DISCUSSION PAPER SERIES

IZA DP No. 10202

The Returns to Education at Community Colleges: New Evidence from the Education Longitudinal Survey

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September 2016

Forschungsinstitut
zur Zukunft der Arbeit
Institute for the Study
of Labor

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Discussion Paper No. 10202
September 2016

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ABSTRACT

The Returns to Education at Community Colleges: New Evidence from the Education Longitudinal Survey*

Community colleges have long been recognized for their potential in providing access to post-secondary education for students of limited means. Indeed, the recent #FreeTuition movement is built on community colleges as a cornerstone. Previous research on the value of community colleges in shaping earnings and career outcomes suggests that encouraging access to community college is a good investment. But, the evidence base on this issue is limited. The main limitations stem from the fact that what we know comes from data collected from cohorts of students who studied in community colleges more than twenty years ago. In the meantime, the market for higher education has changed drastically, and the Great Recession and economy of the early 21st Century have reshaped how young Americans are educated and begin their careers. For these reasons, I update the evidence on the employment and earnings effects of community college education. I study the experiences of the Educational Longitudinal Survey (ELS) cohort, which graduated from high school and began studying in community colleges at the start of the Great Recession, and who began their working careers in the years after. The experiences of this cohort are important in their own right, since they provide insight into the experiences of American workers during and after one of the largest economic downturns in modern history. Moreover, this paper will provide insight into the role post-secondary education plays in shaping economic security more generally.

JEL Classification: I21, I23, I26

Keywords: education, community college

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* Thanks to Brad Herschbein and participants at the 2016 APPAM International Research Conference in London for helpful comments and suggestions. I benefitted from the research assistance of Molly Wiltshire. Any remaining errors are my own.

Rising along with the costs of higher education are the anxieties of students and their families, and the displeasure of policy makers and politicians. Attention to this issue has sometimes led to unproductive finger pointing between state policy makers and administrators at public universities and colleges.[1] But it has also given rise to policies and serious discussion aimed at making the costs of college and student debt central to prospective students' decision-making processes. The U.S. Department of Education's launch of the College Scorecard is one example of the former. The #FreeTuition movement and the centrality of higher education costs during the 2016 U.S. Presidential campaign are examples of the latter.

Though they receive peripheral attention, community colleges are a central pillar of policies and proposals to reduce costs and student debt via consumer information, or by providing low/no cost options. Indeed, the #FreeTuition movement is fundamentally reliant on community colleges, and policies that steer students to low-cost alternatives often point students to community colleges. Indeed, there is no doubt that community colleges are relatively inexpensive. Figure 1 plots time series of the average annual cost of tuition and fees for full-time students at community colleges, along side those at colleges and universities offering 4-year degrees. Not only are community colleges less expensive, but the rate of growth in their costs has been slower, as well.

Previous research suggests that encouraging access to community college is a sound idea. But, what we know comes from data collected from cohorts of students who studied in community colleges more than twenty years ago. In the meantime, the market for higher education has changed drastically, and the Great Recession and economy of

[1] For discussions of the sources and consequences of the escalation of higher education costs, see Archibald and Feldman (2011) and Hemelt and Marcotte (2016).

the early 21st Century have reshaped how young Americans are educated and begin their careers.

In this paper, I update the evidence on the employment and earnings effects of community college education, and provide insight into the relative return to community college. I study the experiences of students from the National Center for Education Statistics' Educational Longitudinal Survey (ELS) cohort. Students in the ELS were high school seniors in 2004, and began their post-secondary and labor market careers at the time of the Great Recession. The experiences of this cohort are important in their own right, since they provide insight into the experiences of American workers during and after one of the largest economic downturns in modern history.

I also compare the employment and earnings effects of community college enrollment for the ELS cohort to the cohort of students surveyed in the National Education Longitudinal Survey (NELS). The NELS cohort began their post-secondary education and their working careers in the early to mid 1990s – a very different labor market than the one young people in the ELS cohort first experienced. These different settings provide the opportunity to assess the merits of current policy proposals encouraging sub-baccalaureate education.

Background

Community colleges have played a key role in access to post-secondary education among both recent high school graduates, and older workers attempting to upgrade their skills.[2] More than 43 percent of all students enrolled in public post-secondary education

[2] Community colleges are two-year post-secondary institutions that award associate degrees as their highest degrees. This includes junior colleges, but not proprietary schools.

in 2014 were at two-year institutions.[3] This is up from approximately 27 percent in 1970. Community colleges have a mission that includes providing open-access education to adults, as well as lifelong learning and training for non-traditional learners. But a central mission is to provide a low-cost and non-selective opportunity for students to take college coursework, earn sub-baccalaureate degrees and credentials, and potentially transfer to 4-year colleges.

