WA	Yes	No
WV	No	
WI	Yes	No
WY	No	

Notes: Coded from state government websites between June 2020 and April 2021.

Table A-2: The Excel Center Campuses Operated by Goodwill of Central & Southern Indiana

IDOE School Name	City	Start Month
Excel Center for Adult Learners - Michigan St Campus	Indianapolis, IN	July 2011
Excel Center for Adult Learners - Decatur Campus	Indianapolis, IN	July 2011
Excel Center for Adult Learners - Meadows Campus	Indianapolis, IN	July 2011
Excel Center for Adult Learners - Franklin Campus	Indianapolis, IN	July 2012
Excel Center - Anderson	Anderson, IN	August 2012
Excel Center - Lafayette	Lafayette, IN	August 2013
Excel Center - Richmond	Richmond, IN	August 2013
Excel Center - Lafayette Square	Indianapolis, IN	August 2013
Excel Center - Kokomo	Kokomo, IN	August 2013
Excel Center - University Heights	Indianapolis, IN	August 2015
Excel Center - Noblesville	Nobleville, IN	August 2015
Excel Center - Shelbyville	Shelbyville, IN	August 2016
Excel Center - Clarksville	Clarksville, IN	July 2017
Excel Center - Muncie	Muncie, IN	July 2018
Excel Center - Bloomington	Bloomington, IN	July 2019

Notes: Dates from school calendar start dates provided by Goodwill. The four campuses under the Excel Center for Adult Learners fall under a single charter as one school, but operate as four separate campuses.

Table A-3: Effect of Enrollment and Graduation from The Excel Center on Quarterly Earnings, No Winsorizing

	Fixed Effects	Fixed Effects	Fixed Effects	Weighted	Weighted	Weighted SD
	(1)	(2)	(3)	(4)	(5)	(6)
Enrolled X Year 1	-124.28***	-101.84***	-124.37***	-84.14**	-77.37**	-22.15
	(35.52)	(37.25)	(37.32)	(36.88)	(36.31)	(55.20)
Enrolled X Year 2	17.40	4.90	-36.03	-1.99	8.62	60.00
	(45.33)	(47.36)	(47.29)	(48.26)	(47.82)	(62.14)
Enrolled X Year 3	206.99***	97.61*	54.03	98.45*	110.58**	160.44**
	(51.47)	(53.22)	(53.24)	(54.57)	(54.14)	(66.75)
Enrolled X Year 4	302.07***	143.16**	90.73	102.45*	117.51*	164.44**
	(57.46)	(59.55)	(59.40)	(60.91)	(60.22)	(70.35)
Enrolled X Year 5	329.42***	169.13**	115.25*	151.04**	165.41**	213.03***
	(64.23)	(66.65)	(66.36)	(67.19)	(66.64)	(76.81)
Graduated X Year 1		-100.32**	-142.66***	-141.12**	-142.68**	-94.12
		(47.74)	(47.03)	(60.43)	(59.38)	(113.01)
Graduated X Year 2		55.84	-17.17	-35.74	-37.30	11.26
		(62.27)	(61.37)	(71.52)	(69.43)	(117.00)
Graduated X Year 3		488.82***	404.05***	370.57***	368.38***	417.57***
		(76.25)	(75.42)	(85.03)	(82.96)	(123.44)
Graduated X Year 4		710.17***	604.12***	652.95***	649.59***	699.95***
		(86.09)	(85.55)	(97.96)	(96.84)	(138.04)
Graduated X Year 5		716.34***	605.30***	684.91***	680.83***	731.91***
		(92.76)	(92.52)	(106.72)	(105.68)	(143.44)
Relative Quarter FE	X	X	X	X	X	X
Person FE	X	X	X	X	X	
Calendar Quarter FE			X		X	
Age Bin X Relative Quarter FE			X		X	
Comp. Mean-Year 1	1,698	1,698	1,698	1,502	1,502	1,502
Comp. Mean-Year 2	2,040	2,040	2,040	1,865	1,865	1,865
Comp. Mean-Year 3	2,201	2,201	2,201	2,025	2,025	2,025
Comp. Mean-Year 4	2,298	2,298	2,298	2,154	2,154	2,154
Comp. Mean-Year 5	2,444	2,444	2,444	2,276	2,276	2,276
$P(\hat{\beta}\_Pre - Enroll^{1--8} = 0)$	0.390	0.278	0.398	1.000	1.000	0.974
$P(\hat{\beta}\_Pre - Grad^{1--8} = 0)$		0.695	0.330	0.951	0.953	0.953
R^2	0.58	0.58	0.59	0.60	0.60	0.02
Observations	378,600	378,600	378,600	378,600	378,600	189,300
Individuals	9,465	9,465	9,465	9,465	9,465	9,465

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development. The sample includes all TEC applicants from January 2013 through June 2015 with any pre-application MPH record. Time is measured in quarters relative to application date, and the data are a balanced panel from quarter -20 to quarter 19. The outcome is unconditional total quarterly earnings (2014Q1 USD), not winsorized. Non-employment is coded as zero earnings. Columns (4) through (6) are re-weighted using inverse propensity score weights. See text for details. Column (6) is a single-difference specification that only includes the 20 post-period quarters. Standard errors clustered by individual are in parentheses. Statistical significance at the 10, 5, and 1 percent levels are denoted respectively by *, **, and ***.

Table A-4: Effect of Graduation on Living Out of State

	Fixed Effects	Fixed Effects	Weighted	Weighted	Weighted SD
	(1)	(2)	(3)	(4)	(5)
Enrolled X Year 1	-0.001	-0.000	0.003	0.003	0.003
	(0.006)	(0.006)	(0.008)	(0.007)	(0.009)
Enrolled X Year 2	0.004	0.005	0.010	0.010	0.009
	(0.006)	(0.006)	(0.008)	(0.007)	(0.007)
Enrolled X Year 3	0.002	0.003	0.006	0.006	0.006
	(0.006)	(0.006)	(0.008)	(0.008)	(0.009)
Enrolled X Year 4	0.002	0.004	0.005	0.005	0.004
	(0.008)	(0.008)	(0.010)	(0.010)	(0.010)
Enrolled X Year 5	0.001	0.002	0.004	0.004	0.001
	(0.009)	(0.009)	(0.011)	(0.011)	(0.011)
Graduated X Year 1	-0.003	-0.005	-0.007	-0.006	-0.009
	(0.006)	(0.006)	(0.008)	(0.008)	(0.010)
Graduated X Year 2	-0.006	-0.008	-0.012	-0.011	-0.014
	(0.006)	(0.006)	(0.008)	(0.008)	(0.009)
Graduated X Year 3	-0.005	-0.007	-0.006	-0.006	-0.008
	(0.007)	(0.007)	(0.009)	(0.009)	(0.009)
Graduated X Year 4	-0.006	-0.009	-0.007	-0.007	-0.008
	(0.008)	(0.008)	(0.011)	(0.011)	(0.011)
Graduated X Year 5	-0.005	-0.009	-0.011	-0.011	-0.009
	(0.009)	(0.009)	(0.012)	(0.012)	(0.012)
Relative Quarter FE	X	X	X	X	X
Person FE	X	X	X	X	
Calendar Quarter FE		X		X	
Age Bin X Relative Quarter FE		X		X	
Comp. Mean-Year 1	0.024	0.024	0.025	0.025	0.025
Comp. Mean-Year 2	0.027	0.027	0.028	0.028	0.028
Comp. Mean-Year 3	0.028	0.028	0.029	0.029	0.029
Comp. Mean-Year 4	0.030	0.030	0.028	0.028	0.028
Comp. Mean-Year 5	0.036	0.036	0.034	0.034	0.034
R^2	0.63	0.63	0.60	0.60	0.00
Observations	130,800	130,800	130,426	130,426	65,026
Individuals	3,270	3,270	3,270	3,270	3,270

Notes: We link TEC application records to address histories from Infutor Data Solutions using name and date of birth. We limit the sample to individuals who match to an address in Infutor prior to applying to TEC. The outcome is an indicator for the most recent recorded address being outside the state of IN. All columns include quarters 0-19 post application. Columns 1-4 include 20 quarters pre-application. Columns 3 and 4 are weighted by an inverse propensity score constructed using indicators for moving in the 20 quarters pre-application, quarter of application indicators, and age at application. Column 5 uses this same IPW, but presents a simple-difference and thus exclude periods pre-application and person FEs. Statistical significance at the 10, 5, and 1 percent levels are denoted respectively by *, **, and ***.

Table A-5: Effects on Earnings with Various Difference-in-Difference Methods

	TWFE	TWFE	BJS	BJS	BJS Event Time	BJS Event Time	BJS Event Time
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Enrolled X Year 1	-97.84***	-114.74***	-116.51***	-119.91***	-111.79***	-120.10***	-90.69***
	(27.34)	(27.34)	(26.40)	(26.05)	(34.87)	(33.08)	(34.06)
Enrolled X Year 2	66.50*	38.35	38.55	25.55	3.74	-20.66	2.22
	(37.84)	(37.88)	(38.85)	(38.39)	(44.72)	(43.68)	(45.58)
Enrolled X Year 3	119.84***	81.55*	98.45**	72.93	100.39**	70.93	108.72**
	(45.49)	(45.42)	(47.58)	(47.02)	(51.08)	(50.56)	(52.26)
Enrolled X Year 4	139.45***	98.57*	123.12**	92.79*	144.30**	101.00*	117.92**
	(51.71)	(51.58)	(53.52)	(52.97)	(56.77)	(56.11)	(57.61)
Enrolled X Year 5	167.88***	122.59**	166.41***	131.51**	184.96***	150.32**	176.75***
	(57.43)	(57.20)	(59.47)	(58.95)	(62.27)	(61.60)	(62.96)
Graduated X Year 1	-107.82**	-127.89***	-105.62**	-99.01**	-98.56**	-113.37**	-141.25**
	(45.66)	(45.32)	(45.46)	(45.60)	(44.94)	(45.09)	(55.23)
Graduated X Year 2	44.06	-3.67	46.24	28.26	54.20	15.60	-38.98
	(59.50)	(58.73)	(59.33)	(59.65)	(59.12)	(59.40)	(65.76)
Graduated X Year 3	468.75***	396.36***	470.25***	426.24***	480.67***	425.70***	367.17***
	(73.08)	(72.41)	(72.93)	(73.56)	(72.93)	(73.65)	(79.78)
Graduated X Year 4	686.50***	598.41***	688.67***	623.20***	698.74***	616.66***	636.58***
	(82.34)	(81.98)	(82.49)	(83.29)	(82.58)	(83.60)	(92.77)
Graduated X Year 5	697.54***	598.29***	699.26***	626.87***	709.57***	635.79***	670.22***
	(90.01)	(89.78)	(90.23)	(91.14)	(90.31)	(91.58)	(102.02)
Panel Period	2008Q1–2020Q2	2008Q1–2020Q2	2008Q1–2020Q2	2008Q1–2020Q2	-Q20–Q19	-Q20–Q19	-Q20–Q19
Person FE	X	X	X	X	X	X	X
Calendar Quarter FE	X	X	X	X		X	X
Age Bin X Calendar Quarter FE		X		X			
Relative Quarter FE					X	X	X
Age Bin X Relative Quarter FE						X	X
$P(\hat{\beta}^{Pre1-8}_{Enroll} = 0)$	0.264	0.342					
$P(\hat{\beta}^{Pre1-8}_{Grad} = 0)$	0.801	0.752					
$P(\hat{\beta}^{Pre1--8}_{BJS} = 0)$			0.150	0.196	0.332	0.477	1.000
Observations	473,250	473,250	438,090	438,090	378,600	378,600	378,600

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development. The sample includes all TEC applicants from January 2013 through June 2015 with any pre-application MPH record. In columns (1) through (4), the sample is a balanced quarterly panel from Q1 2008 through Q2 2020. In columns (5) through (7), the sample is a balanced quarterly panel in relative time that includes quarters -20 through 19. The outcome is quarterly earnings (2014Q1 USD), winsorized at 99%. Non-employment is coded as zero earnings. Columns (1) reports results from a standard two-way fixed effects regression that includes person and calendar quarter fixed effects. Column (2) additionally controls for initial age ventile-calendar quarter fixed effects. Columns (3) through (7) report results using the imputation method of Borusyak et al. (2021). Columns (3) and (4) include the same fixed effects as columns (1) and (2), respectively. Columns (5) and (6) repeats this analysis but using relative time fixed effects. Column (7) incorporates inverse propensity score weights. Standard errors clustered by individual are in parentheses. Statistical significance at the 10, 5, and 1 percent levels are denoted respectively by *, **, and ***.