Estimating the success of community colleges is made complicated by the heterogeneity of their students and the multitude of their educational objectives. Some students are full-time, degree seeking, and right out of high school. Others are mid-career workers seeking specific skills with no intent of earning an associate's degree, or pursuing continuing education or simply enrolling in course for pleasure. In this paper, I limit the focus to students enrolling in community college immediately after earning a high school diploma, whose aims are more likely utilitarian and in line with traditional college students. This is a question that has received a considerable amount of attention from researchers over the years. Previous research nearly uniformly finds substantial improvements in employment and earnings outcomes for these traditional students enrolling in community college compared to peers completing only a high school education (Grubb, 1993 & 1997; Kane and Rouse 1995; and Marcotte et al., 2005).

The empirical challenges inherent in estimating employment and earnings effects of community college attendance are of two principal types. The first is the inherent evaluation problem of establishing the counter-factual. The second is identifying the treatment. Establishing an ideal comparison group for this population is difficult because

[3] National Center for Education Statistics, *Digest of Education Statistics* (2015), Table 303.25

there is no (or very limited) variation in employment and earnings before and after enrollment with which to establish within-student estimates. So, most researchers rely on regression or matching methods, with various controls, including tests of academic proficiency administered while in high school.

The second problem of identifying the treatment of interest is complicated in the case of community college enrollment by the possibility that some students enroll with no intent to earn a diploma. Rather, they might be taking a class or two to learn a skill they perceive important in the labor market. As a result, researchers often estimate the effects of any enrollment, separate from credits earned or diplomas or credentials received.

Early evidence on the impact of community college education comes from Kane and Rouse (1995), who found the those with a community college degree earned about 20 percent more than their comparable peers with only a high school diploma. Kane and Rouse also estimated the net returns associated with coursework/credits that don't lead to a degree to be similar at both community colleges and four-year institutions: with one year's coursework associated with approximately a 5 to 8 percent increase in earnings. Gill and Leigh (1997) found similar results using the NLSY79 data. Grubb (2002) reviewed the early research on degrees and coursework at community colleges. He reported most estimates find that individuals who complete associate degrees earn about 20 to 30 percent more than high school graduates with estimates for men being somewhat lower than for women. He also concluded that a full year of coursework at either a two- or a four-year school increases earnings by about 5 to 10 percent. Grubb found no consistent evidence that certificates led to increased earnings, likely because of small sample size and effect sizes.

Marcotte et al (2005) and Marcotte (2010) updated this early work on the earnings effects of community colleges. They used data from the National Education Longitudinal Survey (NELS), a panel survey of students who generally graduated from high school in 1992. This cohort matriculated in to college and started working in the 1990s, while previous work focused mainly on students graduating high school in the 1970s. Despite the fact that the relative earnings of college educated workers rose over the period, the authors' estimates of earnings premia for young workers with community college educations in the 1990s were remarkably similar to those in earlier decades: They estimated that full-time enrollment in a community college increases earnings between 5-8 percent for each year enrolled, even if no degree was received - and that earning an associate's degree increases earnings by about 15 to 30 percent.

Recent work has employed state administrative data that provides the opportunity to link students attending community college to unemployment insurance wage (UI) records. This work has the advantage of large samples and concomitant statistical power along with detailed information about credits earned and credential and degree receipt. Using data from Kentucky, Jepsen et al (2014) report substantial earnings returns for students completing associate's degrees in 2002 to 2004, with an average earnings premium of $9,600 per year for women, and $6,000 for men. Xu and Trimble (2016) use data from North Carolina and Virginia and also find significant earnings effects for students receiving certificates at community colleges.

These papers using state administrative data provide additional evidence that community colleges can play a key role in the development of employment prospects and productive capacity in the U.S. economy. In both cases the authors exploit pre- vs. post-

enrollment earnings data to limit concerns about omitted variables that might otherwise bias estimates of treatment effects. In doing so, the authors limit external validity, because they rely on students who have previous work experience in UI covered jobs. These papers also rely on data from three southern states, further limiting external validity. An important additional limitation of studies that rely on state administrative data is that they can only observe employment effects indirectly: If a wage record is found in a state for a person observed attending community college, then the person is assumed to be employed, and if no wage record is found, they are assumed unemployed. This is often a safe assumption, but certainly not always. In the cases of Kentucky, Virginia and North Carolina, the assumption is made a hazardous by the facts that each state's largest metro areas straddle state borders.[4] This is not a limitation in nationally-representative panel survey data.

In this paper I seek to update the literature by estimating the employment and earnings effects of enrollment and study in community colleges for young people studying and starting their careers in the 2000s and 2010s, using nationally representative data. Understanding the experiences of a broad sample of young Americans will provide a useful update of the literature on both the wage and employment effects of sub-baccalaureate education. Understanding whether or how the economic value of community college study has changed for young Americans is vital to assessing the wisdom of the current policy proposals described above that rely on sub-baccalaureate study as a foundation for improving college access and reducing costs.

[4] In Kentucky, the Louisville metro area straddles the Indiana border, and the Cincinnati (Ohio) metro area is among the largest in Kentucky. Virginia's most populous region is Northern Virginia, a part of a metro area with Washington DC, Maryland and West Virginia. Charlotte, the largest metro area in North Carolina straddles the border with South Carolina.

Data and Methods

Data

To estimate the employment and earnings effects of community college enrollment for students graduating from high school in 2004, I compare students who enroll in a community college within a year of completing high school to their observationally similar peers who engaged in no post-secondary study. The main sample of interest derives from the Education Longitudinal Survey: 2002 (ELS). The ELS collected a high-school clustered random sample of students in the 10th grade in 2002, and interviewed them (along with school administrators, teachers and parents) in the initial year, and in 2004, 2006 and 2012. I restrict my analysis to the students who graduated high school on time (in 2004) and either enrolled in community college within a year of graduation or didn't enroll in post-secondary education at all. This establishes the basic treatment/control comparison. I exclude those who delay enrollment in post-secondary education because the last follow-up occurs only up eight years after the high school graduation date. So, the ELS does not provide sufficient opportunity to observe post-secondary outcomes for those whose post-secondary enrollment begins later.

The ELS collects detailed information about students and schools, and provides information on family and community life. This includes information about students' prior achievement, college plans, and college enrollment decisions. As I describe below, I attempt to limit differences between those students who enroll in community college and those who do not by controlling for student attributes, and the educational level and income of their parents. I also control for standardized math and reading scores on tests

administered to all students while still in high school. Naturally, students with higher academic ability are more likely to enroll in post-secondary study, so controlling for pre-college achievement levels helps isolate the impact of community college on employment and earnings.

I measure employment and earnings outcomes in 2012. The students in this cohort were entering the labor market and/or finishing college at the start of the Great Recession. Indeed, the labor market prospects of young workers during this period were among the worst in a generation. At the time of the ELS follow up, the unemployment rate for teens exceeded 25%, and for those in their 20s, unemployment rates exceeded 15%.[5]

In addition to estimating the earnings premium associated with sub-baccalaureate education for Millennials, another goal for this paper is to understand whether this premium has changed over time. To assess this, I construct an identical sample of graduates from the high school class of 1992 from the NELS. I define control and independent variables to be directly comparable to the ELS. Because the main, and new analyses here is on the ELS cohort, I direct the interested reader to Marcotte (2010) for a detailed discussion of the NELS.

Empirical Methods

To estimate the employment and earnings effects of community college education for the ELS cohort, I estimate a series of models in which the dependent variables are either indicators of being employed, or the annual labor earnings (if employed) at the

[5] U.S. Bureau of Labor Statistics. http://data.bls.gov

time of the 2012 follow-up, when the modal age of respondents was 26. I begin with parsimonious models, and then sequentially augment the models along two dimensions. One dimension is how community college enrollment is measured; comparing those with no post-secondary education to those who enrolled in at least one for-credit course at a community college. To measure the importance of intensity and persistence, I then add measures of credits earned, and indicators of credential or degree receipt. I also augment the models sequentially to better control for heterogeneity between respondents who attended community college and those who did not. I first control only for student demographic characteristics and parents' income and education. I then add in scores on math and reading achievement tests administered when respondents were in 10^{th} grade, as a means to control for differences in ability that might be correlated both with the likelihood of post-secondary study and labor market outcomes. The final models exploit the cluster-design of the ELS, by controlling for high-school fixed effects. In these final models, identification of employment effects comes from comparing students who enrolled in community college with peers *from their same high school* who did not. This limits threats to validity due to the possibility that high schools vary in their academic culture and quality, or are in different labor markets, both of which can affect the likelihood of post-secondary study as well as employment prospects.

In all models, I control for labor market experience at the time of the 2012 follow up. To do this, I use respondents' answer to the question of how many weeks they worked for pay in the year before the survey. I then apply this estimate to all years since their last enrollment in school (either high school or college).

To assess whether the earnings and employment effects of community college have changed, I develop a comparison sample from the NELS, and define outcome, treatment and control measures identically, and estimate the same models, described above. In the case of the NELS, outcomes were measured in 2000.

Results

Descriptive Statistics:

As a means to begin understanding the analytic sample and the characteristics of those enrolling in post-secondary study at community colleges compared to those with no post-secondary education, consider Table 1. I present descriptive statistics of relevant background characteristics, by student group. There are a number of notable differences between those with only a high school education and those enrolling in community college. For example, Millennial women are much less likely than men to stop their education at high school: Only 39.2 percent of those with no education beyond high school are women, while a majority (52.1 percent) of those studying at community colleges are women. Those with no post-secondary education are also more likely than those in community college to be African American (16.8 vs. 11.7 percent) or Hispanic (21.3 vs. 16.3 percent).