Table A-6: Effect of Enrollment and Graduation from The Excel Center on Quarterly Earnings, Longer Follow-up Samples

	Weighted (1)	Weighted (2)	Weighted (3)	Weighted (4)
Enrolled X Year 1	-104.81***	-89.45***	-31.67	-134.26*
	(29.75)	(33.73)	(41.21)	(77.54)
Enrolled X Year 2	-17.81	5.17	30.48	-113.70
	(39.81)	(45.49)	(54.89)	(108.16)
Enrolled X Year 3	101.67**	111.59**	137.66**	86.46
	(45.92)	(52.29)	(63.24)	(123.18)
Enrolled X Year 4	84.86*	119.65**	83.68	-0.18
	(51.27)	(57.61)	(69.91)	(135.81)
Enrolled X Year 5		179.68***	111.43	49.54
		(62.99)	(77.36)	(142.06)
Enrolled X Year 6			127.68	-76.55
			(84.35)	(162.29)
Enrolled X Year 7				-167.18
				(170.90)
Graduated X Year 1	-118.75**	-142.12***	-179.75**	-196.52
	(51.57)	(55.11)	(70.75)	(120.64)
Graduated X Year 2	33.33	-39.72	-89.20	-39.26
	(63.02)	(65.21)	(81.76)	(150.04)
Graduated X Year 3	468.47***	365.69***	366.27***	465.51**
	(76.65)	(79.06)	(98.58)	(198.13)
Graduated X Year 4	708.35***	634.60***	672.15***	790.08***
	(85.45)	(91.76)	(112.41)	(204.03)
Graduated X Year 5		669.06***	684.98***	770.71***
		(101.00)	(121.39)	(230.40)
Graduated X Year 6			832.22***	811.19***
			(134.37)	(237.98)
Graduated X Year 7				849.64***
				(261.34)
Relative Quarter FE	X	X	X	X
Person FE	X	X	X	X
Calendar Quarter FE	X	X	X	X
Age Bin X Rel. Quarter FE	X	X	X	X
Comp. Mean - Final Year	2,202	2,232	2,376	2,602
$P(\hat{\beta}^{Pre1-8}_{Enroll} = 0)$	1.000	1.000	1.000	1.000
$P(\hat{\beta}^{Pre1-8}_{Grad} = 0)$	0.982	0.994	0.999	0.923
R^2	0.56	0.55	0.54	0.51
Observations	480,348	378,600	264,440	77,520
Individuals	13,343	9,465	6,010	1,615

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development. The sample differ across columns. The first column includes all TEC applicants from January 2013 through June 2016 with any pre-application MPH record. Each subsequent column moves the end date for the sample one year earlier to allow for an additional follow-up year. Time is measured in quarters relative to application date, includes quarters -20 to the indicated end quarter. The outcome is quarterly earnings (2014Q1 USD), winsorized at 99%. Non-employment is coded as zero earnings. All columns report the results of a 'doubly robust' specification that includes person, calendar quarter, and relative quarter-age ventile fixed effects and re-weights using inverse propensity score weights. Standard errors clustered by individual are in parentheses. Statistical significance at the 10, 5, and 1 percent levels are denoted respectively by *, **, and ***.

Table A-7: Effect of Graduation from The Excel Center on Quarterly Earnings, Comparing to Exiting Students with Different Enrollment Lengths

	0-5 Terms	6-10 Terms	11+ Terms
	(1)	(2)	(3)
Graduated X Year 1	-115.14**	-49.42	-134.97
	(50.82)	(58.88)	(82.25)
Graduated X Year 2	-15.29	43.52	12.68
	(62.87)	(77.58)	(112.12)
Graduated X Year 3	391.48***	408.85***	373.87**
	(76.34)	(93.60)	(169.17)
Graduated X Year 4	692.09***	580.10***	431.68***
	(89.24)	(105.87)	(158.94)
Graduated X Year 5	756.84***	556.14***	212.15
	(97.58)	(118.06)	(211.70)
Relative Quarter FE	X	X	X
Person FE	X	X	X
Calendar Quarter FE	X	X	X
Age Bin X Rel. Quarter FE	X	X	X
$P(\hat{\beta}^{Pre1-8}_{Grad} = 0)$	1.000	1.000	1.000
R^2	0.52	0.55	0.56
Observations	185,120	99,120	70,520
Individuals	4,628	2,478	1,763

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development and TEC enrollment records from Goodwill. The sample includes all TEC applicants from January 2013 through June 2015 with any pre-application MPH record and an enrollment spell in the TEC enrollment records. Time is measured in quarters relative to application date, and the data are a balanced panel from quarter -20 to quarter 19. The outcome is quarterly earnings (2014Q1 USD), winsorized at 99%. Non-employment is coded as zero earnings. All columns report the results of a 'doubly robust' specification that includes person, calendar quarter, and relative quarter-age ventile fixed effects and re-weights using inverse propensity score weights. See text for details. The treatment group in all columns is comprised of graduates. The comparison group changes across columns, with each column limited to individuals who dropped out but were enrolled for the listed number of terms. Standard errors clustered by individual are in parentheses. Statistical significance at the 10, 5, and 1 percent levels are denoted respectively by *, **, and ***.

Table A-8: Heterogeneous Effects of Enrollment and Graduation from The Excel Center on Quarterly Earnings

	Age<=23	Age>23	DOE Sample	FRL	Not FRL	Indianapolis	Not Indianapolis	High Absence Rate	Low Absence Rate	Remediation	Not Remediation
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Enrolled X Year 1	-111.19***	-42.60	-101.57**	-86.55**	-171.84	-70.99	-94.56**	-132.08**	-76.35		
	(36.52)	(61.76)	(49.91)	(38.60)	(135.32)	(48.18)	(46.79)	(67.02)	(62.36)		
Enrolled X Year 2	31.31	16.23	56.63	51.48	174.89	13.77	41.54	13.94	83.62		
	(53.72)	(74.53)	(64.60)	(58.99)	(152.30)	(61.12)	(64.14)	(87.70)	(91.49)		
Enrolled X Year 3	117.53*	108.56	101.11	80.87	307.50	37.09	223.84***	-7.79	177.08		
	(63.92)	(82.81)	(85.26)	(76.79)	(187.17)	(70.06)	(75.24)	(120.30)	(111.51)		
Enrolled X Year 4	176.68**	69.57	135.17	91.36	315.71*	45.92	264.90***	9.66	231.94**		
	(72.58)	(90.28)	(89.87)	(86.44)	(189.58)	(77.08)	(85.15)	(130.84)	(110.05)		
Enrolled X Year 5	248.54***	88.22	204.60**	163.98*	509.46***	68.09	338.40***	140.69	245.83*		
	(80.22)	(98.74)	(100.92)	(96.09)	(196.29)	(85.37)	(92.79)	(130.02)	(136.25)		
Graduated X Year 1	17.13	-355.91***	-52.02	15.85	-265.19***	-160.23*	-157.81**	-102.77	-57.16	-228.58***	-22.84
	(50.03)	(117.61)	(47.90)	(50.65)	(102.10)	(84.71)	(71.52)	(73.92)	(60.69)	(77.76)	(71.36)
Graduated X Year 2	276.28***	-517.05***	101.31	160.01**	-33.49	-120.14	24.94	-15.62	135.56	-189.95**	124.06
	(74.77)	(125.70)	(65.00)	(72.22)	(144.69)	(98.32)	(94.98)	(95.50)	(89.18)	(95.19)	(90.39)
Graduated X Year 3	623.62***	-77.71	485.81***	498.28***	360.44**	268.70**	413.52***	386.96***	495.56***	241.84**	392.44***
	(98.52)	(145.91)	(81.14)	(93.42)	(172.54)	(112.96)	(126.98)	(129.53)	(106.95)	(111.78)	(113.55)
Graduated X Year 4	674.22***	547.63***	623.63***	564.34***	580.29***	582.36***	674.62***	609.56***	580.50***	530.65***	504.23***
	(107.25)	(169.41)	(91.29)	(105.16)	(192.13)	(133.03)	(144.30)	(152.71)	(120.26)	(124.99)	(133.17)
Graduated X Year 5	655.55***	601.46***	660.49***	604.01***	568.00***	519.88***	715.58***	610.99***	611.48***	547.91***	444.23***
	(117.35)	(187.77)	(100.88)	(117.69)	(205.14)	(144.23)	(156.32)	(162.10)	(136.47)	(140.32)	(147.42)
Relative Quarter FE	X	X	X	X	X	X	X	X	X	X	X
Person FE	X	X	X	X	X	X	X	X	X	X	X
Age Bin X Relative Quarter FE	X	X	X	X	X	X	X	X	X	X	X
Calendar Quarter FE	X	X	X	X	X	X	X	X	X	X	X
Comp. Mean - Year 5	2,172	2,898	2,298	2,137	2,663	2,629	2,286	2,110	2,473	2,616	2,699
$P(\hat{\beta}^{Pre1-8}_{Grad} = 0)$	1.000	1.000	0.557	1.000	0.777	1.000	1.000	0.898	0.719		
$P(\hat{\beta}^{Pre1-8}_{Enroll} = 0)$	1.000	0.995	0.999	0.999	0.987	0.862	0.997	0.990	1.000	1.000	0.998
Graduation Rate	0.257	0.175	0.237	0.253	0.209	0.229	0.218	0.182	0.284	0.229	0.386
R^2	0.45	0.57	0.51	0.45	0.55	0.55	0.55	0.50	0.53	0.55	0.53
Observations	211,240	166,960	249,680	171,720	72,200	206,760	171,440	117,400	134,840	112,440	74,840
Individuals	5,281	4,174	6,242	4,293	1,805	5,169	4,286	2,935	3,371	2,811	1,871

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development, TEC enrollment records from Goodwill, and high school enrollment records from the Indiana Department of Education. Time is measured in quarters relative to application date. The outcome is quarterly earnings (2014Q1 USD), winsorized at 99%. Non-employment is coded as zero earnings. All columns use a balanced panel from quarter -20 to quarter 19. All columns report the results of a 'doubly robust' specification that includes person, calendar quarter, and relative quarter-age ventile fixed effects and re-weights using inverse propensity score weights. See text for details. The sample varies across columns. Columns (1) and (2) split the main sample of all TEC applicants from January 2013 through June 2015 with any pre-application MPH record by age, according to birthdate on the TEC application. Column (3) limits the main sample to those with a pre-application high school enrollment record. Columns (4)-(9) further limit the sub-sample from column (3) based on characteristics from K-12 school records: receipt of free or reduced-price lunch, applying to an Indianapolis school, and above/below median absence rates. Column (10) and (11) limit the sample to TEC applicants with enrollment records, splitting by whether the student completed any credits for remedial classes. Standard errors clustered by individual are in parentheses. Statistical significance at the 10, 5, and 1 percent levels are denoted respectively by *, **, and ***.

Table A-9: Heterogeneous Effects of Enrollment and Graduation from The Excel Center on Quarterly Earnings

	All	White Female	Black Female	White Male	Black Male
	(1)	(2)	(3)	(4)	(5)
Enrolled X Year 1	-101.57**	-69.94	1.81	-262.33***	-50.15
	(49.91)	(73.93)	(134.77)	(101.04)	(76.29)
Enrolled X Year 2	56.63	133.89	369.27**	-187.46	169.08*
	(64.60)	(101.56)	(183.69)	(170.80)	(96.97)
Enrolled X Year 3	101.11	195.85*	279.83	-309.31	263.20**
	(85.26)	(114.79)	(178.56)	(270.21)	(115.29)
Enrolled X Year 4	135.17	293.39**	226.51	-285.42	327.80**
	(89.87)	(125.18)	(177.67)	(311.16)	(131.97)
Enrolled X Year 5	204.60**	313.52**	264.79	30.59	453.53***
	(100.92)	(145.50)	(164.15)	(351.91)	(136.48)
Graduated X Year 1	-52.02	-8.32	-12.60	-70.70	-0.91
	(47.90)	(69.66)	(93.51)	(91.47)	(97.23)
Graduated X Year 2	101.31	325.50***	8.50	125.56	147.15
	(65.00)	(110.53)	(137.26)	(162.02)	(149.57)
Graduated X Year 3	485.81***	463.68***	382.47**	601.09**	289.01*
	(81.14)	(129.58)	(155.51)	(233.04)	(161.36)
Graduated X Year 4	623.63***	719.34***	304.88*	740.79***	405.21*
	(91.29)	(153.83)	(168.14)	(282.82)	(232.69)
Graduated X Year 5	660.49***	768.70***	143.82	933.36***	431.48**
	(100.88)	(164.15)	(188.57)	(360.98)	(208.69)
Relative Quarter FE	X	X	X	X	X
Person FE	X	X	X	X	X
Calendar Quarter FE	X	X	X	X	X
Age Bin X Rel. Quarter FE	X	X	X	X	X
Comp. Mean - Year 5	2,298	1,585	2,262	3,006	1,822
$P(\hat{\beta}^{Pre1-8}_{Enroll} = 0)$	0.557	0.948	0.852	0.981	0.997
$P(\hat{\beta}^{Pre1-8}_{Grad} = 0)$	0.999	0.921	0.562	0.968	0.793
Graduation Rate	0.235	0.285	0.226	0.239	0.166
R^2	0.51	0.45	0.54	0.50	0.46
Observations	249,680	51,680	55,440	39,640	47,320
Individuals	6,242	1,292	1,386	991	1,183

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development, TEC enrollment records from Goodwill, and high school enrollment records from the Indiana Department of Education. Time is measured in quarters relative to application date. The outcome is quarterly earnings (2014Q1 USD), winsorized at 99%. Non-employment is coded as zero earnings. All columns use a balanced panel from quarter -20 to quarter 19. All columns report the results of a 'doubly robust' specification that includes person, calendar quarter, and relative quarter-age ventile fixed effects and re-weights using inverse propensity score weights. See text for details. The sample varies across columns. Column (1) limits the main sample to those with a pre-application high school enrollment record. Columns (2)-(5) further limit the sub-sample from column (3) based on race and gender characteristics from K-12 school records. Standard errors clustered by individual are in parentheses. Statistical significance at the 10, 5, and 1 percent levels are denoted respectively by *, **, and ***.

Table A-10: Marginal Value of Public Funds Calculations

Outcomes:	5-Year Impacts (1)	7-Year Impacts (2)	20-Year Impacts (3)	40-Year Impacts (4)	40-Year Impacts (5)	40-Year Impacts (6)
Enrolled at Excel Center						
NPV of After-Tax Earnings Gains	2,559	4,907	8,415	34,063	24,073	26,680
	[1,269, 3,871]	[2,919, 6,950]	[5,267, 11,573]	[22,217, 46,101]	[15,622, 32,629]	[17,533, 35,904]
Cost Net of Fiscal Savings	6,809	6,560	6,188	1,648	3,330	4,248
	[6,702, 6,913]	[6,374, 6,741]	[5,878, 6,491]	[90, 3,313]	[2,244, 4,489]	[3,290, 5,198]
MVPF	0.38	0.75	1.36	20.67	7.23	6.28
	[0.18, 0.58]	[0.43, 1.09]	[0.81, 1.97]	[6.78, 498.67]	[3.50, 14.46]	[3.37, 10.93]
Enrolled Only						
NPV of After-Tax Earnings Gains	1,491	2,841	4,859	20,556	14,488	15,365
	[152, 2,809]	[777, 4,875]	[1,669, 8,058]	[8,169, 33,126]	[5,612, 23,461]	[5,974, 24,869]
Cost Net of Fiscal Savings	6,153	6,010	5,795	4,128	4,773	4,680
	[6,042, 6,257]	[5,818, 6,195]	[5,477, 6,107]	[2,798, 5,416]	[3,833, 5,684]	[3,693, 5,645]
MVPF	0.24	0.47	0.84	4.98	3.04	3.28
	[0.02, 0.47]	[0.13, 0.84]	[0.27, 1.47]	[1.51, 11.83]	[0.99, 6.12]	[1.06, 6.73]
Graduated						
NPV of After-Tax Earnings Gains	6,266	12,074	20,750	80,917	57,324	65,932
	[4,078, 8,434]	[8,675, 15,376]	[15,386, 25,966]	[62,402, 99,835]	[44,035, 70,842]	[50,121, 81,432]
Cost Net of Fiscal Savings	9,086	8,469	7,548	-6,956	-1,675	2,750
	[8,903, 9,274]	[8,158, 8,791]	[7,029, 8,081]	[-10,798, -2,260]	[-4,302, 1,559]	[1,133, 4,406]
MVPF	0.69	1.43	2.75	∞	∞	23.98
	[0.44, 0.95]	[0.99, 1.88]	[1.91, 3.70]	[∞, ∞]	[28.22, ∞]	[11.37, 71.73]
Discount Rate	3%	3%	3%	3%	5%	3%
Extrapolation Method	Actual	Lifecycle	Lifecycle	Lifecycle	Lifecycle	Constant

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development. The sample includes all TEC applicants from January 2013 through June 2015 with any pre-application MPH record. The table reports estimates of the net present value of after-tax earnings gain, cost of the program net of fiscal savings, and the marginal value of public funds (MVPF). Outcomes are reported separately by type of student: any enrolled TEC student, students who exit before graduation, and graduates. Results across columns vary the assumed duration of earnings impacts (given by the column header), the discount rate, and the method for extrapolating earnings gains into the future. The lifecycle extrapolation method (columns 2 through 5) assumes Year-5 gains are held constant in proportion to the earnings of non-enrolled applicants, where non-enrolled applicant earnings follow the population age-earnings profile of high school non-completers observed in the 2015 ACS (Ruggles et al., 2020). The constant extrapolation method assumes the Year-5 earnings gains are held constant in dollar terms throughout the remainder of the time horizon. 95% confidence intervals are reported in brackets and come from 10,000 bootstrap samples of the data. See text and Hendren and Sprung-Keyser (2020) for additional details.

Table A-11: Effects of Enrollment and Graduation from The Excel Center on Industry Employment

	Any	Const.	Mfg.	Wholesale	Retail	Trans.	Business Services	Education	Health	Hotel & Restaurant	Other Services	Other
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Enrolled X Year 1	-0.007	-0.004**	0.001	-0.000	-0.001	-0.002	-0.020***	-0.001	0.003	0.014**	0.002	0.001
	(0.008)	(0.002)	(0.003)	(0.001)	(0.004)	(0.002)	(0.005)	(0.001)	(0.003)	(0.006)	(0.001)	(0.002)
Enrolled X Year 2	0.033***	-0.006***	0.001	-0.001	0.017***	-0.005*	0.004	-0.002	0.003	0.020***	0.002	0.001
	(0.009)	(0.002)	(0.003)	(0.002)	(0.005)	(0.003)	(0.006)	(0.002)	(0.004)	(0.007)	(0.002)	(0.003)
Enrolled X Year 3	0.056***	-0.006**	0.009**	-0.001	0.021***	-0.004	0.011*	-0.003*	0.005	0.026***	-0.003	0.001
	(0.010)	(0.003)	(0.004)	(0.002)	(0.005)	(0.003)	(0.006)	(0.002)	(0.004)	(0.007)	(0.002)	(0.003)
Enrolled X Year 4	0.054***	-0.007***	0.010**	0.003	0.010*	-0.001	0.016**	-0.002	0.006	0.016**	-0.000	0.004
	(0.010)	(0.003)	(0.004)	(0.002)	(0.005)	(0.003)	(0.006)	(0.002)	(0.005)	(0.007)	(0.002)	(0.003)
Enrolled X Year 5	0.053***	-0.004	0.014***	0.004**	0.015***	-0.004	0.011*	-0.003	0.005	0.010	0.001	0.005
	(0.010)	(0.003)	(0.004)	(0.002)	(0.005)	(0.003)	(0.006)	(0.002)	(0.005)	(0.007)	(0.002)	(0.003)
Graduated X Year 1	-0.047***	0.001	-0.007**	0.000	0.002	0.002	-0.019***	0.005	-0.006	-0.020**	0.002	-0.006*
	(0.012)	(0.002)	(0.004)	(0.002)	(0.007)	(0.004)	(0.007)	(0.004)	(0.005)	(0.009)	(0.003)	(0.003)
Graduated X Year 2	-0.009	0.002	-0.007*	-0.001	0.005	0.006	-0.006	0.012***	0.007	-0.029***	0.001	0.001
	(0.014)	(0.002)	(0.004)	(0.002)	(0.008)	(0.004)	(0.009)	(0.004)	(0.006)	(0.010)	(0.004)	(0.004)
Graduated X Year 3	0.048***	0.002	-0.008	0.003	0.011	0.008*	0.010	0.016***	0.025***	-0.031***	0.003	0.009*
	(0.014)	(0.003)	(0.005)	(0.003)	(0.008)	(0.004)	(0.010)	(0.004)	(0.007)	(0.010)	(0.004)	(0.005)
Graduated X Year 4	0.071***	0.005*	0.002	-0.000	0.017*	0.006	0.009	0.014***	0.035***	-0.026**	-0.000	0.009*
	(0.015)	(0.003)	(0.006)	(0.003)	(0.009)	(0.005)	(0.010)	(0.004)	(0.009)	(0.011)	(0.003)	(0.005)
Graduated X Year 5	0.069***	0.006	0.005	-0.002	0.013	0.005	0.012	0.013***	0.032***	-0.033***	0.001	0.016**
	(0.016)	(0.004)	(0.007)	(0.003)	(0.009)	(0.005)	(0.009)	(0.004)	(0.009)	(0.010)	(0.003)	(0.006)
Relative Quarter FE	X	X	X	X	X	X	X	X	X	X	X	X
Person FE	X	X	X	X	X	X	X	X	X	X	X	X
Calendar Quarter FE	X	X	X	X	X	X	X	X	X	X	X	X
Age Bin X Rel. Quarter FE	X	X	X	X	X	X	X	X	X	X	X	X
Com. Mean - Year 4	0.531	0.019	0.039	0.009	0.080	0.025	0.135	0.009	0.051	0.125	0.010	0.028
Com. Mean - Year 5	0.519	0.020	0.038	0.009	0.072	0.031	0.131	0.007	0.055	0.120	0.008	0.028
$P(\hat{\beta}^{Pre1-8}_{Enroll} = 0)$	0.876	0.143	0.692	0.863	0.791	0.914	0.037	0.668	0.723	0.246	0.889	0.708
$P(\hat{\beta}^{Pre1-8}_{Grad} = 0)$	0.808	0.441	0.013	0.585	0.318	0.102	0.002	0.231	0.842	0.430	0.110	0.417
R^2	0.43	0.35	0.33	0.27	0.25	0.28	0.21	0.35	0.40	0.28	0.27	0.23
Observations	378,600	378,600	378,600	378,600	378,600	378,600	378,600	378,600	378,600	378,600	378,600	378,600
Individuals	9,465	9,465	9,465	9,465	9,465	9,465	9,465	9,465	9,465	9,465	9,465	9,465

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development. The sample includes all TEC applicants from January 2013 through June 2015 with any pre-application MPH record. Time is measured in quarters relative to application date. The outcome is an indicator for quarterly employment in the listed industry. All columns include quarters -20 through 19 and are re-weighted using inverse propensity score weights. Standard errors clustered by individual are in parentheses. Statistical significance at the 10, 5, and 1 percent levels are denoted respectively by *, **, and ***.

Table A-12: Effects of Enrollment and Graduation from The Excel Center on Health Industry Employment

	Any Health	Nursing Home	Vocational Rehab	Individual & Family	Home Health	General Medicine	Other Health
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Enrolled X Year 1	0.003	0.005**	-0.001	-0.000	0.001	-0.001	-0.000
	(0.003)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)
Enrolled X Year 2	0.003	-0.001	0.000	-0.001	0.002	-0.001	0.003
	(0.004)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)
Enrolled X Year 3	0.005	0.000	0.001	-0.001	0.002	-0.001	0.004
	(0.004)	(0.003)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
Enrolled X Year 4	0.006	0.001	-0.001	0.001	0.000	-0.001	0.005**
	(0.005)	(0.003)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
Enrolled X Year 5	0.005	-0.001	-0.001	0.001	0.002	-0.000	0.005**
	(0.005)	(0.003)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
Graduated X Year 1	-0.006	-0.009***	0.001	0.000	-0.001	-0.002	0.004*
	(0.005)	(0.003)	(0.003)	(0.002)	(0.002)	(0.001)	(0.002)
Graduated X Year 2	0.007	0.000	0.010***	-0.002	-0.002	0.003	-0.002
	(0.006)	(0.004)	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)
Graduated X Year 3	0.025***	0.002	0.015***	0.002	-0.001	0.006**	0.003
	(0.007)	(0.004)	(0.004)	(0.002)	(0.002)	(0.003)	(0.004)
Graduated X Year 4	0.035***	0.006	0.011**	0.003	-0.000	0.009***	0.006
	(0.009)	(0.004)	(0.005)	(0.003)	(0.002)	(0.003)	(0.004)
Graduated X Year 5	0.032***	0.005	0.010***	0.007**	-0.002	0.008**	0.004
	(0.009)	(0.005)	(0.004)	(0.003)	(0.002)	(0.003)	(0.005)
Relative Quarter FE	X	X	X	X	X	X	X
Person FE	X	X	X	X	X	X	X
Calendar Quarter FE	X	X	X	X	X	X	X
Age Bin X Rel. Quarter FE	X	X	X	X	X	X	X
Com. Mean - Year 4	0.051	0.016	0.005	0.007	0.006	0.007	0.011
Com. Mean - Year 5	0.055	0.017	0.005	0.007	0.006	0.006	0.013
$P(\hat{\beta}^{Pre1-8}_{Enroll} = 0)$	0.723	0.160	0.894	0.678	0.040	0.638	0.351
$P(\hat{\beta}^{Pre1-8}_{Grad} = 0)$	0.842	0.604	0.300	0.819	0.066	0.569	0.257
R^2	0.40	0.37	0.23	0.18	0.24	0.39	0.27
Observations	378,600	378,600	378,600	378,600	378,600	378,600	378,600
Individuals	9,465	9,465	9,465	9,465	9,465	9,465	9,465

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development. The sample includes all TEC applicants from January 2013 through June 2015 with any pre-application MPH record. Time is measured in quarters relative to application date. The outcome is an indicator for quarterly employment in the listed industry. All columns include quarters -20 through 19 and are re-weighted using inverse propensity score weights. See text for details. Standard errors clustered by individual are in parentheses. Statistical significance at the 10, 5, and 1 percent levels are denoted respectively by *, **, and ***.

Table A-13: Effects of The Excel Center on Professional Certificates

	Did Not Enroll	Enrolled		Graduated	
	Mean	Coef.	S.E.	Coef.	S.E.
	(1)	(2)	(3)	(4)	(5)
Any	0.197	0.052***	(0.011)	0.427***	(0.016)
Agriculture	0.014	-0.002	(0.003)	0.007*	(0.004)
Construction	0.016	0.003	(0.003)	0.003	(0.004)
Manufacturing	0.017	0.014***	(0.004)	0.154***	(0.012)
Retail Trade	0.000	0.000	(0.000)	-0.000	(0.001)
Transportation & Warehousing	0.003	0.003	(0.002)	-0.005***	(0.001)
Information	0.009	-0.002	(0.003)	0.003	(0.003)
Scientific & Technical Services	0.023	0.009**	(0.004)	0.100***	(0.011)
Business Services	0.001	0.000	(0.001)	0.002	(0.002)
Finance	0.005	-0.001	(0.002)	0.002	(0.002)
Educational Services	0.043	0.005	(0.006)	0.089***	(0.010)
Healthcare & Social Assistance	0.058	0.016**	(0.007)	0.092***	(0.011)
Arts, Entertainment, & Recreation	0.001	0.001	(0.001)	0.000	(0.001)
Hotels & Restaurants	0.012	-0.003	(0.003)	0.009**	(0.004)
Other Services	0.025	-0.004	(0.004)	0.001	(0.004)
Public Adminministration	0.003	-0.001	(0.001)	-0.000	(0.001)
Life Skills	0.077	0.045***	(0.008)	0.165***	(0.015)
Business Skills	0.021	0.017***	(0.004)	0.173***	(0.013)
Observations	3,338	4,756		1,371	

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development. The sample is a cross-section for all TEC applicants from January 2013 through June 2015 with any pre-application MPH record. The outcome is an indicator for earning a professional or course certificate in the the listed industry. See Table B-1 for the mapping of certificate programs to industries. All columns show simple differences re-weighted using inverse propensity score weights. Statistical significance at the 10, 5, and 1 percent levels are denoted respectively by *, **, and ***.