Community college students differ from their high school educated peers on dimensions other than demographics: They were measurably better students while in high school, and their parents were more likely to be college educated. Sample members who enrolled in community college scored nearly a full standard deviation higher on the

10th grade assessment of math achievement, and about half a standard deviation higher on reading. They were also much more likely to have a parent who was a college graduate (34.3 percent versus 16.8 percent for those who got no education beyond high school).

As a means to begin to begin to understand the relationship between community college and outcomes, I present unadjusted measures of employment and earnings by education in Table 1, as well. Respondents with post-secondary education had better employment and earnings outcomes than their high school educated peers. Among those with post-secondary education, more than 85.5 percent were employed at 26, compared with 72.8 percent of high school graduates. Further, the average earnings of those with at least some college was $28,893, compared to $23,940 for their high school educated peers.

Employment:

To further assess the employment outcomes of community college students compared to their high school counterparts, in Table 2 I present results of linear probability models where the dependent variable is employment at the time of the last follow-up survey.[6] Recall that the modal age of respondents was 26. All models control for student demographic characteristics and parental education and income. In column 1, I present results from a parsimonious model that compares outcomes for high school graduates to those who *ever* attended community college (regardless of intensity of study or degree receipt). I estimate that in 2012, persons in their late 20s who attended community college were about 0.118 ppts. more likely to be employed than comparable peers whose education ended with the receipt of a high school diploma ($p < 0.001$).

[6] Marginal effects at the means from logistic regression estimates are highly similar.

In Model 2 I add controls for reading and math proficiency measured in the 10th grade, to limit impacts of pre-existing differences in ability that shape both post-secondary enrollment decisions and labor market outcomes. Inclusion of these measures of math and reading ability marginally reduces the magnitude of the employment effects of community college in both samples, though these coefficients are not statistically different from one another. In any case, it is clear that community college students are substantially more likely than their high school educated peers to be employed in 2012.

In Model 3, I add controls for the number of credits earned in community college to assess the effects of enrollment intensity. I also add dummy variables to measure the employment effects of receiving a sub-baccalaureate certificate, an associate's degree, or a BA degree for those who transfer – over and above the impact of enrollment and credits earned. The probability of employment by the time ELS respondents reach their late 20s does increase with credits earned. However, even controlling for credits, the likelihood of employment for those with any enrollment was about 0.075 higher at the final follow-up. That likelihood increases by about 0.006 for each 10 credits earned. A full-time student will typically earn 30 credits in one academic year, and a typical 2-year degree requires about 60 credit hours. So, I estimate that students enrolled at a community college for a full year will be about 0.10 ppts. more likely than their high school educated peers to be employed in 2012. I find no evidence of increased employment probability associated with receipt of credentials, other than the advantage associated with their requisite credits.

In the last columns (Model 4) I present results for models that include high school fixed effects. Because high schools vary in their academic culture and quality, the impact

of college attendance could be picking up unobserved high school effects on subsequent employment outcomes. By including high-school fixed effects the impact of community college enrollment is estimated by comparing students who enroll with comparable peers who graduated from the same high school but did not pursue post-secondary study. This limits threats to validity due to the possibility that, or are in different labor markets, both of which can affect the likelihood of post-secondary study as well as employment prospects. Notably, the results change little. The relative magnitude of the impact of enrollment and degree completion on employment are statistically indistinguishable between models that do/don't control for high school fixed effects.

Earnings:

In Table 3, I present the results from a similar series of models to estimate the impact of enrollment on labor market earnings. The results in Model 1 suggest that on average, by their late 20s, Millennials enrolling in community college earn approximately 24 percent more annually than their high school educated peers ($p<0.001$). The results in Model 2 suggest that the earnings premium for associate by community college enrollment is not driven by heterogeneity in cognitive ability. Controlling for math and reading proficiency in high school, I estimate that those attending community college earn about 18.6 percent more than comparable high school educated workers.

In Model 3, I include measures of accumulated credits and credentials. As was the case for employment effects, I find that on average outcomes are better for those who attend community college (compared to their high school educated peers). I find no significant earnings advantage increase with additional, accumulated credits. I do find

that students are paid a premium for completing an associate's degree. Specifically, I estimate that by the age of 26, students attending community college earn approximately 14.3 percent more than their high school educated peers. Those who earn a two-year degree earn an additional 18.1 percent bonus. So, on net a student earning an associate's degree can expect to earn approximately a third more than an observationally similar high school graduate.

Finally, when high school fixed effects are included (Model 4) the point estimates change little. As was the case above, the key coefficients are not statistically distinguishable from those obtained in Model 3. Note that the enrollment variables in the earnings models are no longer significant. This is due not to a change in magnitude of the coefficients, but to the larger standard errors that result from relying on within-high school variation.