Table A-14: Effects of The Excel Center on College Credits

	Did Not Enroll	Enrolled		Graduated	
	Mean	Coef.	S.E.	Coef.	S.E.
	(1)	(2)	(3)	(4)	(5)
Any	0.115	-0.026***	(0.007)	0.211***	(0.015)
Agriculture	0.001	-0.000	(0.001)	0.001	(0.001)
Construction	0.004	-0.001	(0.001)	0.005	(0.004)
Manufacturing	0.003	-0.001	(0.001)	0.006**	(0.003)
Transportation & Warehousing	0.000	0.000***	(.)	0.002	(0.002)
Information	0.001	-0.001	(0.001)	0.001	(0.001)
Scientific & Technical Services	0.014	-0.004	(0.003)	0.039***	(0.007)
Business Services	0.003	-0.001	(0.002)	0.002	(0.002)
Educational Services	0.007	-0.002	(0.002)	0.013***	(0.004)
Healthcare & Social Assistance	0.035	-0.008*	(0.004)	0.071***	(0.009)
Arts, Entertainment, & Recreation	0.001	-0.000	(0.001)	0.002	(0.001)
Hotels & Restaurants	0.001	-0.000	(0.001)	0.008***	(0.003)
Other Services	0.004	-0.002	(0.001)	0.009**	(0.003)
Public Adminministration	0.005	0.002	(0.002)	0.005	(0.003)
Business Skills	0.012	-0.002	(0.002)	0.033***	(0.007)
Liberal Arts	0.036	-0.005	(0.004)	0.046***	(0.009)
Observations	3,338	4,756		1,371	

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development. The sample is a cross section of all TEC applicants from January 2013 through June 2015 with any pre-application MPH record. The outcome is an indicator for earning any college credit in the listed industry. See Table B-2 for the mapping of degree programs to industries. All columns are re-weighted using inverse propensity score weights. Statistical significance at the 10, 5, and 1 percent levels are denoted respectively by *, **, and ***.

Table A-15: Effects of The Excel Center on Certificate-Predicted Industry Employment

	Did Not Enroll	Enrolled		Graduated	
	Mean	Coef.	S.E.	Coef.	S.E.
	(1)	(2)	(3)	(4)	(5)
Any	0.512	0.008***	(0.001)	0.094***	(0.005)
Construction	0.030	-0.000	(0.000)	-0.001	(0.001)
Manufacturing	0.106	-0.002***	(0.001)	-0.015***	(0.003)
Wholesal Trade	0.014	-0.000***	(0.000)	-0.003***	(0.000)
Retail Trade	0.066	0.001**	(0.001)	0.000	(0.001)
Transportation & Warehousing	0.022	-0.000*	(0.000)	-0.004***	(0.000)
Business Services	0.085	-0.000	(0.000)	-0.013***	(0.001)
Educational Services	0.009	-0.000***	(0.000)	-0.003***	(0.000)
Healthcare & Social Assistance	0.052	0.003***	(0.001)	0.059***	(0.004)
Hotels & Restaurants	0.095	0.007***	(0.001)	0.080***	(0.003)
Other Services	0.013	-0.000	(0.000)	-0.003***	(0.000)
Other	0.037	-0.000	(0.000)	-0.007***	(0.001)
Healthcare Sub-Industries					
Nursing Home	0.014	0.001***	(0.000)	0.006***	(0.001)
Vocational Rehabilitation	0.003	0.000	(0.000)	-0.000***	(0.000)
Individual & Family	0.005	0.000	(0.000)	0.002***	(0.000)
Home Health	0.004	0.001***	(0.000)	0.014***	(0.001)
General Medicine	0.007	-0.000***	(0.000)	-0.003***	(0.000)
Other Health	0.020	0.002***	(0.000)	0.040***	(0.004)
Observations	3,338	4,756		1,371	

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development. The sample is a cross section of all TEC applicants from January 2013 through June 2015 with any pre-application MPH record. The outcome is the predicted probability of employment in an industry based on types of certificates obtained. All columns are re-weighted using inverse propensity score weights. Standard errors clustered by person are in parentheses. Statistical significance at the 10, 5, and 1 percent levels are denoted respectively by *, **, and ***.

Table A-16: Effects of The Excel Center on Credit-Predicted Industry Employment

	Did Not Enroll	Enrolled		Graduated	
	Mean	Coef.	S.E.	Coef.	S.E.
	(1)	(2)	(3)	(4)	(5)
Any	0.507	0.001	(0.001)	0.054***	(0.002)
Construction	0.030	0.000	(0.001)	0.003***	(0.001)
Manufacturing	0.104	0.001*	(0.000)	-0.001	(0.001)
Wholesal Trade	0.014	-0.000	(0.000)	0.000	(0.000)
Retail Trade	0.065	0.000	(0.000)	0.009***	(0.001)
Transportation & Warehousing	0.022	-0.000	(0.000)	-0.000	(0.000)
Business Services	0.085	0.000	(0.000)	0.001	(0.000)
Educational Services	0.009	-0.000	(0.000)	0.001**	(0.000)
Healthcare & Social Assistance	0.051	-0.001	(0.001)	0.019***	(0.002)
Hotels & Restaurants	0.094	0.002***	(0.000)	0.013***	(0.001)
Other Services	0.013	-0.000	(0.000)	0.001***	(0.000)
Other	0.037	-0.000	(0.000)	0.010***	(0.001)
Healthcare Sub-Industries					
Nursing Home	0.013	-0.000	(0.000)	0.004***	(0.000)
Vocational Rehabilitation	0.003	-0.000	(0.000)	0.001***	(0.000)
Individual & Family	0.004	-0.000	(0.000)	0.001***	(0.000)
Home Health	0.004	-0.000***	(0.000)	0.001***	(0.000)
General Medicine	0.007	-0.000	(0.000)	0.005***	(0.001)
Other Health	0.020	-0.000	(0.000)	0.006***	(0.001)
Observations	3,338	4,756		1,371	

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development. The sample is a cross section of all TEC applicants from January 2013 through June 2015 with any pre-application MPH record. The outcome is the predicted probability of employment in an industry based on types of college credits earned. All columns are re-weighted using inverse propensity score weights. Standard errors clustered by person are in parentheses. Statistical significance at the 10, 5, and 1 percent levels are denoted respectively by *, **, and ***.

Table A-17: Effects of Enrollment and Graduation from The Excel Center on Industry Employment, Black Females

	Any	Const.	Mfg.	Wholesale	Retail	Trans.	Business Services	Education	Health	Hotel & Restaurant	Other Services	Other
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Enrolled X Year 1	-0.033	-0.000	0.004	0.002	-0.012	0.013	-0.041	-0.000	-0.014	0.017	0.000	-0.002
	(0.034)	(0.000)	(0.004)	(0.002)	(0.018)	(0.009)	(0.025)	(0.004)	(0.023)	(0.021)	(0.002)	(0.013)
Enrolled X Year 2	0.041	-0.000	0.002	0.002	-0.001	0.009	0.010	-0.003	-0.011	0.057**	-0.002	-0.022
	(0.029)	(0.000)	(0.006)	(0.002)	(0.028)	(0.011)	(0.022)	(0.004)	(0.015)	(0.027)	(0.004)	(0.015)
Enrolled X Year 3	0.053*	-0.001	-0.001	0.001	-0.045	0.013	-0.010	0.001	0.006	0.100**	-0.001	-0.011
	(0.031)	(0.001)	(0.006)	(0.002)	(0.047)	(0.010)	(0.029)	(0.008)	(0.018)	(0.042)	(0.005)	(0.010)
Enrolled X Year 4	0.053	-0.003	-0.002	0.003	-0.016	0.015	-0.003	0.009	0.000	0.059*	0.006*	-0.015
	(0.035)	(0.002)	(0.008)	(0.003)	(0.027)	(0.012)	(0.031)	(0.008)	(0.023)	(0.033)	(0.003)	(0.014)
Enrolled X Year 5	0.059*	-0.002	0.004	0.004	0.038***	0.008	-0.021	0.014*	0.008	0.055*	0.002	-0.050*
	(0.032)	(0.001)	(0.007)	(0.003)	(0.014)	(0.014)	(0.027)	(0.008)	(0.025)	(0.031)	(0.004)	(0.025)
Graduated X Year 1	0.003	0.000	-0.012	0.002	0.039*	0.008	0.007	-0.006**	-0.008	-0.019	0.003	-0.012**
	(0.027)	(0.000)	(0.008)	(0.004)	(0.023)	(0.007)	(0.018)	(0.003)	(0.012)	(0.021)	(0.003)	(0.005)
Graduated X Year 2	-0.033	0.000	-0.018**	0.006	0.022	-0.002	-0.020	0.021	0.023	-0.055**	0.000	-0.012
	(0.032)	(0.000)	(0.009)	(0.005)	(0.021)	(0.010)	(0.021)	(0.017)	(0.019)	(0.025)	(0.004)	(0.007)
Graduated X Year 3	0.032	-0.000	-0.010	0.009	0.003	0.005	-0.034	0.038*	0.051**	-0.044*	0.011*	-0.005
	(0.030)	(0.000)	(0.009)	(0.007)	(0.022)	(0.013)	(0.020)	(0.022)	(0.022)	(0.026)	(0.006)	(0.009)
Graduated X Year 4	0.015	0.000	-0.016*	0.003	0.008	0.013	-0.040**	0.028	0.043*	-0.052*	-0.000	0.026*
	(0.033)	(0.000)	(0.010)	(0.005)	(0.021)	(0.013)	(0.020)	(0.022)	(0.023)	(0.027)	(0.005)	(0.015)
Graduated X Year 5	-0.018	-0.000	-0.015	-0.002	0.006	0.007	-0.009	0.015	0.000	-0.053**	-0.002	0.034*
	(0.034)	(0.000)	(0.010)	(0.004)	(0.023)	(0.010)	(0.020)	(0.009)	(0.025)	(0.026)	(0.004)	(0.018)
Relative Quarter FE	X	X	X	X	X	X	X	X	X	X	X	X
Person FE	X	X	X	X	X	X	X	X	X	X	X	X
Calendar Quarter FE	X	X	X	X	X	X	X	X	X	X	X	X
Age Bin X Rel. Quarter FE	X	X	X	X	X	X	X	X	X	X	X	X
Com. Mean - Year 4	0.676	0.003	0.018	0.002	0.124	0.019	0.198	0.006	0.109	0.143	0.003	0.050
Com. Mean - Year 5	0.655	0.002	0.013	0.003	0.057	0.029	0.185	0.003	0.113	0.145	0.006	0.101
$P(\hat{\beta}^{Pre1-8}_{Enroll} = 0)$	0.983	0.611	0.308	0.545	0.849	0.200	0.429	0.223	0.151	0.358	0.589	0.578
$P(\hat{\beta}^{Pre1-8}_{Grad} = 0)$	0.224	0.633	0.421	0.956	0.192	0.104	0.237	0.444	0.679	0.077	0.216	0.869
R^2	0.48	0.07	0.18	0.24	0.20	0.19	0.21	0.27	0.35	0.28	0.21	0.21
Observations	55,440	55,440	55,440	55,440	55,440	55,440	55,440	55,440	55,440	55,440	55,440	55,440
Individuals	1,386	1,386	1,386	1,386	1,386	1,386	1,386	1,386	1,386	1,386	1,386	1,386

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development. The sample includes all TEC applicants from January 2013 through June 2015 with any pre-application MPH record. Time is measured in quarters relative to application date. The outcome is an indicator for quarterly employment in the listed industry. All columns include quarters -20 through 19 and are re-weighted using inverse propensity score weights. Standard errors clustered by individual are in parentheses. Statistical significance at the 10, 5, and 1 percent levels are denoted respectively by *, **, and ***.

Table A-18: Effects of Enrollment and Graduation from The Excel Center on Industry Employment, White Females

	Any	Const.	Mfg.	Wholesale	Retail	Trans.	Business Services	Education	Health	Hotel & Restaurant	Other Services	Other
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Enrolled X Year 1	0.027	0.002	0.001	0.001	-0.026*	0.003	-0.003	-0.000	-0.002	0.051**	0.000	0.001
	(0.026)	(0.002)	(0.003)	(0.001)	(0.015)	(0.004)	(0.014)	(0.002)	(0.011)	(0.021)	(0.006)	(0.005)
Enrolled X Year 2	0.051*	-0.000	-0.001	0.000	-0.015	-0.000	0.004	-0.004	0.011	0.045*	0.010*	0.002
	(0.027)	(0.002)	(0.006)	(0.001)	(0.017)	(0.003)	(0.012)	(0.003)	(0.011)	(0.025)	(0.006)	(0.004)
Enrolled X Year 3	0.043	0.003	0.002	-0.001	0.006	0.001	0.014	-0.005	-0.011	0.032	0.005	-0.001
	(0.032)	(0.002)	(0.008)	(0.002)	(0.018)	(0.004)	(0.012)	(0.004)	(0.020)	(0.026)	(0.005)	(0.006)
Enrolled X Year 4	0.078**	0.002	0.011	0.000	0.030*	0.001	0.013	-0.010**	0.012	0.007	0.008**	0.004
	(0.033)	(0.002)	(0.007)	(0.003)	(0.017)	(0.004)	(0.015)	(0.005)	(0.012)	(0.027)	(0.004)	(0.005)
Enrolled X Year 5	0.093***	0.002	0.014*	0.001	0.015	0.002	0.010	-0.004	0.020*	0.021	0.010**	0.004
	(0.034)	(0.004)	(0.007)	(0.002)	(0.019)	(0.004)	(0.015)	(0.003)	(0.011)	(0.026)	(0.004)	(0.006)
Graduated X Year 1	-0.053**	-0.003	-0.001	-0.001	0.005	-0.000	-0.025**	0.002	-0.002	-0.028	-0.000	0.000
	(0.025)	(0.002)	(0.005)	(0.001)	(0.017)	(0.003)	(0.012)	(0.003)	(0.009)	(0.021)	(0.006)	(0.007)
Graduated X Year 2	0.030	0.002	-0.004	-0.000	0.028	0.006	-0.006	0.007	0.029**	-0.040*	0.001	0.009
	(0.029)	(0.003)	(0.006)	(0.002)	(0.019)	(0.005)	(0.015)	(0.005)	(0.013)	(0.024)	(0.007)	(0.009)
Graduated X Year 3	0.074**	0.002	-0.008	0.005	0.017	0.005	-0.012	0.022***	0.055***	-0.030	0.006	0.012
	(0.032)	(0.004)	(0.007)	(0.005)	(0.019)	(0.005)	(0.015)	(0.008)	(0.017)	(0.024)	(0.007)	(0.009)
Graduated X Year 4	0.089***	0.003	0.002	0.003	0.029	0.001	-0.014	0.023***	0.043***	-0.028	-0.001	0.029**
	(0.033)	(0.004)	(0.009)	(0.004)	(0.020)	(0.004)	(0.016)	(0.008)	(0.015)	(0.023)	(0.005)	(0.012)
Graduated X Year 5	0.108***	0.002	-0.004	0.001	0.024	0.007	0.009	0.025**	0.049***	-0.034	0.002	0.025**
	(0.033)	(0.005)	(0.009)	(0.004)	(0.019)	(0.006)	(0.017)	(0.010)	(0.017)	(0.023)	(0.006)	(0.012)
Relative Quarter FE	X	X	X	X	X	X	X	X	X	X	X	X
Person FE	X	X	X	X	X	X	X	X	X	X	X	X
Calendar Quarter FE	X	X	X	X	X	X	X	X	X	X	X	X
Age Bin X Rel. Quarter FE	X	X	X	X	X	X	X	X	X	X	X	X
Com. Mean - Year 4	0.387	0.001	0.013	0.003	0.064	0.005	0.070	0.009	0.034	0.177	0.002	0.010
Com. Mean - Year 5	0.343	0.004	0.012	0.002	0.066	0.004	0.069	0.002	0.035	0.138	0.001	0.011
$P(\hat{\beta}^{Pre1-8}_{Enroll} = 0)$	0.801	0.351	0.109	0.443	0.060	0.828	0.526	0.380	0.573	0.962	0.044	0.934
$P(\hat{\beta}^{Pre1-8}_{Grad} = 0)$	0.769	0.176	0.068	0.594	0.522	0.945	0.288	0.131	0.538	0.381	0.767	0.450
R^2	0.41	0.17	0.16	0.09	0.22	0.14	0.15	0.23	0.34	0.27	0.30	0.14
Observations	51,680	51,680	51,680	51,680	51,680	51,680	51,680	51,680	51,680	51,680	51,680	51,680
Individuals	1,292	1,292	1,292	1,292	1,292	1,292	1,292	1,292	1,292	1,292	1,292	1,292