By Gender:

In Table 4, I consider whether the employment and earnings effects of community college education differ, by gender. As in the broader literature on higher education, the earnings effects of community college education are typically larger for women than men. Indeed the evidence of positive earnings effects for men is typically weak (Marcotte 2010; Xu and Tremble (2016)). In Table 4 I present estimates of the fully specified model of community college enrollment, credits and degree receipt on employment and then earnings, separately by gender.[7] The results are presented by outcome and gender.

[7] Specifications in Table 4 are identical to Model 3 from Tables 2 and 3. I do not include high school fixed effects because the results in the earlier tables are not distinguishable Model 3, and when stratifying on gender, cell sizes for within-high school comparisons are smaller.

I find that the relationship between community college enrollment and employment described in Table 2, is due entirely to effects for women. Young women the ELS cohort who had sub-baccalaureate education were substantially more likely than their high school educated peers to be employed in 2012. This was not true for men. Further, the earnings effects of a sub-baccalaureate education accrue mainly for women. I estimate substantially higher earnings for women who attended community college than their high school educated peers. For the ELS cohort, women who studied at community college earned about 21.4 percent more than their peers, regardless of whether or not they had earned a certificate or degree. For men, I find no statistically significant effect community college attendance on wages, unless a certificate is earned. I estimate that men who earn a certificate earn approximately a third more than their peers, but no other group of male community college students fares significantly better than similar high school graduates. The relative value of certificate programs for men may be due to the importance of certificates in the fields of mechanical repair and protective services.[8]

Comparison to NELS Cohort:

I next consider whether the employment and earnings effects of community college education are different for Millennials, compared to the earlier NELS cohort. Recall that the NELS cohort finished schooling approximately 12 years before the ELS cohort, and their employment outcomes were measured in 2000. In Table 5, I present the results of the fully specified (Model 3) of employment and earnings for both the NELS and ELS cohorts. In columns 1 and 2, it is clear that the relationship between community college and the likelihood of employment is stronger for young workers in

[8] For distributions of types of sub-baccalaureate certificates and relative earnings, see Xu and Trimble (2016).

2012, compared to the NELS cohort in 2000. Millennials who attended community college were 6.3 ppts more likely to be employed than their high school educated peers, regardless of credits earned or degrees attained. For the NELS cohort, community college increased employment likelihood only for those with substantial number of credits, and even then the effect was relatively small. This may be due to the continued decline in the economic prospects of high school educated workers over the period. More than 90 percent of the NELS cohort was employed, suggesting that in the booming economy of 1999-2000, post-secondary education was less necessary as a ticket to employment.

In columns 3 and 4, I present results for the earnings effects, by cohort. For those from the NELS cohort, community college students earned about 10.5 percent more, and those receiving an associate's degree netted approximately 24 percent higher earnings than high school graduates. These coefficients are smaller than those estimated for the cohort of Millennials from the ELS, though not statistically distinguishable at conventional levels of significance. At the very least, it is clear that there was no decline in net earning effects between the NELS and ELS cohorts.

Discussion

The early labor market experiences of young Millennials provide a useful touchstone to gauge the sagacity of recent political and policy positions to encourage more young people to enroll sub-baccalaureate education. As reviewed here, previous research has made clear that the employment and earnings effects of community college education have been substantial for earlier cohorts. While the existing literature

establishes that workers enrolled in community colleges in the early 1990s fared well in their early careers relative to their high school educated counterparts, we do not know whether this is so for those educated more recently. This paper updates the literature by studying a cohort in college in the mid 2000s.

The experiences of this cohort generally provide evidence that is supportive for policy proposals to increase access to sub-baccalaureate education. Clearly, it appears that young people entering the labor market in the late 2000s after study at a community college fared as well as those who entered the labor market in the early 1990s. I estimate that community college students from the ELS cohort were more likely to be employed and those who were earned about 14 percent more than comparable peers with only a high school education – and those earning an associate's degree earn approximately 30 percent more. This is slightly larger than the earnings difference for students from the NELS cohort.

It is important to recognize that the estimates here are based on observational data and cannot readily be interpreted as causal estimates. While the models estimated here control for student and family attributes, cognitive ability measured in high school, and high school fixed effects, those enrolling in community college are surely different from their high school educated peers in unobserved ways. Previous work using sample data has attempted to use information on the location and costs of 2- and 4-year colleges near a student's high school as instruments for post-secondary enrollment decisions. Those instrumental variables estimates generally are not different from ordinary estimates, likely because of weak first stage predictive power. Further, whether location and cost of colleges pass exclusion restrictions is an open question, since they can affect labor supply

and thereby wage and employment prospects. For the task of comparing how returns to community college education have changed over time, concern about selection bias is less of a problem: Any omitted variables bias has likely not changed substantially from the NELS cohort to the ELS cohort.