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development. The sample includes all TEC applicants from January 2013 through June 2015 with any pre-application MPH record. Time is measured in quarters relative to application date. The outcome is an indicator for quarterly employment in the listed industry. All columns include quarters -20 through 19 and are re-weighted using inverse propensity score weights. Standard errors clustered by individual are in parentheses. Statistical significance at the 10, 5, and 1 percent levels are denoted respectively by *, **, and ***.

Table A-19: Effects of Enrollment and Graduation from The Excel Center on Industry Employment, Black Males

	Any	Const.	Mfg.	Wholesale	Retail	Trans.	Business Services	Education	Health	Hotel & Restaurant	Other Services	Other
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Enrolled X Year 1	-0.020	0.001	-0.002	0.005**	-0.008	-0.007	-0.013	0.004	-0.004	0.006	-0.000	-0.001
	(0.025)	(0.002)	(0.005)	(0.002)	(0.011)	(0.008)	(0.017)	(0.005)	(0.009)	(0.021)	(0.003)	(0.006)
Enrolled X Year 2	0.064**	-0.001	-0.001	0.002	0.008	-0.004	0.025	0.004	-0.004	0.045**	-0.016	0.006
	(0.029)	(0.003)	(0.008)	(0.004)	(0.013)	(0.009)	(0.019)	(0.005)	(0.008)	(0.019)	(0.015)	(0.006)
Enrolled X Year 3	0.072**	-0.003	0.012*	-0.001	0.008	-0.010	0.013	0.004	-0.011	0.055**	-0.001	0.005
	(0.029)	(0.004)	(0.007)	(0.005)	(0.015)	(0.009)	(0.020)	(0.005)	(0.010)	(0.022)	(0.004)	(0.008)
Enrolled X Year 4	0.075**	-0.004	0.021***	0.006	-0.007	-0.008	0.025	-0.001	-0.008	0.038*	0.005	0.008
	(0.030)	(0.004)	(0.007)	(0.005)	(0.015)	(0.009)	(0.020)	(0.008)	(0.010)	(0.020)	(0.005)	(0.006)
Enrolled X Year 5	0.062**	-0.006	0.016*	0.010**	0.018	0.009	0.003	0.003	-0.013	0.012	0.006	-0.000
	(0.030)	(0.005)	(0.009)	(0.005)	(0.012)	(0.009)	(0.020)	(0.005)	(0.009)	(0.021)	(0.005)	(0.008)
Graduated X Year 1	-0.016	0.000	-0.007*	-0.003	0.021	0.000	-0.023	0.001	-0.005	-0.007	0.009	-0.000
	(0.034)	(0.003)	(0.004)	(0.005)	(0.020)	(0.013)	(0.020)	(0.001)	(0.010)	(0.023)	(0.010)	(0.010)
Graduated X Year 2	0.057	-0.001	0.007	-0.004	0.009	0.033*	-0.009	0.006	0.004	-0.003	0.015	0.001
	(0.044)	(0.004)	(0.011)	(0.006)	(0.020)	(0.019)	(0.030)	(0.006)	(0.011)	(0.033)	(0.021)	(0.012)
Graduated X Year 3	0.078*	0.007	-0.009	-0.004	0.021	0.006	0.027	0.002	0.005	-0.014	0.022	0.016
	(0.040)	(0.008)	(0.010)	(0.005)	(0.023)	(0.013)	(0.031)	(0.002)	(0.011)	(0.038)	(0.017)	(0.012)
Graduated X Year 4	0.060	0.004	0.002	-0.005	0.033	-0.012	0.053*	0.004	0.008	-0.025	-0.009*	0.006
	(0.044)	(0.005)	(0.015)	(0.006)	(0.025)	(0.013)	(0.029)	(0.006)	(0.015)	(0.037)	(0.005)	(0.012)
Graduated X Year 5	0.091*	0.010	0.002	0.001	0.035	-0.001	0.015	0.011	0.029	-0.017	0.009	-0.002
	(0.047)	(0.008)	(0.014)	(0.008)	(0.026)	(0.014)	(0.029)	(0.007)	(0.020)	(0.037)	(0.009)	(0.011)
Relative Quarter FE	X	X	X	X	X	X	X	X	X	X	X	X
Person FE	X	X	X	X	X	X	X	X	X	X	X	X
Calendar Quarter FE	X	X	X	X	X	X	X	X	X	X	X	X
Age Bin X Rel. Quarter FE	X	X	X	X	X	X	X	X	X	X	X	X
Com. Mean - Year 4	0.497	0.012	0.014	0.007	0.080	0.034	0.170	0.008	0.029	0.124	0.007	0.011
Com. Mean - Year 5	0.488	0.015	0.022	0.005	0.055	0.025	0.191	0.001	0.031	0.127	0.007	0.016
$P(\hat{\beta}^{Pre1-8}_{Enroll} = 0)$	0.858	0.334	0.140	0.942	0.836	0.390	0.298	0.432	0.685	0.169	0.475	0.530
$P(\hat{\beta}^{Pre1-8}_{Grad} = 0)$	0.624	0.216	0.020	0.167	0.953	0.778	0.182	0.601	0.297	0.399	0.379	0.267
R^2	0.43	0.22	0.16	0.18	0.19	0.19	0.22	0.41	0.24	0.22	0.16	0.14
Observations	47,320	47,320	47,320	47,320	47,320	47,320	47,320	47,320	47,320	47,320	47,320	47,320
Individuals	1,183	1,183	1,183	1,183	1,183	1,183	1,183	1,183	1,183	1,183	1,183	1,183

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development. The sample includes all TEC applicants from January 2013 through June 2015 with any pre-application MPH record. Time is measured in quarters relative to application date. The outcome is an indicator for quarterly employment in the listed industry. All columns include quarters -20 through 19 and are re-weighted using inverse propensity score weights. Standard errors clustered by individual are in parentheses. Statistical significance at the 10, 5, and 1 percent levels are denoted respectively by *, **, and ***.

Table A-20: Effects of Enrollment and Graduation from The Excel Center on Industry Employment, White Males

	Any	Const.	Mfg.	Wholesale	Retail	Trans.	Business Services	Education	Health	Hotel & Restaurant	Other Services	Other
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Enrolled X Year 1	-0.036	-0.009	0.001	-0.009	0.007	0.006	-0.041**	0.003*	-0.000	-0.001	0.001	0.009
	(0.028)	(0.009)	(0.008)	(0.007)	(0.019)	(0.004)	(0.019)	(0.002)	(0.006)	(0.022)	(0.007)	(0.007)
Enrolled X Year 2	-0.010	-0.029*	0.017	-0.008	0.047**	-0.019*	-0.016	0.000	-0.004	-0.016	0.007	0.012*
	(0.032)	(0.017)	(0.013)	(0.005)	(0.020)	(0.010)	(0.020)	(0.002)	(0.007)	(0.030)	(0.006)	(0.007)
Enrolled X Year 3	0.018	-0.055*	0.016	-0.010	0.046**	-0.010	0.055***	0.001	-0.007	0.006	-0.026**	0.004
	(0.045)	(0.029)	(0.015)	(0.010)	(0.021)	(0.008)	(0.020)	(0.002)	(0.007)	(0.029)	(0.010)	(0.010)
Enrolled X Year 4	0.004	-0.051*	0.030**	-0.011	0.007	0.000	0.039*	0.000	-0.004	0.010	-0.021	0.004
	(0.047)	(0.029)	(0.015)	(0.011)	(0.022)	(0.008)	(0.023)	(0.001)	(0.006)	(0.027)	(0.014)	(0.012)
Enrolled X Year 5	0.058	-0.034	0.033*	0.005	0.030	0.004	0.020	-0.002	0.003	0.027	-0.020	-0.004
	(0.047)	(0.031)	(0.017)	(0.007)	(0.019)	(0.010)	(0.022)	(0.002)	(0.005)	(0.025)	(0.014)	(0.013)
Graduated X Year 1	-0.035	-0.004	-0.007	0.004	0.008	0.000	-0.005	0.008	-0.012	0.001	-0.014	-0.013
	(0.029)	(0.005)	(0.009)	(0.005)	(0.023)	(0.009)	(0.022)	(0.010)	(0.011)	(0.025)	(0.009)	(0.013)
Graduated X Year 2	0.035	-0.004	-0.015	0.005	0.006	0.004	0.055*	0.023	-0.001	-0.022	-0.010	-0.006
	(0.037)	(0.009)	(0.013)	(0.005)	(0.024)	(0.014)	(0.032)	(0.019)	(0.012)	(0.030)	(0.011)	(0.015)
Graduated X Year 3	0.086**	-0.009	-0.015	0.005	0.025	0.010	0.060*	0.021	-0.002	-0.011	-0.007	0.009
	(0.036)	(0.011)	(0.016)	(0.009)	(0.027)	(0.013)	(0.034)	(0.019)	(0.011)	(0.027)	(0.008)	(0.016)
Graduated X Year 4	0.065	-0.009	0.007	0.003	0.044	0.008	0.021	0.004	0.009	-0.010	-0.009	-0.005
	(0.042)	(0.012)	(0.019)	(0.008)	(0.028)	(0.013)	(0.030)	(0.005)	(0.012)	(0.032)	(0.010)	(0.016)
Graduated X Year 5	0.034	-0.024	0.066*	-0.011	0.028	0.022	0.004	0.010	0.008	-0.052**	-0.009	-0.009
	(0.048)	(0.018)	(0.034)	(0.007)	(0.029)	(0.018)	(0.025)	(0.010)	(0.014)	(0.024)	(0.008)	(0.017)
Relative Quarter FE	X	X	X	X	X	X	X	X	X	X	X	X
Person FE	X	X	X	X	X	X	X	X	X	X	X	X
Calendar Quarter FE	X	X	X	X	X	X	X	X	X	X	X	X
Age Bin X Rel. Quarter FE	X	X	X	X	X	X	X	X	X	X	X	X
Com. Mean - Year 4	0.583	0.096	0.052	0.021	0.089	0.018	0.106	0.000	0.009	0.133	0.031	0.027
Com. Mean - Year 5	0.548	0.109	0.059	0.011	0.064	0.021	0.105	0.001	0.006	0.110	0.024	0.038
$P(\hat{\beta}^{Pre1-8}_{Enroll} = 0)$	0.688	0.172	0.668	0.593	0.465	0.203	0.219	0.297	0.678	0.398	0.658	0.105
$P(\hat{\beta}^{Pre1-8}_{Grad} = 0)$	0.736	0.363	0.121	0.412	0.559	0.490	0.300	0.290	0.514	0.898	0.345	0.150
R^2	0.45	0.29	0.24	0.16	0.23	0.25	0.19	0.21	0.30	0.24	0.24	0.17
Observations	39,640	39,640	39,640	39,640	39,640	39,640	39,640	39,640	39,640	39,640	39,640	39,640
Individuals	991	991	991	991	991	991	991	991	991	991	991	991

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development. The sample includes all TEC applicants from January 2013 through June 2015 with any pre-application MPH record. Time is measured in quarters relative to application date. The outcome is an indicator for quarterly employment in the listed industry. All columns include quarters -20 through 19 and are re-weighted using inverse propensity score weights. Standard errors clustered by individual are in parentheses. Statistical significance at the 10, 5, and 1 percent levels are denoted respectively by *, **, and ***.

Table A-21: Effect of Enrollment and Graduation from The Excel Center on Employment Stability

	Number of Quarters				Coef. of Variation Earnings
	Employed	Continuous Employment Any	Continuous Employment in Sector	Continuous Employment in Industry	
	(1)	(2)	(3)	(4)	(5)
Panel A: Black Females					
Graduated	-0.19	-0.14	0.09	0.43	-0.05
	(0.51)	(0.54)	(0.35)	(0.30)	(0.07)
Enrolled	-0.25	-0.57	0.10	0.08	-0.02
	(0.80)	(1.05)	(0.35)	(0.26)	(0.12)
Comp. Mean	13.08	10.27	5.22	4.36	1.31
R^2	0.00	0.00	0.00	0.00	0.00
Observations	1,386	1,386	1,386	1,386	1,320
Panel B: White Females					
Graduated	0.94*	0.89*	0.80**	0.96***	-0.35***
	(0.50)	(0.47)	(0.32)	(0.29)	(0.07)
Enrolled	1.76***	1.57***	0.86**	0.62*	-0.12
	(0.63)	(0.52)	(0.36)	(0.33)	(0.09)
Comp. Mean	8.01	5.81	3.81	3.36	1.77
R^2	0.02	0.02	0.02	0.02	0.03
Observations	1,293	1,293	1,293	1,293	1,168
Panel C: Black Males					
Graduated	1.34**	1.55**	0.76*	0.81**	-0.19**
	(0.62)	(0.63)	(0.42)	(0.40)	(0.08)
Enrolled	1.24***	1.03**	0.71***	0.77***	-0.19**
	(0.43)	(0.41)	(0.21)	(0.19)	(0.07)
Comp. Mean	9.87	6.99	3.89	3.30	1.70
R^2	0.02	0.02	0.02	0.02	0.01
Observations	1,183	1,183	1,183	1,183	1,100
Panel D: White Males					
Graduated	0.89	1.32**	0.95**	1.07***	-0.27***
	(0.55)	(0.59)	(0.39)	(0.34)	(0.07)
Enrolled	0.57	-0.05	-0.42	-0.76*	0.01
	(0.52)	(0.55)	(0.45)	(0.44)	(0.08)
Comp. Mean	11.11	8.87	5.74	5.35	1.42
R^2	0.01	0.01	0.01	0.01	0.01
Observations	994	994	994	994	935

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development. The sample includes all TEC applicants from January 2013 through June 2015 with any pre-application MPH record. This sample uses one observation per applicant. Outcomes are measured using post-application earnings data in quarter -20 to quarter 19. Column (1) counts the total number of quarters with positive earnings. Columns (2) count the longest string of consecutive quarters of with positive earnings. Columns (3) and (4) narrow to consecutive strings with the same 2-digit NAICS code and 6-digit NAICS code, respectively. Column (5) measures the coefficient of variation of total earnings across quarters within a person. All specifications measure simple post-period differences, weighted by inverse propensity scores. Standard errors clustered by individual are in parentheses. Statistical significance at the 10, 5, and 1 percent levels are denoted respectively by *, **, and ***.

Table A-22: Effects of The Excel Center on Professional Certificates, Black Females

	Did Not Enroll	Enrolled		Graduated	
	Mean	Coef.	S.E.	Coef.	S.E.
	(1)	(2)	(3)	(4)	(5)
Any	0.232	0.079**	(0.039)	0.434***	(0.037)
Agriculture	0.002	0.002	(0.003)	-0.003	(0.002)
Construction	0.003	-0.000	(0.004)	-0.001	(0.003)
Manufacturing	0.026	0.016	(0.012)	0.049**	(0.021)
Retail Trade	0.000	0.000***	(0.000)	0.000***	(0.000)
Transportation & Warehousing	0.000	0.000***	(0.000)	0.000***	(0.000)
Information	0.021	-0.015	(0.010)	-0.004	(0.004)
Scientific & Technical Services	0.025	0.004	(0.012)	0.134***	(0.032)
Business Services	-0.000	-0.000	(0.000)	0.005	(0.005)
Finance	0.000	0.001	(0.001)	0.001	(0.003)
Educational Services	0.090	0.005	(0.023)	0.071**	(0.030)
Healthcare & Social Assistance	0.091	0.030	(0.024)	0.138***	(0.033)
Arts, Entertainment, & Recreation	0.002	-0.002	(0.002)	-0.000	(0.000)
Hotels & Restaurants	0.014	-0.003	(0.007)	0.013	(0.010)
Other Services	0.022	-0.003	(0.009)	0.012	(0.013)
Public Adminministration	0.002	0.002	(0.003)	-0.004*	(0.002)
Life Skills	0.091	0.065***	(0.024)	0.228***	(0.039)
Business Skills	0.008	0.031***	(0.008)	0.267***	(0.035)
Observations	319	918		268	

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development. The sample is a cross-section for all TEC applicants from January 2013 through June 2015 with any pre-application MPH record. The outcome is an indicator for earning a professional or course certificate in the the listed industry. See Table B-1 for the mapping of certificate programs to industries. All columns show simple differences re-weighted using inverse propensity score weights. Statistical significance at the 10, 5, and 1 percent levels are denoted respectively by *, **, and ***.

Table A-23: Effects of The Excel Center on Professional Certificates, White Females

	Did Not Enroll	Enrolled		Graduated	
	Mean	Coef.	S.E.	Coef.	S.E.
	(1)	(2)	(3)	(4)	(5)
Any	0.347	0.028	(0.046)	0.368***	(0.035)
Agriculture	0.029	-0.000	(0.012)	0.016	(0.013)
Construction	0.003	0.007	(0.005)	-0.003	(0.006)
Manufacturing	0.022	-0.004	(0.010)	0.148***	(0.025)
Retail Trade	0.003	0.000	(0.004)	-0.001	(0.004)
Transportation & Warehousing	-0.000	0.001	(0.001)	-0.001	(0.001)
Information	0.007	-0.002	(0.005)	0.000	(0.005)
Scientific & Technical Services	0.048	-0.007	(0.016)	0.051***	(0.019)
Business Services	0.001	0.001	(0.002)	-0.002	(0.002)
Finance	0.016	-0.006	(0.009)	0.013	(0.009)
Educational Services	0.110	0.038	(0.026)	0.183***	(0.033)
Healthcare & Social Assistance	0.135	0.022	(0.029)	0.081***	(0.031)
Arts, Entertainment, & Recreation	0.000	0.000***	(0.000)	0.000***	(0.000)
Hotels & Restaurants	0.014	0.002	(0.008)	0.000	(0.009)
Other Services	0.015	0.001	(0.010)	-0.012*	(0.007)
Public Adminministration	-0.000	0.003	(0.002)	0.008	(0.006)
Life Skills	0.143	0.015	(0.029)	0.205***	(0.034)
Business Skills	0.054	0.013	(0.018)	0.183***	(0.030)
Observations	283	814		325	

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development. The sample is a cross-section for all TEC applicants from January 2013 through June 2015 with any pre-application MPH record. The outcome is an indicator for earning a professional or course certificate in the the listed industry. See Table B-1 for the mapping of certificate programs to industries. All columns show simple differences re-weighted using inverse propensity score weights. Statistical significance at the 10, 5, and 1 percent levels are denoted respectively by *, **, and ***.

Table A-24: Effects of The Excel Center on Professional Certificates, Black Males

	Did Not Enroll	Enrolled		Graduated	
	Mean	Coef.	S.E.	Coef.	S.E.
	(1)	(2)	(3)	(4)	(5)
Any	0.288	0.062*	(0.032)	0.367***	(0.051)
Agriculture	0.003	0.003	(0.004)	-0.006**	(0.003)
Construction	0.042	-0.006	(0.013)	0.026	(0.022)
Manufacturing	0.018	0.022**	(0.010)	0.167***	(0.038)
Retail Trade	0.000	0.000***	(0.000)	0.000***	(0.000)
Transportation & Warehousing	0.013	-0.006	(0.007)	0.001	(0.009)
Information	0.011	0.003	(0.008)	0.022	(0.016)
Scientific & Technical Services	0.033	0.043***	(0.014)	0.154***	(0.042)
Business Services	0.000	-0.000***	(.)	0.005	(0.005)
Finance	0.002	0.001	(0.003)	0.001	(0.005)
Educational Services	0.024	-0.012	(0.009)	0.026*	(0.015)
Healthcare & Social Assistance	0.059	0.022	(0.016)	0.074**	(0.033)
Arts, Entertainment, & Recreation	0.003	0.001	(0.004)	-0.000	(0.004)
Hotels & Restaurants	0.022	-0.014	(0.009)	0.025	(0.019)
Other Services	0.056	-0.017	(0.015)	0.004	(0.022)
Public Adminministration	0.008	-0.006	(0.006)	-0.003	(0.002)
Life Skills	0.099	0.079***	(0.023)	0.154***	(0.050)
Business Skills	0.021	0.028**	(0.011)	0.193***	(0.044)
Observations	344	751		149	

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development. The sample is a cross-section for all TEC applicants from January 2013 through June 2015 with any pre-application MPH record. The outcome is an indicator for earning a professional or course certificate in the the listed industry. See Table B-1 for the mapping of certificate programs to industries. All columns show simple differences re-weighted using inverse propensity score weights. Statistical significance at the 10, 5, and 1 percent levels are denoted respectively by *, **, and ***.

Table A-25: Effects of The Excel Center on Professional Certificates, White Males

	Did Not Enroll	Enrolled		Graduated	
	Mean	Coef.	S.E.	Coef.	S.E.
	(1)	(2)	(3)	(4)	(5)
Any	0.481	-0.044	(0.045)	0.431***	(0.034)
Agriculture	0.061	-0.010	(0.019)	0.044*	(0.024)
Construction	0.080	-0.005	(0.023)	0.026	(0.027)
Manufacturing	0.041	0.034*	(0.018)	0.283***	(0.043)
Retail Trade	0.000	0.000***	(0.000)	0.000***	(0.000)
Transportation & Warehousing	0.003	0.027***	(0.008)	-0.027***	(0.008)
Information	0.013	0.010	(0.011)	-0.012	(0.010)
Scientific & Technical Services	0.053	-0.008	(0.019)	0.116***	(0.029)
Business Services	0.006	-0.001	(0.005)	0.008	(0.008)
Finance	0.004	0.005	(0.006)	-0.000	(0.008)
Educational Services	0.019	0.007	(0.012)	0.128***	(0.037)
Healthcare & Social Assistance	0.107	-0.015	(0.039)	0.070**	(0.031)
Arts, Entertainment, & Recreation	0.008	0.001	(0.009)	-0.005	(0.006)
Hotels & Restaurants	0.035	-0.022	(0.016)	0.008	(0.011)
Other Services	0.119	-0.033	(0.027)	0.006	(0.026)
Public Adminministration	0.004	-0.002	(0.005)	-0.002	(0.002)
Life Skills	0.140	0.064**	(0.031)	0.087**	(0.044)
Business Skills	0.059	0.008	(0.019)	0.097**	(0.038)
Observations	263	628		197	

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development. The sample is a cross-section for all TEC applicants from January 2013 through June 2015 with any pre-application MPH record. The outcome is an indicator for earning a professional or course certificate in the the listed industry. See Table B-1 for the mapping of certificate programs to industries. All columns show simple differences re-weighted using inverse propensity score weights. Statistical significance at the 10, 5, and 1 percent levels are denoted respectively by *, **, and ***.

Table A-26: Effects of The Excel Center on College Credits, Black Females

	Did Not Enroll	Enrolled		Graduated	
	Mean	Coef.	S.E.	Coef.	S.E.
	(1)	(2)	(3)	(4)	(5)
Any	0.136	-0.017	(0.029)	0.215***	(0.037)
Agriculture	-0.000	0.001	(0.001)	-0.001	(0.001)
Construction	0.000	0.000***	(0.000)	0.000***	(0.000)
Manufacturing	0.002	-0.002	(0.002)	0.006	(0.006)
Transportation & Warehousing	0.000	0.000***	(0.000)	0.000***	(0.000)
Information	0.004	-0.004	(0.004)	0.004	(0.004)
Scientific & Technical Services	0.012	-0.003	(0.007)	0.009	(0.008)
Business Services	0.000	0.003*	(0.002)	0.001	(0.004)
Educational Services	0.010	-0.005	(0.006)	0.026**	(0.011)
Healthcare & Social Assistance	0.066	-0.014	(0.018)	0.107***	(0.030)
Arts, Entertainment, & Recreation	0.002	-0.001	(0.003)	-0.002	(0.002)
Hotels & Restaurants	0.003	-0.000	(0.003)	0.014	(0.011)
Other Services	-0.000	0.001	(0.001)	0.002	(0.003)
Public Adminministration	0.005	0.002	(0.004)	0.006	(0.007)
Business Skills	0.014	0.010	(0.013)	0.036**	(0.018)
Liberal Arts	0.035	-0.008	(0.014)	0.035**	(0.016)
Observations	319	918		268	

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development. The sample is a cross section of all TEC applicants from January 2013 through June 2015 with any pre-application MPH record. The outcome is an indicator for earning any college credit in the listed industry. See Table B-2 for the mapping of degree programs to industries. All columns are re-weighted using inverse propensity score weights. Statistical significance at the 10, 5, and 1 percent levels are denoted respectively by *, **, and ***.

Table A-27: Effects of The Excel Center on College Credits, White Females

	Did Not Enroll	Enrolled		Graduated	
	Mean	Coef.	S.E.	Coef.	S.E.
	(1)	(2)	(3)	(4)	(5)
Any	0.133	-0.046	(0.040)	0.202***	(0.031)
Agriculture	0.000	0.000	(0.000)	0.005	(0.005)
Construction	0.000	-0.000	(0.000)	0.003	(0.003)
Manufacturing	-0.000	0.001	(0.001)	-0.001	(0.001)
Transportation & Warehousing	0.000	0.000***	(0.000)	0.000***	(0.000)
Information	0.003	-0.002	(0.004)	0.002	(0.003)
Scientific & Technical Services	0.040	-0.033	(0.036)	0.027*	(0.015)
Business Services	0.005	-0.001	(0.005)	-0.002	(0.003)
Educational Services	0.007	-0.000	(0.005)	0.029**	(0.012)
Healthcare & Social Assistance	0.044	-0.004	(0.014)	0.069***	(0.020)
Arts, Entertainment, & Recreation	-0.000	0.002	(0.002)	-0.002	(0.002)
Hotels & Restaurants	0.000	0.002	(0.002)	0.001	(0.004)
Other Services	0.000	0.000	(0.000)	0.012*	(0.006)
Public Adminministration	0.001	0.001	(0.002)	0.016*	(0.010)
Business Skills	0.011	-0.004	(0.006)	0.020**	(0.010)
Liberal Arts	0.037	-0.007	(0.016)	0.063***	(0.020)
Observations	283	814		325	

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development. The sample is a cross section of all TEC applicants from January 2013 through June 2015 with any pre-application MPH record. The outcome is an indicator for earning any college credit in the listed industry. See Table B-2 for the mapping of degree programs to industries. All columns are re-weighted using inverse propensity score weights. Statistical significance at the 10, 5, and 1 percent levels are denoted respectively by *, **, and ***.