To make sense of the current estimates in light of recent policy discussions encouraging community college enrollment, it is useful to consider their magnitude in relation to the costs of enrollment. The results in Table 3 suggest that community college increases earning by about 14 percent. At the mean, that would improve earnings by about $3,350 per year. Those earning an associate's degree would earn about $7,600 more per year. The average tuition and fee costs for a year of full-time community college at the time the ELS cohort was in college was $2,631[9]. A student who studied full time at a community college for a year (without working) and left without a degree, would incur a loss of foregone wages of about $24,000 in addition to tuition and fee costs. A simple calculation (without accounting for the countervailing effects of discounting and differential rates of wage growth) implies that the earnings effect would compensate for the opportunity and direct costs of community college after 8 years. A student earning an associate's degree would make up the larger opportunity and tuition and fee costs within 7 years. [10] Even if the estimates here are 50% higher than true causal effects, the college investment would be paid off within 10 years.

Nonetheless, the declining real incomes of young workers are essential to interpreting the enduring *relative* earnings advantage of post-secondary education. In 2000, the median annual earnings of 25-34 year olds employed full-year, full-time who

[9] Digest of Education Statistics, 2006. Table 319. Dollars converted to 2012 terms using the CPI-U.
[10] Assuming foregone wages of $48,000 over two years, and $5,500 in tuition and fees.

had an associate's degree was $41,240. By 2012 it was $36,830.[11] The median cost of two years worth of tuition and fees necessary for an associate's degree was $5,426 for the ELS cohort (in 2014 dollars). For the NELS cohort it was $3,358.[12] So for an ELS sample member, an associate's degree cost 15 percent of subsequent median pre-tax annual earnings. For the NELS cohort, tuition and fees to cover the costs of an associate's degree took only 8 percent of median pre-tax annual earnings. Even if the earnings advantage associated with community college education is as large for Millennials as it was for Generation X, educated in the early 1990s, the costs of paying for that education relative to real earnings have risen markedly. These real changes are surely part of the misgivings expressed by young college educated workers who paid more for a college education than their predecessors, but earn less.

[11] Digest of Education Statistics, 2015, Table 502.30. Both figures are in 2014 dollars.
[12] Digest of Education Statistics, 1995, Table 306. Dollars converted to 2014 using the CPI-U.

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Table 1 Descriptive Statistics of the ELS Cohort

	Respondents w/ HS Degree		Respondents enrolling in Comm. College	
Variable	Mean	Standard Dev.	Mean	Standard Dev.
Background:				
Female	0.392	0.488	0.521	0.500
Black	0.168	0.374	0.117	0.321
Hispanic	0.213	0.410	0.163	0.370
Asian	0.048	0.214	0.097	0.296
Math score (10th gr.)	43.87	9.00	49.02	8.34
Reading score (10th gr.)	44.10	8.89	48.75	8.62
Parent Highest Education level				
some college	0.347	0.310	0.377	0.336
college graduate	0.168	0.310	0.343	0.411
Outcome:				
Employed at Follow up? (0/1)*	0.728	0.445	0.855	0.353
Employment Earnings	$23,940	20485	$28,893	27168

* The modal age for respondents at last follow up was 26.

Table 2 Employment Effects of Enrollment, Credits and Degrees

	ELS: HS Class of 2004			
	Model 1	Model 2	Model 3	Model 4
Enrolled in Comm. College	0.118***	0.099***	0.063***	0.064***
	0.016	0.017	0.02	0.023
Experience	0.00004**	0.00005**	0.0001***	0.0001***
	0.00002	0.00002	0.00002	0.00002
Female	-0.146***	-0.143***	-0.019*	-0.149***
	0.014	0.015	0.008	0.017
White, non-hispanic	0.062**	0.054	0.027	0.041
	0.03	0.03	0.028	0.037
Asian or pacific islander	0.041	0.032	0.008	0.009
	0.039	0.04	0.034	0.05
Black, non-hispanic	0.0456	0.072	0.032	0.072
	0.036	0.037	0.031	0.047
Hispanic	0.029	0.035	0.034	0.038
	0.035	0.035	0.03	0.044
Parent has BA?	0.05	0.038	-0.007	0.009
	0.032	0.031	0.013	0.039
Parent has some college?	0.05	0.038	-0.008	0.013
	0.03	0.032	0.008	0.036
Family Income (in 1000s)	0.003	0.001	0.001	-0.003
	0.003	0.003	0.003	0.004
HS Reading Score		0.001	0.001	0.001
		0.001	0.001	0.001
HS Math Score		0.003***	0.001	0.002
		0.001	0.001	0.0013
Credits earned			0.0002	0.0002
			0.0003	0.0003
Earned Certificate?			-0.012	-0.007
			0.014	0.04
Earned Associates Degree?			0.023	0.082**
			0.015	0.033
Earned Bachelors Degree?			0.005	0.094***
			0.021	0.027
Include HS Fixed Effects?	No	No	No	Yes
Constant	0.688***	0.543***	0.575***	0.645***
	0.048	0.0611	0.061	0.074
R-squared	0.061	0.066	0.075	0.2925
N	2792	2773	2773	2773