Table A-28: Effects of The Excel Center on College Credits, Black Males

	Did Not Enroll	Enrolled		Graduated	
	Mean	Coef.	S.E.	Coef.	S.E.
	(1)	(2)	(3)	(4)	(5)
Any	0.078	-0.027	(0.017)	0.170***	(0.045)
Agriculture	0.000	0.000***	(0.000)	0.000***	(0.000)
Construction	0.012	-0.007	(0.007)	-0.000	(0.005)
Manufacturing	0.007	-0.005	(0.005)	0.004	(0.006)
Transportation & Warehousing	0.000	0.000	(0.000)	0.005	(0.005)
Information	0.000	-0.000***	(.)	0.011	(0.011)
Scientific & Technical Services	0.013	-0.003	(0.008)	0.046**	(0.018)
Business Services	0.003	-0.003	(0.003)	-0.000	(0.000)
Educational Services	0.000	0.004	(0.003)	-0.004	(0.003)
Healthcare & Social Assistance	0.007	0.000	(0.005)	-0.007**	(0.003)
Arts, Entertainment, & Recreation	0.000	0.000***	(0.000)	0.000***	(0.000)
Hotels & Restaurants	0.003	-0.001	(0.003)	0.010	(0.009)
Other Services	0.005	-0.002	(0.004)	0.027	(0.019)
Public Adminministration	0.000	0.003*	(0.002)	0.003	(0.004)
Business Skills	0.011	-0.002	(0.006)	0.053	(0.035)
Liberal Arts	0.020	-0.007	(0.009)	0.054**	(0.024)
Observations	344	751		149	

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development. The sample is a cross section of all TEC applicants from January 2013 through June 2015 with any pre-application MPH record. The outcome is an indicator for earning any college credit in the listed industry. See Table B-2 for the mapping of degree programs to industries. All columns are re-weighted using inverse propensity score weights. Statistical significance at the 10, 5, and 1 percent levels are denoted respectively by *, **, and ***.

Table A-29: Effects of The Excel Center on College Credits, While Males

	Did Not Enroll	Enrolled		Graduated	
	Mean	Coef.	S.E.	Coef.	S.E.
	(1)	(2)	(3)	(4)	(5)
Any	0.070	-0.016	(0.019)	0.166***	(0.036)
Agriculture	0.002	-0.002	(0.002)	0.006	(0.006)
Construction	0.006	0.003	(0.006)	0.004	(0.009)
Manufacturing	0.007	-0.003	(0.005)	0.031	(0.020)
Transportation & Warehousing	0.000	0.000***	(0.000)	0.000***	(0.000)
Information	0.006	-0.006	(0.006)	0.000	(0.000)
Scientific & Technical Services	0.019	-0.016*	(0.009)	0.022**	(0.010)
Business Services	0.000	0.000***	(0.000)	0.000***	(0.000)
Educational Services	0.010	-0.010	(0.007)	0.006	(0.006)
Healthcare & Social Assistance	0.006	-0.001	(0.007)	0.014	(0.010)
Arts, Entertainment, & Recreation	0.001	-0.001	(0.001)	0.015*	(0.009)
Hotels & Restaurants	0.000	0.000***	(0.000)	0.000***	(0.000)
Other Services	0.005	0.002	(0.006)	0.027	(0.017)
Public Adminministration	0.002	0.006	(0.004)	0.002	(0.008)
Business Skills	0.005	0.003	(0.005)	0.012	(0.010)
Liberal Arts	0.017	0.005	(0.010)	0.044**	(0.020)
Observations	263	628		197	

Notes: Data come from TEC application records linked to UI earnings data from the Indiana Department of Workforce Development. The sample is a cross section of all TEC applicants from January 2013 through June 2015 with any pre-application MPH record. The outcome is an indicator for earning any college credit in the listed industry. See Table B-2 for the mapping of degree programs to industries. All columns are re-weighted using inverse propensity score weights. Statistical significance at the 10, 5, and 1 percent levels are denoted respectively by *, **, and ***.

B Data Appendix

B.1 State Administrative Records

We measure education and labor market outcomes using administrative data from the Indiana Management Performance Hub (MPH). The data include quarterly wage records from the Indiana Department of Workforce Development (DWD); information on demographics, high school enrollment and graduation – including qualifying graduation exam (QGE) results – from the Indiana Department of Education (DOE); post-secondary education information from the Indiana Commission for Higher Education (CHE); and professional and course certificates and GED test results from DWD. All state administrative records are limited to what is observable in the state of Indiana, i.e. formal sector employment in Indiana and education obtained by public schools in Indiana.

In addition to the main sample of TEC applicants, we have these same administrative records for all recorded GED test takers in the MPH database. These records primarily cover January 2011 to January 2020. They include all people passing the GED. Coverage of unsuccessful and repeat attempts varies over time. We use data on all available GED takers to categorize higher education credits and certificates (see below). When we measure the return to the GED, we focus on a subset of people who took the test in Indiana between February and September 2014. This group has sufficient follow-up data to match our main sample and complete histories of unsuccessful and repeat tests.

B.1.1 Employment and Earnings

Employment and earnings records maintained by DWD come from the unemployment insurance (UI) system. Wages associated with quarterly UI records reflect the sum of all wages earned in a given quarter in UI-covered employment. We observe data from the first quarter of 2008 through the first quarter of 2020. This time frame allows us to observe applicants' employment and earnings outcomes at least five years before and after application for our primary sample. We winsorize earnings at the 99$^{\text{th}}$ percentile within each calendar quarter separately for our three comparison groups.[29] When identifying the 99$^{\text{th}}$ percentile, we include the implicit 0 values for individuals who do not have a wage record in a given quarter. We adjust earnings for inflation to first quarter 2014 values using the CPI-U Midwest.

We categorize employment by sector using NAICS codes. For people with multiple employers in a quarter, the data list the NAICS code for the employer that paid the most earnings. We construct NAICS industry groups based on the first two digits of the NAICS code. We concentrate on the most popular industries for our sample, including construction (23), manufacturing (31–33), wholesale (42), retail (44–45), transportation (48–49), business services (56), education (61), health care (62), hotels and restaurants (72), and other services (81). All remaining industries are classified as other. Additional detail is used to analyze employment trends in health care and social assistance. We use 4-digit NAICS codes to construct sub-sectors of health, include vocational rehab, general medicine, and home health care. All remaining health sectors are classified as "Other health." We adhere to all NAICS categorizations with the exception of daycare (62-4410), which we classify as education for our analysis.

[29] When winsorizing earnings for the GED and community college samples, we similarly winsorize separately by the relevant comparison groups.

B.1.2 Secondary Education

The MPH data includes secondary schooling records maintained by DOE. We observe enrollment records but only for secondary school enrollments that occurred within four years of starting ninth grade. The limit to four years means that we can measure enrollment in traditional schooling, which we use to define some baseline demographic and school experience controls. However, we cannot observe adult enrollment in or graduation from secondary school (TEC or otherwise) for most applicants in the administrative data. Instead, we focus on DOE reported results of the Indiana state Graduation Qualifying Exam (GQE).

We also observe GED test attempts from DWD, including test dates and test outcome (pass or fail). States use different but very similar tests for high school equivalency. In 2014, Indiana switched from the GED to the similar TASC High School Equivalency test. We refer to both of these tests as "the GED" and treat taking and passing them as interchangeable.

B.1.3 Certificates and Higher Education

We track professional and course certificates using DWD data. Common certificates for our study sample include, Preparing for College and Careers; Nutrition and Wellness; Child Development; Applied Digital Application and Responsibilities; and Technical Business Communications. These certificates do not track the date of certificate, so we consider all certificates earned as of the second quarter of 2020.

We categorize certificates into NAICS 2-digit industry codes in two ways. First, we categorize certificates directly based on course descriptions available through annually updated publications of "Indiana State Approved Course Titles and Descriptions." Certificates that were not closely associated with NAICS sectors could be classified as "Life Skills" or "Business Skills." Courses in these categories include "Preparing for College and Careers," "Technical Business Communication," or "Technology Lab."[30] Second, we categorize certificates based on the empirical distribution of employment among GED test-takers who hold that certificate. To do this, we link all GED test-takers to their industry of employment in the third quarter of 2019. We group employment into sectors using the same NAICS categorization scheme described above. For each certificate, we estimate the share of certificate-earners who work in a given industry and use these industry shares to proxy for the probability of employment in a given sector for our TEC sample.[31]

We measure higher education participation using CHE data on college credits earned and attempted. These data cover only public schools in Indiana, but the vast majority of college-going for this population will be covered by such institutions. For example, Indiana's College Readiness Reports indicate that public schools in Indiana cover 79% of college-going even for the full population of Indianapolis Public Schools students. The data are reported by school year and we aggregate across schools. Common college credit programs for our sample include Medical/Health Management and Clinical Assistant/Specialist; Liberal Arts and Science; General Studies; Business Administration and Management; and Criminal Justice/Safety Studies.

[30] Technical Business Communication and Technology Lab provide introductory information on communicating in the business place and using a suite of basic business products include Microsoft Office.

[31] For individuals in our TEC sample who have earned multiple certificates, we average the industry shares across the various earned certificates. Individuals who have not earned a certificate are assigned the industry distribution from the subset of GED-takers who also had not eared any certificates.

We also categorize credit programs into 2-digit NAICS industry codes in two ways. First, we directly code courses to industries informed by course definitions available through the National Center for Education Statistics' Classification of Instruction Programs (CIP) (National Center for Education Statistics, 2022). Courses that could not be associated with any NAICS 2-digit industry code could be classified as "Liberal Arts" (examples include humanities, liberal arts, and general studies) or "Business" (examples include business administration and management). Second, we categorize credit programs using the empirical distribution of employment among GED test-takers with at least one credit in a given field. We implement this method in the same way as for certificates.

B.2 Age Bins

In many specifications, we include interactions between a set of age bins and relative time fixed effects. We construct these age bins by identifying 20 age ventiles based on an applicant's integer age at the time of TEC application. In practice, this groups applicants into 15 age groups: 18 and under, 19, 20, 21, 22–23, 24, 25, 26–27, 28, 29–30, 31–32, 33–35, 36–39, 40–45, and 46 and older.

Table B-1: Certificate Classifications

Category	DOE Code	Course Title
Agriculture		
	5622	Tractor/Trailer Operation
	5070	Advanced Life Science: Animals (L)
	5072	Advanced Life Science: Foods (L)
	5074	Advanced Life Science: Plants and Soils (L)
	5002	Agribusiness Management
	5088	Agriculture Power, Structure and Technology
	5008	Animal Sciences
	5022	Farm Management
	5132	Horticultural Science
	5056	Introduction to Agriculture, Food and Natural Resources
	5170	Plant and Soil Science
	5229	Sustainable Energy Alternatives
Business Services		
	5592	Building and Facilities Management I
	5593	Business & Facilities Maintenance I
	5136	Landscape Management I
	5137	Landscape Management II
Business Skills		
	5268	Advanced Business Management
	4512	Applied Business Math
	4560	Business Law and Ethics
	5240	Business Technology Lab I
	5244	Business Technology Lab II
	5334	Consumer Economics
	5966	Entrepreneurship and New Ventures
	4518	Introduction to Business
	4562	Principles of Business Management
	4508	Technical Business Communications
	5260	Work Based Learning, Business and Marketing
Construction		
	4830	Construction Trades: Electrical I
	4832	Construction Trades: Electrical II
	4792	Introduction to Construction
Education		
	5360	Advanced Child Development
	5362	Child Development
	5412	Early Childhood Education I
	5406	Early Childhood Education II
	5408	Education Professions I

Continued on next page

Table B-1 – continued from previous page

Category	DOE Code	Course Title
Finance		
	5258	Banking and Investment Careers
Healthcare		
	5340	Advanced Nutrition and Wellness
	5276	Anatomy & Physiology
	5206	Dental Assisting IV
	5203	Dental Careers I
	5204	Dental Careers II
	5210	Emergency Medical Services
	5282	Health Science Education I
	5284	Health Science Education II: Nursing
	5214	Health Science II: Pharmacy
	5215	Health Science II: Physical Therapy
	5286	Health Science II: Special Topics
	5366	Human Development and Wellness
	5336	Human and Social Services I
	5294	Integrated Health Sciences I
	5208	Intro to Community Health Services
	5213	Intro to Medical Assisting
	5272	Introduction to Health Science Careers
	5274	Medical Terminology
	5456	Nutrition Science Careers I
	5342	Nutrition and Wellness
	5216	PLTW Human Body Systems
	5217	PLTW Medical Interventions
	5218	PLTW Principles of Biomedical Sciences
	5207	Work Based Learning, Health Science
Hotels & Restaurants		
	5346	Culinary Arts and Hospitality II: Culinary Arts
	5440	Culinary Arts and Hospitality Management
	5438	Introduction to Culinary Arts and Hospitality
	5982	Marketing in Hospitality
Information		
	4790	Introduction to Communication
	5986	Radio and Television I
	5992	Radio and Television II
Life Skills		
	4528	Digital Applications and Responsibility
	4540	Personal Financial Responsibility
	5254	Career Planning and Success Skills
	5364	Interpersonal Relationships

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Table B-1 – continued from previous page

Category	DOE Code	Course Title
	5484	Personal Resource Management and Family Finance
	5394	Preparing for College and Careers
	5256	Professional Career Internship
	5330	Adult Roles and Responsibilities
Manufacturing		
	5608	Advanced Manufacturing I
	5606	Advanced Manufacturing II
	5888	Cabinet and Furniture Manufacturing
	5420	Fashion and Textile Careers I & II
	5102	Food Science
	4796	Introduction to Advanced Manufacturing and Logistics
	5380	Introduction to Fashion and Textiles
	4784	Introduction to Manufacturing
	5782	Precision Machining I
	5784	Precision Machining II
	5602	Warehouse Operations and Materials Handling
	5776	Welding Technology I
	5778	Welding Technology II
	5892	Work Based Learning, Trade and Industry
Other Services		
	X117	Auto Collision Repair Technology 1 & 2
	5514	Automotive Collision Repair I
	5544	Automotive Collision Repair II
	5510	Automotive Services Technology I
	5546	Automotive Services Technology II
	5802	Cosmetology I
	5806	Cosmetology II
	5620	Diesel Service Technology I
	5842	Recreational and Mobile Equipment I
Professional & Science Tech Services		
	4816	Aerospace Engineering PLTW
	5640	Architectural Drafting and Design I
	5610	Automation and Robotics I
	4820	Civil Engineering and Architecture PLTW
	5650	Civil Engineering and Architecture non PLTW
	5570	Commercial Photography
	4810	Computer Integrated Manufacturing PLTW
	5532	Computer Network Technology
	4534	Computer Programming I
	5236	Computer Programming II
	4801	Computer Science and Software Engineering PLTW

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Table B-1 – continued from previous page

Category	DOE Code	Course Title
	5230	Computer Tech Support
	4800	Computers in Design and Production
	4826	Digital Electronics PLTW
	5684	Electronics and Computer Technology I
	4828	Engineering Design and Development PLTW
	5550	Graphic Design and Layout
	5572	Graphic Imaging Technology
	5232	Interactive Media
	4524	Introduction to Accounting
	4794	Introduction to Design Processes
	4812	Introduction to Engineering Design PLTW
	4802	Introduction to Engineering Design non PLTW
	5350	Introduction to Housing and Interior Design
	5990	Marketing Field Experience
	5234	Network Fundamentals
	4062	Photography
	4814	Principles of Engineering PLTW
	5644	Principles of Engineering non PLTW
	5914	Principles of Marketing
	5918	Strategic Marketing
	5601	Supply Chain Management and Logistics
	5530	Three D Computer Animation and Visualization
	5211	Veterinary Careers I
	5212	Veterinary Careers II
Public Administration		
	5822	Criminal Justice I
	5824	Criminal Justice II Advanced
	5820	Fire and Rescue I
	5826	Fire and Rescue II
Retail		
	5430	Consumer Service Careers I & II
	5962	Merchandising
Transportation		
	5520	Aviation Maintenance
	5528	Aviation Operations
	4798	Introduction to Transportation

Table B-2: Credit Classifications

Category	CIP Code	Course Title
Agriculture		
	01.0000	Agriculture, General
	03.0301	Fishing and Fisheries Sciences and Management
	03.0101	Natural Resources/Conservation, General
Business Services		
	52.0302	Accounting Technology/Technician and Bookkeeping
	52.0401	Administrative Assistant and Secretarial Science, General
	52.0407	Business/Office Automation/Technology/Data Entry
	52.0402	Executive Assistant/Executive Secretary
	52.1001	Human Resources Management/Personnel Administration, General
	52.1201	Management Information Systems, General
Business Skills		
	52.0201	Business Administration and Management, General
	52.9999	Business, Management, Marketing, and Related - Support Services, Other
	52.0101	Business/Commerce, General
	52.0701	Entrepreneurship/Entrepreneurial Studies
	52.0203	Logistics, Materials, and Supply Chain Management
	52.1201	Management Information Systems, General
	52.0205	Operations Management and Supervision
	52.0213	Organizational Leadership
Construction		
	46.0499	Building/Construction Finishing, Management, - and Inspection, Other
	46.0412	Building/Construction Site Management/Manager
	46.0201	Carpentry/Carpenter
	15.1001	Construction Engineering Technology/Technician
	46.0000	Construction Trades, General
	46.9999	Construction Trades, Other
	49.0202	Construction/Heavy Equipment/Earthmoving Equipment Operation
	46.0301	Electrical and Power Transmission Installation/Installer, General
	46.0399	Electrical and Power Transmission Installers, Other
	46.0302	Electrician
	47.0201	Heating, Air Conditioning, Ventilation and Refrigeration - Maintenance Technology/Technician
	46.0414	Insulator
	46.0101	Mason/Masonry
	47.0000	Mechanics and Repairers, General
	46.0502	Pipefitting/Pipefitter and Sprinkler Fitter

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Table B-2 – continued from previous page

Category	CIP Code	Course Title
	46.0503	Plumbing Technology/Plumber
Education		
	13.0201	Bilingual and Multilingual Education
	19.0706	Child Development
	13.1210	Early Childhood Education and Teaching
	13.0101	Education, General
	13.1202	Elementary Education and Teaching
	13.1305	English/Language Arts Teacher Education
	19.0701	Human Development and Family Studies, General
	13.1311	Mathematics Teacher Education
	13.1205	Secondary Education and Teaching
	13.1099	Special Education and Teaching, Other
Fine Arts		
	50.0701	Art/Art Studies, General
	50.0501	Drama and Dramatics/Theatre Arts, General
	50.0799	Fine Arts and Art Studies, Other
	50.1002	Fine and Studio Arts Management
	50.0702	Fine/Studio Arts, General
	50.0913	Music Technology
	50.0901	Music, General
	31.0504	Sport and Fitness Administration/Management
Healthcare		
	51.0999	Allied Health Diagnostic, Intervention, and Treatment - Professions, Other
	51.0899	Allied Health and Medical Assisting Services, Other
	51.0204	Audiology/Audiologist and Speech-Language Pathology/Pathologist
	26.0101	Biology/Biological Sciences, General
	51.1005	Clinical Laboratory Science/Medical Technology/Technologist
	51.1004	Clinical/Medical Laboratory Technician
	30.25	Cognitive Science
	51.1504	Community Health Services/Liaison/Counseling
	11.0101	Computer and Information Sciences, General
	51.0601	Dental Assisting/Assistant
	51.0602	Dental Hygiene/Hygienist
	51.0699	Dental Services and Allied Professions, Other
	51.0910	Diagnostic Medical Sonography/Sonographer and - Ultrasound Technician
	09.0702	Digital Communication and Media/Multimedia
	51.0810	Emergency Care Attendant (EMT Ambulance)
	51.0904	Emergency Medical Technology/Technician (EMT Paramedic)
	42.2704	Experimental Psychology

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Table B-2 – continued from previous page

Category	CIP Code	Course Title
	51.3805	Family Practice Nurse/Nursing
	51.2601	Health Aide
	51.0706	Health Information/Medical Records Administration/ - Administrator
	51.0707	Health Information/Medical Records Technology/Technician
	51.2211	Health Services Administration
	51.0701	Health/Health Care Administration/Management
	30.2701	Human Biology
	50.0408	Interior Design
	51.3901	Licensed Practical/Vocational Nurse Training
	51.1505	Marriage and Family Therapy/Counseling
	51.3501	Massage Therapy/Therapeutic Massage
	51.0713	Medical Insurance Coding Specialist/Coder
	51.0907	Medical Radiologic Technology/Science - Radiation Therapist
	51.0801	Medical/Clinical Assistant
	51.0711	Medical/Health Management and Clinical Assistant/Specialist
	51.2603	Medication Aide
	51.3902	Nursing Assistant/Aide and Patient Care Assistant/Aide
	51.2306	Occupational Therapy/Therapist
	51.0805	Pharmacy Technician/Assistant
	51.1009	Phlebotomy Technician/Phlebotomist
	51.1102	Pre-Medicine/Pre-Medical Studies
	51.1105	Pre-Nursing Studies
	51.1502	Psychiatric/Mental Health Services Technician
	42.0101	Psychology, General
	51.2201	Public Health, General
	51.0911	Radiologic Technology/Science - Radiographer
	10.0203	Recording Arts Technology/Technician
	51.3899	Registered Nursing, Nursing Administration, Nursing - Research and Clinical Nursing, Other
	51.3801	Registered Nursing/Registered Nurse
	42.2799	Research and Experimental Psychology, Other
	51.0908	Respiratory Care Therapy/Therapist
	44.0701	Social Work
	51.1501	Substance Abuse/Addiction Counseling
	51.0909	Surgical Technology/Technologist
	09.0908	Technical and Scientific Communication
Hotels & Restaurants		
	12.0503	Culinary Arts/Chef Training
	12.0509	Culinary Science/Culinology
	52.0901	Hospitality Administration/Management, General

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Table B-2 – continued from previous page

Category	CIP Code	Course Title
	52.0999	Hospitality Administration/Management, Other
	12.0501	Baking and Pastry Arts/Baker/Pastry Chef
	12.0503	Culinary Arts/Chef Training
	12.0509	Culinary Science/Culinology
	52.0901	Hospitality Administration/Management, General
	52.0999	Hospitality Administration/Management, Other
	12.0504	Restaurant, Culinary, and Catering Management/Manager
	52.0903	Tourism and Travel Services Management
Information		
	09.9999	Communication, Journalism, and Related Programs, Other
	09.0702	Digital Communication and Media/Multimedia
	09.0401	Journalism
	25.0301	Library and Archives Assisting
	10.0203	Recording Arts Technology/Technician
	09.0101	Speech Communication and Rhetoric
	11.1004	Web/Multimedia Management and Webmaster
Liberal Arts		
	24.0101	Liberal Arts and Sciences/Liberal Studies
	24.0199	Liberal Arts and Sciences, General Studies - and Humanities, Other
	24.0101	Liberal Arts and Sciences/Liberal Studies
Liberal Arts - Humanities		
	16.0300	East Asian Languages, Literatures, and Linguistics, General
	23.0101	English Language and Literature, General
	05.0209	Folklore Studies
	16.9999	Foreign Languages, Literatures, and Linguistics, Other
	54.0101	History, General
	16.0902	Italian Language and Literature
	16.0302	Japanese Language and Literature
	24.0199	Liberal Arts and Sciences, General Studies - and Humanities, Other
	23.0101	English Language and Literature, General
	24.0102	General Studies
	54.0101	History, General
	54.0199	History, Other
	24.0103	Humanities/Humanistic Studies
Liberal Arts - Social Science		
	45.02	Anthropology
	45.0601	Economics, General
	45.1001	Political Science and Government, General
	45.11	Sociology

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Table B-2 – continued from previous page

Category	CIP Code	Course Title
	45.0401	Criminology
	45.0601	Economics, General
	45.0901	International Relations and Affairs
	45.1001	Political Science and Government, General
	44.0701	Social Work
Manufacturing		
	19.0901	Apparel and Textiles, General
	15.0699	Industrial Production Technologies/Technicians, Other
	15.0612	Industrial Technology/Technician
	48.0509	Ironworking/Ironworker
	15.0613	Manufacturing Engineering Technology/Technician
	48.0506	Sheet Metal Technology/Sheetworking
	48.0508	Welding Technology/Welder
Other Services		
	47.0608	Aircraft Powerplant Technology/Technician
	47.0607	Airframe Mechanics and Aircraft Maintenance - Technology/Technician
	47.0604	Automobile/Automotive Mechanics Technology/Technician
	47.0605	Diesel Mechanics Technology/Technician
	12.0301	Funeral Service and Mortuary Science, General
	48.0503	Machine Shop Technology/Assistant
	47.0613	Medium/Heavy Vehicle and Truck Technology/Technician
Professional Science & Tech Services		
	52.0301	Accounting
	52.0302	Accounting Technology/Technician and Bookkeeping
	14.0501	Bioengineering and Biomedical Engineering
	26.9999	Biological and Biomedical Sciences, Other
	30.0101	Biological and Physical Sciences
	26.0101	Biology/Biological Sciences, General
	26.1201	Biotechnology
	40.0501	Chemistry, General
	14.0801	Civil Engineering, General
	50.0402	Commercial and Advertising Art
	14.0901	Computer Engineering, General
	11.0203	Computer Programming, Vendor/Product Certification
	11.0701	Computer Science
	11.1006	Computer Support Specialist
	11.0901	Computer Systems Networking and Telecommunications
	11.0101	Computer and Information Sciences, General
	11.1099	Computer/Information Technology Services Administration and Management, Other

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Table B-2 – continued from previous page

Category	CIP Code	Course Title
	11.0802	Data Modeling/Warehousing and Database Administration
	50.0401	Design and Visual Communications, General
	15.1301	Drafting and Design Technology/Technician, General
	14.1001	Electrical and Electronics Engineering
	15.0503	Energy Management and Systems Technology/Technician
	14.0101	Engineering, General
	15.0699	Industrial Production Technologies/Technicians, Other
	11.0104	Informatics
	11.0401	Information Science/Studies
	11.0103	Information Technology
	22.0302	Legal Assistant/Paralegal
	52.1401	Marketing/Marketing Management, General
	15.1306	Mechanical Drafting and Mechanical Drafting CAD/CADD
	14.1901	Mechanical Engineering
	30.1801	Natural Sciences
	11.1001	Network and System Administration/Administrator
	15.0701	Occupational Safety and Health Technology/Technician
	14.0102	Pre-Engineering
	22.0202	Programs for Foreign Lawyers
	16.1603	Sign Language Interpretation and Translation
	11.0801	Web Page, Digital/Multimedia and Information Resources Design
	11.1004	Web/Multimedia Management and Webmaster
Public Administration		
	43.0103	Criminal Justice/Law Enforcement Administration
	43.0107	Criminal Justice/Police Science
	43.0104	Criminal Justice/Safety Studies
	45.0401	Criminology
	43.9999	Homeland Security, Law Enforcement, - and Related Protective Services, Other
	44.0401	Public Administration
Transportation		
	49.0205	Truck and Bus Driver/Commercial - Vehicle Operator and Instructor