* p<0.05, ** p<0.01, *** p<0.001

Table 3 Earnings Effects of Enrollment, Credits and Degrees

	ELS: HS Class of 2004			
	Model 1	Model 2	Model 3	Model 4
Enrolled in Comm. College	0.242***	0.186***	.143**	0.111
	0.05	0.051	0.06	0.071
Experience	0.000	0.000	0.000	0.000
	0.001	0.001	0.001	0.001
Female	-0.348***	-0.344***	-.353***	-.372***
	0.043	0.043	0.044	0.051
White, non-hispanic	0.099	0.079	0.082	0.002
	0.091	0.091	0.091	0.111
Asian or pacific islander	0.118	0.107	0.112	0.037
	0.119	0.119	0.12	0.154
Black, non-hispanic	-0.189	-0.126	-0.111	-0.103
	0.108	0.109	0.109	0.139
Hispanic	-0.012	0.012	0.024	-0.126
	0.104	0.104	0.104	0.132
Parent has BA?	-0.051	-0.093	-0.103	-0.096
	0.099	0.099	0.099	0.12
Parent has some college?	-0.037	-0.083	-0.085	-0.061
	0.095	0.095	0.095	0.114
Family Income (in 1000s)	.037***	0.031***	0.031***	0.021
	0.01	0.01	0.01	0.012
HS Reading Score		0.005	0.005	0.005
		0.003	0.003	0.004
HS Math Score		0.009***	0.009***	0.01**
		0.003	0.003	0.004
Credits earned			-0.0003	0.005
			0.0008	0.001
Earned Certificate?			0.027	0.006
			0.099	0.114
Earned Associates Degree?			0.181**	0.067
			0.083	0.097
Earned Bachelors Degree?			0.119	0.094
			0.066	0.077
Include HS Fixed Effects?	No	No	No	Yes
Constant	9.531***	8.448***	9.003***	9.125***
	0.145	0.147	0.186	0.227
R-squared	0.053	0.063	0.066	0.3484
N	2442	2432	2432	2432

* p<0.05, ** p<0.01, *** p<0.001

Table 4 Employment and Earnings Effects of Community College, by Gender

	ELS: HS Class of 2004			
	Outcome: Employed? (0/1)		Outcome: Ln(Earnings)	
	Men	Women	Men	Women
Enrolled in Comm. College	0.029	0.128***	0.094	.214**
	0.024	0.033	0.08	0.093
Experience	0.00002	0.0002***	0.0001	0
	0.00005	0.00005	0.0001	0.00008
White, non-hispanic	0.074**	0.039	-0.038	0.167
	0.036	0.047	0.128	0.129
Asian or pacific islander	0.008	0.058	-0.042	0.256
	0.048	0.062	0.167	0.171
Black, non-hispanic	0.039	0.116*	-0.244	0.026
	0.045	0.056	0.157	0.152
Hispanic	0.052	0.038	-0.211	0.248
	0.042	0.054	0.146	0.148
Parent has BA?	-0.039	0.076	-0.172	-0.025
	0.041	0.047	0.144	0.135
Parent has some college?	-0.036	0.086	-0.135	-0.032
	0.04	0.045	0.14	0.131
Family Income (in 1000s)	0.001	0.001	0.028	0.035**
	0.004	0.005	0.015	0.015
HS Reading Score	-0.0002	0.001	0.003	0.008
	0.012	0.002	0.004	0.005
HS Math Score	0.0013	0.004*	0.004	0.014***
	0.0013	0.002	0.005	0.005
Credits earned	-0.0003	0.0003	0.0003	-0.001
	0.0004	0.0004	0.001	0.001
Earned Certificate?	0.058	-0.045	0.362**	-0.235
	0.045	0.049	0.15	0.133
Earned Associates Degree?	0.088**	0.04	0.193	0.165
	0.037	0.042	0.123	0.114
Earned Bachelors Degree?	0.093***	0.098***	0.066	0.127
	0.029	0.034	0.096	0.092
Constant	0.772***	0.234*	9.50***	8.03***
	0.072	0.094	0.253	0.27
R-squared	0.029	0.082	0.037	0.074
N	1331	1442	1228	1204

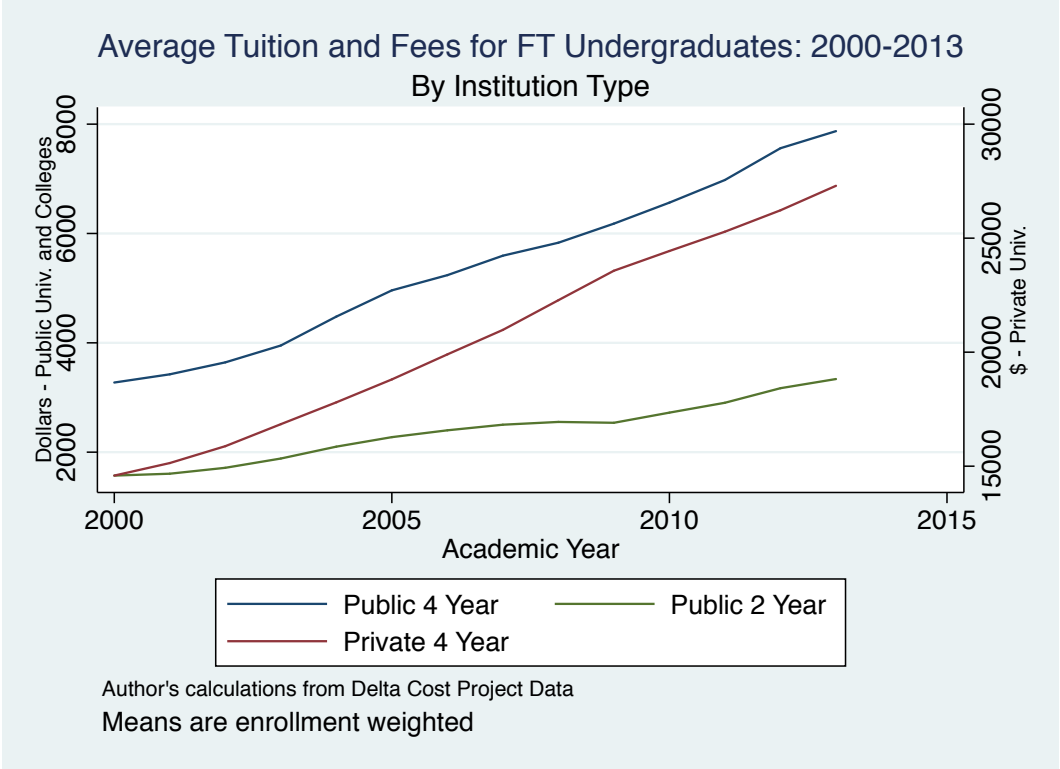
* p<0.05, ** p<0.01, *** p<0.001

Table 5 Employment Effects of Enrollment, Credits and Degrees

Outcome:	Employed? (0/1)		Ln(Earnings)	
Cohort	NELS	ELS	NELS	ELS
Enrolled in Comm. College	-0.005	0.063***	0.105**	.143**
	0.011	0.02	0.037	0.06
Experience	0.002***	0.0001***	0.015***	0.000
	0.00002	0.00002	0.001	0.001
Female	-0.019*	-0.019*	-0.390***	-.353***
	0.008	0.008	0.027	0.044
White, non-hispanic	0.027	0.027	0.064	0.082
	0.028	0.028	0.101	0.091
Asian or pacific islander	0.008	0.008	0.146	0.112
	0.034	0.034	0.121	0.12
Black, non-hispanic	0.032	0.032	0.003	-0.111
	0.031	0.031	0.111	0.109
Hispanic	0.034	0.034	0.139	0.024
	0.03	0.03	0.107	0.104
Parent has BA?	-0.007	-0.007	-0.06	-0.103
	0.013	0.013	0.044	0.099
Parent has some college?	-0.008	-0.008	-0.007	-0.085
	0.008	0.008	0.029	0.095
Family Income (in 1000s)	0.0003	0.001	0.003***	0.031***
	0.0002	0.003	0.001	0.01
HS Reading Score	-0.0005	0.001	-0.001	0.005
	0.001	0.001	0.002	0.003
HS Math Score	0.001	0.001	0.005*	0.009***
	0.001	0.001	0.002	0.003
Credits earned	0.0004*	0.0002	0.001	-0.0003
	0.0002	0.0003	0.001	0.0008
Earned Certificate?	-0.012	-0.012	0.03	0.027
	0.014	0.014	0.048	0.099
Earned Associates Degree?	0.023	0.023	0.135**	0.181**
	0.015	0.015	0.051	0.083
Earned Bachelors Degree?	0.005	0.005	0.307***	0.119
	0.021	0.021	0.07	0.066
Constant	0.756***	0.575***	8.564***	9.003***
	0.041	0.061	0.145	0.186
R-squared	0.047	0.075	0.275	0.066
N	2282	2773	2100	2432

* p<0.05, ** p<0.01, *** p<0.001

Figure 1


Average Tuition and Fees for FT Undergraduates: 2000-2013
By Institution Type
Dollars - Public Univ. and Colleges
2000
4000
6000
8000
$ - Private Univ.
15000
20000
25000
30000
2000
2005
2010
2015
Academic Year
Public 4 Year
Public 2 Year
Private 4 Year
Author's calculations from Delta Cost Project Data
Means are enrollment weighted